

Project Title

The Impact of Transportation Service on Food Access Among Native Americans in North Dakota: A Case Study

University

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Research Needs

Indigenous people were associated with food insecurity in Canada, Australia, and the U.S (Skinner, Pratley, and Burnett 2016). In Canada, Indigenous children in rural areas coped with hunger through social support, while children in urban areas coped through reducing food consumption (Tam, Findlay, and Kohen 2014). In Australia, older Aboriginal “5–7 fold risk of experiencing food insecurity relative to their non-Indigenous peers.” (Temple and Russell 2018). In Mexico, the level of income and the unemployment percentage were the main two factors that increased food insecurity among Indigenous households (Ahiman, Estrada, and Colmenero 2017).

In the U.S, the American Indian and Alaska Native (AIAN) population were 5.7 million (1.7%) in 2019 (HHS 2021). In addition, food insecurity is a persistent problem in the U.S, and it is disproportionately distributed across racial/ethnic groups (Myers and Painter 2017). USDA-ERS identified the AIAN tribes as the highest food insecurity ethnic groups in the U.S. The food insecurity percentage among the AIAN in 2019 was 23.5% (1 in 4) (Feeding America March 2021). The median income of AIAN households in 2017 was \$ 40,315 compared with \$ 41,361, the median income of African American households, and \$51,450, the median income of Hispanic households (Asante Muhammad, Tec and Ramirez 2019). In the U.S, Native communities face food insecurity in urban and rural areas (Tomayko et al., 2017). In addition, most AIAN tribes live in rural areas and reservations, where these places were classified as areas with low food access and high food insecurity percentages.

In addition, recognizing that not all food-insecure households are alike, the USDA classifies them into two levels. The first level is the low food security or what used to be called food

insecurity without hunger. Usually, individuals who face this level do not show any indication of reduced food intake. But they face reduced food quality, variety, or desirability of diet. The second level is the very low food security or what used to be called food insecurity with hunger, where individuals may face multiple indications of disrupted eating patterns and reduced food intake (USDA-ERS 2021).

According to USDA-ERS, 59% of all U.S residents live within one mile (walking distance) of a supermarket. But, only 26% of AIAN live within this distance. Two-thirds of AIAN tribes live in areas considered a driving distance (between 1 to 10 miles) of a supermarket, and some households do not own vehicles (Kaufman, Dicken, and Williams 2014). In addition to the food access limitation that most AIAN suffers from, the Native communities also suffer from high poverty and unemployment rates. Poverty, level of income, and unemployment are considered the main factors for food insecurity. According to the U.S census, 23% (1 in 3) of the AIAN are below the poverty level (n.a 2020).

The limitation of food access and the very low food insecurity situation have numerous implications for the health and welfare of AIAN families (Jernigan et al. 2012). The rate of nutrition-related diseases, such as cardiovascular disease, diabetes, and obesity, is doubled among Native households (Kaufman, Dicken, and Williams 2014; Jernigan et al. 2013; Jernigan et al. 2017). Adults Native with very low food insecurity has more than twice the risk of developing diabetes. In addition, some Native adults who are facing very low food insecurity are facing hunger in some areas (First Nations Development Institute n.a).

“It seems that 200 years of poor judgment led to the crises among not only Native American elders but also Native Americans in general.” (Kaelber 2001). However, “little work has been done regarding the food insecurity of American Indians.” (Gundersen 2008). For that, we will investigate food insecurity and hunger among Midwest Native Americans. According to Brown, Noonan, and Nord (2007), 44% out of 187 households of Northern Plains Indians were found under food insecurity. They noticed that the food insecurity rate and level decreased with increasing household income. As the authors claimed, this region is in urgent need of “programs that decrease the prevalence of food insecurity and health disparities in this population.” (Brown, Noonan, and Nord 2007).

Therefore, this study will focus on Native American households in Midwest Native American. However, due to time constraints and funding requirements is not possible to cover all Midwest states or Northern Plains area within a year. Consequently, this research will be a case study, focusing on and investigating all Native American tribes in North Dakota (ND). The Native American tribes in ND consider the 6th largest AIAN population in the U.S. In ND, there are 42,996 (6.4%) Native Americans (with one race alone or in combination with other races) in ND (tribal-nations/statistics n.a). This population is divided into five federally recognized Tribes and one Indian community (See Figure 1). These include the Mandan, Hidatsa, & Arikara Nation (Three Affiliated Tribes), the Spirit Lake Nation, the Standing Rock Sioux Tribe, the Turtle Mountain Band of Chippewa Indians, the Sisseton-Wahpeton Oyate Nation, and the Trenton Indian Service Area (ND.gov n.a; Saenz 2020).

