SURTCOM 22-12

Veteran Mobility and COVID-19

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ABSTRACT

The current pandemic has affected the lives of all Americans. Rural communities are particularly vulnerable because of a lack of mobility services and the great distances individuals must travel for healthcare and other needs. Nearly five million veterans live in rural communities, representing 57% of Veterans Administration (VA) health care enrollees (MOAA 2020). COVID-19 cases and deaths among rural veterans have increased at a faster rate compared to veterans in urban areas according to Johns Hopkins University (2020). They also found that delayed COVID-19 testing contributed to a higher rate of cases in rural areas compared to urban areas.

The primary objective of this research was to identify veterans affected by COVID-19 who live in rural areas and have mobility needs and to quantify the cost of transportation options for meeting these needs. Secondary objectives included analyzing the role of telehealth and how the pandemic has affected mobility and isolation among veterans in rural America.

Survey results of 150 military veterans showed that many veterans have experienced considerable change due to the COVID-19 pandemic. Twenty percent indicated they have had difficulties accessing VA health care facilities with nearly one third of veterans responding that they began using telemedicine as a direct result of the COVID-19 pandemic.

Similar to findings by Peterson (2014), regional VA health care simulations showed that a coordination effort between VA medical centers and rural public transit agencies would be feasible if projected ridership levels could be met. Policies to encourage possible coordination should be considered to improve veteran medical transportation services. The most challenging obstacle continues to be the transitioning of rural veterans, now mainly late middle age to retirement age, away from their own personal vehicles to other, more long-term sustainable transportation options including public transit.

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1. INTRODUCTION

The current pandemic has affected the lives of all Americans. Rural communities are particularly vulnerable because of a lack of mobility services and the great distances individuals must travel for healthcare and other needs. Nearly five million veterans live in rural communities, representing 57% of VA health care enrollees (MOAA 2020). COVID-19 cases and deaths among rural veterans have increased at a faster rate compared to veterans in urban areas according to Johns Hopkins University (2020). They also found that delayed COVID-19 testing contributed to a higher rate of cases in rural areas compared to urban areas.

The VA Office of Rural Health recently increased efforts to combat the pandemic in rural areas. According to Federal Veterans News (2020), these efforts include:

- 1,476% increase in telehealth visits
- 8,000 completed contact traces
- 102,000 rural veterans reached through the suicide prevention program
- Active debt referral
- 55,000 new rural veteran job hires

While these resources have aided rural veterans during the past year, VA health care enrollees continue to face issues related to medical provider shortages, limited broadband internet access, and transportation concerns, and other barriers to health care. Many rural veterans also have special mobility needs and must travel long distances to receive medical care.

1.1 Objectives

The primary objective of this research was to identify veterans affected by COVID-19 living in rural areas who have mobility needs and to quantify the cost of transportation options for meeting these needs. Secondary objectives included analyzing the role of telehealth and how the pandemic has affected mobility and isolation among veterans in rural America. We also take a cursory look at how access to food impacted veterans during the pandemic.

1.2 Organization of Content

The study begins with a literature review. Previous research and related materials address telehealth services, transportation issues, and specific COVID-related problems. Following the literature review are results from a veterans mobility survey conducted in North Dakota, South Dakota, Minnesota, Iowa, and Nebraska which addresses current transportation issues among veterans along with COVID-specific concerns and food insecurity topics. Next is a simulation analysis that looks specifically at a hypothesized coordination effort between VA health centers and rural public transit agencies. Finally, a summary completes the study with recommendations based on research findings.

2. LITERATURE REVIEW

There are around 19 million military veterans in the United States, according to the Department of Veterans Affairs (2021). While projections indicate that the number of veterans will continue decreasing for the next 25 years, the American Community Survey (ACS) reports about 5 million veterans lived in areas designated as rural (U.S. Census 2015) and nearly 30% have ACS-defined disabilities (ACS 2017).

Transportation is important for both young veterans who are returning from recent service and older veterans. For most veterans, transportation to work, school, medical appointments, or other social activities is difficult because of a disability, illness, lack of accessibility, or financial constraints. Providing affordable and accessible transportation options so veterans can rejoin civilian life and access health care must be considered within the reintegration processes (Burkhardt et al. 2011).

Through the VA, the federal government already offers a service that is focused on assisting with transportation to medical centers. Veterans Transportation Service (VTS) provides eligible veterans with access to health care through reliable and accessible transportation. Veterans who meet the eligibility criteria are granted free transportation services to and/or from VA Health Care Centers (VAMCs) in multi-passenger minivan-type vehicles. VTS guarantees that all eligible veterans who do not have access to their own transportation means can get to VA medical centers or VA-approved community center appointments to receive the care they deserve (U.S. Department of Veterans Affairs 2022). Nevertheless, this service is limited, and state agencies need to develop programs to help veterans access the 152 medical centers and 1,400 community-based outpatient clinics within the health care system operated by the Veterans Health Administration (VHA) (Rall and Wheet 2013).

2.1 Telehealth and Veterans

The VA remains committed to taking care of those who fought for the country through the nation's largest integrated health system, offering care at 1,255 health centers including 170 medical and 1,074 outpatient sites, serving 9 million registered veterans each year. A third of veterans live in rural communities across the country, far from a VA medical center (U.S. Department of Veterans Affairs 2022). However, the implementation of telemedicine not only allows for timely medical care for marginalized populations, but also improves and relieves health services on a large scale, substantially reducing health costs for both public and private institutions.

As a matter of fact, the VA documented its first instance of telehealth in the 1960s, when VA doctors communicated with patients through a closed-circuit television system. As both the number and needs of veterans have grown, the VA has been at the forefront of health innovation, and reaching veterans outside of metropolitan areas has become a central point of their health care delivery (Gogia 2020).

The vision of the VA telehealth was to enable veterans to connect virtually with their healthcare providers, regardless of location, through an easy-to-use platform: VA Video Connect. VA Video Connect allows veterans to meet with their healthcare providers via encrypted video conference. It works on almost any device that can connect to the Internet and is equipped with a webcam, microphone, and speakers to connect with applications through smartphones, tablets, and desktop or laptop computers (U.S. Department of Veterans Affairs 2022).

The VA has offered telemedicine services through its Video Connect platform since 2017. Telemedicine appointments have increased more than 1,000% since the pandemic began. Veterans currently have about 32,000 video inquiries per day (VA Telehealth Services 2022). The VA is focused on optimizing funds to

offer meaningful health care options and benefits to veterans. This includes everything from the best precision oncology treatments to suicide prevention programs and care for the elderly.

Patients receive different types of care through telehealth including mental health, physical therapy, audiology, routine physical exams, and medication management for diabetes and high blood pressure. During 2020 there were 1.5 million mental health consultations, which represent an increase of more than 80% from the previous year (VA Telehealth Services 2022). The most common diagnosis is post-traumatic stress disorder. Other reasons for mental health consultation include depression and anxiety, among others. The VA also offers remote patient monitoring services through telemedicine, which has been especially helpful for patients with symptoms of COVID-19.

Implementing a good and effective telehealth service is an enormous challenge as it requires the participation of: 1) human resources: medical staff, nursing staff, information technology and systems technicians, administrative staff for planning, agenda coordination and collections, call centers; 2) infrastructure: Internet access, computers or smart devices, telephony, geolocation systems, data protection, alarms, etc.; and 3) permanent updating and innovation that allow the optimization of time and resources through the generation of artificial intelligence algorithms and the generation of electronic documents or formats, including prescriptions and instructions for patients. (VA Telehealth Services 2022).

2.2 Transportation Issues

Misjudging the role of transportation can downplay the impact it has in meeting daily living needs, harming veterans' chances to adapt to civilian life and address health requirements. Intelligently designed transportation options will not only improve the transition from military to civilian life but will help veterans develop better life quality (Hussey et al. 2016).

Veterans and military families can experience a number of key transportation problems including:

- Transportation challenges faced by older military veterans are similar to those of seniors and people with disabilities.
- Access to local medical services for all veterans through Veterans Administration hospital services is very important.
- Access to job training and jobs is needed by younger military veterans.

(Burkhardt et al. 2011)

Veterans represent a segment of the population whose members are less likely to meet their mobility needs through ownership or having access to a private vehicle. Some veterans living in rural areas must travel longer distances to get their medical care, or other services they might be eligible for (Burkhardt et al. 2011). In some states, these longer trips are required because there are few VA facilities. The VA can mitigate this situation by contracting with independent healthcare providers when VA facilities can't provide affordable care or services, or when its location is hard to reach from certain communities (LaVela et al. 2004)

Veterans face a higher risk of being unemployed, homeless and often deal with traumatic disorders such as depression and suicide. In some cases, it becomes imperative for them to get early access to jobs, school, social services, and both mental and physical care (Rall and Wheet 2013).

For veterans living in rural areas, it is more difficult to access to assistance because community services and transportation options are less readily available. The Veterans Mobility Corps is an exclusive veterans-to-veterans program that offers free assistance to all military veterans who are not able, or unwilling to drive vehicles due to physical, emotional, or mental disabilities. Veteran volunteers (military

veterans) help their colleagues to commute and remain independent. This is achieved through training on how to get around using public transportation and access to other alternatives to private vehicles, such as community transportation services. Volunteers are selected through a rigorous process and are trained to work with veterans of any age and with existing disabilities. Volunteer veterans, in addition to conducting individual training and group meetings, can also conduct educational presentations and organize group trips on public transport to popular destinations (Samtrans 2022).

Being aware that veterans not only need assistance with medical services, but also require the ability to be productive members of society, the United States Department of Transportation (DOT) in collaboration with the Federal Motor Carrier Safety Administration (FMCSA), the Department of Defense, and the American Association of Motor Vehicle Administrators, have developed measures to facilitate the reintegration of veterans into the civilian labor market. These agencies have launched programs that train ex-soldiers as professional drivers so that they can find employment in the road transport sector (FMCSA 2022). This program allows veterans who have at least two years of experience driving military buses or trucks to get a license and work as a professional driver without having to take a driving skills test, which reduces the cost of obtaining the license and makes the process easier for them.

The Highly Rural Transportation Grant (HRTG) is a program run by the Federal VA. This grant was awarded to the North Dakota Department of Veterans Affairs (NDDVA) in 2015. The aim of this initiative is to provide transportation services for medical facilities to veterans in highly rural counties. In a joint effort between the NDDVA and North Dakota Department of Transportation (NDDOT), this program has worked with different transit providers to offer transportation services for veterans so they can attend their appointments at VA and non-VA health care facilities (NDDVA 2022).

In addition, NDDVA has purchased and donated vans to the Veterans Affairs Health Care Systems (VAHCS). They take care of the maintenance of these units, and vans are managed by the County Veteran Service Offices who look for volunteer drivers to provide free rides to veterans to VA medical facilities (NDDVA 2022).

Most recently, during a legislative session last November, a grant was awarded to NDDVA to work with transit providers to provide transportation services to veterans who live in rural areas and don't have access to travel to medical appointments at VA Community-Based Outpatient Clinics, and who do not qualify for VA travel reimbursement, or cannot afford to wait for reimbursement. Providers that offer their services within a 10-mile zone of Fargo, Bismarck, Dickinson, Devils Lake, Grafton, Grand Forks, Minot, or Williston are encouraged to take advantage of this grant and work with the NDDVA to mobilize rural veterans and they will be paid for their monthly services (NDDVA 2022).

2.3 COVID-19 Pandemic and Veterans

Nationally, the Veterans Affairs Healthcare System faces multiple health care challenges arising from the COVID-19 pandemic including continuing to provide care to patients with mental illnesses and other non-COVID-19 pathologies, preventing contagion among patients and personnel within its facilities, and providing medical care to those citizens who have stayed at home following the public health orders. Care was often already provided through telemedicine, but the VA had to increase remote care to meet these challenges. The weekly number of appointments for patients with mental illnesses increased from 7,442 in March 2020 to 52,609 by the end of April 2020. During the same timeframe, primary care increased weekly video calls from 1,102 to 13,068, and rehabilitation and specialist care calls increased from 2,533 to 5,833 weekly. The number of clinicians using telemedicine and video visits increased from 10,542 to 12,880 in primary care, from 8,599 to 11,173 in mental health care, and from 2,533 to 5,833 in specialist care. The use of care by telephone increased by 131%, going from a weekly average of 327,180 to 756,195 (Heyworth et al. 2020).

In the United States, there are more than 50 health systems with telemedicine programs, such as: Jefferson Health, Mount Sinai Health System, Kaiser Permanente, Cleveland Clinic, Providence, among others. Some strategies implemented during this pandemic include the prioritization of patient care before they arrive at the emergency room, including forward triage, and artificial intelligence (use of cognitive assistants) to identify patients with moderate-high risks and channel them to be evaluated in the emergency room; allowing patients to schedule appointments to take diagnostic samples for COVID-19; remote medical interrogation; remote monitoring of patients in intensive care units; and coordinating patient care at home (Hollander and Carr 2020).

Being away from family is a constant problem for military families, and according to the Military Family Lifestyle Survey responses, the pandemic exacerbated the situation. Time spent away from family was the top concern for all military segments surveyed last fall, with the exception of spouses of active-duty service members. COVID-19 has affected the mental health of many people in the country, including military families. Six out of every 10 military personnel surveyed said the pandemic decreased their overall happiness. Other major fears were access to wages and allowances earned through military service, regular access to a health system, and support for those affected by post-traumatic stress disorder (PTSD) or combat fatigue (Blue Star Families 2022).

