

**OUR VOICE: IMPLEMENTATION RESULTS OF
HEALTHY DINÉ NATION ACT
2016 - 2018**

Navajo Department of Health, Navajo Epidemiology Center
Ramona Antone-Nez, BSN, MPH and Del Yazzie

Navajo Division of Community Development
Shirleen Jumbo-Rintila

Office of the Navajo Tax Commission
Martin Ashley

Tse Si Ani Chapter
Christine Ashley

San Juan Chapter
Kathleen Skeet

Diné College
Herbert Benally, Jr., Ph.D. and Moroni Benally

Northern Arizona University, Department of Health Sciences
Kristen Tallis, B.S., Priscilla R. Sanderson, Ph.D., CRC, Hendrik 'Dirk' de Heer, Ph.D.,
and Timothy Behrens, Ph.D.

Dedication

This report is dedicated to the Navajo Nation chapters, health programs, community members, leaders, and Navajo Nation Human Research Review Board for their tireless efforts to reduce the health disparities on the Navajo Nation—they are a symbol of hope for future Navajo generations. The project team intends the report to inform the Navajo people and leaders, and through increasing awareness and sharing of resources will contribute to decreasing the burden of chronic diseases among the Navajo people.

The project team respectfully dedicates this report to the late Dr. Larry Emerson from Shiprock, New Mexico, whose previous work and vision inspired continued efforts toward sustainability and health on the Navajo Nation.

Acknowledgement

The HDNA evaluation team prepared the report to support the Navajo Nation and Healthy Diné Nation Act (HDNA) implementation to serve as a model to curb obesity and chronic diseases. The project team included representatives from the Navajo Epidemiology Center, Navajo Division of Community Development (DCD), Office of the Navajo Tax Commission (ONTC), Diné College (DC), San Juan Chapter, Tse Si Ani Chapter, and Northern Arizona University's Health Sciences Department. The Robert Wood Johnson Foundation (RWJF) funded the one-year project.

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Executive Summary

With the presence and influence of Western culture, many Navajo families moved away from their traditional way of life, and today, many Navajo people have limited access to healthy foods and recreational physical activity opportunities, and are affected by common metabolic and cardiovascular conditions. According to the Navajo Tribal Epidemiology Center's Mortality Report (2013), the top-ten leading causes of death among the Navajo people included: 1. unintentional injuries, 2. cancer, 3. heart disease, 4. diabetes, 5. liver cirrhosis, 6. influenza/pneumonia, 7. stroke, 8. dementia, 9. septicemia and 10. suicide. Currently, an estimated 25,000 Navajo suffer from diabetes, and another 75,000 have pre-diabetes, with an enormous economic and human cost (Indian Health Service, 2012; O'Connell et al., 2012).

In an effort to support health promotion and disease prevention among the Navajo people, the Navajo Nation (NN) signed into law the Healthy Diné Nation Act (HDNA) in November 2014. Informed by research that has found that taxation of unhealthy foods may reduce consumption (e.g. Andreyeva et al., 2010; Mytton et al., 2012; Powell et al., 2013), the law includes a 2% tax on foods of little-to-no-nutritional value (and removal of the 5% tax on fruits, vegetables, water), the first-ever such tax in the U.S. The 2% tax is collected and disbursed to all 110 Navajo Chapters to support Community Wellness Projects (after 20% set-asides for the Permanent Trust, Veterans Trust, Land Acquisition Fund, and Tax Suspense Fund). The Navajo Nation Council delegated the Navajo Epidemiology Center (NEC) to lead the HDNA legislation's assessment of the HDNA implementation. The HDNA legislation is up for review by the NN Council at the end of the 2020 calendar year, and this report is intended to contribute to facilitate gaining insight into the HDNA implementation.

Aims

The report had two aims:

1. **Aim one-** To determine the fidelity and implementation of the HDNA by capturing three distinct outcomes.
 1. Whether the tax has been collected as intended (i.e., compliance);
 2. Whether the disbursement to chapters has occurred as intended (i.e., distribution);
 3. Description of what the chapters have done with the tax funds (i.e., implementation).
2. **Aim two-** To assess HDNA implementation through three community/leadership surveys.
 1. Grassroots support of HDNA from chapter officials and community members;
 2. Support from leadership (i.e., Council members, community leaders);
 3. Cultural alignment of HDNA with traditional Navajo practices and concerns.

Methodology

In August 2017, the Navajo Nation Human Research Review Board approved the study of the HDNA implementation by our team. The research required mixed methodologies to evaluate the tax and address several areas of compliance, distribution, implementation, support and awareness of the tax.

To investigate the research aims, the project team used separate methods of data collection. Aim 1 required data extraction from the Division of Community Development (DCD) and Office of the Navajo Tax Commission databases relevant to chapter wellness projects, tax information, and HDNA disbursements from 2016-2018.

Aim 2 was investigated with the use of three culturally relevant survey tools that targeted specific populations among selected Fort Defiance agency, Northern agency, Navajo Nation leadership and public health officials. The surveys were conducted in person over the course of six months from February to July 2018.

Findings

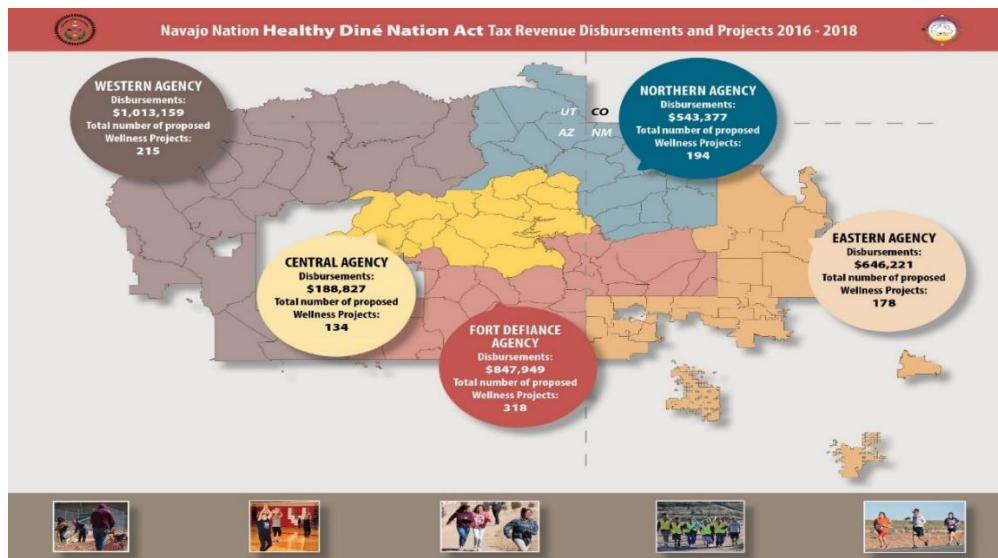
Tax revenue and disbursement

The HDNA tax on foods of little-to-no nutritious value has been implemented since the last quarter of Fiscal Year 2015. Tax revenue and disbursement data have shown that:

- The revenue generated since last quarter of FY15 is over \$4 million to date.
- Disbursements to chapters for community wellness projects has totaled over \$3.2 million (the other \$800,000 has been allocated to set-asides such as the Veterans Trust Fund).
- This indicates that annually, over \$90 million in foods of little-to-no nutritious value are being taxed annually 2% on the Navajo Nation
- No funds have been available to allow the Office of the Navajo Tax Commission, limiting their ability to provide guidance and assess compliance of businesses.

Chapter wellness programming

- As a result of the law, each chapter receives on average over \$13,000 annually for wellness programming (almost \$30,000 on average per chapter since start of the tax).
- Funds were received on average about 14 days after proposed budgets were submitted.
- Since the first collection, 1,039 chapter wellness projects have been proposed.
- Since the start of the tax, each chapter has proposed 9.5 different wellness projects, about 4 per full year of funding.
- The most commonly proposed activities are similar across agencies and include community food & water initiatives (i.e. farming and vegetable gardens), equipment purchases, wellness instruction (i.e. fitness classes) and funds for the built recreational environment (building a walking trail).



Community, Leadership survey and cultural alignment

As assessed by a survey among 238 people in two agencies (Ft. Defiance and Northern), the majority of people responded that they had heard about the tax (71.4%).

- About two thirds of respondents indicated that they knew about the tax at least moderately well ('moderately well' 26.7%, 'fairly well' 19.7%, or 'very well' 19.7%).
- About 50% of people said they 'support' or 'strongly support' taxing foods of little-to-no nutritious value, another 35% of people said they were neutral or somewhat supportive.
- Only 15% of respondents indicated they did not support the tax.
- Over 50% mentioned that they believed the Navajo people would become healthier as a result of the tax, fewer than 30% said they would not, 20% indicated they did not know.
- Purchasing behaviors generally indicate a desire to purchase healthy foods, but that access is limited on the Navajo Nation (see details in full Aim 2.1 pages 17-21).
- Several barriers to implementation are identified and center around a need for guidance with implementation, a desire to interact with the department of health, community health workers and local organizations and for materials to be tailored to the preferences of the population (culturally sensitive, visually oriented, using clear terminology).

Leadership Survey

A leadership survey among 11 community leaders and politicians indicated:

- Over 80% agreed or strongly agreed the HDNA was a strong policy) and that the HDNA was symbolic of progress.
- 100% believed that their communities were supportive of the HDNA tax.
- Almost all leaders indicated that lack of access to healthy foods in their community was a major issue and that healthy foods continued to be expensive.
- Over 90% reported an increase in chapter wellness activities as a result of the HDNA.
- More modest majorities agreed that the Navajo people were more educated about healthy eating as a result of the tax.
- Open-ended questions indicated that the leaders believed the funds in their chapter were used for physical activity promotion, such as classes, equipment and events.
- They reported their community supports the tax because of the need to address chronic disease in their community such as cancer, diabetes etc.
- They also indicated the need for increased awareness and education, and monitoring of the implementation of the tax at the policy level. At the chapter level, a need for technical support and guidance on how/what funds can be used for was identified.

Cultural alignment

A cultural assessment based on the *Hozhoogoo Na'adah* model (Benally, 2008) was conducted in two communities and a total of 100 participants and included surveys and in-depth interviews.

- The survey found that the HDNA funded chapter wellness projects impacted the community's notion of traditional Navajo health in both communities, although there were some differences between the two communities. (see full report in appendix)
- What we also uncovered from the participants is that they did not realize their actions and behaviors reflected reverence for the spirituality inherent in Navajo notions of health, activated and enhanced, in part, by the presence of health programs, and unknowingly act on the spiritual connections between eating/drinking healthily and obligations to community and clan.

- What this suggests is that health programs ought to be designed to incorporate the whole being, not just the body or the physical body. This study suggests that Navajos still associate health and mundane activities like cooking to spiritual health.
- This implies that the design of health programs in the Navajo Nation ought to be centered on maintaining balance, by drawing on activities that incorporate all four areas of knowledge (work, family, home/environment, spiritual) into the program design.

Conclusion and Recommendations

In sum, over \$4 million has been successfully collected by the Office of the Navajo Tax Commission since the start of the tax in FY2015, and (minus set asides) an average of almost \$30,000 per chapter has been successfully disbursed to all 110 chapters by the Division of Community Development. Chapters have proposed an average of 9.5 community wellness projects per chapter, or 1,046 total. Most commonly, these have been food and water initiatives, and exercise equipment, classes, or the built recreational environment.

Three separate surveys indicate that there is broad support for the tax among community members, policy and community leaders, and that the HDNA funded projects can facilitate cultural connections. Only 15% of community members surveyed opposed to the tax and over 80% of surveyed policy/decision makers indicating they thought the HDNA was a strong policy.

Community members indicated a need for chapter technical assistance/guidance with implementation, preferably from the Navajo Department of Health or Community Health Workers/local organizations. Leaders indicated a desire for improvements in monitoring of the implementation and evaluation of effectiveness. Using an in-depth cultural approach specific to the Navajo people in two chapters elicited that the HDNA funded chapter wellness projects were aligned with Navajo cultural perspectives, but that these may differ between communities.

In closing, it has been well-documented that the Navajo people and most indigenous and tribal nations suffer disproportionately from cardiovascular and metabolic conditions including type 2 diabetes. These factors were key drivers in the passage of the HDNA legislation and it is important to engage in rigorous long-term evaluation of HDNA implementation to discern effectiveness of reducing consumption of unhealthy food by taxation. However, obesity, diabetes, heart disease, and cancer are multifactorial health problems which cannot be affected solely by the elimination of a single food type in the diet. Based on our findings HDNA may ultimately address the critical public health concern by promoting communities to improve their health through physical activity, health education, and traditional knowledge, as well as improving access to these healthy resources.

The team recommends:

- Continuation of partnerships to maintain and improve ongoing HDNA evaluation efforts
- Promote research that examines risk factors and causes of obesity and chronic disease
- Increased education and awareness about HDNA legislation
- Improve HDNA monitoring, tax enforcement, and collection by addition of personnel to the ONTC to collect tax revenues from commercial businesses on the Navajo Nation
- Provide education to commercial business owners/managers
- Increase training for chapter personnel in the development and execution of culturally appropriate and health directed community wellness plans.

Introduction

The Navajo Nation (NN) is one of the largest tribal nations in the U.S. by geography and population. An estimated 173,000 members live across 110 chapters and 27,425 square miles of NN land, and an additional 175,000 tribal members live in border towns and metropolitan areas. Prior to European contact, Navajo families lived an active lifestyle and consumed healthy traditional foods that promoted by physical, spiritual, and cultural health. With the presence and influence of Western culture, many Navajo families moved away from their traditional way of life. Today the Navajo population is affected by type 2 diabetes, heart disease, end-stage renal disease, and other chronic diseases.

In November 2014, a comprehensive approach to promote the health of the Navajo people was developed in the form of a Navajo Nation (NN) legislation, the Healthy Diné Nation Act of 2014 (Navajo Nation Council CN-54-14). The law enforced a two-percent tax applied to NN businesses on all unhealthy or “little-to-no-nutritional” foods. The tax revenues generated were to be allocated and disbursed to each of the 110 chapters on the NN. The unhealthy food tax is the first of its kind in the United States. The findings from the implementation and evaluation of HDNA have substantial potential to inform public health policy nationwide, including tribal communities.

Purpose of Research

Since the HDNA legislation, there have few systematic efforts to summarize and disseminate information on tax collection, distribution, and implementation including community wellness activities. Moreover, there has been a lack of information about the HDNA awareness and evidence of health impact to the Navajo people. Therefore, the purpose of the research is to start filling the gaps through the collection of data from major stakeholders: community members, public health officials, HDNA tax authorities, and Navajo leadership to understand the implementation of HDNA. The data regarding HDNA tax compliance, distribution, and implementation plus cultural, community, and leadership perspectives were collected to gain a holistic understanding of the tax implementation outcomes.

In 2020, the HDNA legislation will be reviewed for extension by the NN Council. Therefore, it is critical to initiate the assessment of the implementation of the HDNA as a resource for the NN Council. The project was approved by the Navajo Nation Human Research Review Board (NNHRRB NNR.17-251T). The NNHRRB is an independent tribal institutional review board exercising sovereign rights to regulate, monitor and control all research activities on the NN.

Research Aims

This study sought to examine HDNA through the following Aims:

Aim one – To determine the fidelity and efficacy of the HDNA implementation by capturing three distinct outcomes. In Aim 1, HDNA implementation was assessed individually by compliance, distribution, and implementation to shed light on how these factors impact food tax policies.

1. Whether the tax has been collected as intended (i.e., compliance);
2. Whether the disbursement to chapters has occurred as intended (i.e., distribution);
3. Description of what the chapters have done with the funds (i.e., implementation).

Aim two – To determine what makes HDNA implementation successful by examining three components. In Aim 2, the exploration of leadership support provided identification of specific factors at various levels (i.e., grassroots, legislative, and cultural) that may impact the adoption and successful implementation of HDNA.

1. Grassroots support of HDNA from chapter officials and community members;
2. Support from high-level policy makers (i.e., Navajo Nation Council members and legislators);
3. Cultural alignment of HDNA with traditional Navajo practices and concerns.