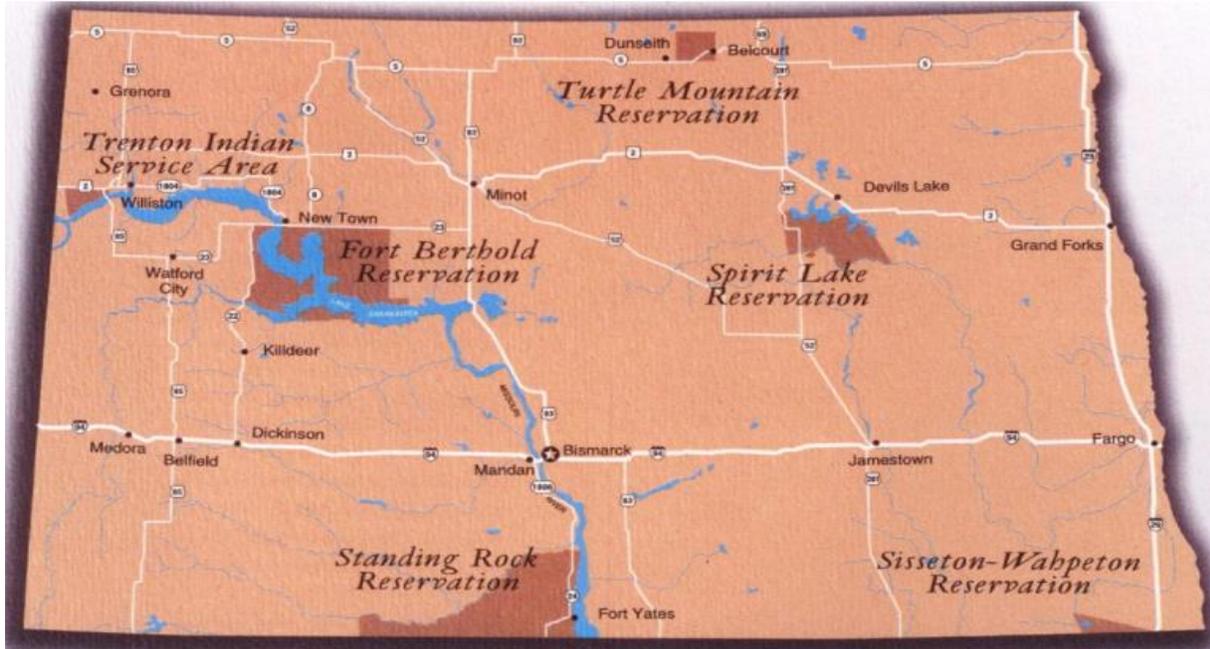


Figure 1. Native Americans Reservations in North Dakota

Source: Tribal Nations | Indian Affairs Commission, North Dakota

Research Objectives

We aimed to accomplish three main objectives and test four research hypotheses at the end of the research, and they are as follow:

Objective 1: Understand and evaluate food access, food environment, and local food system available in and off Native American reservations in ND.

Objective 2: Evaluate public transportation service and food access in and off Native American reservations in ND.

Objective 3: Measure the effect of lack/low public transportation service on food insecurity, hunger percentages among Native Americans in and off reservations.

Objective 4: Assess Native American households' status living in and off reservations before and after the COVID-19 pandemic.

Hypothesis 1: Native American in ND have low food access to affordable healthy food.

Hypothesis 2: Seniors and single parents are the most affected groups from food insecurity and hunger.

Hypothesis 3: The percentage of food insecurity and hunger increase among Native Americans who live on reservation compared with Native Americans off-reservation.

Hypothesis 4: Food insecurity and hunger percentages increased during the COVID-19 among Native Americans who live on reservation compared with Native Americans off-reservation.