2.4 COVID-19 and Veteran's Access to Healthy Food

Access to nutritious food is an important determinant in a healthy lifestyle. Feeding America reports that people who are food insecure are more often impacted by diet-related chronic diseases such as diabetes (Feeding America 2022). The United States Department of Agriculture (USDA) defines food insecurity as "a lack of access to enough food for an active, healthy life for all household members (Coleman-Jensen, et al. 2020).

In a study conducted by the Economic Research Service of the USDA, researchers examined food insecurity among working-aged veterans (ages 18-64 years) in the United States compared to nonveterans. After using regression analysis to adjust for observable differences in characteristics, the results found that veterans are 7.4 percent more likely than nonveterans to live within a household that is food insecure (Rabbit and Smith 2021). Further, the study identified the food insecurity among working-age veterans by individual-level characteristics and documents that the prevalence of food insecurity was higher than the national average for veterans within 10 subpopulation groups:

- veterans with a disability (33.6 percent)
- veterans with less than a high school diploma (24.0 percent),
- veterans with a high school diploma (14.4 percent),
- veterans with some college or an associate degree (12.7 percent),
- female veterans (13.5 percent),
- non-Hispanic Black veterans (13.8 percent),
- non-Hispanic other race veterans (13.6 percent);
- veterans who are employed part time (16.5 percent),
- veterans who are out of the labor force (20.9 percent),
- veterans who are unemployed (20.0 percent), and
- veterans who are not retired or disabled (17.6 percent).

This study helped highlight the issue of food insecurity among veterans and identified which veterans may be at higher risk of food insecurity compared to the general population. The study did not look at the health-related illnesses or chronic diseases resulting from a lack of access to healthy foods. The complex relationship between food insecurity and chronic disease is important but is beyond the scope of this study.

3. VETERAN SURVEY

3.1 Survey Design and Administration

The Small Urban and Rural Center on Mobility (SURCOM) designed an online survey to be distributed to veterans. Surveys contained questions focusing on veteran travel patterns, food security concerns, mobility issues, and changes in medical and general travel patterns resulting from to the COVID-19 pandemic. A copy of the survey is found in Appendix A. The survey was distributed via email to Veterans Service Officers (VSO) and Veterans Affairs representatives throughout North Dakota, South Dakota, Minnesota, Iowa, and Nebraska.

Small urban and rural areas were targeted as the metro areas of Minneapolis-St. Paul, MN, Des Moines, IA, and Omaha, NE were excluded from the survey. Representatives were asked to forward the survey to veterans within their service area, usually at the county level. A total of 150 surveys were received. A number of other surveys were received, but some were either completed incorrectly, or some veterans completed the same survey more than once. Also, some veterans completed part of the survey, but when they felt the questions were becoming too personal, they either quit responding to further questions, or responded with "this is none of your business" multiple times.

3.2 Profile of Respondents

Survey respondents were residents of the five states studied (Figure 3.1). North Dakota had the most respondents representing 36% of all surveys received followed by Minnesota with 31% of surveys received. South Dakota represented 16% of respondents while Nebraska included 12% of total respondents. Iowa had the least number of respondents representing 5% of total surveys received.

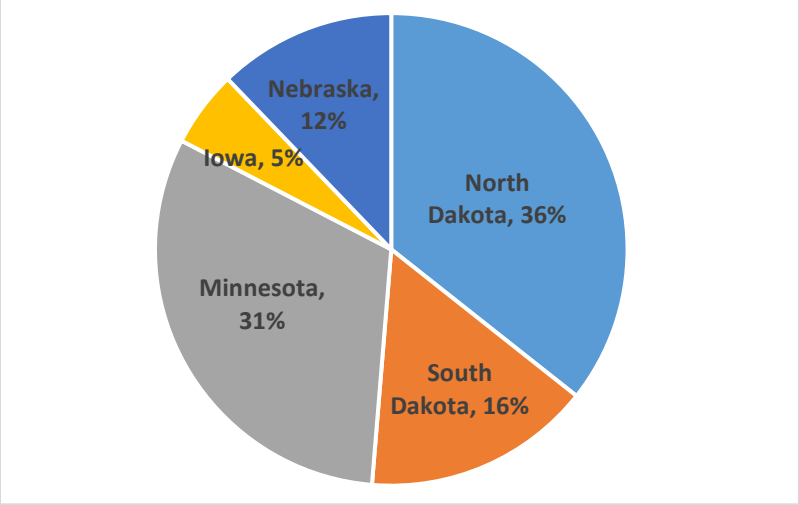

Figure 3.1 Respondent state of residency

Survey participants were far more likely to be male (89%) than female (11%). Responses by gender are illustrated in Figure 3.2.

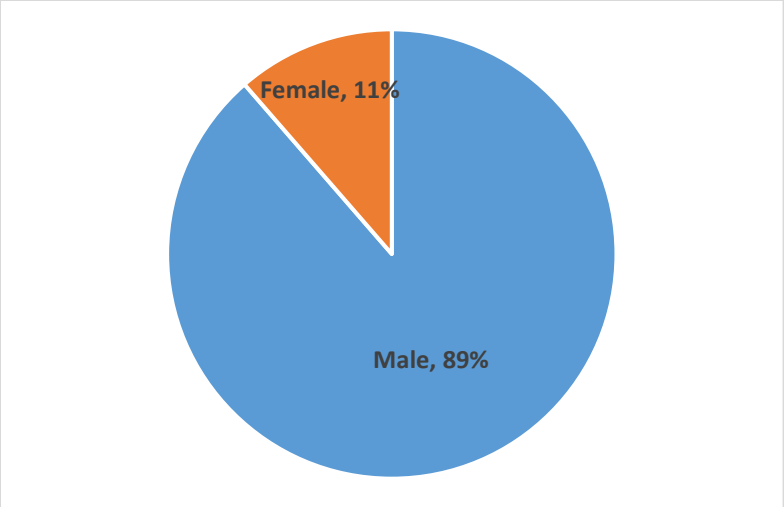

Figure 3.2 Respondent gender

The vast majority of respondents (97%) indicated their ethnicity to be Caucasian while more than 70% also indicated that they were currently married (Figures 3.3 and 3.4). About 10% indicated they were divorced, and 6% specified that they were widowed. Finally, nearly 10% responded that they had never been married.

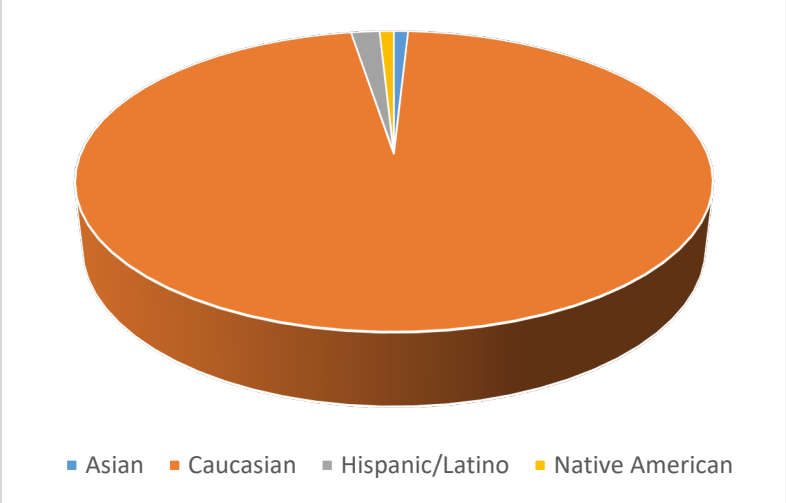

Figure 3.3 Ethnicity

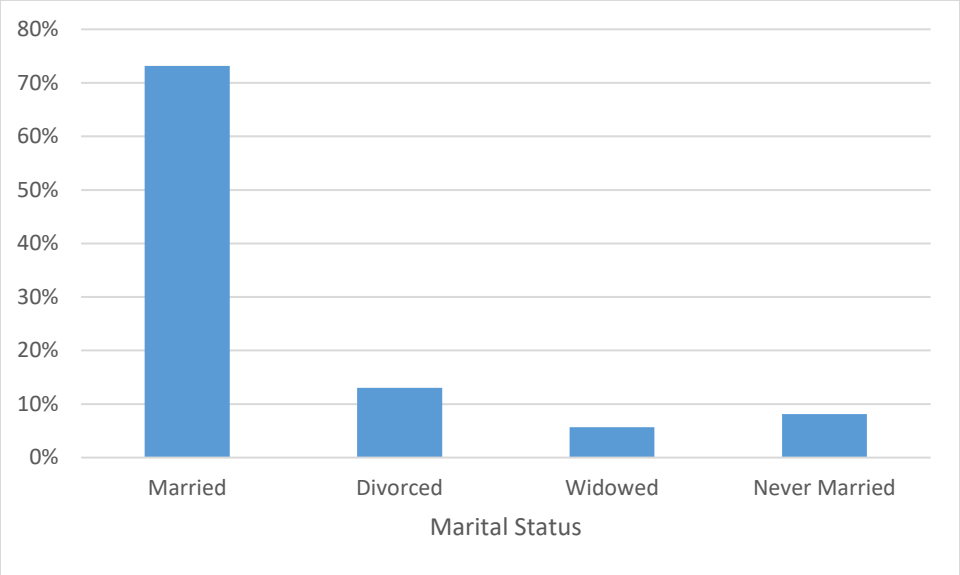

Figure 3.4 Marital Status

Age among veteran survey participants varied substantially, trending towards older adults (Figure 3.5). The highest percentage of participants (39%) were between the ages of 70 and 79 while 19% and 18% were between the ages of 50 and 59 and 60 and 69, respectively. These three age ranges represented nearly 80% of total survey responses. Veterans in their 40s totaled 10% of responses while those in their 20s, 30s, and those over age 80 all represented less than 10% of total survey respondents.

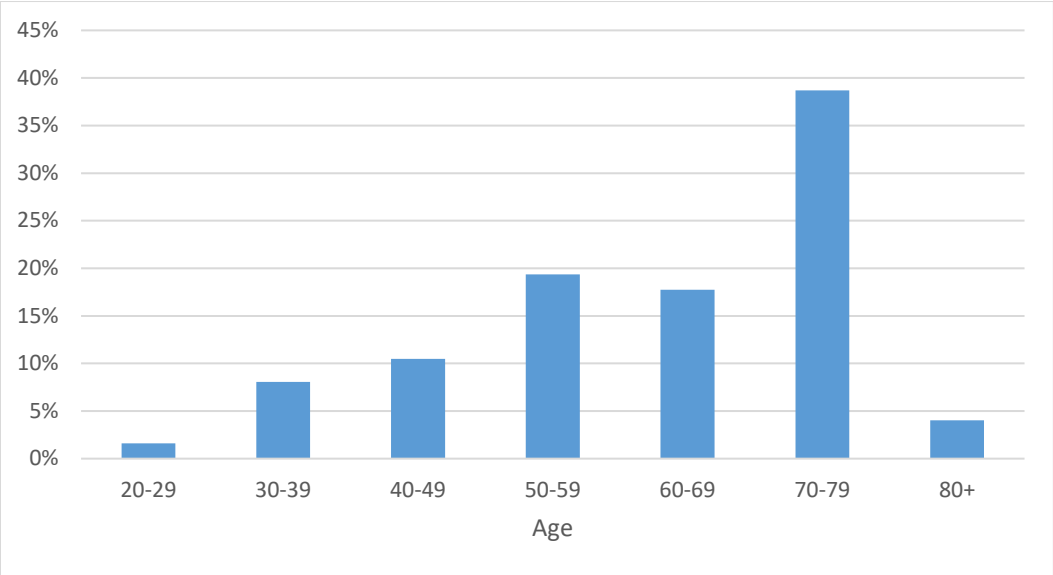

Figure 3.5 Participant age

Participants were asked to indicate their highest level of education attained (Figure 3.6). Nearly 40% of participants indicated a bachelor's degree to be their highest level of education obtained followed by almost 35% of respondents who responded with a high school diploma. Vocational/technical degrees had been obtained by 16% of veterans surveyed while 10% have obtained a graduate degree.

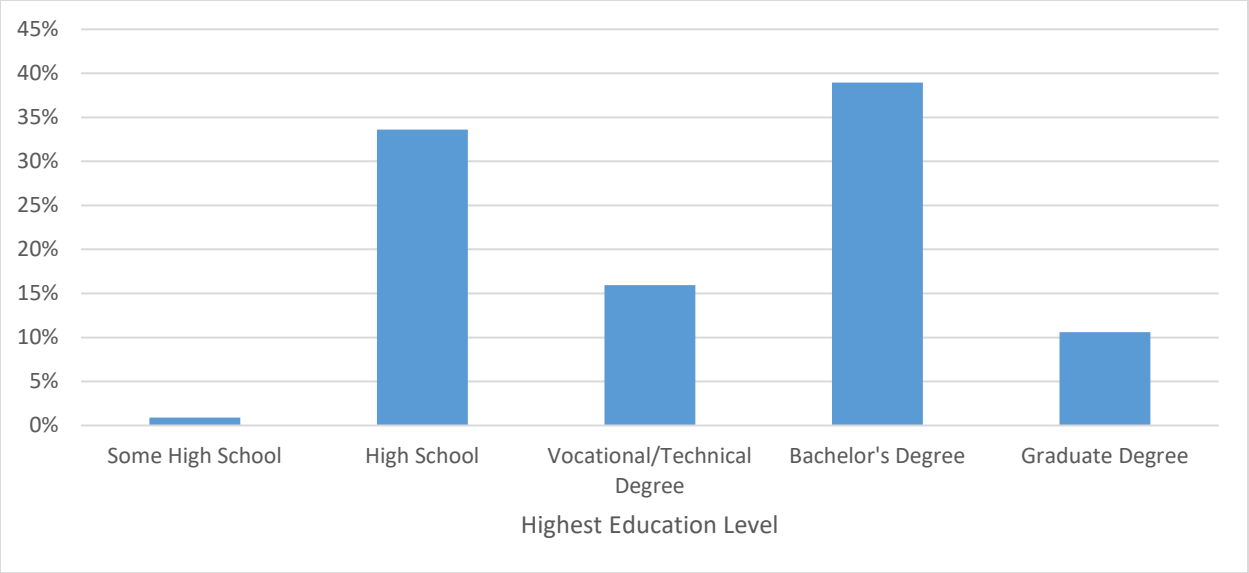

Figure 3.6 Highest education level attained

Respondents indicated a wide range of annual household incomes. Figure 3.7 illustrates that roughly 10% of veterans reported their household income to be less than $30,000 while nearly 40% replied that their annual household income was greater than $75,000. The majority, more than 50%, indicated that their household income was between $30,000 and $75,000 per year.