Study team

The Navajo Epidemiology Center is charged with managing the Navajo Nation's public health information systems, provide data and reports to help health programs effectively manage programs, respond to public health emergencies, and coordinate these activities with other public health authorities. In this role, the NEC led the current project to study the implementation of the HDNA tax, in collaboration with partners including the Navajo Division of Community Development (DCD), the Office of the Navajo Tax Commission (OTNC), Diné College (DC), and Northern Arizona University's Health Sciences Department (NAU). Project partners from the NEC and DCD provided local community knowledge and expertise, and led the implementation and facilitation of the data collection processes. NAU provided project management and research expertise. NEC has largely facilitated the collaborative relationship between all partners.

Aim 1: HDNA Compliance, Distribution, and Chapter wellness projects

The 2014 legislation mandated that the Office of the Navajo Tax Commission (ONTC) would be responsible for enforcing and monitoring the “unhealthy food tax” on all applicable items the tax at all stores located on the Navajo Nation. The legislation also appointed the Office of Navajo Tax Commission (ONTC) and Navajo Division of Community Development (DCD) monitor, collect and distribute tax generated to the chapters. Specifically, for this Aim, we analyzed overall tax revenue data and data on chapter wellness programming. Tax data was provided by the Office of the Navajo Tax Commission (ONTC) and data on chapter wellness programming was provided by the DCD, in part through public repositories maintained by the agencies.

Aim 1.1 Total taxes collected and compliance Fiscal Years 2015-2017:

- A. What were the total taxes collected (gross revenue) in each year?
- B. Were businesses compliant with the tax?

Aim 1.2 Distribution of HDNA funds for Fiscal Years 2015-2017:

- A. Were funds from the tax distributed to chapters as intended?
- B. Did distribution change over time or by agency?
- C. Were the funds distributed according to published timelines?

Aim 1.3 The Community Wellness Projects 2016-2018:

- A. Data from the public repository (‘Woven Integrated Navajo Data’ (WIND) system) and the budget forms submitted by the Chapters to the DCD were used to assess:
 - a. Disbursement amounts
 - b. Dates of disbursements
 - c. Proposed Community Wellness Projects from 2016-2018

Results

Aim 1.1. Compliance

The gross amount generated is subject to a 20% deduction for “Set Asides” to the Permanent Trust Fund, Veterans Trust Fund, Land Acquisition Fund, and to the Tax Suspense Fund. The remaining amount is allocated to the 110 Chapters base budget on a ‘50/50 Formula’:

- 50% of net tax revenue (minus 20% NN deduction) is evenly distributed to 110 Chapters.
- 50% of annual tax revenue is distributed to chapters based on voter registration enrollment at each Chapter.

The total gross revenue generated are represented in Figure 1.

- Since Fiscal Year 2015 (FY2015), over \$4 million has been collected across 9 quarters.
- The total gross revenue in the first full two years of implementation almost 1.9 million in FY2016 (\$1,887,323) and 1.8 million in FY2017 (\$1,828,011).
- This represents over \$94.4 million (FY16) and \$91.4 million (FY17) in purchases of foods of little-to-no nutritious value over the year (gross revenue divided by 2%)
- This represents > \$500 of little-to-no nutritious foods per Navajo Nation resident/ year.
- From FY16 to FY17, the gross revenue decreased by 3.2%, primarily because of a reduction in purchases in Quarter 2 (October-December).
- Highest generated revenue was reported in the 2nd Quarter of 2016 and reflected unhealthy food purchases for October - December 2015.

- Lowest generated revenue was reported in the 3rd Quarter of 2016 and reflected unhealthy food purchases for January - March 2015.

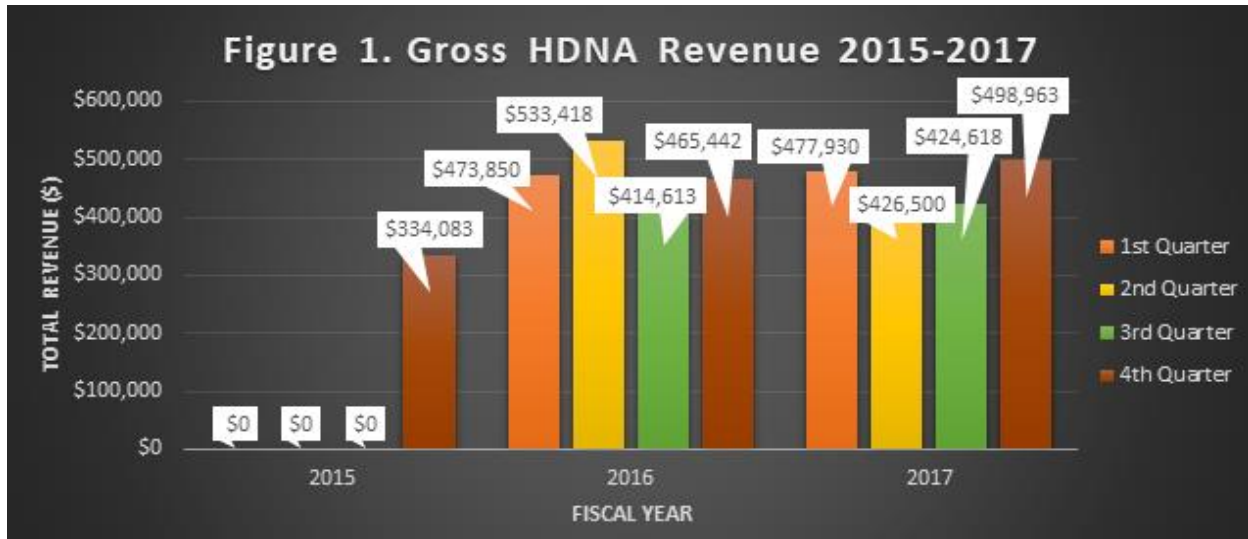


Figure 1. Gross HDNA Revenue 2015-2017

Business Compliance: As of 2017, it was disclosed that ONTC did not have the capacity (e.g. Insufficient funding, tools, resources, and staff) to enforce and ensure regular tax monitoring of the 2% tax at all businesses (personal communications, Ashley, 2017). Therefore, we do not know the sample of businesses and the proportion of businesses that are compliant at this time. The relatively stable collection and the amount of funds collected suggest that at least a proportion of the businesses are compliant.

Aim 1.2 Distribution

- FY15 generated a net amount of \$267,267 for distribution the year after. The first full year FY 2016 generated \$1.5 million in revenue that was distributed in 2017. FY 2017 generated \$1.4 million that was distributed in 2018 (see Figure 2).
- Total revenue distributed since the tax started amounts to \$3,239,533 (see Figure 2).

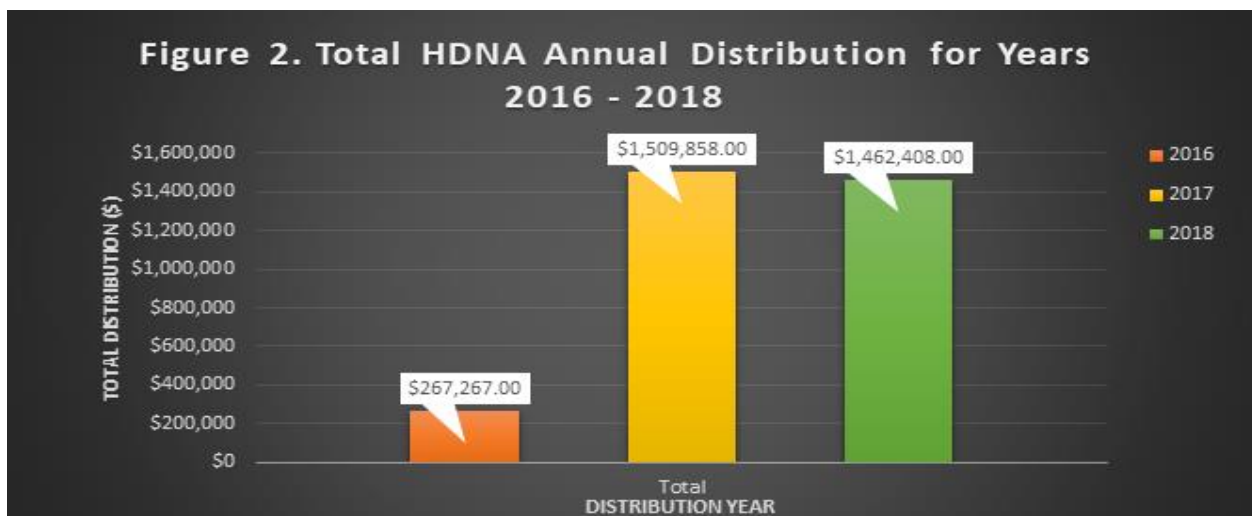


Figure 2: Total HDNA annual distribution for 2016-2018

Consistent with population estimates, from 2016 to 2018 the agency with the highest HDNA disbursements was Western Agency, followed by Fort Defiance, Central, Northern, and Eastern.

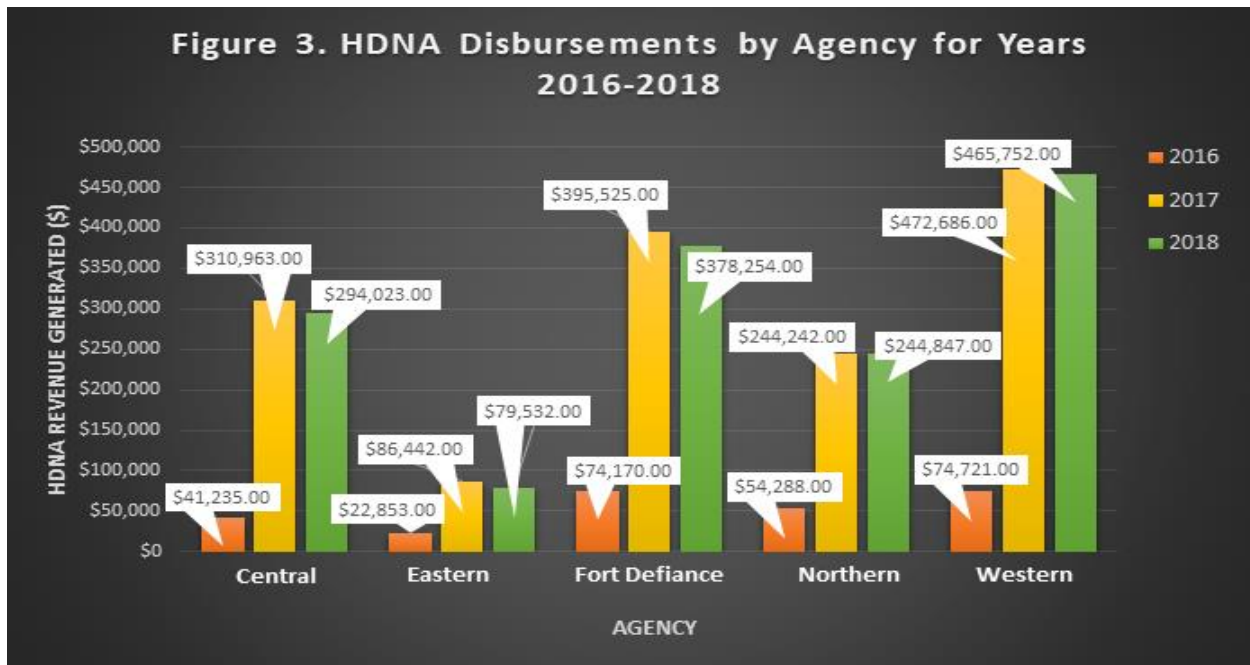
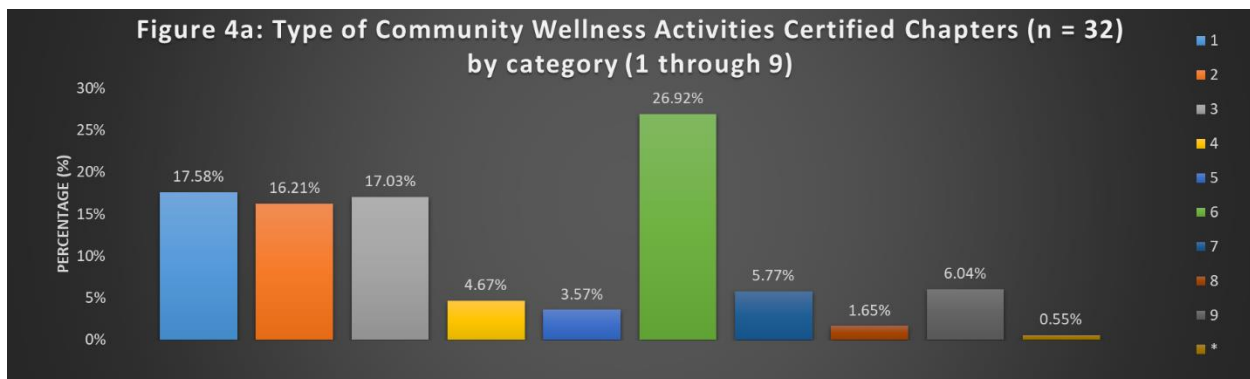
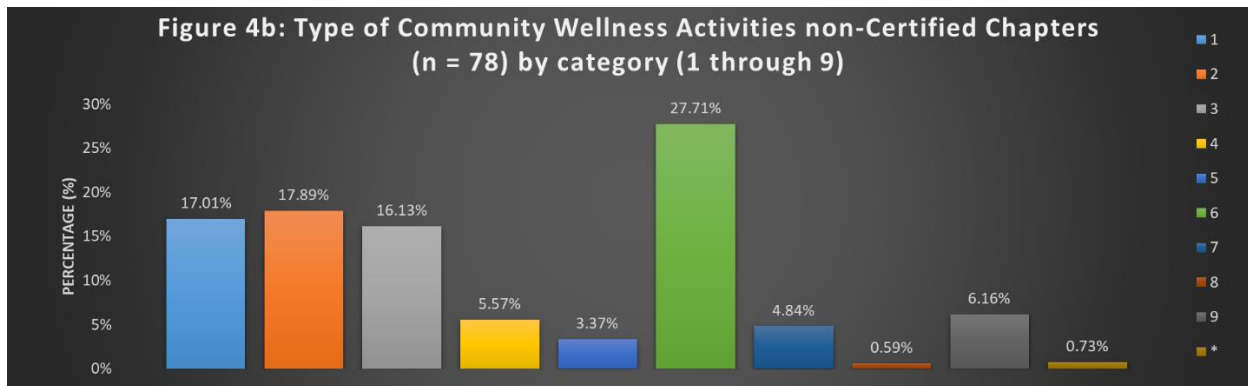


Figure 3: HDNA disbursement by agency

- Total HDNA tax revenue to date amounts to over \$3.2 million available for chapter wellness programming (\$3,239,533, Navajo Tax Commission, 2018).
- This represents almost \$30,000 on average per chapter since the inception of the tax, and approximately \$13,500 per year on average for each of the two last years.
- Total HDNA tax revenue for 2018 decreased by \$47,450, a 3.2% decrease, however the disbursement amounts were not significantly different from previous years ($p = 0.13$).
- For 2016-2018, consistent with population sizes, Western Agency received the highest HDNA allocation, whereas Eastern Agency received the lowest.
- Based on the data from the WIND software all chapters there is no difference among chapter disbursements whether they are established as certified or non-certified chapters (See Figures 4a and 4b).





Figures 4a/4b: Proportion of each activity type for certified (4a) and non-certified (4b) chapters

Time to distribution

For 2017- a total of 40 chapters recorded submission dates used to provide the total amount of days from budget form submission to an issued check (from “Date Received” to “Date Check Issued”). Data were summarized and broken down by agency.

- On average, it took about two weeks (average 13.5 days) before checks were issued across chapters in all agencies.
- The agency with the longest time (Ft. Defiance), the average was 32 days

Aim 1.3 Implementation: Chapter wellness projects

CWP data were abstracted from the public repository- the WIND system- and organized into categories based on what type of project was proposed using Microsoft Excel. Categories were predetermined by HDNA legislation into the following taxonomy:

Table 1. Categories of Community wellness projects proposed by chapters

Category type	Example
1. Instruction	Fitness class, Zumba, food preparation workshops, health coaching
2. Equipment	Exercise equipment, storage facilities
3. Built Recreational Environment	Walking trail, playground (build, maintenance, upgrade)
4. Social Setting	Youth club, senior citizens events
5. Education	Health education materials, presentations, library
6. Community Food & Water Initiatives	Farming and vegetable gardens, greenhouse, clean water initiatives
7. Healthy Emergency Preparedness	First-aid, CPR/AED courses
8. Matching Funds	Wellness projects partially funded by non-Navajo or tribal budgets
9. Additional Expenses	Professional/consultation fees, incentives, promotional items

Results

A chapter can propose many different activities with the HDNA funds. For example, funds permitting, one chapter could propose to purchase equipment, teach nutrition classes and build a walking trail.