Exploring the food environment and estimating the food available for the Native Americans in and off reservations is the primary purpose of this case study. By quantifying the distance between households and supermarkets, we can report the effect of low transportation services on food insecurity and hunger status among Native Americans in ND. In addition to Measuring the food insecurity and hunger status among Native American households and recognizing the most affected household groups. This will allow us to identify the gaps in transportation operation service and how can we provide recommendations to increase food accessibility and decrease food insecurity and hunger percentages among Native Americans.

Research Methods

This research depends on primary data collection due to the nature of the research problem. Primary data is appropriate to investigate and study fields linked with scant information and data. We will collect the needed quantitative data for this case study from the cross-sectional survey method since few researchers investigated the relationship between Native Americans, public transportation, and food access.

The quantitative data we will gather for this research comes from a multi-section cross-sectional questionnaire. Each section of this survey will cover one aspect. For example, section one will cover transportation factors, section two will cover the food access factors, and section three will cover the food insecurity and hunger factors. All the sections together will allow us to report the food access, food insecurity in and off ND reservations, and how they are associated with public transportation.

Because we are targeting a low-income population, and some of them might have no access to the internet or technology, there will be two versions of the survey—the electronic version for people who have access to the internet and technology to take the survey online. The second version of the survey will be a hard copy that will be filled and sent back to us with a return paid envelope.

We will adopt two methods for the survey distribution. The first method is using Qualtrics software to send the survey link. The survey link will be sent to many Native American entities such as tribe leaders and senior centers to distribute the survey among Native American households. The second distribution method is in-person. For example, a research team will attend the Native Americans gathering (the powwow on April 2nd) in MSUM, NDSU, M State, and Concordia), reservations, and senior centers. The audience will have a chance to fill the survey online by the research team tablet, or they will be handling a hard copy with a paid return envelope to fill it up and send it to us. Quantitative data will be transferred from Qualtrics and SPSS for descriptive and inferential statistics. In addition to using the ArcGIS software for visualization.

Expected Outcomes

By completing this case study, we will quantify the reasons for food insecurity among Native Americans ND. We are finding gaps in the transportation agency's operation and strategies related to food insecurity and food access and providing recommendations to improve the transportation service. This case study should be a robust model to study and investigate food

access, food insecurity, and hunger among Native Americans who live in the rest of the U.S states. We also aim to extract recommendations from this case study for policymakers.

Relevance to Strategic Goals

- **Livable Communities:** Improve the food access and transportation service in Native American communities, which will improve their lifestyle and decrease the adverse health-associated outcomes that are linked with food insecurity and hunger. And that will reduce the medical expenses.
- **Economic Competitiveness:** Transit agencies willing and able to provide a new service may gain a competitive advantage because of this differentiation.

Educational Benefits

A graduate student will be involved with the survey aspect of the study. Through their involvement, the graduate student will learn how to develop and administer a survey, participate in a team process of conducting research and be involved in creating and submitting a journal article. This involvement will help the student to improve their research and writing skills. In addition, graduate students will learn how to create a survey and distribute it, which will advance them in research methodology.

Technology Transfer

We will publish a technical report, an executive summary, a journal article submission, a YouTube video, and submit a presentation to a tribal conference.

Work Plan

- **From January 1, 2022, to February 28, 2022, bring together all journal articles and collected information:**
 - Literature review
 - Design the survey questionnaire
 - Test the questionnaire
 - IRB process for survey approval
- **From February 1, 2022, to May 30, survey creation:**
 - Entering the survey in Qualtrics and printing hard copies
 - Testing the online version and packing the hard copies
 - Distribute the survey as hard copies and online link
 - The survey will be available for three months
- **From Jun 1, 2022, to August 30, Data gathering and results analysis:**
 - Transfer the quantitative data from Qualtrics to SPSS for descriptive and inferential statistics
 - Finish the results section

- **From September 1, 2022, to October 30, Results Interpretation and Discussion**
 - Finish discussion and conclusion section
 - Complete final report
 - Create executive summary
 - Create YouTube video
 - Identify journals for publication
 - Identify conference to submit abstract/presentation

Project Cost

Total Project Costs: \$256,882
 MPC Funds Requested: \$128,441
 Matching Funds: \$128,441
 Source of Matching Funds: North Dakota State University, \$78,441
 National Rural Transit Assistance Program, \$25,000
 Community Transportation Association of America, \$25,000

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