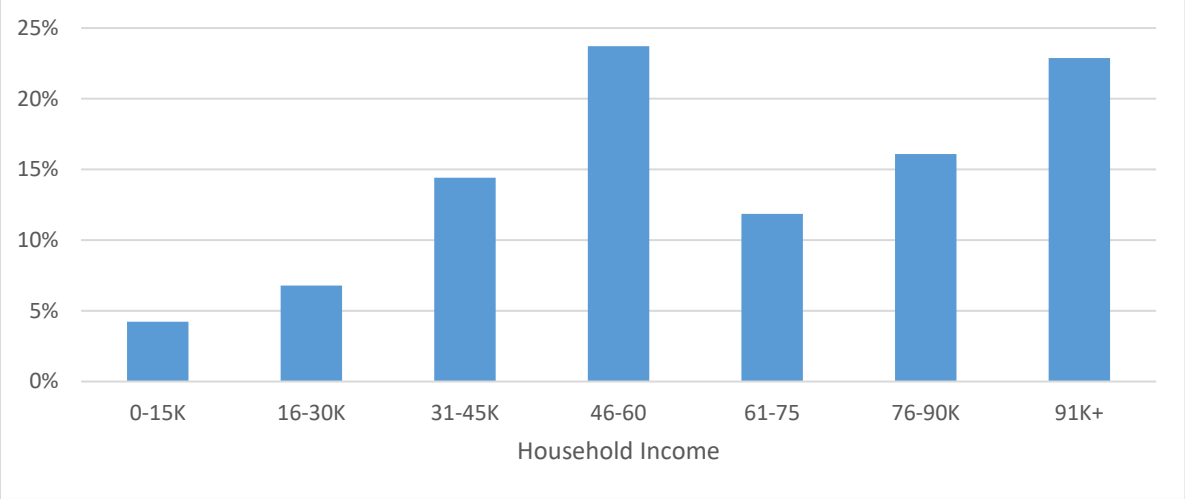

Figure 3.7 Annual household income

Finally, veterans were asked to specify in which veterans group(s) they hold membership. This question permitted multiple answers shown in Figure 3.8. More than 100 respondents indicated to be members of the American Legion while 75 are members of their local Veterans of Foreign Wars (VFW) organization. Disabled American Veterans (DAV) represented 52 veteran respondents and 5 veterans are members of the Purple Hearts organization.

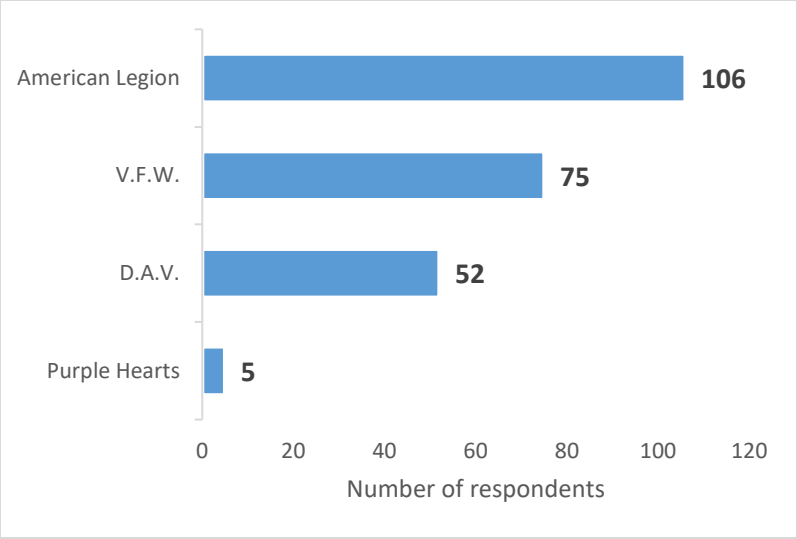

Figure 3.8 Veteran group membership

3.3 Mobility and Travel Patterns

The main section of the survey asked veterans to provide information concerning how and when they travel to both medical appointments and life essential activities. Veterans were asked to indicate whether or not they were disabled and to specify their disability rating. Figure 3.9 shows that approximately two-thirds of respondents were disabled, and numerous participants represent each disability rating category (Figure 3.10). To attain a disability rating, a veteran must have a condition diagnosed by a VA medical facility, and it must be service-connected. This means that there must be a verifiable connection between the disability and an event that occurred while the veteran was in active service (Department of Veteran Affairs 2022).

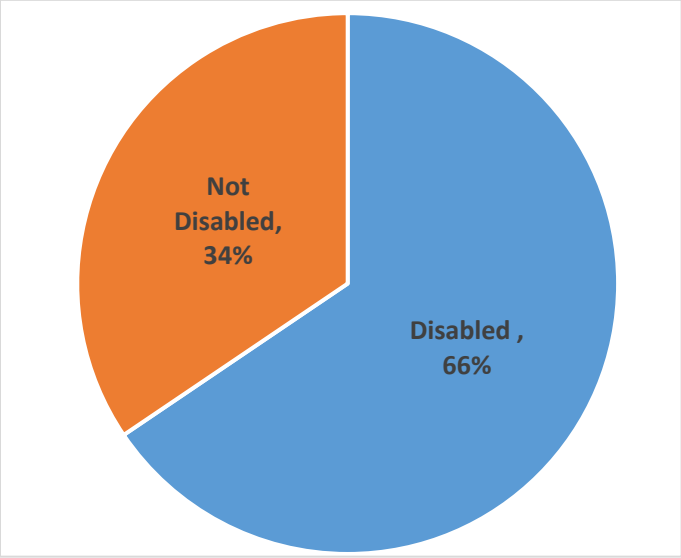

Figure 3.9 Disabled veterans

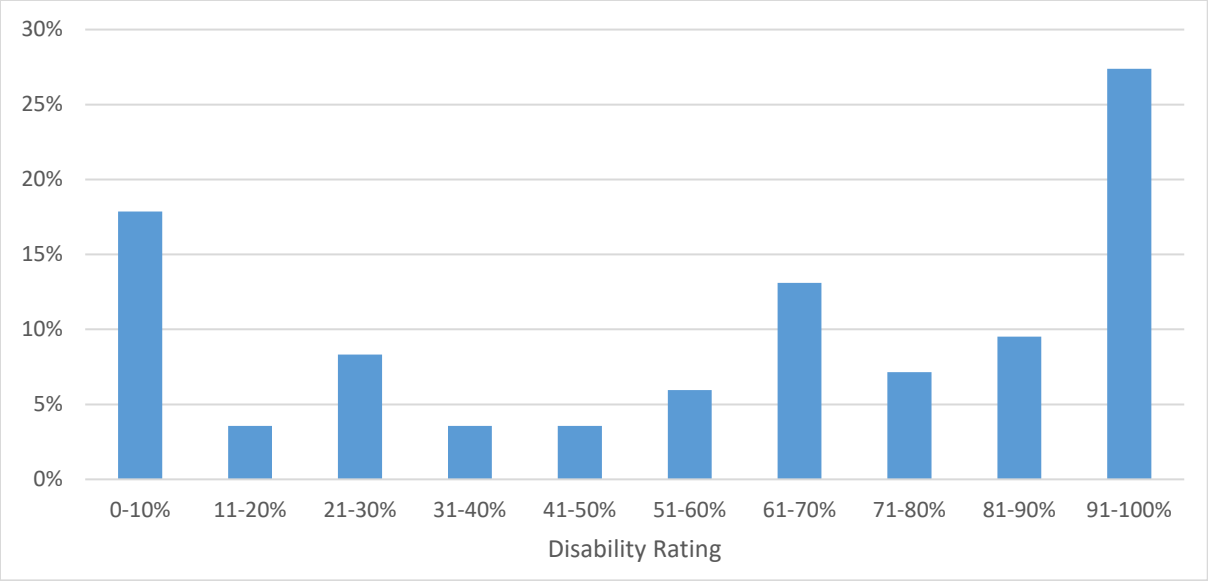

Figure 3.10 Veteran disability ratings

Veterans were also asked to specify the nature of their disability (Figure 3.11). This question allowed for the indication of more than one disability with a number of veterans selecting more than one. More than half of respondents indicated they had a hearing impairment and more than one-third specified a mental health disability. Nearly 10% indicated they use a walker or a cane due to mobility issues while disabilities requiring either a service animal or a wheelchair were specified by less than 5% of respondents. Finally, cognitive disabilities were indicated by less than 5% of veterans as well.

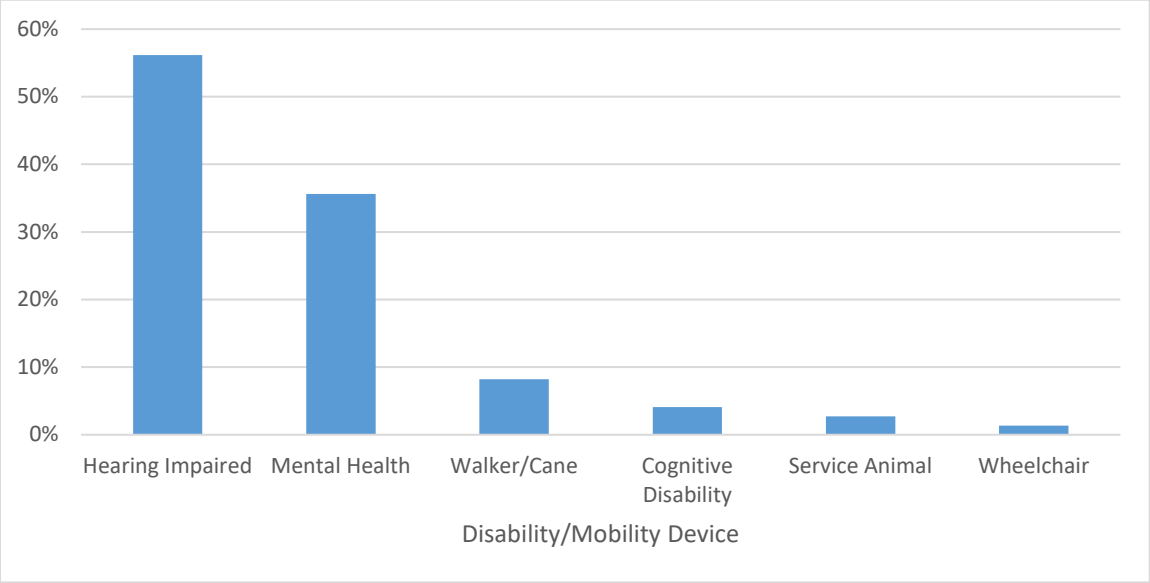

Figure 3.11 Veteran disabilities

A series of questions regarding veteran medical services followed. First, veterans were asked how far they travel to a veteran health care facility (Figure 3.12). Roughly one-third of participants indicated they travel 30 miles or less one-way to their veteran health care facility. Just over 20% responded they travel between 31 and 60 miles, and nearly half of veterans replied that they travel more than 60 miles one-way to receive medical services.

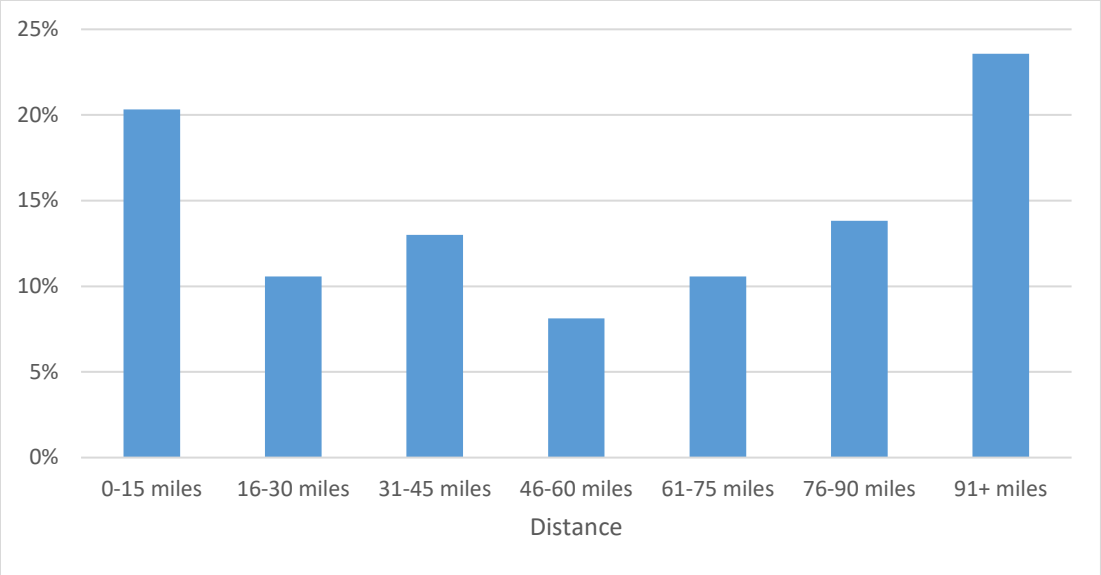

Figure 3.12 Distance traveled to veteran medical services

Next, veterans were questioned how they typically travel to their medical appointments (Figure 3.13). About 80% of veterans indicated they drive themselves to their own appointments while 8% indicated utilizing veteran transportation service to travel to veteran medical appointments. Finally, 5% indicated they either use Disabled American Veterans (DAV) transportation, or travel as passengers by private vehicle to access veteran medical services.