- In total, there were 1,046 data points collected providing information on CWPs from 2016-2018 (only seven data points had chapters without any proposed CWPs).
- In 2016, a total of 190 projects were proposed (funds collected in FY15), which increased to 455 in 2017, the first full year funds were distributed, which decreased to 394 in 2018 (funds collected in FY17).

- The numbers indicate that on average, each chapter proposes approximately 4 different wellness activities each year with funding from a full year.
- Since the inception of the tax, each chapter has, on average, proposed between 9 and 10 (average 9.5) different wellness projects/activities.
- The Eastern Agency had the highest number of chapters in the agency, but the smallest amount of funds distributed and the smallest overall proportion of CWP projects.

Table 2. Number of HDNA funded Community Wellness Projects for 2016-2018 by agency

Years	Central	Eastern	Ft. Defiance	Northern	Western	NN Yearly Total
1 - 2016	21	36	58	40	35	190
2 - 2017	65	76	147	78	89	455
3 - 2018	48	66	113	76	91	394
Agency Total	138	179	318	196	215	1039

Across all agencies, the types of proposed activities are fairly similar, with the same 4 categories of activities proposed.

- The most frequent project type proposed on the chapter budget forms were category 6 – Community Food and Water Initiatives for every year (2016-2018). In total, 287 of the 1,046 proposed activities fell in this category (although this category has a larger number of possible activities in comparison to other project categories).
- The next most common types of activities proposed were equipment purchases (181 total times), followed by instruction (180 times) and built recreational environment (172).
- The top 4 categories together (Community food/water initiatives, equipment, instruction and built recreational environment) accounted for 826 of the 1,046 activities (79%).
- **Table 2:** Number of HDNA funded Community Wellness Projects for 2016-2018 by agency

Table 3. 2016-2018 Community Wellness Project Totals in all Navajo agencies.

Project Types	Agency					
	Central	Eastern	Fort Defiance	Northern	Western	Total
1 – Instruction	20	33	70	23	34	180
2 – Equipment	20	34	60	43	24	181
3 – Built Recreational environment	36	17	42	32	45	172
4 – Social Setting	7	4	14	11	19	55
5 – Education	2	10	11	8	5	36
6 – Community Food and Water Initiatives	37	60	84	49	57	287
7 – Healthy Emergency Preparedness	6	8	17	17	6	54
8 – Matching funds	0	0	4	3	3	10
9 – Additional expenses	6	12	16	8	22	64
* - No projects	4	1	0	2	0	7
Grand Total	138	179	318	196	215	1046

A graphical summary to be used for dissemination is shown in Figure 5. This figure provides a visual summary of the HDNA tax distribution amounts to each agency and the number of community wellness projects implemented at each agency.

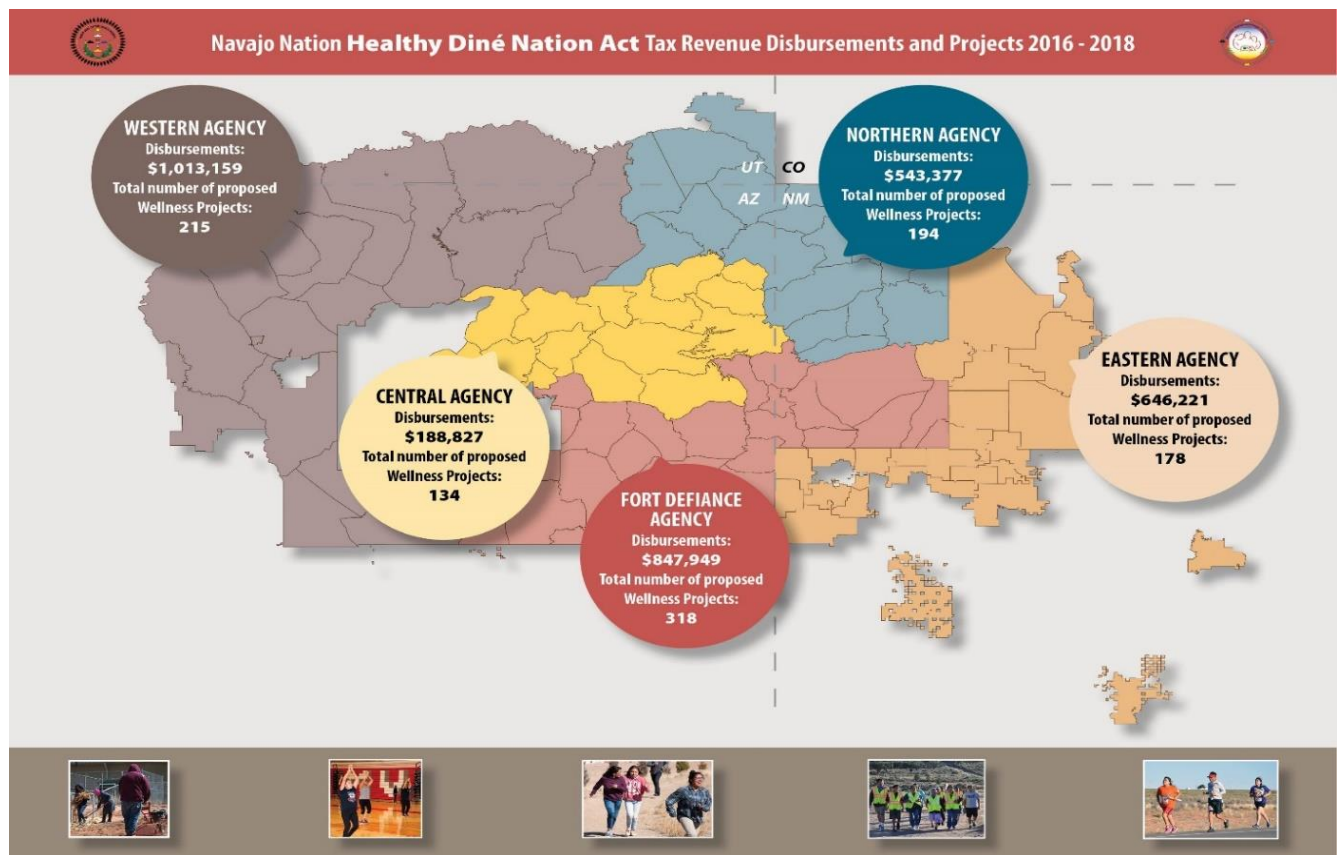


Figure 5: Infographic summarizing the amount of funds distributed within each agency and the number of wellness projects implemented 2016-2018

Summary Aim 1

The HDNA tax on foods of little-to-no nutritious value has been implemented since the last quarter of Fiscal Year 2015. The revenue generated since then is over \$4 million, and disbursements to chapters for community wellness projects totaling over \$3.2 million (the other \$800,000 has been allocated to set-asides such as the Veterans Trust Fund). This indicates that annually, over \$90 million in foods of little-to-no nutritious value are being taxed 2% on the Navajo Nation, and as a result, each chapter receives on average over \$13,000 annually for wellness programming. Funds were received on average about 20 days after proposed budgets were submitted. No funds have been available to allow the Office of the Navajo Tax Commission to assess adequate compliance by businesses.

Since the first collection, more than 1,000 wellness projects have been proposed by chapters. On average, each chapter has proposed between 9 and 10 different wellness projects since the start of the tax collection, and about 4 per full year of funding. The most commonly proposed activities are similar across agencies and include community food & water initiatives (i.e. farming and vegetable gardens), equipment purchases, wellness instruction (i.e. fitness classes) and funds for the built recreational environment (building a walking trail).

Aim 2: To gain insight into perspectives on HDNA among community, Navajo Nation Leadership, and within Navajo cultural perspective.

To gain insight into key stakeholders' knowledge of the HDNA, the extent of their support for the tax and perceptions of alignment of the HDNA with Navajo cultural values, the team conducted three separate surveys. These included:

- 2.1.** A survey among 238 community members including chapter officials across 22 selected chapters in Ft. Defiance and Northern Agencies assessing their knowledge and support for the tax, food purchasing behaviors and perceived chapter needs.
- 2.2.** An individual in-person/phone survey and interview with 10 community leaders including high-level policy makers assessing their perceptions of the tax and policy implications.
- 2.3.** A series of focus groups and in-depth interviews conducted with community members from 2 chapters assessing cultural alignment of the HDNA tax and chapter wellness programming with traditional Navajo practices and concerns.

Aim 2.1 “Our Voice” Community Survey

A 62-item survey was developed and conducted in a sample of 22 chapters in two agencies: Northern and Fort Defiance Agencies. Survey items asked about demographic characteristics, knowledge of the tax, extent of support for the tax, eating and purchasing behaviors and chapter wellness programming needs. Items were intended to gain insight into the following questions:

- What are the characteristics of people who participated in the survey?
- Do people know about the tax?
- Are people supportive of the HDNA tax?
- Are food purchasing behaviors influenced by price?
- Do people who support the tax (vs. not support the tax) differ on demographic or chapter characteristics, purchasing behaviors etc.?

To calculate the required sample size for sufficient statistical power (with a 95% confidence level with 10% margin), we aimed to recruit a total of 233 participants. The actual total number of surveys conducted was 238 (119 in each agency), just exceeding the goal. Using the Navajo Nation Population Profile, we calculated the estimated number of participants for each of the 22 communities. Anyone 18 and over affiliated with the selected chapters were eligible to participate. Bilingual (Navajo/English) interviewers administered the survey between January and April 2018. Each participant received a \$10 gas card.

Table 4. Participating chapters in the “Our Voice” community survey

Ft. Defiance Agency Chapters			Northern Agency Chapters		
Cornfields	Kinlichee	Oak Springs	Beclabito	Gad ii' Ahii	Red Valley
Crystal	Klagetoh	Red Lake	Burnham	Hogback	San Juan
Ganado	Lupton	Sawmill	Cove	Nenahnezad	Teec Nos Pos
Houck	Nahaatah Dziil		Upper Fruitland	Newcomb	

All data were entered in a spreadsheet and checked for potential errors. Analyses were conducted using the Statistical Package for the Social Sciences v.24.0 (SPSS Inc). Descriptive statistics and frequency distributions were used to summarize participant characteristics and variability of answers. Finally, inferential tests were conducted to evaluate whether demographic characteristics were associated with knowledge of and support for the HDNA tax.

Results

Across both agencies and 22 chapters, a total of 238 people participated (119 in each agency). Almost 70% of respondents were and most respondents were middle aged, with over 45% of respondents born between 1950 and 1970, 21% of respondents born before 1950 and 31% after 1970. Almost all participants were Navajo (97.0%), and over two thirds spoke Navajo in the home (most both Navajo and English). About 55% of participants had attained a high school degree or less, and 20% attained an Associates' degree or higher (5% MS/Doctorate).

Table 5. Participant demographic characteristics in community survey

Variable	Category	Value
Number of people		238
Agency	Ft. Defiance Shiprock	119 119
Males/Females	Female Male Missing/Other	69.7% 29.4% 0.9%
Urban/rural	More rural More urban or access to major highway	42.8% 57.2%
Age group (year of birth)	Before 1950 1950-1959 1960-1969 1970-1979 1980 or after Missing/Refused	21.1% 20.3% 24.9% 11% 21.3% 2.6%
Tribe	Navajo Navajo and Hopi/other Missing/Refused/Other	97.0% 1.7% 1.2%
Income level	Less than \$10,000 \$10,000-\$24,999 \$25,000-\$34,999 \$35,000-\$49,999 Over \$50,000 Missing/Refused	40.8% 26.9% 13.0% 6.3% 8.0% 5.0%
Language	Navajo English Navajo and English Other/ Missing	11.4% 30.8% 56.9% 0.9%
Education level	Less than 12 th grade High school/GED Some college or trade school College degree or higher Refused/missing	18.0% 29.4% 32.0% 19.7% 0.8%

Knowledge of and support for the tax

Most respondents had heard of the tax and felt that they knew it moderately well. Most people were at least somewhat supportive of taxing foods of little-to-no-nutritious value.

- The majority of people responded that they had heard about the tax (71.4%).
- About two thirds of respondents indicated that they knew about the tax at least moderately well ('moderately well' 26.7%, 'fairly well' 19.7%, or 'very well' 19.7%).
- About 50% of people said they 'support' or 'strongly support' taxing foods of little-to-no nutritious value, another 35% of people said they were neutral or somewhat supportive.

- Only 15% of respondents indicated they did not support the tax.
- Over 50% mentioned that they believed the Navajo people would become healthier as a result of the tax, fewer than 30% said they would not, 20% indicated they did not know.

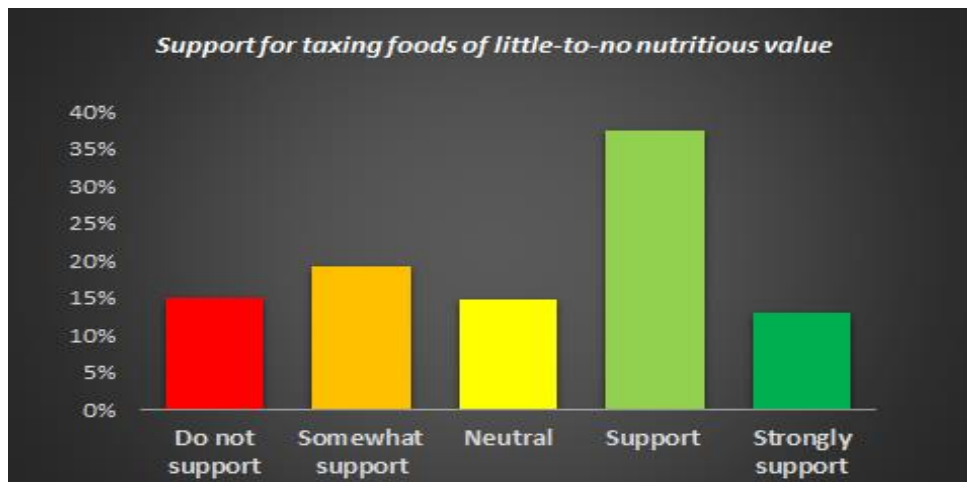


Figure 6. Support for HDNA tax of little-to-no nutritious value

Table 6: Knowledge of and support for HDNA/unhealthy food tax

Question	Category	Value
Have you heard about the Navajo Nation unhealthy food Tax?	Yes	71.4%
	No	26.9%
	Missing/don't know	1.7%
How would you rate your level of understanding of HDNA?	Not at all	12.2%
	Slightly	18.1%
	Somewhat	26.9%
	Fairly well	19.7%
	Very well	19.7%
	Refused/Don't know	3.3%
Are you in favor of taxing junk foods?	No, I do not support	15.1%
	Somewhat support	19.3%
	Neutral	14.7%
	Support	37.4%
	Strongly support	13.0%
	Missing	0.4%
Do you think Navajo people would become healthier by taxing junk foods?	Yes	51.7%
	No	29.8%
	Don't Know	18.1%
	Refused	0.4%

Purchasing behaviors and preferences

Almost 4 out of 10 participants reported not shopping on the Navajo Nation. Fast food purchasing was fairly high, although 8 out of 10 people reported their local store sold at least some fruits/vegetables. Most individuals believed their local store charges the 2% tax, but did not know whether they waived the 5% sales tax on fruits/vegetables.

- Over 55% of people reported regularly purchasing soda or fast foods.
- About 61% of people reported shopping on the Navajo Nation, and almost 37% reported not shopping on the Nation.

- Almost 54% of respondents stated that they thought their local grocery store/gas station charged the 2% tax, but only 29.4% reported that they thought the 5% sales tax was waived on fruits/vegetables.
- A high proportion of people did not know whether the taxes were levied or waived (33.6% for the 2% tax on foods of little-to-no nutritious value, 54.4% for waiving the 5% sales tax on fruits/vegetables).
- A total of 79.5% of respondents indicated that their local store sold some fruits/vegetables, and 10.8% said the local store did not.
- Approximately 90% of people reported that they had access to a refrigerator (90.8%), running water (89.3%) and transportation (89.1%)
- About a quarter (25.5%) reported receiving food stamps, and 7% supplemental nutrition/WIC support
- Over 40% (42.9%) of people reported having access to a vegetable garden or fruit tree

A series of questions queried perceptions of the impact of foods on health. The questions demonstrated that people thought foods were impactful:

- Over 90% of respondents agreed or strongly agreed that *‘what you eat can make a big difference in your chance of getting a disease, like heart disease or cancer.’*
- Respondents were split on whether they thought they currently ate healthy and did not need change (52% disagreed/ strongly disagreed vs. 48% agreed/strongly agreed)
- Respondents were also split on whether people’s weight is pre-determined and not much can be done about it as 47% agreed it cannot be modified, 53% disagreed.
- Four questions asked about the price participants would be willing to pay for a fast food meal, with price options ranging from current 2% taxed to 15% added tax. The majority of individuals indicated they would be willing to pay only the lowest or second lowest price point for fast foods (fast food meal, soda), but a higher price point for healthier foods such as apples or avocado.

Chapter Needs and challenges to implementing wellness projects

Respondents were asked about their perceived barriers and needs for implementation of wellness projects. At least 20% responded that any of the 14 listed challenges were a barrier, but 5 barriers were mentioned at least 35% of the time (see Table 8).

Table 7. Barriers for implementation of Community Wellness Projects.

Barrier	Percentage of people
No guidelines for planning wellness projects	41%
Prioritizing needs of community members	39%
No information on successful projects in other communities	37%
Health reports in our area	37%
Unclear who is supposed to lead program	37%
Hiring and managing staff	35%
No guidelines for tracking project results	34%
No information on existing health needs in our agency	32%
No guidelines for requesting for funds	28%
No guidelines for doing (implementing) projects	28%
No guidelines to figure out whether project worked	28%
No training on report/grant writing	28%
No training on budget management	27%
Not sure how much money to request	21%

Help was desired most from the Navajo Department of Health (52%), community health workers (45%) and local organizations (37%). The most common elements of documents to support chapter wellness programming were that the document is visually oriented (58% of people), includes background on Navajo health, follows cultural teachings and written in simple terms (over 40%; Tables 9 and 10).

Table 8. Organization desired to help Chapter Wellness Projects.

Desired organizations to help with chapter wellness programming	Percentage of people
Help from the Navajo Department of Health	52%
Help from Community Health Workers	45%
Help from local organizations	37%
Help from the Division of Community Development	29%
Help from traditional practitioners	23%
Help from other chapters nearby	23%

Table 9. Elements desired for potential Chapter Wellness Project support materials

Desired elements of documents to support chapter wellness programming	Percentage of people
Includes a lot of visuals (pictures, graphics)	58%
Includes background on Navajo health status	48%
Follows Navajo cultural teachings	44%
Written in simple terms	42%
Includes documents to assess community needs	38%

Associations

As a final step, the team evaluated if level of support and knowledge of the tax were associated with demographic characteristics or purchasing behaviors.

- Supporting the tax was not significantly associated with agency membership (Northern or Ft. Defiance), gender (male or female), language spoken (Navajo vs. English), setting (more urban vs. rural), having a fruit/vegetable garden, having access to a refrigerator, access to running water, receiving food stamps or nutrition assistance, with correlations ranging from 0.01 to 0.11, *not significant*.
- The strongest association was found between level of educational achievement and support for the tax ($r= 0.25, p<.001$), followed by income ($r= 0.18, p=.009$). Just over 50% of respondents with an educational attainment of less than high school supported the tax, compared to 71% of respondents with a high school degree or some college, and 91% of people with at least a bachelor's degree.
- The only other socio-economic variable associated with support for the tax was transportation, with 50% of people with no access to transportation supporting the tax, compared to 74.4% of people with access to transportation ($r=0.17, p=.009$), although the sample size for people with no access to transportation was small ($n=26$).

Aim 2.2: Leadership Survey

The Leadership Survey was administered to individuals who held leadership positions (tribal council, chapter officials, health program managers) on the NN. The sample included randomly-selected interviews with 11 participants. Open-ended survey questions asked about support (current and prior support for the tax, decision reached regarding HDNA), process (perceptions

of the process to gain support for the passage of the law), future (barriers for continuation of the tax, future vision, information that are needed to continue or to gain support).

The interviews were facilitated through the NEC at the office of each participant. Interviews were conducted by the project team and recorded per consent by each participant. The survey took 20-30 minutes, and was conducted almost entirely in the English language. A \$10 gas card was provided as an incentive for participation. Quantitative and qualitative data analysis were conducted by multi-investigator consensus.

Results

A total of 11 people participated, 7 participants were male. Almost all (10 of 11) reported that the funds had been received by their chapter, and the majority reported that the funds had been used for a wellness project. 100% of leaders believed their community supported the tax. Prior to HDNA enactment, almost 82% of the participants supported ('strongly agree or agree') a policy to tax consumers purchasing unhealthy foods and 91% supported a policy on tax to remove sales tax on healthy food items (fruits and vegetables) to promote health and wellness.

Table 10. Leadership knowledge of chapter wellness projects

Variable	Answer			
	YES		NO	Don't Know
Have the funds from HDNA been received by your chapter?	90.9%		0%	9.1%
If yes, have the funds been used for a community wellness project?	63.6%		18.2%	18.2%
Do you think your community/chapter supports the tax?	100%		0%	0%
	Strongly Agree	Agree	Disagree	Strongly Disagree
Before the 2014 HDNA policy was passed by the Navajo Nation Council, I supported a policy to tax consumers of non-nutritional value foods, or "unhealthy food tax" on the Navajo Nation.	54.5%	27.3%	9.1%	9.1%
Before the 2014 HDNA policy was passed by the Navajo Nation Council, I supported removal of sales taxes on foods such as fruits/vegetables to promote healthier diets and address health concerns.	72.7%	18.2%	0%	9.1%

Open-ended questions indicated that the leaders understood the tax was used for local-level health promotion and believed that most of the funds in their chapter were used for physical activity promotion, such as classes, equipment and events. They reported their community supports the tax because of the need to address chronic disease in their community such as cancer, diabetes etc. They also indicated the need for increased awareness and education, and monitoring of the implementation of the tax at the policy level. At the chapter level, a need for technical support and guidance on how/what funds can be used for was identified.

Table 11. Multi-Investigator Qualitative Themes and Examples

Question	Theme	Examples
What type of project have the funds been used for?	Physical activity	Zumba classes, “Just Move It” activities, 5K/10K walks/runs, hiking and running trails, youth basketball tournaments, fun run and walks.
Describe why your community/chapter support the tax?	Decrease chronic health conditions	Diabetes, heart disease, childhood obesity, cancer, and other health issues.
Describe your understanding of the HDNA and specifically the 2% tax on non-nutritional food value or “unhealthy food tax”?	Use the tax revenue to promote health	
Describe if there are resources missing to make sure HDNA is successfully implemented at the policy-level.	Policy-level	The need for regulation and monitoring, increase partnerships, increase awareness and education.
Describe if there are resources missing to make sure HDNA is successfully implemented at the chapter-level.	Chapter-level	Need more education, technical assistance, project staff, and confusion on ways to spend HDNA funds.
Is there anything you would like to say about HDNA before this interview ends?	There is support to continue HDNA legislation with better monitoring and reporting from chapters, inform NDOH leadership about HDNA to promote healthier outcomes, especially younger generation.	

Using survey items with a rating from Strongly Agree to Strongly Disagree, a majority strongly agreed (27.3%) or agreed (45.5%) that the ‘HDNA is a strong policy’. Most leaders did not believe that since passing the tax, fresh foods were cheaper (63% strongly disagreed), and that lack of access to fresh produce was a big challenge in their community.

A majority reported that they believed more Navajos are educated about healthy foods because of the HDNA, and that the tax has made an impact on the Navajo Nation. Almost all (10 of 11) leaders reported seeing an increase in wellness activities at their chapter.

Table 12. Leadership Survey Questions and Responses

Variable	Answer				
	Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
1. HDNA is a strong policy.	27.3%	45.5%	27.3%	0%	0%
2. More Navajos are educated about buying healthier foods because of the HDNA policy.	36.4%	27.3%	36.4%	0%	0%
3. Taxing sugary drinks and baked goods has made an impact on the Navajo Nation.	18.2%	36.4%	27.3%	9.1%	9.1%
4. I currently support the HDNA policy because I have seen an increase in consumer purchases of healthier foods.	36.4%	36.4%	18.2%	0%	9.1%

5. I currently support the HDNA policy because I have seen an increase in wellness activities in my community.	45.5%	45.5%	9.1%	0%	0%
6. The Navajo Nation Council's decision is "a real victory" and is also symbolic of progress.	36.4%	45.5%	9.1%	9.1%	0%
7. Within the past year, my perception changed because the HDNA policy's goal is to address health concerns on the Navajo Nation.	27.3%	18.2%	27.3%	18.2%	9.1%
8. The biggest obstacle that my community faces is the lack of access to fresh produce on or near the Navajo Nation.	63.6%	18.2%	9.1%	9.1%	0%
9. Since the passing of the 2014 HDNA policy, fresh food is cheaper because of the tax cut on fruits and vegetables.	18.2%	0%	63.6%	18.2%	0%
10. Since the passing of HDNA, the grocery stores or gas stations now stock fresh quality vegetables and fruits.	9.1%	27.3%	36.4%	27.3%	9.1%
11. The tax hurts low-income families who shop at nearby gas stations and/or grocery stores.	18.2%	9.1%	36.4%	27.3%	9.1%
12. In the last 30 days, I have noticed information about the dangers of eating non-nutritional food or unhealthy food on the Navajo Nation.	36.4%	36.4%	27.3%	0%	0%
13. "We live in a giant food desert."	63.6%	27.3%	0%	9.1%	0%

Summary Aims 2.1 and 2.2

Broadly, there appeared to be fairly strong support for the tax among 238 community members across 2 agencies and 22 chapters (>70%) and community leaders (>80% agreed or strongly agreed the HDNA was a strong policy).

In the community survey, most participants believed that taxing unhealthy foods will lead to health benefits for the Navajo people. People reported being at least moderately familiar with the tax, and report that their local stores implement the 2% tax on foods of little-to-no nutritious value. The knowledge about implementation of the 5% removal of tax on fruits/vegetables is much lower. Few factors were associated with support for the tax; only income, education and access to transportation demonstrated modest positive associations with supporting the tax.

Several barriers to local chapter wellness programming were identified in both surveys, including educational and logistic support such as needing guidance with implementation, identifying community needs and a desire to learn more about the health of the Navajo people. In the community survey, agencies that were mentioned as most desirable to assist included the Navajo Department of Health, Community Health Workers and local organizations. Any supporting documentation for chapter wellness implementation was recommended to use graphical representations, include background on Navajo health, use cultural teachings and written in simple terms.

Aim 2.3 Examining culturally-appropriate messaging & meaning around HDNA activities.

Herbert John Benally developed the Diné-centered research methodology or *Hozhoogoo Na'adah* in 2008. (H.J. Benally, 2008). The methodology was used to assess the wellness projects in Beclabito and Gadii'ahii Chapters; this study was part of the larger study on Health Diné Nation Act (HDNA) assessment.

Traditional knowledge holders shared their knowledge of the Navajo historical concepts of wellness and health at the onset of this project. This information guided the operationalization of the balancing construct that led to the development of the survey questions. Operationalizing the

four domains of knowledge, or the balancing construct, is the product of over 40 years of study with elders and traditional knowledge holders. Dr. Benally developed a research process and analytic methodology based on this balancing construct. This methodology operationalized traditional notions of Navajo health and was used to assess whether the two Chapters' wellness projects aligned with traditional Navajo health practices.

The primary puzzle of this study focused on understanding Navajo notions of health and whether the Chapter administered health programs impacted how one lives and views Navajo health. This assessment also explored the extent to which different Navajo communities' notions of health departed from a baseline of balanced Navajo health as understood from the balancing construct.

Methodology

Dialogue with traditional knowledge holders informed the development of the variables of Navajo health, further dialogue led to the development of survey questions. These questions were tested in a small group of students and community members at Diné College, and the questions were further refined. The Chapters provided a sampling frame of households. We used a convenience sampling strategy to recruit 100 participants between the two Chapters. We conducted 100 survey interviews over 2.5 months between the 2 Chapters.

Sixty individuals were selected to take the survey using this process in the Beclabito Chapter and 40 in the Gadii'ahi Chapter. The demographics in terms of age, education levels, gender were not measured, though noted. Each Chapter had a spread from 18 to 70+ participating with many of the participants in the age range of 35 to 50. The Chapter was the unit of analysis in this study.

Beclabito and Gadii'ahii Chapters were selected based on several characteristics of their proximity to the "urban" area. The following assumptions were made about the Chapters and their proximity to urban areas: the closer the proximity the more likely to speak less Navajo and therefore less access to Navajo knowledge of health, leading to less habits and behaviors that comport to the Navajo baseline of health. While both populations were constructed using a convenience sample, it was random to the extent in which individuals showed up at the Chapter house. Half interviews were conducted at the Chapter house. Individuals visiting the Chapter house vary in background, language ability, age, gender, education levels, and so forth. This survey however, focused on the "community" as the unit of analysis.

Results

A Mann-Whitney test was used to test the difference between the Chapters. The results of the test found differences around three questions, one in the first domain of knowledge or *bek'ehgo da'iinaanii*, and two in the second domain of knowledge or *nihigáál*.

Table 13: Statistical tests for differences between chapters by domain of knowledge

Domain of Knowledge	Question	Mann-Whitney test
<i>Bek'ehgo da'iinaanii</i> (Spirituality)	Traumatic circumstances affect my health	$p = .02$
<i>Nihigáál</i> (Work)	I only eat and drink that which makes my body healthy	$p = .02$
<i>Nihigáál</i> (Work)	I know how to cook healthy meals	$p = .01$

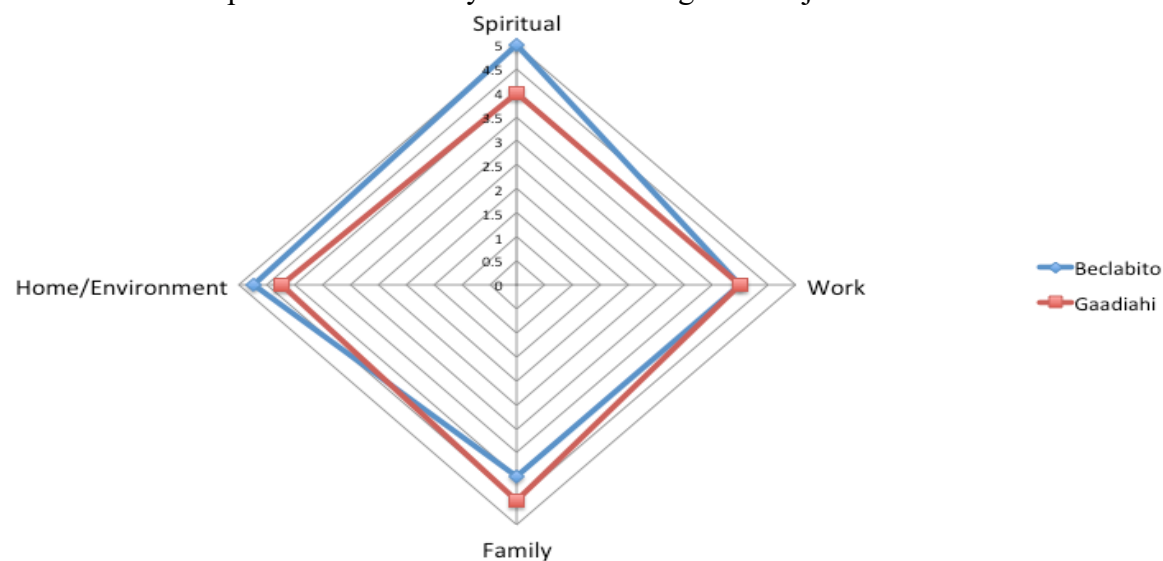
These results raised questions about why these populations had different understandings of Navajo traditional health¹. In other words, we wanted to know what explains these specific differences, given the other variables we measured.