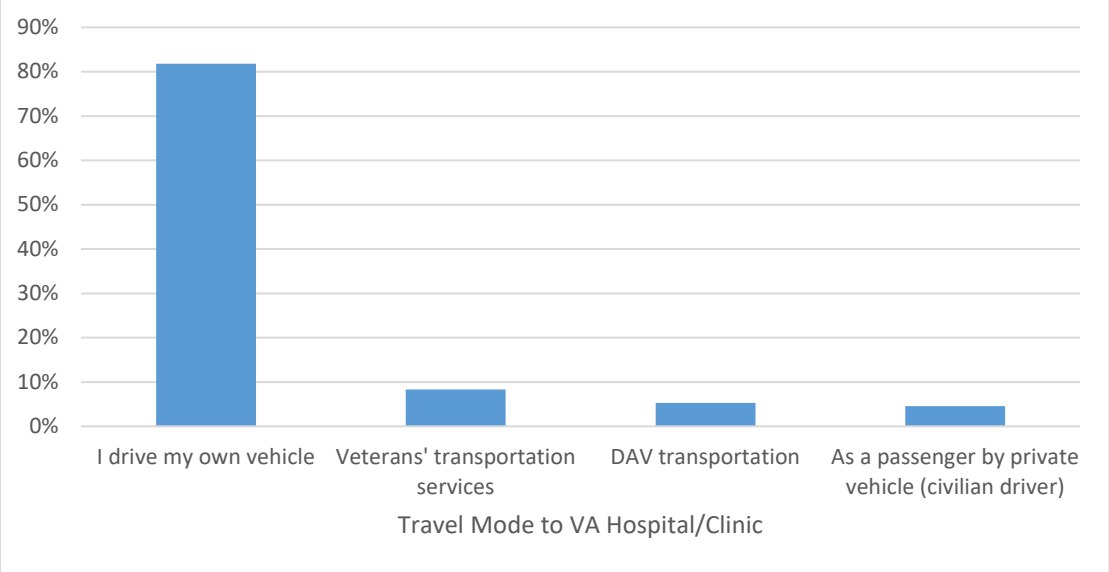

Figure 3.13 Travel mode to veteran medical appointments

Veterans were also asked about the frequency with which they travel to appointments at their veteran health care facility (Figure 3.14). More than 75% indicated they visit their respective facility either semi-annually or annually. Four percent specified weekly appointments while 20% have monthly veteran healthcare appointments.

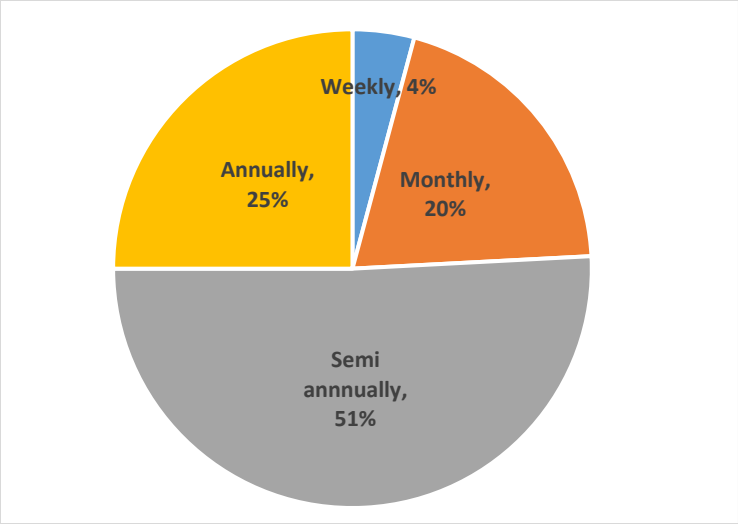

Figure 3.14 Frequency of veteran health care appointments

Questions regarding medical appointments and telemedicine showed that veterans have experienced considerable change during the COVID-19 pandemic. First, 20% of respondents indicated they have had difficulty accessing their veteran healthcare facility due to COVID-19 (Figure 3.15). The main problems cited included appointments being canceled or changed to telemedicine appointments. More than half of survey participants indicated they currently use or have used telemedicine in the past (Figure 3.16) with approximately one-third of these participants responding that they began using telemedicine as a direct result of the COVID-19 pandemic (Figure 3.17).

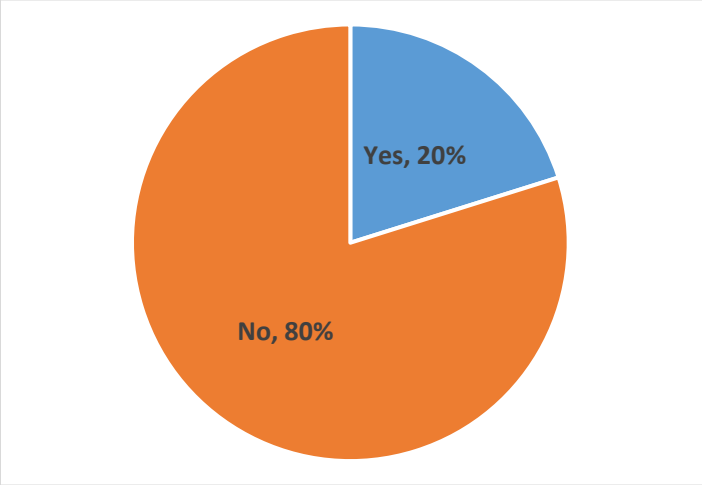

Figure 3.15 Has COVID-19 affected travel to veterans healthcare facility?

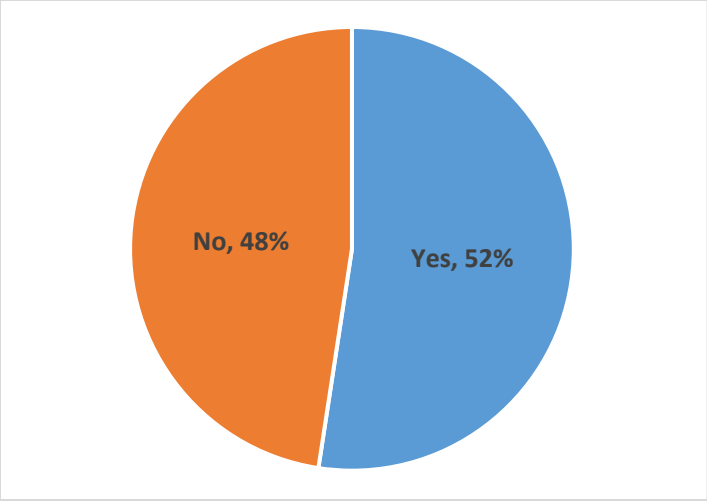

Figure 3.16 Have you used telemedicine?

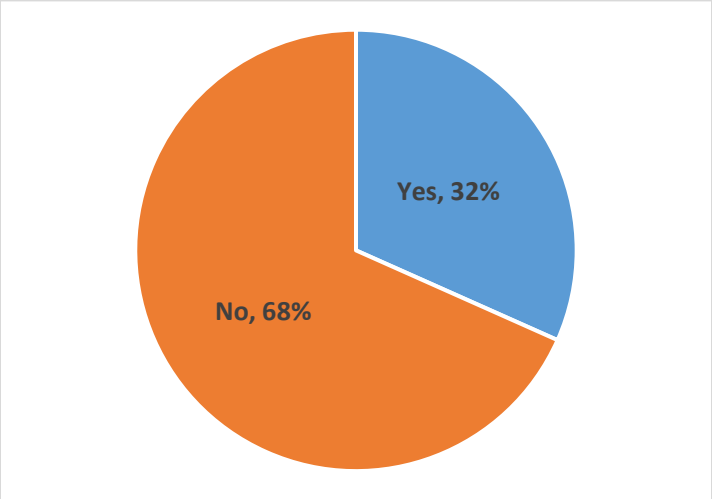

Figure 3.17 Did you begin using telemedicine due to COVID-19?

The next survey section asked veterans travel questions pertaining to work, essential, and social activities. Respondents were first asked whether or not they worked outside their home with 65% indicating they did. Next, they were asked their one-way travel distance to work (Figure 3.18). More than half of respondents answered they travel between 0 to 10 miles to work while 17% indicated they travel either 11 to 20 miles or 21 to 30 miles to work. Eight percent travel between 31 to 60 miles one-way to work, and 6% indicated travelling more than 60 miles one-way to work.

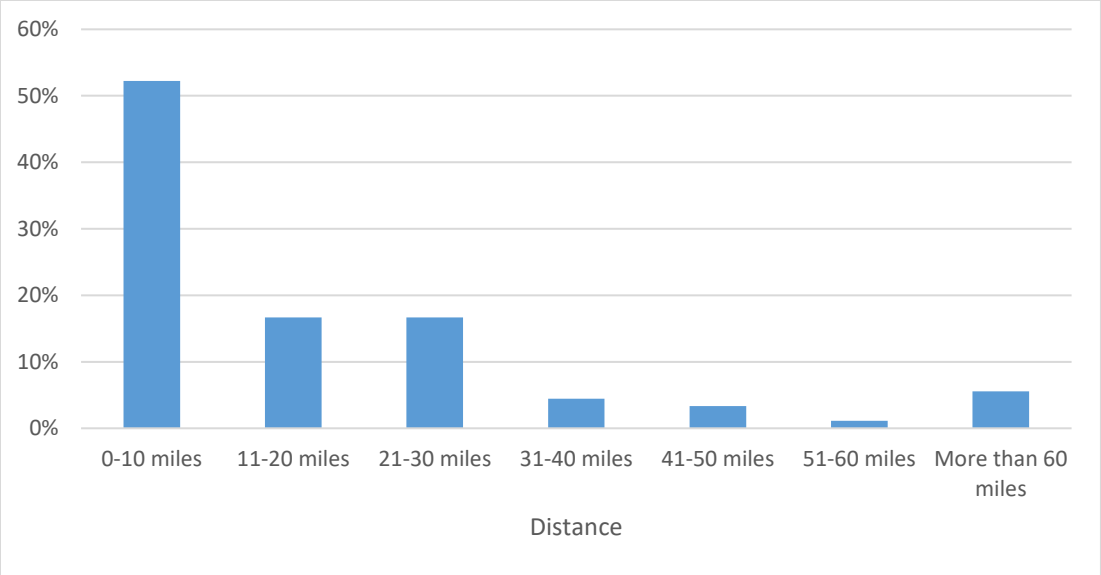

Figure 3.18 Veteran one-way travel distance to work

Travel for essential and social activities was also measured (Figure 3.19). This question allowed for more than one activity to be chosen by veterans. Both grocery and general shopping were chosen by more than 80% of respondents. Community events were chosen by nearly 60% of respondents, and church was chosen by almost half. Veteran support groups, athletic events, and community center activities were chosen by between 30 and 50% of participants, respectively.

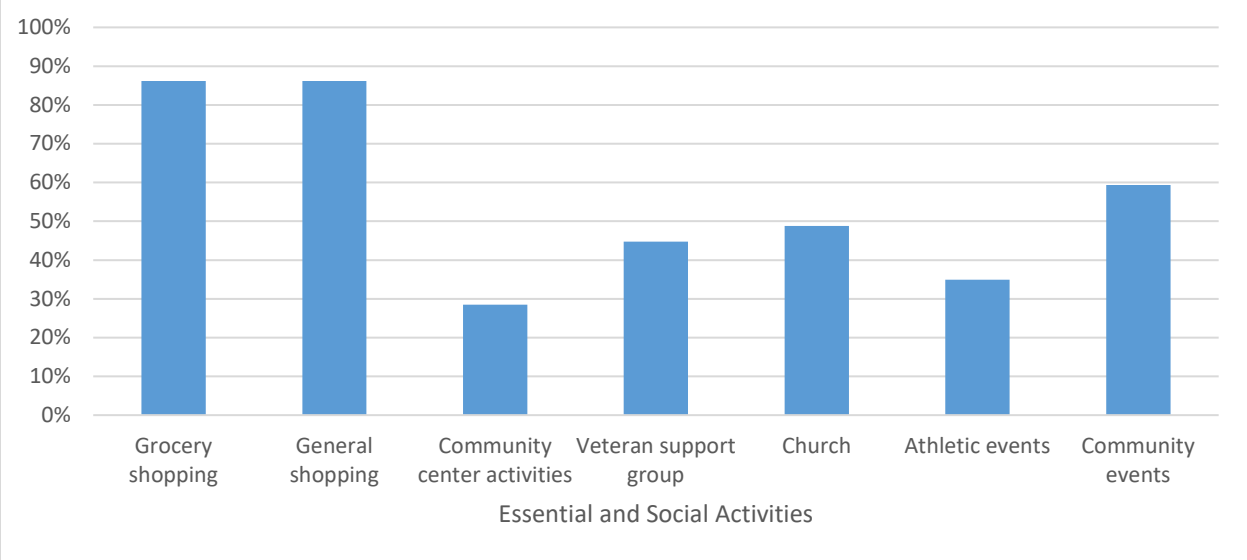

Figure 3.19 Essential and social activities performed

Finally, veterans were asked how they travel to essential and social activities with 93% specifying they drive their own vehicle (Figure 3.20). Four percent answered that they travel as a passenger by private vehicle while 3% use public transportation. Note that 95% of married veterans indicated that their spouse does not have a mobility issue so it can be assumed veterans traveling by private vehicle are primarily being driven by their spouses.