Figure 7: HDNA wellness projects' ratings on *Hozhoogoo Na'adah* dimensions

Analyzing the medians, the face-validity shows differences in understanding of Navajo health around the spiritual, family, and home/environment domains.

Did the health programs administered by the Chapters impact the Chapter community's notion of traditional Navajo health? Both Chapters appear to have met the Navajo traditional notions of holistic health but in different ways. The Beclabito community is more "urban" than the Gadii'ahi community. The work domain is relatively unaffected for both communities. Given this, we expected a more traditional reasoning to prevail in the Gadii'ahi community. However, this was not the case. What we see is an emphasis on different domains of knowledge. While both communities have health programs, it appears those programs may have activated different areas of knowledge in practicing health.²

We asked, if the health program did impact the community, in what ways did the health program or its absence impact the community's understanding of Navajo health? We found that Gadii'ahi



is closer to "strongly agree" in the questions with difference relative to Beclabito. What this suggests is the presence of the health program may have impacted the differential understanding and perspectives of the underlying inter-connected or spiritual notions of Navajo health. That is, Gadii'ahi has a greater reverence for the spiritual dimension embedded within these three questions. Given that both Chapters have health programs we can infer, albeit weakly, that there is a difference in the importance each has of the components and practice of Navajo health.

We examined each Chapter and used an open-ended exploratory method to identify why each Chapter had different notions on the 3 concepts of Navajo health embedded in the 3 questions of

¹ An important implication highlights the fact that despite self-admitted "non-practice" and "knowledge" of historic/traditional practices, it persists.

² Further study ought to focus on why the health programs may have impacted these communities' notions of Navajo health differently.

difference. To that end, we ran several multinomial logistic regressions with each of the 3 questions as the dependent variable and the other questions as explanatory variables. Because of the size of the sample (N=60 for Beclabito and N=40 for Gadii'ahi) we used a threshold of $p = 0.15$. While, this is a large confidence interval, we felt that because we were exploring the explanatory factors, this approach at least would provide us with some inference to the differential reasoning of each Chapter.

We were more interested in the variables of significance and explaining the relationship between each variable. Future studies will focus on the probabilities and odd-ratios of this model. However, in this study, we seek to understand *why* there is a relationship between the variables rather than the odds. We sought only to describe what variables explained the why each chapter placed importance on the three questions of difference. Consequently, we focused on understanding the following: question of difference $f(\text{Variable 1, Var 2, Var 3, Var N...})$.

Discussion Aim 2.3

A key implication from this study focuses on the underlying notion of the sacred and the spiritual within rather mundane, daily activities like cooking food. It demonstrated health is more than just physical fitness and detached eating, but uncovered an understanding of the spiritual significance of eating. That preparing and eating food is a spiritual act that invokes the blessings on others, on land, on spirit, on family, and on self. That eating and preparing food is concomitantly tied to place, to emotional strength, and mental health. It represents an obligation to community and community health. This study illustrated that a relationship between what may be considered inconsequential actions and behaviors to health mediated by the spiritual. The act of cooking itself becomes a spiritual act that impacts one's relationship with family and community.

"I know how to cook healthy meals" in Beclabito is connected to the spiritual domain, specifically, the variable that "My beliefs help me during my time of need." In Navajo cooking is a spiritual process. For example, traditionally, a mother puts her blessing in the food she is preparing for her children for health and strength. A traditional saying note that a brother visits his sister and says, "*Chiiyaan yee sidook'as*" or "She will bless me and strengthen me with her food." The relationship then underscores the element and belief that cooking is a spiritual process not meant just for physical health but for emotional and spiritual health. More than 10 variables were significant in explaining the three questions of difference.

This suggests that the presence of the health programs does impact or rather activates traditional ways of living and enhances the practice, sometimes, unknowingly. Using the Hozhoo na'adah model, we reviewed our findings with the community and discovered that Beclabito, despite their urban setting characterized what they heard (the findings) as "teachings they heard from their elders." They felt divorced from the values of the elders and felt they did not understand or practice what they Elders did.

What we uncovered from those who took this survey is they did not realize their actions and behaviors reflected reverence for the spirituality inherent in Navajo notions of health, activated and enhanced, in part, by the presence of health programs. While they may have said they do not practice these things anymore, the empirical evidence suggests, at least through their levels of agreement, they have reverence for the spiritual nature of health. They have reverence and unknowingly act on the spiritual connections between eating and drinking healthily and obligations to community and clan.

What this suggests is that health programs ought to be designed to incorporate the whole being, not just the body or the physical body. This study suggests that Navajos still associate health and mundane activities like cooking to spiritual health. This implies that the design of health programs in the Navajo Nation ought to be centered on maintaining balance, by drawing on activities that incorporate all four areas of knowledge into the design of those programs.

Overall Project Conclusions and Recommendations

In sum, over \$4 million has been successfully collected by the Office of the Navajo Tax Commission since the start of the tax- an average of almost \$30,000 per chapter has been disbursed. Chapters have proposed an average of about 4 community wellness projects per full year, or almost 10 since the inception of the tax and over 1,000 total. Most commonly, the proposed projects center on food availability and exercise promotion (either through classes, equipment or modification of the built environment).

Surveys with community members and leaders indicate that there is broad support for the tax. Only 1 in 6 community members in the two agencies surveyed opposed to the tax and over 80% of surveyed policy/decision makers indicating they thought the HDNA was a strong policy. Community members indicated a need for chapter technical assistance/guidance with implementation, preferably from the Navajo Department of Health or Community Health Workers and local organizations. Leaders indicated a desire for improvements in monitoring of the implementation and evaluation of effectiveness. Using an in-depth cultural approach specific to the Navajo people in two chapters elicited that the HDNA funded chapter wellness projects were aligned with Navajo cultural perspectives, but that these may differ between communities.

According to the Navajo Tribal Epidemiology Center's Mortality Report (2013), the top-ten leading causes of death are: 1. unintentional injuries, 2. cancer, 3. heart disease, 4. diabetes, 5. liver cirrhosis, 6. influenza/pneumonia, 7. stroke, 8. dementia, 9. septicemia and 10. suicide. With the large burden of chronic diseases and growing public health concern, Navajo Nation leaders and community members supported HDNA in that it may serve as a model for taxes to curb obesity, diabetes, heart disease and cancer.

However, obesity, diabetes, heart disease, and cancer are multifactorial health problems which cannot be affected solely by the elimination of a single food type in the diet. Based on our findings HDNA may ultimately address the critical public health concern by promoting communities to improve their health through physical activity, health education, and traditional knowledge, as well as improving access to these healthy resources.

The HDNA evaluation team recommends the following:

1. To engage in rigorous ongoing long-term evaluation of HDNA implementation in order to discern its effectiveness at reducing consumption of junk foods and ultimately improving the health of the Diné people.
2. Continue partnerships to maintain and improve ongoing HDNA evaluation efforts and to promote research that examines the risk factors and causes of obesity and chronic disease.
3. Increase education and awareness about HDNA, better monitoring of HDNA tax enforcement and collection.
4. Training for chapters in development and execution of culturally appropriate community wellness plans.

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Resources

Navajo Nation Division of Community Development
www.ndcd.org

Office of the Navajo Tax Commission
www.tax.navajo-nsn.gov

Northern Arizona University
www.nau.edu

Navajo Nation Human Research Review Board
www.nnhrrb.navajo-nsn.gov

Robert Wood Johnson Foundation
www.rwjf.org

Navajo Epidemiology Center
www.nec.navajo-nsn.gov

Diné College
www.dinecollege.edu

Navajo Nation Chapters
www.navajonation-nsn.gov/chapters

Centers for Disease Control and Prevention
www.cdc.gov

Community Outreach and Patient Empowerment (COPE) Project
www.copeprogram.org

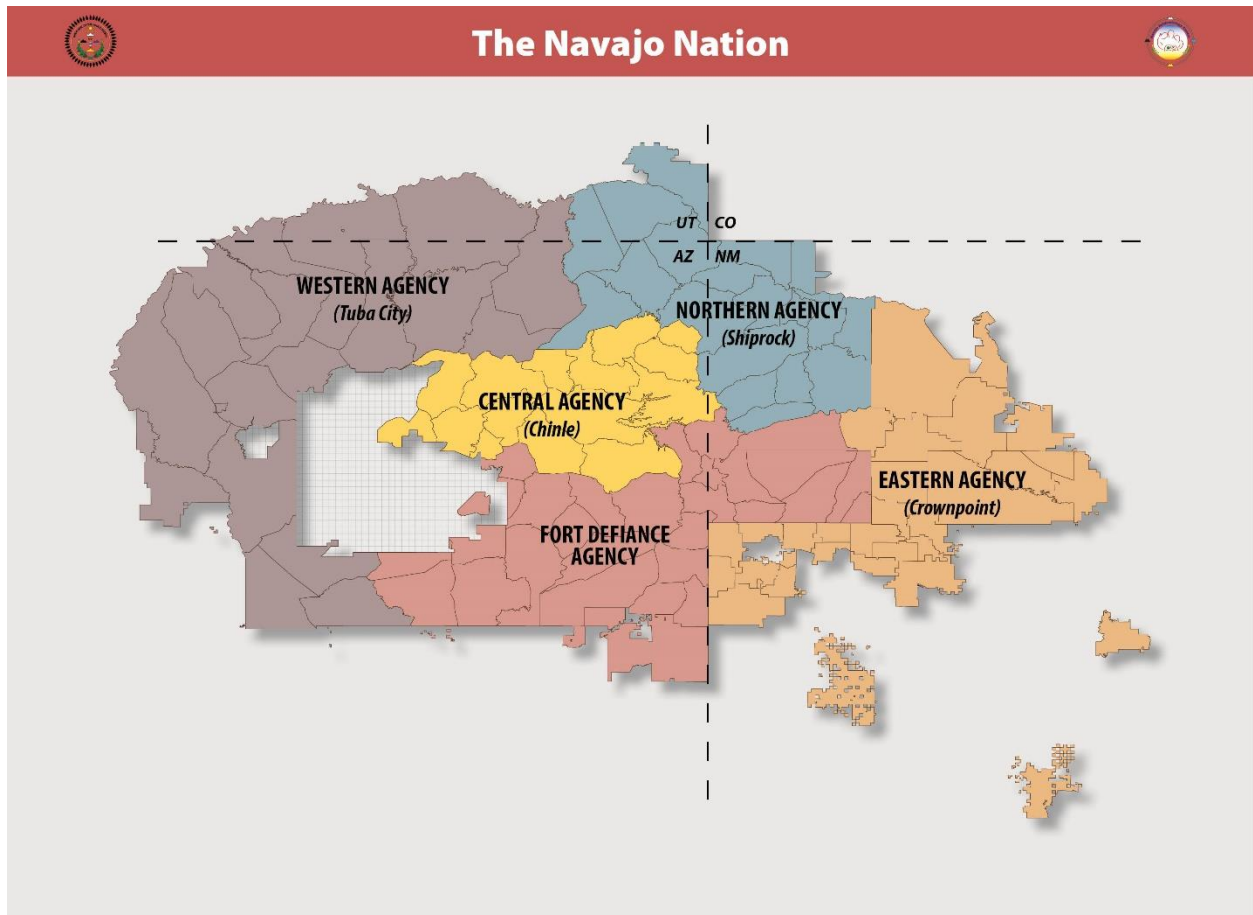
Indian Health Service
www.ihs.gov

Navajo Health, Education and Human Services Committee
www.navajonationcouncil.org

Navajo Department of Health
www.ndoh.org

Tribal Epidemiology Centers
www.Tribalepicenters.org

Appendix A: Map of the Navajo Nation and agencies



Appendix B: Full coding taxonomy of community wellness projects

Project Type coding Table.

1. INSTRUCTION

- A. Fitness classes (i.e. Zumba, aerobic, core training, indoor cycling, Traditional, intergenerational, and contemporary wellness workshops, (i.e. Navajo philosophical and education teachings, Tai-Chi, Yoga)
- B. Health coaching (i.e. healthy eating education, goal-setting, self-care management) Navajo traditional craft class (i.e. jewelry making, beading, weaving)
- C. Traditional and non-traditional healthy food preparation workshops (i.e. making chilchin, making blue corn mush, cleaning, and prepping corn, food processing workshops (i.e. canning, food safety)

2. EQUIPMENT

- A. Wellness and exercise equipment
- B. Supplies
- C. Storage Facilities
- D. Maintenance,
- E. Conservation, or improvement of any of these projects

3. BUILT RECREATIONAL ENVIRONMENT

- A. Activity/exercise facility, fitness/wellness center
- B. Walking trails, running trails, biking trails
- C. Picnic grounds
- D. Playgrounds
- E. Basketball/volleyball courts
- F. Baseball/softball fields
- G. Swimming pools
- H. Maintenance, conservation, or improvement of any of these projects

4. SOCIAL SETTING

- A. Recreational health, youth clubs (i.e. Senior citizens events, walking club)
- B. Equine therapy (i.e. activities and interaction with horses, trail rides, introduction to horses, saddling, training.)
- C. Maintenance, conservation, or improvement of any of these projects

5. EDUCATION

- A. Health education materials
- B. Presentations
- C. Library

6. COMMUNITY FOOD AND WATER INITIATIVES

- A. Healthy Food initiatives
- B. Community food operatives
- C. Farming and vegetable gardens
- D. Greenhouse Farmers markets
- E. Clean water initiatives
- F. Clean communities initiatives (i.e. community trash pick-up day) Recycling initiatives Healthy store improvements
- G. Agricultural projects
- H. Maintenance, conservation, or improvements of any of these project

7. HEALTHY EMERGENCY PREPAREDNESS

- A. First-Aid,
- B. CPR,
- C. AED certification

8. MATCHING FUNDS

- A. Community wellness projects
- B. Set aside

9. ADDITIONAL EXPENSES

- A. Professional consultation/fees
 - B. Promotional Items/Incentives
 - C. Set aside
 - D. Other
-

Appendix C: Full HOZHOOGO NA'A DA Assessment report

Aim 2.3: HOZHOOGO NA'A DA ASSESSMENT OF THE NAVAJO NATION - HEALTHY DINE NATION ACT INITIATIVE TO DEVELOP A WELLNESS PROJECT IN TWO CHAPTERS IN THE NORTHERN NAVAJO AGENCY

A PILOT HOLISTIC HEALTH ASSESSMENT CONDUCTED IN BECLABITO AND GAD II'AHII CHAPTERS

Dr. Herbert John Benally, Principle Investigator
Mr. Moroni Benally, Co-Investigator

June 2018

OVERVIEW AND BACKGROUND

Herbert John Benally developed the Diné-centered research methodology or HOZHOOGO NA'ADAH in 2008. (H.J. Benally, 2008) It was used to assess the wellness projects in Beclabito and Gad ii'ahii Chapters; this study was part of the larger study on Health Diné Nation Act assessment (HDNA).

Medicine men or traditional knowledge holders shared their knowledge of the Navajo traditional concept of wellness at the onset of this project. This information guided the operationalization of the four domains of knowledge or balance and led to the generation of the survey questions. This operationalization is the product of years of study. After over 40 years of interaction and study with elders and medicine people, Dr. Benally pieced together the nature of knowledge associated with the diurnal process, or the four areas of knowledge that informed the methodology. This methodology was used to assess whether the two chapters' wellness projects aligned with traditional and historic notions of Navajo health practices and concerns.

This exploratory study sought to understand the relationship between Chapter administered health and wellness programs and one's understanding of traditional Navajo health. The primary puzzle focused on understanding Navajo notions of health and whether chapters that administered the health programs impacted how one lives and views Navajo health. This assessment also explored the extent to which different Navajo communities' notions of health departed from a baseline of balanced Navajo health.

We anticipated that conducting this Diné-centered research project would reveal the relationships between ordinary, sometimes mundane, daily activities to traditional, holistic notions of spiritual health.

Two Navajo medicine men along with previous research help establish the baseline for the Navajo traditional concept of health that guided the formation of the survey questions. The questions

reflect activities (i.e. actions and behaviors) in each of the major areas of knowledge: *Bek'ehgo da'iinIanii* (knowledge that guides and directs life), *NihigIil* (sustenance), *Aha'ana'oo'o'n77l* (the family, community), and *ha'Iy77h d00 hodilzin* (rest, home/environment).