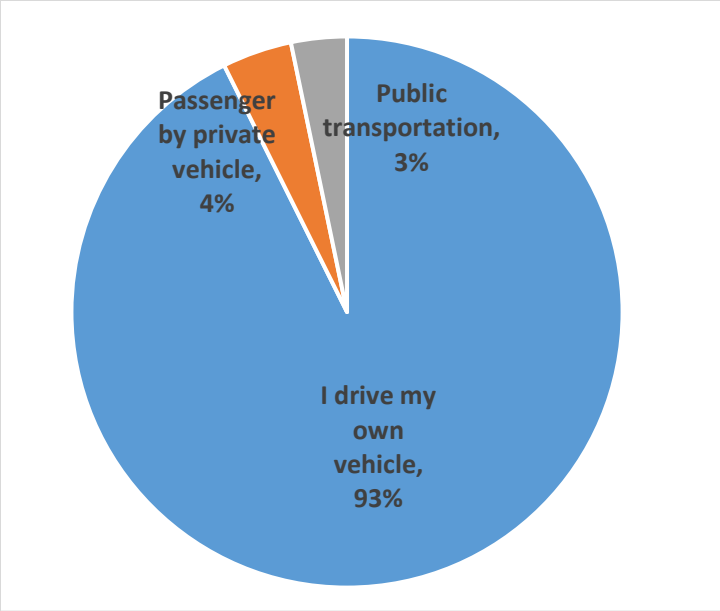

Figure 3.20 Travel mode to essential and social activities

3.4 Safety and Food Insecurity

The final section of the survey asked veterans about their experiences during the COVID-19 pandemic regarding safety and food security. First, participants were questioned about whether or not they felt safe during the COVID-19 pandemic while using shared transportation. Seventy-five percent of respondents indicated they felt safe using shared transportation during the pandemic while 25% did not (Figure 3.21). One veteran respondent indicated a COVID-19 positive veteran required transportation for surgery, and the vehicle driver was infected and died as a result.

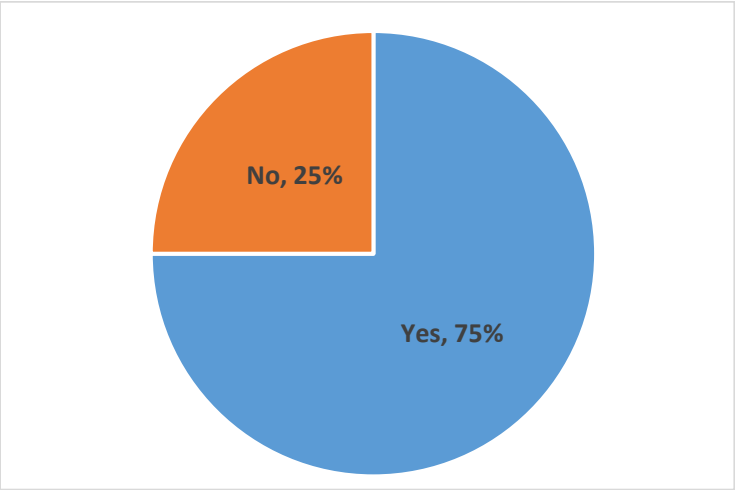

Figure 3.21 Shared transportation safety during COVID-19 pandemic

Food insecurity was found to be an issue for 8% of veteran respondents during the COVID-19 pandemic (Figure 3.22). The survey respondents that identified food insecurity as an issue during the pandemic were within subpopulation groups identified by Babbitt and Smith (2021) that experience food insecurity. Although Babbitt and Smith (2021) studied working-age veterans between the age of 18-64 and 20% of

the respondents from this study were older than 64, all of the survey respondents that reported food insecurity had a disability and 50% of the respondents were female.

The food insecure veterans lived mainly in very remote areas with limited access to services during the pandemic. When asked about the reasons for food insecurity during the pandemic, 90% of survey participants specified that restaurants were closed, while 50% indicated that stores were closed as well (Figure 3.23). Thirty percent designated either the inability to purchase food online, or a lack of finances for their insecurity. Finally, 30% of respondents also indicated that not being able to wear a mask was a cause of their food insecurity as their local grocery stores were requiring them for entry to their business. Twenty percent reported the food insecurity was due to lack of transportation (Figure 3.23).

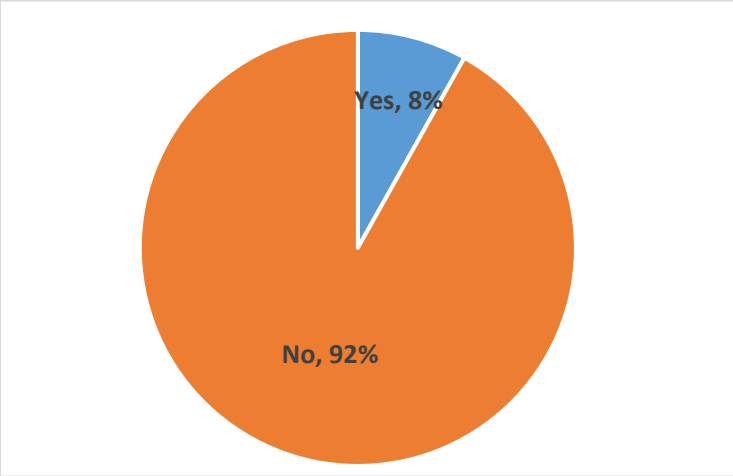

Figure 3.22 Food insecurity during COVID-19 pandemic

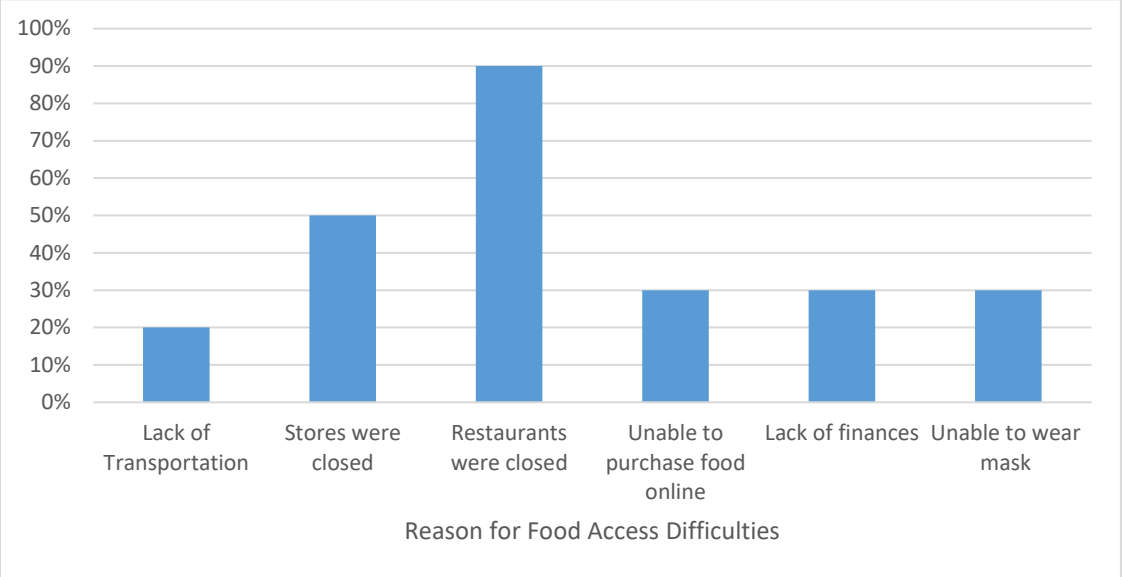

Figure 3.23 Food access difficulties during the COVID-19 pandemic

An open-ended question concluded the survey asking what increased transportation services would improve veterans' quality of life. An increase in consistent, accessible transportation that serves a greater area was indicated by numerous respondents. Increases in both Uber and Lyft services were also requested along with greater rail service in certain locations. Gas prices were also a major problem for many veteran respondents as the higher prices have made many limit their transportation to regional shopping communities. Finally, more DAV vans were requested by many, but finding willing drivers has been difficult throughout the survey study area.

4. VETERAN MOBILITY SIMULATIONS

A simulation overview and results for rural veteran mobility are the focus of this chapter. Simulations were completed from a transit agency perspective to predict the number of veteran passengers required for Veterans Affairs (VA) Health Care Center medical trips so that transit fare recovery levels are equaled or exceeded. Simulations were conducted for transit agencies that serve the VA health care centers in Fargo, ND, St. Cloud, MN, Mankato, MN, Sioux Falls, SD, and Norfolk, NE. Sensitivities focused on targeted fare recovery levels for all five different VA health care centers as well. These simulations and findings build on previous work conducted by Peterson (2014).

4.1 Methodology

Simulations were designed to concentrate on the feasibility of VA health care centers coordinating with transit agencies to provided veteran medical transportation. Specific attention was given to the different transportation reimbursement levels associated with each medical trip corresponding to a certain VA health care center. The specific purpose of the simulations was to determine when it would be cost-effective for transit agencies to transport veterans to their assigned health care center. All veteran medical trips were assumed to be unique and dependent on personal likings and limitations as well. To help account for the uncertainty in travel behaviors, simulations were conducted using a program called @Risk. The following discussion explains the functionality of @Risk and how it can be useful in analyzing data volatility.

When an individual encounters a problem that includes uncertainty, it becomes challenging to find an analytical model that will provide useful results. @Risk, a Microsoft Excel add-on program, uses functions that make it easier to create observations from random variables. Input variables are allowed to vary according to a given probability distribution. For example, entering RISKNORMAL (3,2) into a Microsoft Excel worksheet cell will create an observation from a normal random variable with mean 3 and standard deviation 2. When cells that include variability are replaced with @Risk functions, a simulation is run that generates a result defined as an output. The purpose of the simulation is to imitate real-life circumstances. Within the model, a particular @Risk cell is simulated a set number of times, called iterations, to provide an output. The output value varies for each iteration, depending on the values of the random inputs. The result of the simulation, therefore, is not just a single value for the output but a probability distribution for the output, from which the mean, standard deviation, range, or percentiles can be calculated.

Various probability distributions can also be defined within @Risk for the input variables. Decision-makers then have the option of using a probability distribution that best fits their given dataset. Some common distributions include normal, logistic, uniform, exponential, and many more. The technique of simulation can also be chosen. For this research, Monte Carlo simulations were used as they were thought to best represent the conditions being analyzed. The random number used for each iteration using a Monte Carlo simulation is similar to a spin on the roulette wheel in a casino. Comparable to these spins, the random numbers used to generate results during each iteration are independent from one another. Previous research by Peterson (2014) used this same technique to generate estimates.

The two main variables used to represent uncertainty for this research were transit operating cost per mile and fare recovery percentage for all transit agencies. These variables were selected because they represented two of the most highly regarded statistics when an agency is contemplating expanding or reducing service levels, and they also displayed significant variability within the dataset. Sensitivities included altering the percentage of fare recovery to show the change in ridership necessary to meet

specific fare recovery levels. The following section will illustrate and describe variables used in the simulations.

4.2 Data and Definitions

Data used in simulations were collected from a combination of the Department of Veterans Affairs (2022), the National Transit Database (2019), and survey findings discussed in the previous chapter. Table 4.1 illustrates three important variables used throughout the simulations. These are the transit agency averages for operating expense per mile and fare recovery percentage for agencies that currently or could potentially serve VA health centers in Fargo, ND, St. Cloud, MN, Mankato, MN, Sioux Falls, SD, and Norfolk, NE. Operating expense per mile are similar between the five locations with average operating expense per mile of less than $4 per mile near Fargo, ND and Norfolk, NE while the other three locations all have operating expenses between $4 and $5 per mile. Fare recovery rates among the five locations do not vary considerably. Fargo, ND has the lowest fare recovery rate at 9.0% and Norfolk, NE showed the highest at 13.2% with the other three locations having fare recovery rates between 9% and 12%. The VA travel reimbursement of 41.5 cents per mile for health care services is constant for all five locations and throughout the country. Simulations all assume that veterans would either drive themselves individually to VA medical appointments or they would use public transit. Therefore, every trip taken via public transit would otherwise by reimbursed by the VA at 41.5 cents/mile.

Table 4.1 Important Simulation Variables

VA Health Care Center	Operating Expense/mile	Fare Recovery	VA Travel Reimbursement
Fargo, ND	$3.91	9.0%	41.5 cents/mile
St. Cloud, MN	$4.61	9.3%	41.5 cents/mile
Mankato, MN	$4.80	10.2%	41.5 cents/mile
Sioux Falls, SD	$4.53	12.0%	41.5 cents/mile
Norfolk, NE	$3.44	13.2%	41.5 cents/mile

The VA medical travel reimbursement is offered to veterans who meet certain criteria. Veterans may qualify for the travel reimbursement benefit if:

- they have a VA disability rating of 30% or more,
- they are traveling for treatment of a service-connected condition
- they receive a VA pension
- their income does not exceed the maximum annual VA pension rate
- they are traveling for a scheduled compensation or pension examination
- they are traveling to get a service dog
- they can't afford to pay for travel as defined by VA guidelines

Department of Veterans Affairs (2022)

4.3 VA Health Care Center Simulation Results

VA health care location scenarios were developed to estimate coordination efforts for rural public transit agencies who currently or potentially serve regional VA health care centers. Figure 4.1 illustrates the five regional veteran health care regions analyzed including Fargo, ND, St. Cloud, MN, Mankato, MN, Sioux Falls, SD and Norfolk, NE. All five locations were chosen because more than 60% of survey respondents indicated that they receive veteran medical care at one of these veteran health care centers. Also, travel simulations coordinating VA health care centers and rural public transit agencies were completed at three different distance radiuses from each VA health care center as seen in Figure. 4.1. The market radiuses

were set to 30, 50, and 100 miles from each center, which corresponded with survey results. Veteran responses indicated that nearly one-third travel 30 miles or less one-way to receive veteran health services, another 20% travel between 30 and 50 miles one-way while nearly half travel more than 50 miles to veteran medical appointments. Rural public transit agencies that serve their communities within the given radiuses were used in simulations. At the 100-mile radius, there is an overlap within the travel regions of Fargo, ND and St. Cloud, MN, St. Cloud, MN and Mankato, MN, Mankato, MN and Sioux Falls, SD and Sioux Falls, SD and Norfolk, NE, at the 100-mile radius level. Because of this, simulations allowed the same transit agency to serve more than one veteran health care center if their location fell within the service region of more than one center.

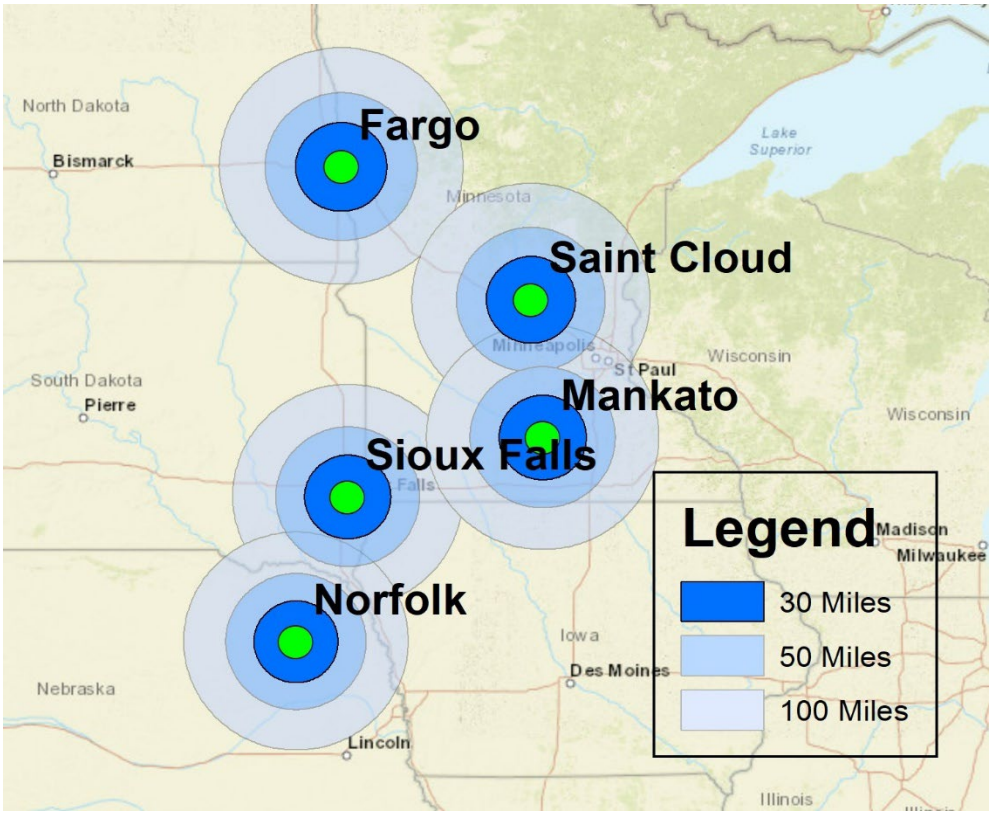

Figure 4.1 VA health care center travel regions

The initial simulation evaluated rural transit agencies within 50 miles of the five regional VA health care centers. Variables used are illustrated in Table 4.2. The simulation was conducted for a 100-mile round trip. Both the operating expense per mile and the fare recovery rate were calculated using @Risk. Distributions used in the calculations included extreme value, exponential, normal, uniform, and triangular. Notice how the values are similar to the average values in Table 4.1, but not the same, showing the variability present within the data. The fare recovery was then divided by various potential VA reimbursement rates ranging from 10 to 40 cents per mile. This reimbursement rate is based on one veteran driving their own personal vehicle so the results demonstrate how many veterans a transit agency must transport to equal their current fare recovery rate for a given trip at a given distance. This result shows a transit agency the minimum number of veterans that must be transported per trip to equal their current fare recovery level.

Table 4.2 Regional Simulation Variables

Regional Location	Operating Expense/Mi. @Risk	Fare Recovery @Risk	Trip Mileage	Average Total Trip Cost	Total Fare Recovery
Fargo, ND	$4.04	8.6%	100	$404	$34.82
St. Cloud, MN	$5.34	8.7%	100	$534	$46.49
Mankato, MN	$4.40	10.1%	100	$440	$44.51
Sioux Falls, SD	$5.18	12.0%	100	$518	$61.99
Norfolk, NE	$4.06	13.3%	100	$406	$53.92

In this chapter, all of the results related to the number of passengers per trip are rounded up to the next whole number, even though exact results often show fractions of passengers. Whole numbers are used because all simulations need to meet or exceed the estimated totals to cover fare recovery rates and each passenger represents one person who cannot be divided. Therefore, Figure 4.2 illustrates that with a VA reimbursement rate of 10 cents per mile transit agencies within both a 30- and 50-mile radius from Fargo, ND, must transport 4 passengers to exceed their current fare recovery level. Three passengers must be transported within a 100-mile radius of Fargo, ND, to exceed the fare recovery level of these agencies. This is due to the lower fare recovery level present within the 100-mile radius (200-mile round trip) compared to the 60- and 100-mile round trips, respectively. Note that all point values shown throughout the results represent the mean values estimated.

As VA reimbursement rates increase, fewer veterans must be transported per trip to surpass current fare recovery levels. Also, all region-specific simulations included no fare charged to the veteran passenger by the transit agency. That's because transitioning veterans to public transit will be difficult enough, thus charging a fare for the ride could potentially deter potential riders from using the service when available. Also, notice that all of the VA reimbursement levels for the simulations were set to less than the current 41.5 cents per mile reimbursement rate for beneficiary travel used for VA medical travel. Therefore, coordinating travel between rural transit agencies and VA medical centers while either meeting or exceeding transit agency ridership numbers generated by the simulations will equal, or improve upon current fare recovery rates and VA travel reimbursement payments will drop as well.

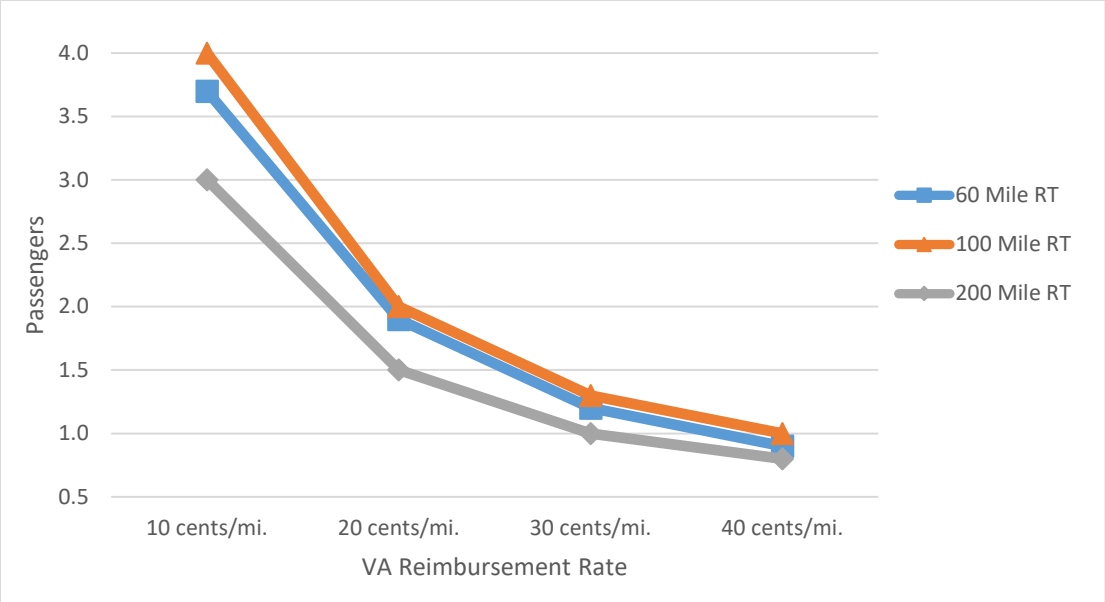

Figure 4.2 Fargo, ND veteran health care simulations

Figure 4.3 shows the Fargo, ND regional ridership needed to meet various fare recovery levels. Current ridership levels by trip length are illustrated within the figure. These simulations assume a 20-cent-per-mile VA travel reimbursement with no transit fare charged. To equal the current transit recovery rate, agencies must average between one and a half and two passengers for the trip lengths simulated. To double their current fare recovery levels agencies must transport three passengers for each 100-mile round trip and four passengers for each 60- and 200-mile round trip, respectively.

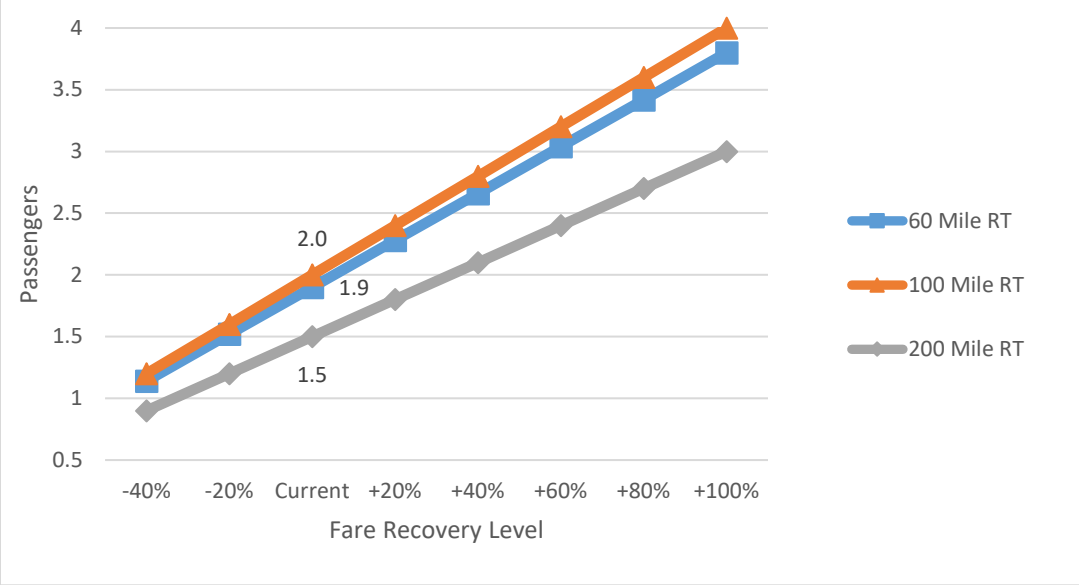

Figure 4.3 Fargo, ND, 20-cent-per-mile VA reimbursement

Figure 4.4 displays simulation outcomes for the St. Cloud, MN, service region. Assuming no fare was charged by transit agencies serving this region, the 200-mile round trip at the 20 cents per mile fare would require two passengers to be transported to exceed current fare recovery levels. Both the 60- and 100-mile round trips would require three veterans to be transported at the same 20-cents-per-mile fare. This was

primarily due to fare recovery rates being lower for the 200-mile round trip compared to both the 60- and 100--mile round trip.