This study revealed that larger spiritual notions of health mediated these relationships. In other words, the study showed, that despite years of colonization these different communities, despite some assuming they forget the “old ways,” continued and persisted with certain activities because of historic/traditional spiritual significance. The spiritual significance is at the core of the HOZHOOGO NA'ADAH research methodology.

BACKGROUND

The Diné-centered research methodology is a knowledge gathering and analysis process that centers Diné knowledge systems. Consequently, its ontological and epistemic emphasis is holistic rather than reductionist. The extant literature is extensive ranging from theoretical conjecture of there being a relationship between “balance” and educational attainment, mental health, physical health, and academic success to empirical testing of formal hypothesis of these relationships. Yet, this literature employed methodology that assumed individual disconnectedness, and obviated the importance of connectedness, in general. While helpful, it did not provide guidance on how Navajo think about Navajo concepts of health, rather the literature attempted to place Navajo notions of health into a construct of non-Navajo health, with its discrete, measureable aspects related to mental, physical, and emotional health. Yet, these constructs are limiting in a Diné perspective and represent only one aspect of Navajo health and fails to qualify the inter-relatedness of knowledge.

This study relied on the assumption that Navajo individual behavior, while appearing discrete, is more representative of collective inter-related behavior. That is, there is a form of collective identity operational at the core of Navajo behavior; a behavior shaped by the spiritual origins that tie individuals together to create a communal/shared identity. These “spiritual origins” are the foundation of the Diné knowledge systems. The HOZHOOGO NA'ADAH model provides the theoretical and analytic framework to capture this Navajo ethos and guides empirical processes to ensure interpretation explains the communal/shared behavior and thinking.

Diné Knowledge System

The core of Navajo life is found in *Sa'ah Naaghai Be'keh Hozh00* (SNBH): the power that surges throughout all creation. It is the order and life force of creation. The Creators are SNBH and all that they created is SNBH. According to traditional songs and prayers humankind are children of SNBH. SNBH is what the Holy People called the pollen path *t1d7d77n bek'eh e'e't77n* – the way of peace, happiness, and an excellent way of life *hozh=ji* that humanity must walk.

In the beginning, when the Creators were laying the parts of the day, Mother Earth identified and placed four domains of knowledge into the four parts of the day: dawn *bek'ehgo da'iinaanii* (all knowledge that guide and directs life), day *nihigaal* (sustenance), evening *aha'ana'oo'niil* (gathering of families), and night *hodilzin d00 haa'ayiih* (reverence and rest for home/environment). These thematic areas of knowledge placed by the Creators, from the beginning, were intended to regulate and guide and Navajo thought and behavior.

This research project is entirely informed by this Navajo epistemology. Health and balance is found in understanding, applying, and balancing these four areas of knowledge:

1. *Bik'ehgo Da'iinaanii*, or "that which gives direction to life" emphasizes character development, particularly excellence of the heart and mind. It encompasses all knowledge that enables the individual to make intelligent decisions whenever a choice involving values is to be made. This area of learning includes belief, self-discipline, and values that provide standards of behavior and meaning to life. (Benally, 1992, p. 19)
2. *Nihig111* or "sustenance" emphasizes self-reliance, providing for the family and being a contributing member of the community (Benally, 1994). Navajo does not separate the technical and spiritual dimensions of work. One is endowed to think for oneself, but with these endowments come responsibility, for example, the responsibility to derive a living without destroying the system established for living or stewardship. (Benally, 1997, p. 91)
3. *Aha'In1'oo'n77[* or "the gathering of family" focuses on *k'4*, which circumscribes the emotional, spiritual, and physical ties with family, community, and environment. *K'4* is love and caring: it is the language of the heart. (Benally, 1997, p. 90)
4. *Haa'ly99[d00 hod7lzin* or "rest and reverence for all creation" emphasizes human's understanding of their relationship to their environment. Intrinsic in this knowledge domain is the notion that humans are an integral part of creation and they are to move within it in harmony and reverence in a reciprocal relation (Benally, 1997).

Health and wellbeing is found within these interrelated and interdependent areas or domains of knowledge. Meaning that a person walking the path of SNBH or the beauty way of life ought to be capable of the following: providing for their family, helping others, genuine love, compassion for family, others and all life, and finally exercising stewardship that leads to environmental sustainability. Imbalance or disharmony occurs when any of these areas is disrupted by omission or neglect.

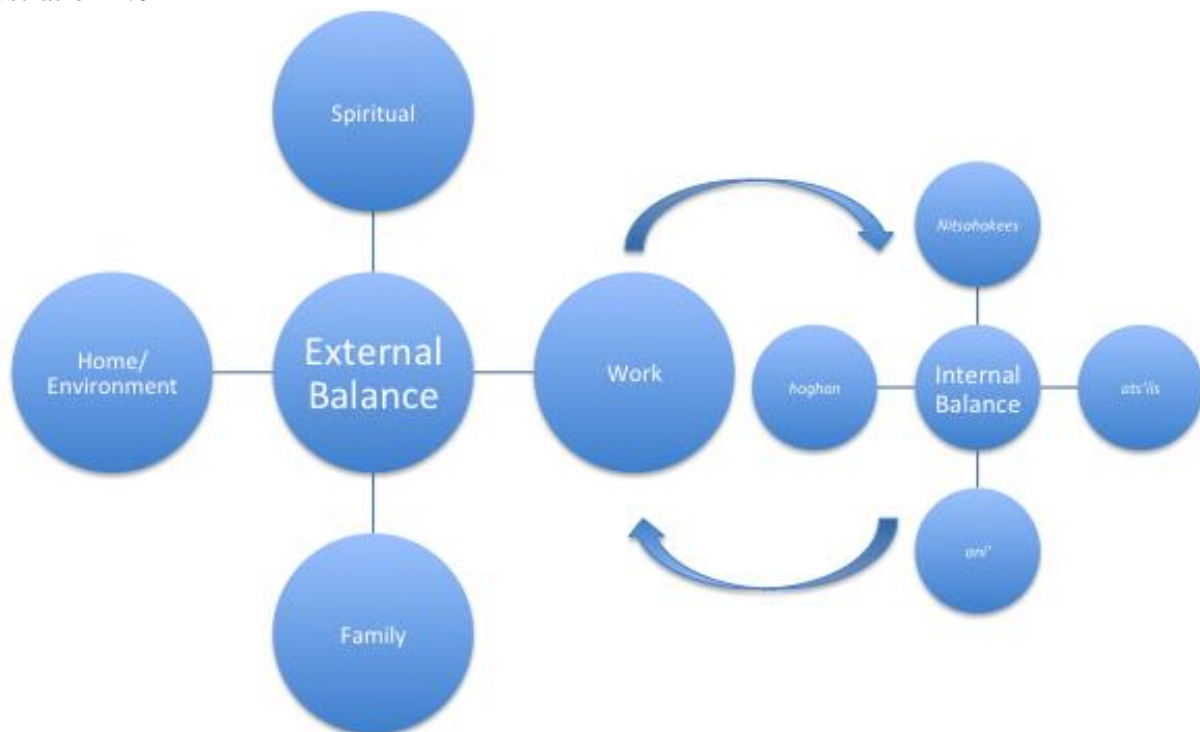
Daily activities, thoughts and behaviors we often think are mundane and routine are inherently connected to the diurnal system or the four areas of knowledge in powerful ways. These areas of knowledge can uncover the deep personal internal balance and imbalance in one's life. For instance, the first area of knowledge *bek'ehgo da'iinaanii* instills moral principles that are the basis of good thinking and sound judgment or *nizhoonigo nitsehakees*. *Nihigaal*, the second area of knowledge, is about ensuring one has enough to eat or sufficient material accumulation to maintain a healthy physical body or *ats'77s ya'It'44h*. *Aha'ana'oo'niil* is *k'4* or the intimate spiritual and emotional ties with the family; it is the source of order and harmony among people and the environment – it structures those interactions. It is about nurturing one's heart/mind or *ani'*. *Haa'ly99h d00 hodilzin* is rest, respect, and reverence for the home/environment or *hogan haz'32gi*.

Individual's actions and behaviors influence the balance of the intrinsic core values tied to the domains of knowledge or their internal constitution; *nitsahakees* (mental), *ats'77s* (body), *ani'*

(heart, mind) and *haghan haz'langi* (home-place). Balance is characterized by a person's thinking free from stress, being in line with the morals placed in the four areas of knowledge, the body nurtured with health, being secure in their sense of belonging in a family, community, and comfortably secure in their home and environment. This balance is called *hozhoogo na'adah* being able to walk in the light of the Holy Ones with health, peace and harmony in the family, community and home-place.

The internal core domains of *nitsahakees* (mental health), *ats'77s* (physical health), *ani'* (emotional- heart and mind health), and *haghan* home/environment (comfort and security) function as part of the external balance provided by the four areas of knowledge. These internal core domains operate and are embedded within each of the four domains of knowledge. The four domains of knowledge constitute external balance, the internal core domains function as the internal balance, with one impacted and shaping the other.

Illustration 1.0



Consequently, what one experiences with their external reality affects their internal balance. Mental stress affects spiritual wellness, physical health, emotional state and home/environmental health. A medicine person once said this about one of their patients, she lost her husband last year and that has affected her:

Ch44h ts7diskees tooh hwo[yaa'as'2nahalin. Shighan y44nid7 t'oo shi'de'1t'eh, shil77' ind7 1ajish99 adahaz'k1, doo nid7 anisin dah.

(I can't seem to think, like I am covered with something, my home lies in neglect and I don't know what happen to my livestock, I eat just to eat.)

Any part of a person's constitution will disturb the other areas of their being. These disturbances, according to Navajo thought, lead to mental health issues, physical illness, family issues, and disharmony with one's environment/home.

These areas of knowledge are interdependent and interrelated meaning that success in one area impacts the fulfillment of the other three areas of knowledge. To excel in academia depends on a healthy spiritual and mental wellness, sound financial support, strong family support, and a healthy home environment. "One must remember that these areas of knowledge are all interrelated and interdependent" (Benally 1994, 30). A disturbance and disharmony in any one area affects the remaining three areas resulting in imbalance at the external and internal balance levels.

This short review of the Navajo knowledge system provides background on the framework used in this study that informed the methodology used to develop the survey questions, the survey, the data collection process, and the data analysis process.

PARTICIPANTS

Survey participants were selected using a convenience sample in both Chapters. 60 individuals were selected to take the survey using this process in the Beclabito Chapter and 40 in the Gadii'ahi Chapter. The demographics in terms of age, education levels, gender were not measured, though noted. Each chapter, had a spread from 18 to 70+ participating with many of the participants in the age range of 35 to 50. The chapter was the unit of analysis in this study.

We had one enumerator in the field; they left surveys with the chapter administrative assistant. Additionally, they received names and addresses from the chapter. The enumerator visited homes to conduct in person surveys and when needed translated the survey into Navajo for individuals taking the survey.

The development of the survey required focused dialogue with traditional knowledge holders. These knowledge holders provided the constructs for the variables and logic for operationalizing the variables in the survey. A series of guided questions was asked of each elder recorded and analyzed. This analysis led to categories of behaviors, actions, and habits that constituted living a balanced and healthy Navajo life. These categories were then turned into survey questions and established the baseline of traditional Navajo health. The following criteria was used to select these individuals: 1) possession of ceremonial or sacred knowledge, 2) elders defined as over 70 years of age, and 3) understanding of high Navajo, defined as understanding of ceremonial language, imagery, and aesthetics.

METHODOLOGY

This study used an experimental mixed methods approach from sampling to analysis in the research process. This mixed method approach was informed entirely by Diné-centered research methods and the mandates of the study. This study seeks to understand from the Navajo perspective whether one's understanding of Navajo health was impacted by the presence or non-presence of health programs funded by the Navajo Nation's Healthy Diné Nation Act. The needs of the study required a methodology that adequately and sufficiently capture, uncover, and respects traditional

Navajo notions of wellness and health. To that end, this section will briefly describe the research methodology used in this study.

Description of Hozhoogo Na'a dah Research Process

This research process stresses consensus building (*t'áá altsxó lá danizin*) and participation (*t'áá altsxó baahas'ah*) (Benally 2008).

1. *Bee Hozin*: (Canvassing what is known about the subject from narratives, songs, observation, prayers, other significant sociological traditions.) This study relied on traditional knowledge holders and a “literature” review of Dr. Benally’s research over the last 40 years in this area. From this came a set of concepts about health that were connected to the four domains of knowledge. These concepts were then refined to include behaviors, thought processes, and actions of individuals that coincide with these four areas of knowledge.
 - A. *Bina'idik'id* (Inquiry and data collection) – Formulate broad questions to identify the indicators of the four aspects of balance.
 - i. Questions are formulated by conducting review of what is known from narratives, songs, observation, prayers, and other significant sociological traditions. Focused dialogue with traditional knowledge holders on the meaning and actions, behaviors, and thought processes associated with wellness led to the development of a series of concepts reflective of traditional Navajo wellness.
 - ii. Develop questionnaire of indicators identified through previous process for community members. With concepts identified by the “literature” review and dialogue with traditional knowledge holder, a series of indicators of each concept of health and wellness was developed. This operationalization process is iterative. Once the knowledge holders reviewed the concepts and indicators, a series of questions consonant with that review were then created. A Likert-Scale was chosen to reflect levels of agreement with these questions that asked about their actions, behaviors, and thought processes related to traditional Navajo notions of health and wellness.
 - B. *Jini'iih* (Reflection and Analysis) – Data are analyzed with culturally informed, knowledgeable community members. This process is similar to grounded theory and participatory research data analysis.
 - i. Collaborate with community experts on explaining findings. The data was collected and a database was constructed for statistical analysis. A Mann-Whitney test was conducted to test the differences in population between the Beclabito and Gadii'ahi Chapters. This Mann-Whitney test resulted in three differences across these populations. Based on these differences, the authors conducted a series of multinomial logistic regressions to explain the differences. Once these explanatory variables were identified, they were brought back to the knowledge holders for review.

- C. *Nahalin* (It appears to be) – The findings and results of the survey were then taken to the community experts for validation.

This second part of the process has not been completed and will be subject to further research.

2. *Nabik'id Tsijiilkees* (Reflection, Analysis, New Action)

- A. *Bina'idik'id* (Inquiry and data collection) – With the indicators, the researcher returns to the community collaborators and refines them
- i. Return to previously defined experts and present newly refined indicators and questionnaire.
 - ii. With collaborators further refine questions for identifying indicators.
- B. *Jini'iih* (Reflection and Analysis) – With the new set of indicators, consensus building of indicators results.
- i. Collaborate with these community experts on refining the new set of indicators identified from the canvassing stage through open-ended interviews.
 - ii. With collaborators further refine questions for identifying indicators.

FINDINGS AND DISCUSSION

Differences Between Chapters

Beclabito and Gadiahi Chapters were selected based on several characteristics proximity to “urban” area. The following assumptions were made about the Chapters and their proximity to urban areas: the closer the proximity the more likely to speak less Navajo and therefore less access to Navajo knowledge of health, leading to less habits and behaviors that comport to the Navajo baseline of health. While both populations were constructed using a convenience sample, it was random to the extent of which individuals showed up at the Chapter house. Individuals visiting the Chapter house vary in background, language ability, age, gender, education levels, and so forth. This survey attempted to focus on the “community” as the unit of analysis.