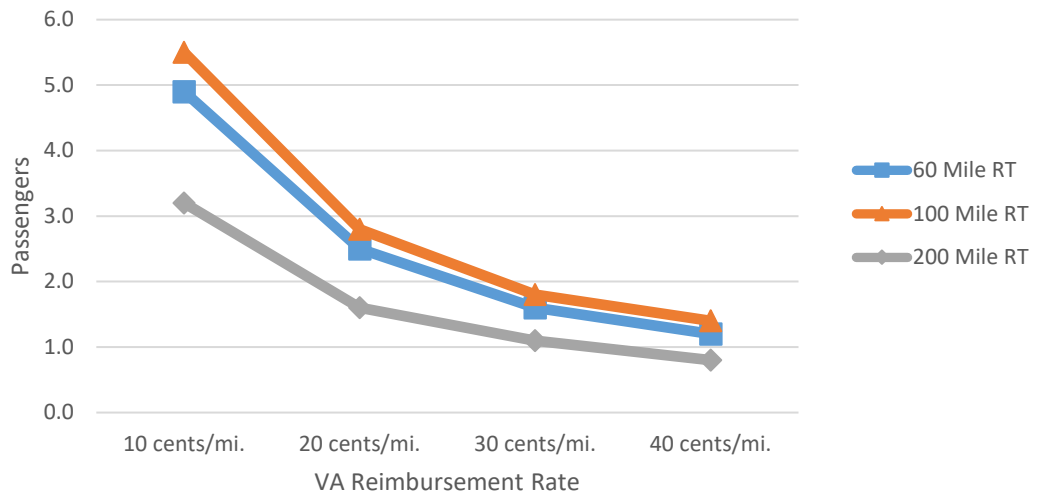

Figure 4.4 St. Cloud, MN veteran health care simulations

Figure 4.5 shows the St. Cloud, MN, regional transit ridership necessary to meet fare recovery levels. Once again, the shorter trips require greater ridership compared to longer trips because those agencies had higher fare recovery rates compared to agencies further from St. Cloud. Three veteran passengers were required to exceed current fare recovery levels for the 100-mile round trip while only two passengers were needed to exceed fare recovery levels for the 200-mile round trip. To double current fare recovery levels, the 100-mile trip would require six passengers while the 200-mile trip would need only four passengers, respectively.

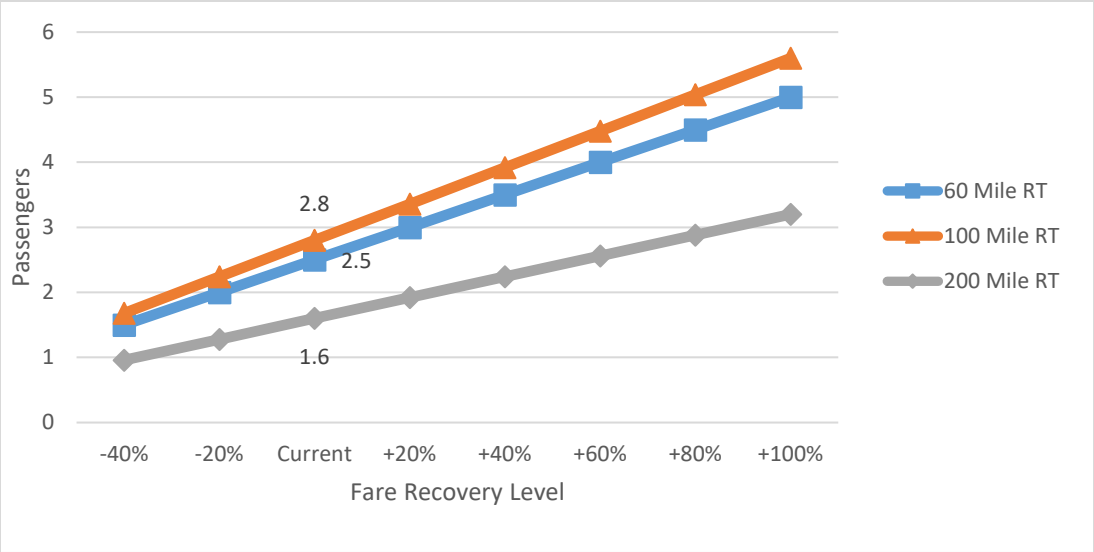

Figure 4.5 St. Cloud, MN, 20-cent-per-mile VA reimbursement

Figure 4.6 shows simulation results for the Mankato, MN, service region. Results were quite similar for the three round trips lengths simulated. Thus, all three would require three passengers to ride to exceed current fare recovery levels at the 20-cents-per-mile level and five passengers to ride at the 10-cents-per-mile level to exceed fare recoveries.

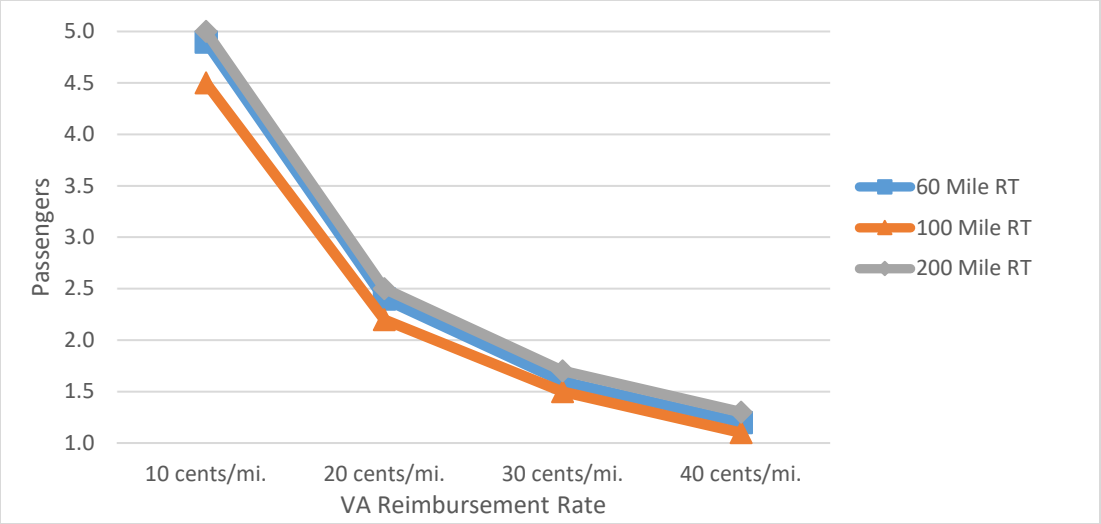

Figure 4.6 Mankato, MN veteran health care simulations

Similar to the previous figure, Figure 4.7 shows little variability comparing different round trip distances. Five passengers would be required to ride for transit agencies within all completed simulations to double the current fare recovery levels representing each round-trip length whereas only three need to ride to equal current fare recovery levels.

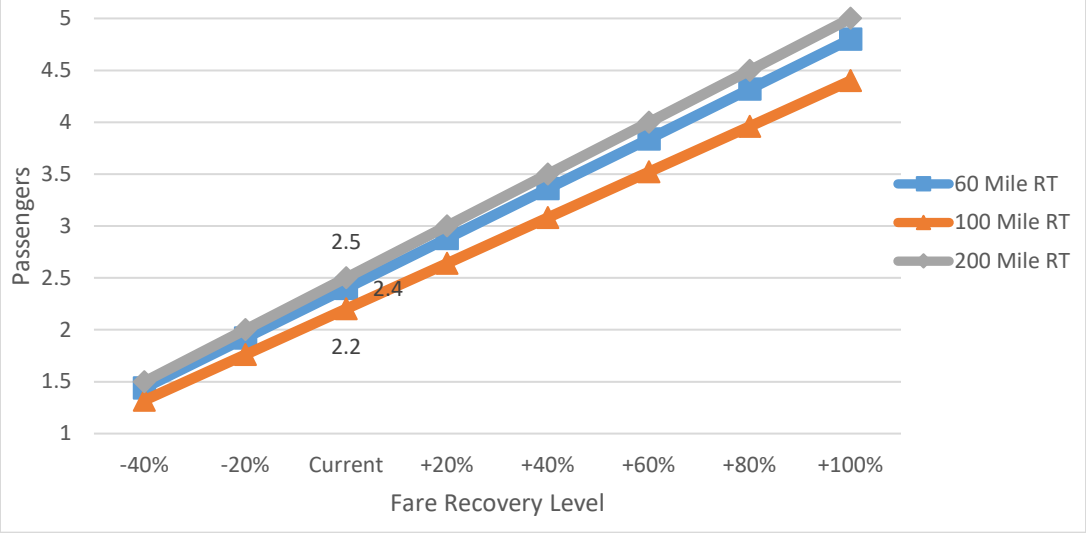

Figure 4.7 Mankato, MN, 20-cents-per-mile VA Reimbursement

Figure 4.8 illustrates simulation results for the Sioux Falls, SD, region. The Sioux Falls results showed little variability. This was similar to Mankato, MN, but the 200-mile round trip showed lower fare recovery levels compared to the other two while the 100-mile round trip was lower for Mankato. At the 20-cents-per-mile reimbursement rate, three veteran passengers would need to be transported to exceed fare recovery levels for all three trip distances.

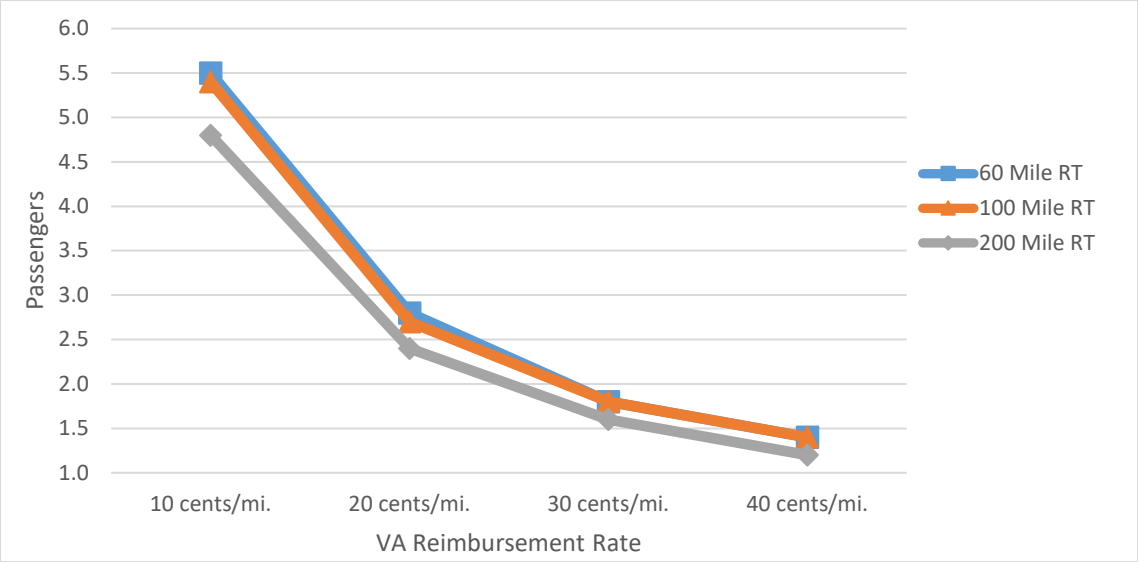

Figure 4.8 Sioux Falls, SD veteran health care simulations

Figure 4.9 shows the simulation results for transit ridership needed to meet different fare recovery levels for the Sioux Falls, SD, region. Because the 200-mile round trip required lower fare recoveries compared to the other two round trips, only five passengers would be needed to double fare recovery rates while the 60- and 100-mile round trips would require six passengers each.

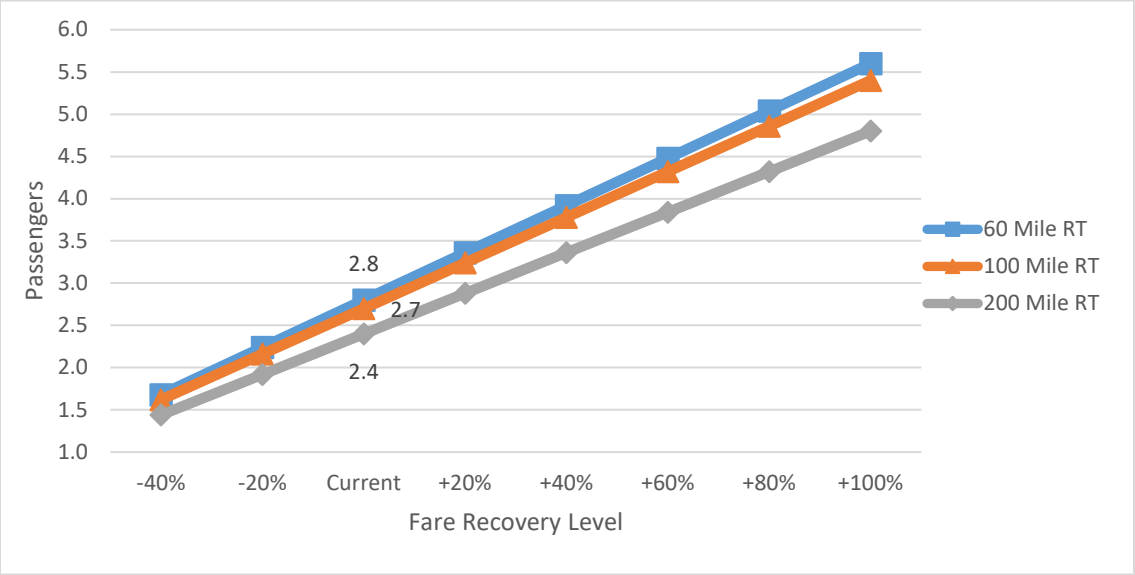

Figure 4.9 Sioux Falls, SD, 20-cents-per-mile reimbursement

Figure 4.10 displays simulation results for the Norfolk, NE region. These simulations showed greater variability compared to all others. At the 10 cent per mile reimbursement rate, six passengers would need to be transported to exceed fare recovery rates for the 60- mile round trip while three and four veteran passengers would need to be transported for the 200- and 100- mile round trips, respectively. This result occurred because fare recovery rates were noticeably higher for transit agencies within a 30-mile radius of Norfolk, NE.