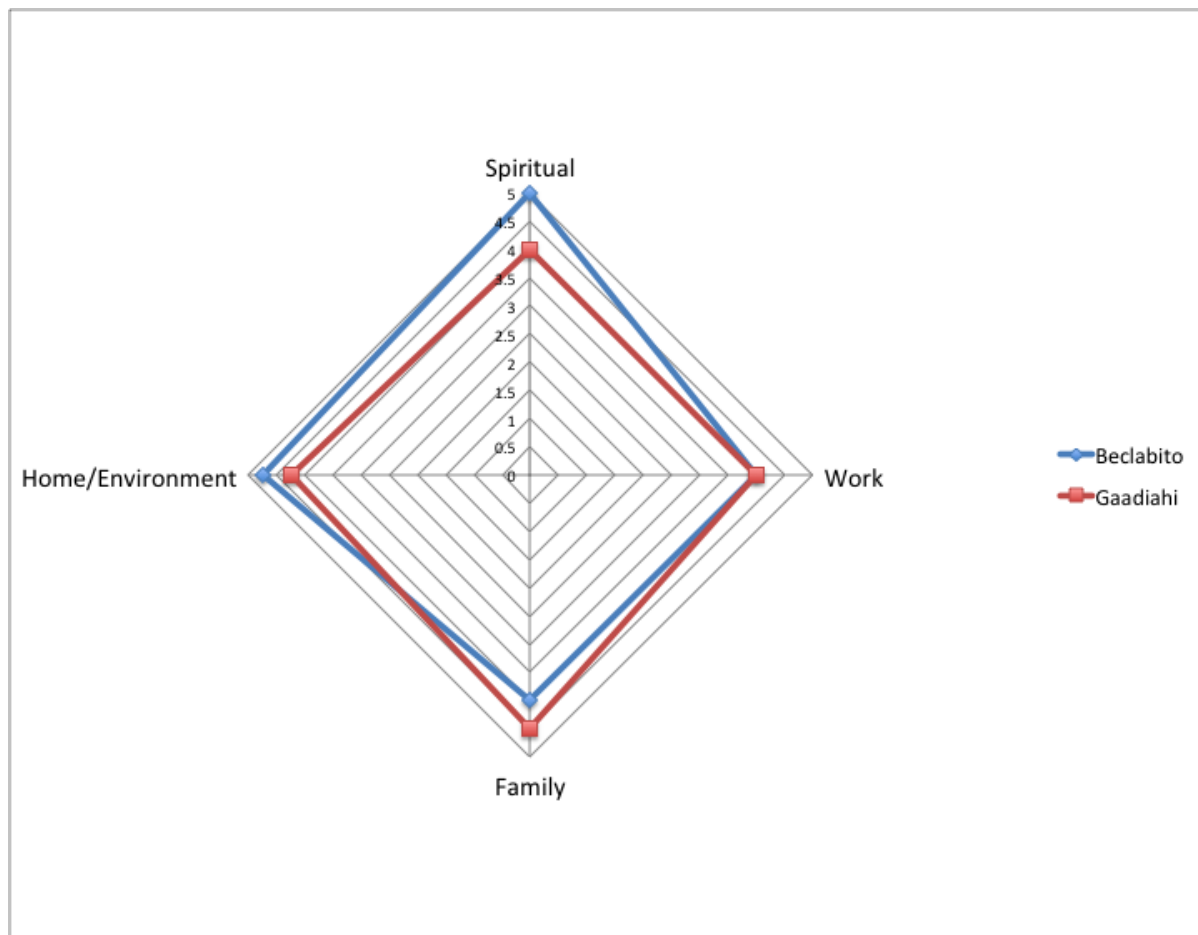
Because the survey questions were categorical in nature, a Mann-Whitney test was used to test the difference in the populations of the two populations. The results of the test found include difference around three questions, two in the second domain of knowledge or *Nihigáál*, and one in the first domain of knowledge *bek'ehgo da'iinaanii*.

Domain of Knowledge	Question	Mann-Whitney test
<i>Bek'ehgo da'iinaanii</i> (Spirituality)	Traumatic circumstances affects my health	$p = .02$
<i>Nihigáál</i> (Work)	I only eat and drink that which makes my body healthy	$p = .02$
<i>Nihigáál</i> (Work)	I know how to cook healthy meals	$p = .01$

The results of this test raised the question about what was different between the two chapters. These difference show, in the least, that there are differences in how these chapters understand the traditional/historic Navajo notions of health. Additionally, an important implication, given the

demographic makeup of the informants, highlights the fact that historic/traditional knowledge persists despite self-admitted “non-practice” of traditional activities. This implication ought to be studied further as it has important implications on cultural memory and its inertia and persistence despite colonization and its goal of erasing culture and cultural practice in the past and present.

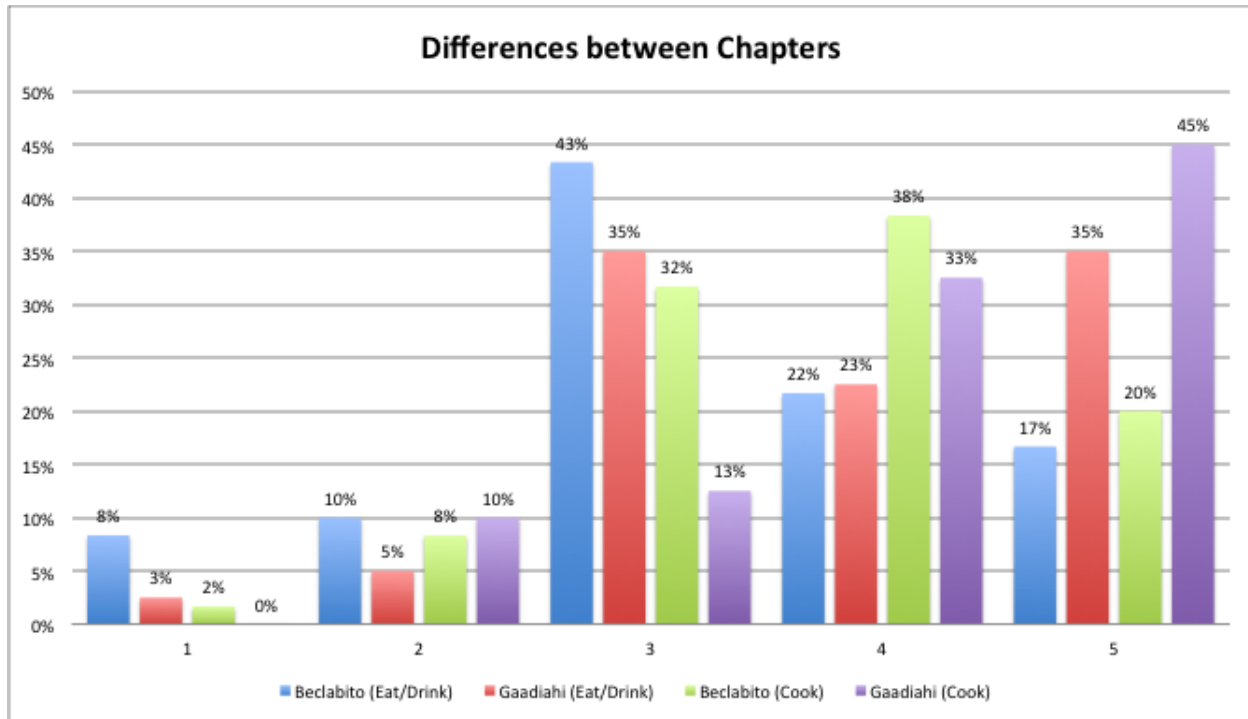
To understand the difference, simple descriptive statistics was used to home into these differences. A break down of differences around the median revealed the following between the two chapters:



From this analysis of the medians, the face-validity shows differences in understanding of Navajo health around spirituality, family, and home/environment. Notions of health, as related to work, are the same. That is, the level of agreement on actions, behaviors, and thought processes around health differ around these areas of knowledge. Thus, each is slightly out of balance, and relative to the other. Yet, Beclabito Chapter, despite it being an “urban” area, agrees that spirituality, work, and home/environment are aspects of health. Further, their higher level of agreement in these areas is slightly contradictory of our original hypothesis that an urban area would be less “traditional.” Gadii’ahi Chapter is relatively higher in their agreement that family is central to health, and seems to agree less that spirituality and the home/environment are aspects of health. Again, this runs slightly contrary to the notion that this “rural” area with more “traditional” people shows less agreement around the four areas of knowledge.

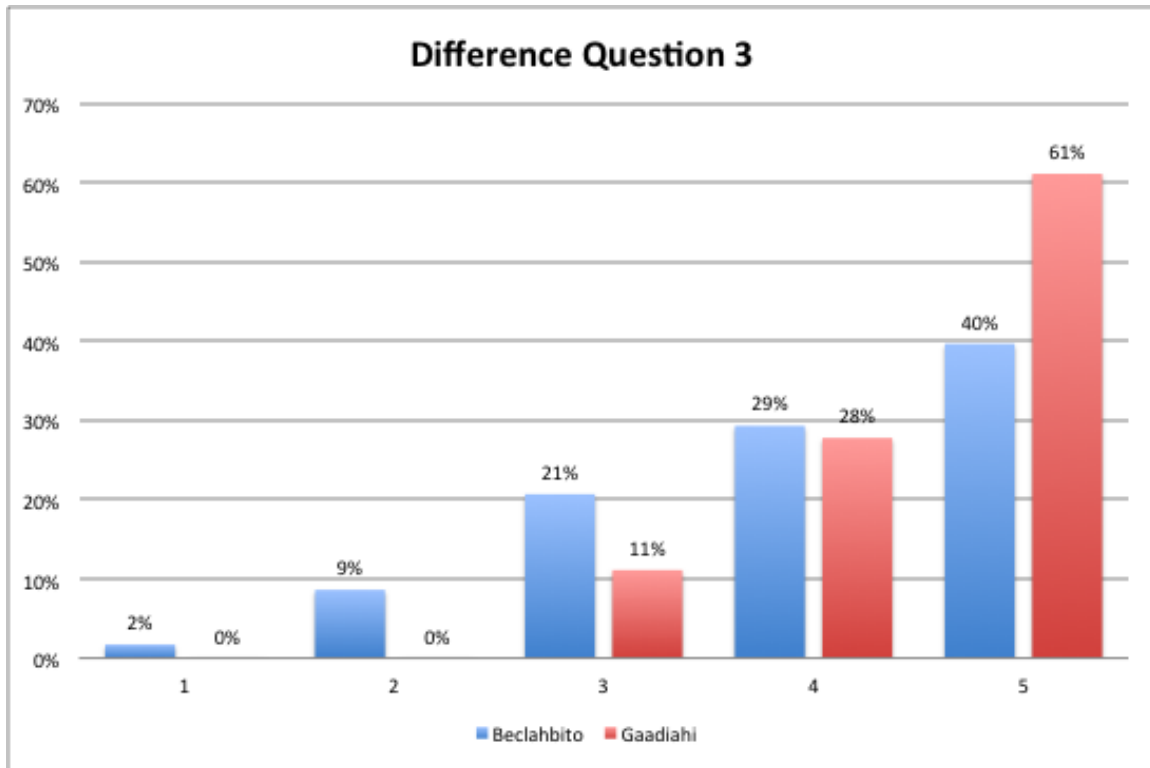
Important implications are raised about the differences around notions of health and agreement as to whether these activities are central to balance. What can be inferred from this is that the demographic of individuals in Beclabito are younger and more “urbanized” but yet have a cultural memory that instructs and behavior despite their self-admittance that they do not do these traditional activities. What is interesting is these individuals had not seen nor connected their agreement that different activities are spiritual in nature and are situated within a “traditional” paradigm.

A closer look at the percentage difference around the 3 questions shows:



This graph shows difference around the following two questions: “I only eat and drink that which makes my body healthy” and “I know how to cook healthy meals.” Overall, Gadii’ahi Chapter agrees relatively more that these things are important. In other words, they are closer to baseline for traditional Navajo health.

The following graph shows the breakdown of the third question: “Traumatic circumstances affects my health”



Gadii’ahi Chapter overwhelmingly agrees that “traumatic” circumstances play a role in one’s health.

What these graphs show is the differences in reasoning in these communities around these issues. This raises the question on what explains these differences in these rather similar populations. We asked:

Did the health programs administered by Chapters impact the Chapter community’s notion of traditional Navajo health?

Both chapters appear to have met the Navajo traditional notion of holistic health but in slightly different ways. These findings indicate that a divergence from the traditional reasoning on health. The Beclahbito community is more “urban” than the Gadii’ahi community. Given, this we expected a more traditional reasoning to prevail in the Gadii’ahi community. However, this was not necessarily the case. What we see is an emphasis on different domains of knowledge. While both communities have health programs, it appears those programs may have impacted different areas of knowledge regarding health. It appears the work domain was unaffected in both communities. Further study ought to focus on why the health programs may have impacted these communities’ notions of Navajo health differently.

A second question we asked, followed from the first. If the health program did impact the community, in what ways did the health program or its absence impact the community’s understanding of Navajo health?

From the tables above, we notice the difference around the three questions, places Gadii’ahi level

of agreement closer to “strongly agree” relative to Beclabito. What this suggests is the presence of the health program may have impacted the differential understanding and perspectives on the underlying inter-connected or spiritual notions of Navajo health. That is, Gadii’ahi has a greater reverence for the spiritual dimension around these three questions. Given that both chapters have health program we can draw an inference, albeit weak, that there is a difference in how each views the concepts embedded in the questions.

The last question raised from this analysis centered on deviation from the baseline (which was implicitly coded as 5 or “strongly agree” in the survey). To what extent did different Navajo communities’ notions of health depart from a baseline of balance Navajo health in those chapters that administered the HNDA programs?

The health program’s presence in the Chapter appear to be meeting its objectives in both communities, but as noted above, in slightly different ways. That is overall, it appears to be impacting different domains of the balancing construct, while this is still unclear, it could suggest that the programs may be altering or addressing deficiencies in the practice of Navajo health. This requires further study.

Explaining Differences

While the presence of the health program appears to be connected to shifting notions of Navajo health, we examined each chapter and used an open-ended exploratory method to identify why each chapter had different notions on the 3 concepts embedded in the 3 questions of difference. To that end, we ran several multinomial logistic regressions with each of the 3 questions as the dependent variable and the other questions as explanatory variables. Because of the size of the sample (N=60 for Beclabito and N=40 for Gadii’ahi) we used a threshold of $p = 0.15$. While, this is a large confidence interval, we felt that because we were exploring the explanatory factors, this approach at least would provide us with some inference to the reasoning around each chapter.

In this model we were more interested in the variables of significance and explaining the relationship between each variable. Future studies will focus on the probabilities and odd-ratios of this model. However, in this study, we seek to understand *why* in Navajo, there is a relationship between the variables rather than the odds indicative of logit regressions.

We started with the question, what explains the difference in Chapters level of agreement that “I know how to cook healthy meals” and why is there difference around these concept embedded in the question. Our model took the generic form:

$$\text{“I know how to cook healthy meals”}_{\text{chapter}} = \text{intercept} + \beta_1(\text{Spirituality}) + \beta_2(\text{Work}) + \beta_3(\text{Family}) + \beta_4(\text{Home/Environment}) + \text{error.}$$

Beclabito Results

In Beclabito chapter we found the following as explanatory factors for “I know how to cook healthy meals.”

Knowledge Domain	Survey Question
Work	<i>I know how to cook healthy meals</i>
Spirituality	My beliefs help me during my time of need
Family	No relationship
Home/ Environment	No relationship
	Respecting one's self increases personal responsibility
Work	I regularly exercise (run, hike, physical labor). I conserve and am not wasteful with what I have.

We then asked a series of question that took the following form: What is it about the concept of “survey question” that is related to and shapes “I know how to cook a healthy meals”? Each of these questions was presented to Navajo knowledge experts to assist in understanding the relationship between these activities, behaviors, and thought processes.

“My beliefs help me during my time of need”

In Navajo cooking is a spiritual process. For example, traditionally, a mother puts her blessing in the food she is preparing for her children for health and strength. A traditional saying note that a brother visits his sister and says, “*Chiiyaan yee sidook'as*” or “She will bless me and strengthen me with her food.” The relationship then underscores the element and belief that cooking is a spiritual process not meant just for physical health but for emotional and spiritual health.

“Respecting one's self increases personal responsibility”

There is a Navajo adage, “*Adaa Iholy3*” or “Take care of yourself.” This is a comprehensive statement on how one dress, speaks, conducts themselves, and cares for themselves. In light of the fact that individuals in Navajo consider themselves to by that creative power SNBH, respecting one's self expands the capacity for one to take of themselves in personal conduct and so forth. Eating right is taking personal responsibility for of caring for one's self, which is also respecting one's self.

“I regularly exercise”

In Navajo thought, discipline is commonly associated with the dawn when children are encouraged to run to greet the Holy People who come with the dawn. The Navajo term is *ha'ahoni* or discipline, endurance and perseverance. Eating right is about respecting the relationship between exercise and the fuel to function. In the past, food was what was affordable, what could be grown in that season. One elder said, “our physical activities was taking care of our livestock and farm land and that built physical health and strength. Today most people don't work the land or own livestock they just sit around and eat and become obese and subject to all kind of health problems.” This relationship between discipline inherent in this notion of running regularly is connected to one cooking meals that ensure balance.