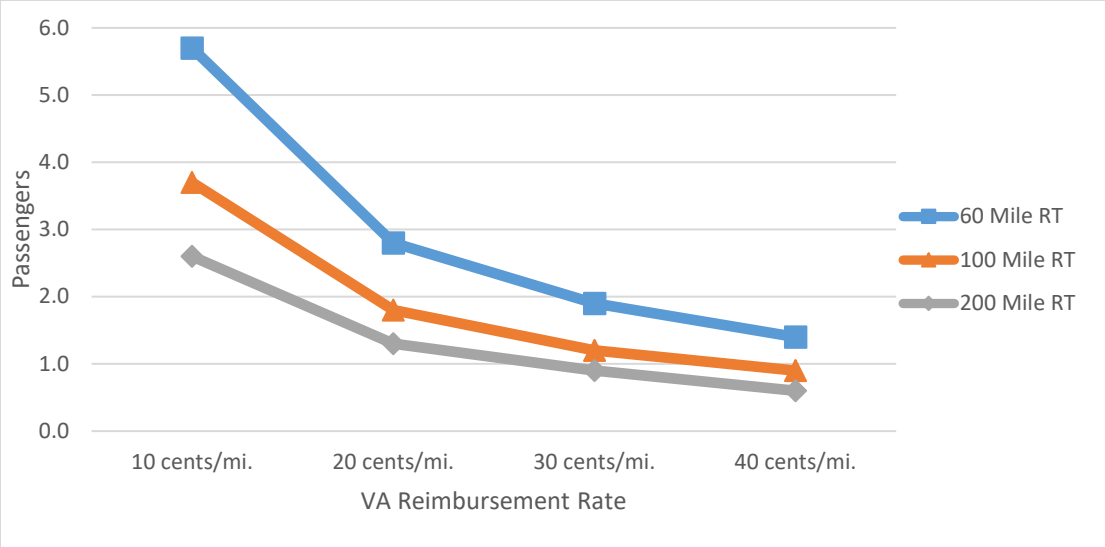

Figure 4.10 Norfolk, NE veteran health care simulations

Figure 4.11 simulations for Norfolk, NE showed greater variability as well, with three veteran passengers needing transport to the Norfolk VA Medical Health Center to exceed current fare recovery levels for the 60-mile round trip. However, only two passengers would require transport to exceed fare recovery levels for both the 100- and 200-mile round trips. Six passengers need to be transported to double current fare recovery levels for the 60-mile round trip while only three and four passengers would require transport to exceed fare recovery levels for the 200- and 100-mile round trips.

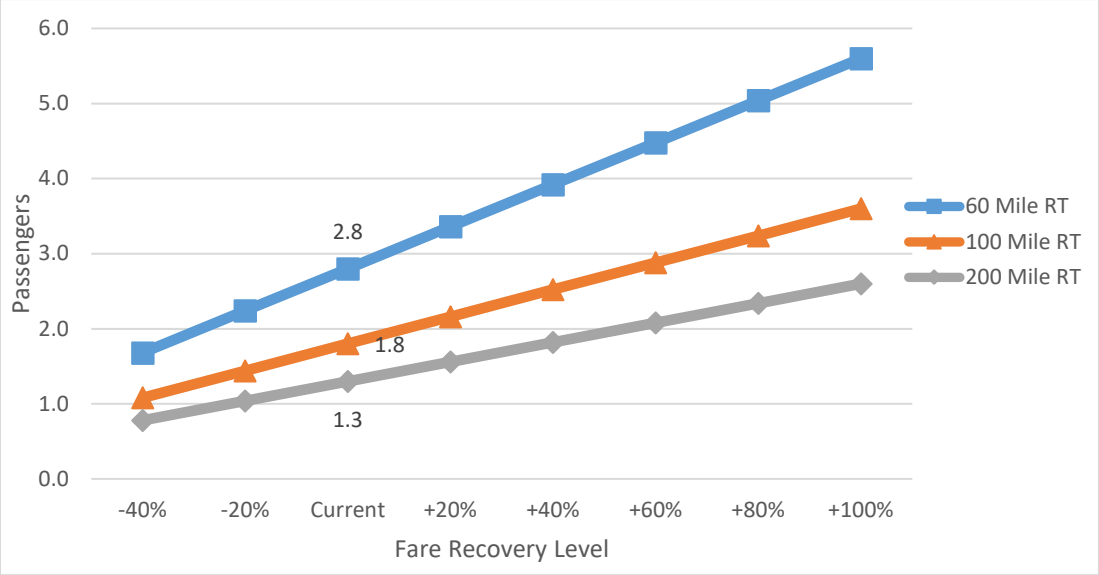

Figure 4.11 Norfolk, NE, 20-cents-per-mile reimbursement

5. SUMMARY AND CONCLUSIONS

One objective of this research was to identify veterans affected by the COVID-19 pandemic who have mobility needs and live in rural North Dakota, Minnesota, South Dakota, Iowa, and Nebraska. Survey results of 150 military veterans showed that many veterans have experienced considerable change due to the COVID-19 pandemic. Twenty percent indicated they have had difficulties accessing VA health care facilities with nearly one-third of veterans said they began using telemedicine as a direct result of the COVID-19 pandemic.

Overall, the majority of respondents were Caucasian, married, male, and late middle aged to retirement aged. More than 60% had attained an education level beyond high school with nearly 40% attaining a bachelor's degree. About half of respondents had a household income of more than $60,000 per year.

Two-thirds of respondents classified themselves as disabled with more than half of these indicating their veteran disability rating is greater than 60%. To qualify for VA travel benefits, a disability rating of 30% or greater is needed, so all of these veterans qualified for VA travel benefits. Hearing impairment and mental health were the most common disabilities reported, followed by mobility impairments. Even with these high levels of disability among veterans, 80% of respondents indicated they drive themselves to medical appointments with more than 90% indicating they drive themselves to social activities. However, both social and work trips were much shorter on average compared to VA medical appointment trips.

Eight percent of the survey respondents reported they experienced food insecurity. All the respondents reporting food insecurity also reported having a disability and 50% reported they were female. Some of the respondents could not access food because restaurants were closed, they could not purchase food online, they lacked transportation, and they lacked financial resources.

Another objective of this study was to quantify the costs of viable transportation options to meet veteran medical needs. Simulating a potential coordination effort between VA medical centers and rural public transit agencies yielded varying results by region because of differing fare recovery rates and operating costs. Norfolk, NE, simulations had the highest average fare recovery rate when compared to Sioux Falls, SD, Mankato, MN, Fargo, ND, and St. Cloud, MN. Mankato, MN, had the highest average cost per mile compared to the other four locations while Norfolk, NE, had the lowest cost per mile.

By including a 10- to 20-cents-per-mile VA reimbursement for medical travel, most regional transit agency simulations required ridership of between one and six passengers per trip to meet or exceed current fare recovery levels. St. Cloud, MN, and Norfolk, NE, regional simulations show the most variability among round trip lengths due to differing fare recovery rates among transit agencies located at various distances from corresponding VA medical centers.

Similar to findings by Peterson (2014), most simulations showed that a coordination effort between VA medical centers and rural public transit agencies would be feasible if projected ridership levels could be met. Policies to encourage possible coordination should be considered to improve veteran medical transportation services. The most challenging obstacle continues to be the transitioning of rural veterans, now mainly late middle age to retirement age, away from their own personal vehicles to other, more long-term sustainable transportation options including public transit.

5.1 Limitations and Need for Further Study

Survey bias may have been present within the survey findings as the online survey used did not allow for veterans without access to internet service to complete the survey. Also, this study did not look at access to healthy food and its relationship to chronic disease. That topic was beyond the scope of this research. Finally, the survey was cross-sectional and was completed at a certain point in time and did not consider how COVID affected veterans at different times during the COVID pandemic.

Access to food/food insecurity for veterans was a minor aspect of this study. However, the topic is relevant and deserves more in-depth study as it is clear that food insecurity is an issue among veterans. Also, a survey targeting homeless veterans and others without ready internet access would allow for a more in-depth understanding related to COVID difficulties and access to food.

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APPENDIX

1.1 Survey

1) Are you a disabled veteran? (If you check No, skip to question 4)
□ Yes
□ No

2) If Yes, what is the nature of your disability and what mobility device, if any, do you use? (select all that apply)
□ Scooter
□ Walker
□ Wheelchair
□ Cognitive Disability
□ Service Animal
□ Mental Health
□ Hearing Impaired
□ Sight Impaired Other_____

3) If Yes, what is your disability rating?
□ 0-10% □ 51-60%
□ 11-20% □ 61-70%
□ 21-30% □ 71-80%
□ 31-40% □ 81-90%
□ 41-50% □ 91-100%

4) Are you a member of a veterans' group? (select all that apply)
□ D.A.V.
□ V.F.W.
□ Purple Hearts
□ American Legion
□ Other_____

5) How do you usually travel?
□ I drive my own vehicle
□ As a passenger by private vehicle (civilian driver)
□ As a passenger by private vehicle (veteran driver)
□ Public transportation (Fixed-route)
□ Public transportation (Dial-a-ride, Paratransit)
□ DAV transportation
□ Veterans' transportation services
□ Other veterans' transportation
□ Volunteer driving service

6) Has the COVID-19 Pandemic affected your ability to travel?

□ Yes
□ No
If Yes, please explain_____

7) Where do you typically receive Veterans medical services?
City_____ State_____

8) How far do you travel to your Veterans Hospital or Veterans Clinic?
□ 0-15 miles
□ 16-30 miles
□ 31-45 miles
□ 46-60 miles
□ 61-75 miles
□ 76-90 miles
□ 91+ miles

9) How do you usually travel to a Veterans Hospital or Veterans Clinic?
□ I drive my own vehicle
□ As a passenger by private vehicle (civilian driver)
□ As a passenger by private vehicle (veteran driver)
□ Public transportation (Dial-a-ride, Paratransit)
□ DAV transportation
□ Veterans' transportation services
□ Other veterans' transportation
□ Volunteer driving service
□ Other_____

10) How often do you travel to a Veterans Hospital or Veterans Clinic?
□ Daily
□ Weekly
□ Monthly
□ Semi annually
□ Annually

11) Has the COVID-19 Pandemic affected your ability to travel to a Veterans Hospital or Veterans Clinic?
□ Yes
□ No
If yes, please explain_____

12) Have you used Telemedicine (the remote treatment of patients using internet services, not in-person) to receive medical services?
□ Yes
□ No

13) Did you begin to use Telemedicine due to the COVID-19 Pandemic?
□ Yes

□ No
If yes, please explain_____

14) Do you currently work outside your home?
□ Yes
□ No

15) If yes, how do you usually travel to work?
□ I drive my own vehicle
□ As a passenger by private vehicle (family member driver)
□ As a passenger by private vehicle (co-worker driver)
□ Public transportation (Fixed-route)
□ Public transportation (Dial-a-ride, Paratransit)
□ Volunteer driving service
□ Other_____

16) How far do you travel to work? (One way)
□ 0-10 miles
□ 11-20 miles
□ 21-30 miles
□ 31-40 miles
□ 41-50 miles
□ 51-60 miles
□ 61+ miles

17) What essential and social activities do you perform or attend? (select all that apply)
□ Grocery shopping
□ General shopping
□ Community/senior center activities
□ Veteran support group
□ Church
□ Athletic events
□ Community events
□ Other_____

18) How do you usually travel to essential/social activities?
□ I drive my own vehicle
□ As a passenger by private vehicle
□ Public transportation (Fixed-route)
□ Public transportation (Dial-a-ride, Paratransit)
□ Volunteer driving service
□ Other_____

19) If you have used shared transportation (public transportation, volunteer driving service) during COVID-19, do you feel safe traveling this way?
□ Yes

□ No
If no, please explain_____

20) During COVID-19, did you have difficulties accessing food?
□ Yes
□ No

21) If Yes, please identify if the difficulty was due to any of the following reasons (check all that apply)
□ Lack of transportation
□ Safety concern using public transportation
□ Safety concern using any available transportation
□ Stores were closed
□ Restaurants were closed
□ Senior centers were closed
□ Unable to purchase food online
□ Lack of finances to purchase food
□ Other, please explain_____

22) Have you at any time in your life experienced food insecurity (food insecurity is described as a lack of consistent access to enough food for an active, healthy life)?
□ Yes
□ No

23) If Yes, please tell us about your experience with food insecurity, e.g., when it took place, how long it lasted, did you seek help, etc. (Open-ended)

24) What is your highest education level attained?
□ Some High School
□ High School
□ Some College
□ Vocational/Technical Degree
□ College Degree
□ Graduate Degree

25) What is your annual household income?
□ 0 - $15,000
□ $16,000 – 30,000
□ $31,000 – 45,000
□ $46,000 – 60,000
□ $61,000 - 75,000
□ $76,000 – 90,000
□ $91,000+

26) Is your household a:
□ One income household
□ Two income household

27) What is your ethnicity/race?
□ African descent
□ Asian
□ Caucasian
□ Hispanic/Latino
□ Native American
□ Other_____

28) What is your current occupation/job? _____

29) What is your marital status?
□ Married
□ Divorced
□ Widowed
□ Single

30) If married, is your household comprised of:
□ One vehicle
□ Two vehicles
□ Other_____

31) If married, does your spouse have difficulty with transportation issues?
□ Yes
□ No
If Yes, please explain_____

32) What is your gender?
□ Male
□ Female

33) Please select your age range:
□ 20-29 □ 60-69
□ 30-39 □ 70-79
□ 40-49 □ 80-89
□ 50-59 □ 90+

34) What is your current city of residence? City_____ State_____

35) What increased transportation services would improve your quality of life? (Open-ended)