“I conserve and am not wasteful”

Navajo begins thinking, planning and preparations for spring planting during the winter months. Among the many Navajo stories is one about someone leaving some corn behind when they moved to another area. The corn cried after them and someone went back and retrieved the corn. Corn, the main staple in Navajo life, is considered as one of the Holy People. The elders taught that one should not be without seeds and if they should find a seed along a path one should pick it up. According to Navajo thought, the seed can give one enough to eat and can be traded for soft and hard goods. To be wasteful, according to Navajo tradition, leads to poverty. Conserving and not wasting food is an important part of the spiritual process of knowing how to cook healthy meals.

Gadii’ahi Results

Knowledge Domain	Survey Question
Work	<i>I know how to cook healthy meals</i>
Spirituality	Respecting the body is spiritual
	Prayer leads to [good] mental health
Family	Using clans is important for community health
Home/ Environment	No relationship
Work	No relationship

“Respecting the body is spiritual”

To show gratitude for the food that is both prepared and served to you, it was customary to sit up straight and not lean on anything while eating; removing one’s hat before eating showed respect for one’s self the food prepared; and, after eating one would pat themselves while saying a prayer. This prayer acknowledged providence or the source of life and asked that one would have good health and strength to complete their tasks, and they would end by invoking a blessing on all their family. Food is sacred and the thoughts that are placed into preparing that food are sacred. *Nits’iis baa aholya, adaa aholya*. Historically, Navajos maintain food taboos to protect the body as it is sacred and holy. Stabbing one’s food is taboo – to do so is to desecrate the sacred. Consuming reptiles was forbidden, consumption, it was believed would cause illness. Eating sheep, cattle, or horses that died and not killed via butchering, explicitly for food was also taboo. Eating raw meat, bears, spiders, or sheep or cattle that was bitten by a snake was also taboo. Hence, healthy meals are meant to protect the sacred nature of the body. Understanding and believing this encourages individuals to learn how to cook healthy meals.

“Prayer leads to [good] mental health”

Chiyaa ei tsodizin bee nidiyah or food was secured by prayers. The prayers of hope, health, and wellness comes to the table via healthy meals and is consumed. The prayer, by food, has become the person. You become what you eat. Hence, knowing how to cook healthy meals mediates the

prayer that the food will become a part of that person. In these prayers, as demonstrated before, others prayers and thoughts are included in food, hence its need to be healthy. This food, secured by prayer, provides the basis of mental health for individuals.

“Using clans important to community health”

Navajos use ancestral links as a basis for establishing relationships. Non-Navajos are often given a clan name that is either the name of their tribal group or they take on the clan name of the group that adopted them. The system of clan relations is then applied to all. There are around 100 clans within the Navajo Nation. A pueblo from the San Juan region, for instance, continues to identify as San Juan pueblo by its Navajo name *Kin lich’iinii* (Red House). If two people are both *Kin lichii’nii* they would address each other as brothers or sisters. A complex relationship exists to identify specific familial relationships between those who have the same clan, certain obligations and duties come with those clan relationships.

The relationship system unites the tribes as a family. With this form of relating everyone is a member of a family, it is not just a name there are obligation to being a part of a family. Once a clan relationship has been established it never changes. The clan establishes a special bond with all throughout the clan. I know how to cook healthy meals is extending the healthy food with its blessing to all clan members and people. It was customary to feed a person who is visiting and send them on their way with some material gift. One of the obligations of family is to provide meals that will provide sustenance to family members – healthy meals provided to clan family is one of those obligations.

Second Model

We sought to understand if there were differential explanations to “Traumatic circumstances affect my health” between the two chapters. This took the following generic form for the multinomial logistic regression:

$$\text{“Traumatic circumstances affect my health”}_{\text{chapter}} = \text{intercept} + \beta_1(\text{Spirituality}) + \beta_2(\text{Work}) + \beta_3(\text{Family}) + \beta_4(\text{Home/Environment}) + \text{error.}$$

Beclabito Results

Knowledge Domain	Survey Question
<i>Family</i>	<i>Traumatic circumstances affect my health</i>
Spirituality	No relationship
Family	Good parent/child relationships lead to good health
Home/ Environment	I should grow my own food
Work	No relationship

“Good parent/child relationships lead to good health”

Family is *ani'* or the mind/heart in Navajo. In a traumatic event *ani'* or the mind/heart is raw, the mind is confused and in agony, one seeks emotional support from the family. *K'e* is about expressing one's feeling (love and compassion), this connects the family, and through the clan system, *k'e* is extended to the entire community. In times of problems, the family, along with the community, responds as a unit. These compassionate responses comfort and calm the flared and disturbed *ani'* (mind/heart). When the mind/heart is comforted overall health returns. In other words, the parent/child relationship is about *k'é* and family and if this relationship is good, there is a level of dependence on that sacred, healing space with family. It is also about one's ability, through their closeness and support of parents, that when one is hurting there is safety to be vulnerable, and recognize that without support one's health will be affected.

“I should grow my own food”

Navajo believe in being prepared and self-reliant, growing one's food is a characteristic of this element. They also believe that food is sacred. The ability to grow one's food signifies a space of maturity and goodness with family, this in turn is about being able to understand with this responsible maturity comes an understanding of self love and love for other through *k'é* that address the physical needs and more importantly recognizes the need to be open about one's own experiences and knowing how to self care. Traumatic experiences require self-care, and the desire to grow one's food is also about self -are and self- love.

Gadii'ahi Results

Knowledge Domain	Survey Question
<i>Family</i>	<i>Traumatic circumstances affect my health</i>
Spirituality	No relationship
Family	No relationship
Home/ Environment	Walking in the natural world is important for health
	My umbilical cord connects me with the earth
Work	Physical health leads to mental health
	Beautiful things inspire me
	I have enough food for me and my family for 72 hours
	I can afford to buy/grow my own food

“Walking the natural world is important for health”

Dah hozhoonigo nijigaago t'aa 47 bee hat'ah ya'ahot'eeh or being in and walking in scenic areas relieves one of stress, experiencing the fresh air, smell of rain and the sound of thunder invigorate

me and renew me as being part of a dynamic process. Being in sacred and hollow places as the cornfield or in the mountains is uplifting and connecting one with the sacred. This intimacy with the natural world, according to Navajo, is also about self-concern, compassion for self. It is about recognizing when the body and mind is disturbed, consequently, this closeness to the natural world, according to Navajo, translates into an attunement with one's self and one's health.

“My umbilical cord connects me to the earth”

Visiting the place where one was born and raised (or the place where the umbilical cord is buried) renews and strengthens the individual, for the place floods the individual with happy memories, faces of people one loves, the laughter, songs, prayers and teachings, and the playground equips the individual with a level of emotional and mental maturity to recognize how events and experiences affect others.

“Physical health leads to mental health”

Honitsekees ya'at'eehgo t'II 47 bee hats'77s baa' ahøjilly3go haglll ya'at'eeh. To think “good” is to take care of your self and keeping your body physically strong and healthy. Walking the path of the Blessing Way is about maintaining reverence for your self. It is this reverence of self, the recognition of that one is sacred, comes when the body is healthy and the mind fully sound. This practice of self-reverence is achieved, in part through physical health, recognizes traumatic events can affect ones physical, emotional, and mental health.

“Beautiful things inspire me”

A Navajo Elder stated, “as a Navajo rug weaver I am constantly thinking about my art, my work, I seek beautiful design and think of the design I want to weave next. My art keeps me from thinking negative thoughts and for the moment forget my problems. Seeing and holding a baby or looking at the lambs, colts, and calves is uplifting and seeing the goodness in life lifts me from the darkness.” This Navajo adage about health is linked again to the self-awareness that trauma is disruptive of healthy things and must be addressed. This explanation underscores respecting the beauty around much the same as respecting the beauty in within each individual, as the Navajo believe. Hence, a traumatic event disrupts that beauty or health.

“I have enough food for me and family for 72 hours”

Hanoo'hol=-go al9 or Having food storage is the thing to do. *Tl'7zi hacheed33 siziigo a{9* or Have livestock at your entrance. *Ilasts'ii' hwee holoogo al9* or Have seed in your storage. Traditionally having livestock and seed against unforeseen future is to think ahead. To be prepared for all inevitabilities is security and ease of mind. This preparation guards against events that could affect one's mental, emotional, spiritual, and physical health, according to Navajo reasoning.

“I can afford to buy/grow healthy food”

The underlying concept is preparedness where growing one's own food is meant to protect against potential events that could affect one's livelihood and health.

Third Model

We examined the explanatory factors for the third question “I only eat and drink that which makes my body healthy.” The model took the following generic form:

$$“I\ know\ how\ to\ cook\ healthy\ meals”_{chapter} = intercept + \beta_1(Spirituality) + \beta_2(Work) + \beta_3(Family) + \beta_4(Home/Environment) + error.$$

Beclabito Results

Knowledge Domain	Survey Question
Work	<i>I only eat and drink that which makes my body healthy</i>
Spirituality	Wandering from family spirituality leads to regret My beliefs help me during my time of need
Family	Being friendly is essential for my health
Home/ Environment	Places affect my health and well being Home and family protect me from unhealthy things
Work	Volunteering to help others improves my mental health

“Wandering from family spirituality leads to regret”

According to Navajo reasoning, the good feeling among the family brings out the love and joy in cooking and eating. This disconnection affects how one consumes food and drink: prayer is an essential element to honoring family, according to elders. The individual recognizes that their spiritual connection helps them in times of need. Health is not just eating and fitness. The underlying relationship places food and drink as sacred as family is sacred, hence, according to Navajo when one deviates from the home (the sacred place) it affects how they view themselves and how they care for themselves. This results in changing the type of foods and drink one consumes.

“My beliefs help me during my time of need”

Traditionally, the one who prepares the food for the family from the beginning prepares it with good thought and prayers. When the food is prepared on an open fire, the mother (the usual food preparer) will push the embers back into the fire and she audibly offers a prayer for the family. In prayer, elders would say “from the mountains may I be visible and favored as I walk in peace.” In times of needs families always turn to prayer. This reliance on beliefs invokes the memory of self-reverence, self-care, and self-compassion that comes from practicing beliefs, this then extends to taking care of the body and recognizing the sacredness of food as part of that belief system.

“Being friendly is essential for my health”

Navajos maintain harmony with all people by applying kinship and clanship system. This is a social system of interrelatedness and interdependence where an individual would seek opportunities to help someone in their time of need. When there is any discord among people or contention within the family system, *k'e* or the kinship system one won't be able to sleep, eat, think or feel right, according to Navajo elders. To eat right is to exercise temperance, forgiveness, and being kind.

“Places affect my health and well being”

Home places affect one's well being. Traditional Navajo teachings stress that one ought to be organized and tidy otherwise the holy people will pass one by without bestowing upon them blessings. People who maintain a well organized home also have good minds and enjoy better health, according to this line of Navajo reasoning. *Nizhonigo haz'aago t'aa ei nizhonigo nits'iilkees d00 at'ah ya'ahot'eehgo o'osin* or “This home life begins with prayers and good thoughts, wishes, and hope in preparation of food for the family.”

“Home and family protect me from unhealthy things”

Food and how it is prepared centers the family. Traditionally, the parents prayed with and taught their children over dinner or a meal. The family members raised in this environment are said to be embraced in care, love, and belonging. This remains with the individual sense of belonging and protection extends to what one consumes and imbibes, often elders would say, “do not eat these or those, they are bad for you” this type of teaching shapes what one eats and drinks.

“Volunteering to help others improves my mental health”

T'11 doo aho'di'nin7 lah doo anijilw0'go hani' ya'1t'44h d00 alkango 1jji1an7gii. Doo jjioba'go 47 aji1an7 doo bee hozinda. Helping others is uplifting brings about a sense of completeness and helping feed others is one way to uplift others. Helping others is about turning one's self outward in the service of others, this, according to Navajo, has a rejuvenating effect on the heart and mind of the individual it makes them kinder, more self-aware, more attune with the obligations of spirituality associated with *k'é*. It reminds them, their body is as sacred as those they help and therefore will not take into their bodies anything that will disrespect the teachings of parents and the state of completeness they are achieving through serving others.

Gadii'ahi Results

Knowledge Domain	Survey Question
Work	<i>I only eat and drink that which makes my body healthy</i>
Spirituality	No relationship
Family	No relationship
Home/ Environment	Where my umbilical cord is buried is where I am from
Work	No relationship

“Where my umbilical cord is buried is where I am from”

Elder responses to this relationship were as follows: “where one's umbilical cord is buried is one's home. Just as the umbilical cord was once a lifeline, where one's umbilical cord is buried ties one to the home. The home-place holds a wealth of pleasant memories of families, security, and comfort. The sense of place and family eating together is a healthy thing.” *Hoghan doo nisdii'nah, aadoo hayaahaz'lii'* or “One is born and grows up in a home.” All Navajo ceremonial prayers begin by acknowledging mother earth, which represents literal mother and home. The umbilical cord represents the home and family, its symbolism encourages the individual to take care of themselves and to eat and drink what is good for the body, as that food and drink come to represent home and family.

IMPLICATIONS AND RECOMMENDATIONS

A key implication from this exploratory analysis focuses on the underlying notion of the sacred and the spiritual among rather mundane, daily activities like cooking food. This study, using the Diné-centered research process, sought to discover whether or not the different Chapter communities aligned with a baseline of Navajo notions of health. The findings suggested that there were differences between the two chapters, but the differences were subtle and focused on their understanding of Navajo notions of health. Further, it focuses specifically on the spiritual dimensions of health.

What this study demonstrated is health is more than just physical fitness and detached eating, but an understanding of the spiritual significance of eating. That preparing and eating food is a spiritual act that invokes the blessings on others, on land, on spirit, on family, and on self. That eating and preparing food is tied concomitantly to place, to emotional strength, and mental health. More so it represents an obligation to community and community health. The study demonstrated, at least a relationship between what we may consider inconsequential actions and behaviors to health. The act of cooking itself becomes a spiritual act that impacts one's relationship with family, with community. The implications of this notion is vast.

Using the Hozhoo na'adah model, we reviewed the findings with the community in that process discovered that Beclabito, despite their urban setting characterized what they heard as “teachings they heard from their elders.” They felt divorced from the values of the elders and felt they did not understand or practice what they Elders did. What we uncovered as those who took this survey did not realize their actions and behaviors reflected reverence for the spirituality inherent in Navajo notions of health. While they may have said, they do not practice these things anymore, the empirical evidence suggests, at least through their levels of agreement, have reverence for the spiritual nature of health, of the spiritual connections between eating and drinking healthily and obligations to community and clan. This has implications for further study on cultural memory and its strength and persistence in the presence of colonization.

What this suggests is that health programs ought to be designed to incorporate the whole being, not just the body or the physical body. This study suggests that Navajos still associate health and mundane activities like cooking to spiritual health. This implies that the design of health programs

in the Navajo Nation ought to be centered on maintaining balance, by drawing on activities that incorporate all four areas of knowledge into the design of those programs.

CONCLUSION

Navajo health is a function of balance between the four areas of Navajo knowledge placed by the Creators, or a function of a Navajo knowledge system that privileges the individual only as part of the whole. This method rejects reductionist approaches in favor of holistic systems to diagnose issues and to provide solutions to address “imbalance.”

This study showed differences in understanding of Navajo health in two Navajo communities, these differences were subtle, but substantial in the presence of various types of health programs administered by the respective chapters. This study focused on explaining how health is more expansive and broader than often-compartmentalized notions of physical health, mental health, and emotional health. This study demonstrated mundane, ignored, but substantively important aspects of understanding the inter-related of Navajo health. It showed the importance of memory that ties on to land as an important aspect of individual physical, emotional and spiritual health. This is significant, as place or grounding is rarely considered and constitutive element of health. Yet, this study demonstrated that one’s ties to land are associated with knowing how to cook healthy meals.

This relationship uncovered the Navajo beliefs of these symbols, whether there were active or passive, in the construction of what is healthy and what is not healthy. This suggests, that Navajos be they cognizant of these beliefs, actively practice them and believe health is a holistic, spiritual construct.