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Veterinary Access Barriers Experienced by Urban Versus Rural Clients: A Case Study in Middle America

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**Veterinary Access Barriers Experienced by Urban Versus Rural Clients:
A Case Study in Middle America**

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Undergraduate Honors Thesis
University Honors Program
College of Arts and Sciences
University of Nebraska Omaha

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Abstract

The comparing of urban versus rural clientele as to their access to veterinary care and preferences regarding veterinary services has received little research attention. Better understanding of client perspectives is critical for ongoing efforts to provide more equitable availability of veterinary services across varying demographic areas. In this study I directly assess differences in access to veterinary services based on client perspectives from both rural and urban locales across Nebraska, USA, a state almost directly in the middle of America. It was expected that rural clients would experience more barriers to veterinary access in general and with respect to specific services based on the knowledge that rural areas generally have fewer veterinary clinics and those that are available provide fewer services. I found many similarities across urban and rural populations, the most surprising was that neither population experienced any of the most common barriers to veterinary access. Additionally, both rural and urban clients would rather seek their usual clinic than emergency services, which have greater availability in urban areas, for emergency care. These results suggest that the veterinary-patient relationship is an important aspect regardless of availability of services. Overall, the shortage of rural veterinary providers does not seem to contribute to clients' barriers to access or their use of veterinary services such as annual visits, additional treatments, or specialist care.

Chapter 1: Project Proposal

This year for my Honors Thesis Capstone project, I will be implementing a survey to compare client differences between rural and urban veterinary clinics. I will draw conclusions based on the differences and similarities between rural and urban communities, while also examining if either or both are associated with the key barriers that usually prevent people from seeing veterinary professionals. I will be comparing the differences in clientele from urban veterinary clinics here in Omaha to those in my hometown of Columbus, Nebraska. I will conduct surveys at three clinics in Omaha and three in Columbus. The survey will consist of some simple demographic questions, but most will focus on the key barriers preventing clients from seeing a veterinary professional. The five most prevalent barriers were determined generally to be cost, accessibility, veterinary-client communications, cultural/language barriers, and lack of client education (LaVallee et al. 2017). Most questions will be in the form of ranking and multiple choice to facilitate statistical analyses, but some will be short answers. I plan to have the survey to each clinic starting at the beginning of the spring semester (mid to end January). I will conduct the survey until the end of February to collect data from each of the clinics. While the data is being collected I will research the literature on veterinary accessibility issues and begin writing the introduction and methods for the final manuscript. During the month of March, I will analyze the data with Dr. Robbins, while also comparing it with information from accredited journals. After analyzing the data and drawing conclusions I will draft a poster to be completed by April 10th to be sent to Dr. Morrison. Every week or two I will check in with Dr. Robbins to keep him updated with the status of my project, via email or meetings over Zoom.

TIMELINE:

January 23rd: Abstract written

February sometime: Give questionnaires to clients

End of February/March: Analyze data/compare with journals/ work on poster

April 10: Poster due to Dr. M

April 27th: Honors Symposium

May 10th: Written component of the research done, conclusions drawn (no minimum or maximum limit) submitted to digital commons

NOTES:

Key barriers for not having vet care:

1. Cost
2. Accessibility - transportation, location and availability
3. vet-client communications - lack of trust regarding costs, ethics, and judgment in order to provide care
4. cultural/language barrier - beliefs regarding use of animals and what is acceptable animal care for different cultures
5. lack of client education - care gap, clients do not understand the importance and need of routine pet care - spay/neuter efforts and annual exams/vaccines/preventatives

SDC: There are programs across the country and opportunities to provide health care services to humans. This could be pop up clinics or urgent cares or discounted medical offices in underserved communities. Additionally, there is government aid and opportunities within that for those unable to afford medical care. Yet there are no options for veterinary care. Most people are paying out of pocket for these services which over time can be costly. So what about those who are already low income and at risk of homelessness? How will they afford to take care of their furry family members' medical needs? There is a specific non-profit that comes to mind: **The Street Dog Coalition.**

Urban vs rural: There is a need for rural vets compared to urban - per journals found by Dr. Robbins. - I will consider this when looking for a job after vet school. Since there is much more of a need for rural compared to urban their practices will be much different. In omaha the practices are much more able to specialize in just exotics (SouthPaw) or just cats (completely cat clinic). Where in rural areas they are not able to do this.

Rural: not able to do as intense work up because they do not have specific machines or as expensive equipment as some urban clinics. These could include X-rays, ultrasounds, CT scans, MRI scans, specialists (orthopedics, cardiac, ophthalmologist, dermatology) and emergency services. One thing to consider is that in the **urban** environment they are more equipped to be able to care for pets compared to rural ones because of the services that they are able to provide their clients, yet this all comes at a cost.

Chapter 2: Veterinary Access Barriers Experienced by Urban Versus Rural Clients:

A Case Study in Middle America

Introduction

The capability of veterinary professionals having positive patient results is correlated to how well they can understand the needs and wants of their clients (Fawcett 2018). Clients are generally interested in veterinarians who are committed to the overall welfare of the animal and have the knowledge to treat them. However, more specific needs and wants of veterinary clients may vary based on where a client may live (Fawcett 2018). Nebraska has a population density of 25.5 people per square mile, which means it is a mostly rural state (U.S. Census Bureau Quickfacts: Nebraska). Around 72% of Nebraskan communities have populations between 100 and 800 people (Burkhart-Kriesel 2019). There are urban centers spread out, such as Lincoln, Omaha, and Grand Island. These urban and rural populations will likely have different consumer needs, wants, and preferences across a range of services (Cullen and Kingston 2009; Suliburska et al. 2012; Zhou et al. 2018) including veterinary care for their animals. Veterinary services have been compared between rural and urban areas from the perspective of veterinarians (Villarroel et al. 2010), but rural and urban client perspectives are not well resolved.

It has been suggested that clients who are living in underserved communities often become neglected by those who provide veterinary services. From the perspective of the service providers, there are concerns about cost, compliance, and cultural differences (HSUS 2012). Ultimately these concerns become barriers from the client perspective, preventing them from receiving veterinary care for their animals. Rural clients can fall into the category of the underserved community and directly struggle with correlated barriers of cost, accessibility, lack of client education, veterinary/client communications, and cultural/language barriers (LaValle et al. 2017). Although it is acknowledged that there is a care gap in veterinary medicine that directly affects underserved communities, there is a lack of research in this field.

The need for research addressing demographic care gaps can partially explain the emerging field of community-based veterinary medicine, in correlation with the one-health approach (LaValle et al. 2017). This reality of differences (barriers) can result in inequitable veterinary services across the urban-to-rural gradient, which can be directly assessed. Another factor is the geographic and socioeconomic correlation that often exists between animal and human health (LaValle et al. 2017), an idea that has recently experienced a surge in focus under the concept of One Health. One Health is “the integrative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment” (AVMA,22015a, p. 1; Centers for Disease Control and Prevention, 2013, p. 1). The One Health framework is addressing the veterinary care gap barriers by using community-based veterinary medicine initiatives.

Here, I directly assess differences in access to veterinary services based on client perspectives from both rural and urban locales across Nebraska, USA, a state almost directly in the middle of America. Based on past socioeconomic and geographic research, I hypothesized that rural clients would be more likely to experience barriers to veterinary access, utilize different veterinary services, and exhibit different veterinary needs compared to urban clients.

Materials and Methods

To examine the barriers, utilization, and needs of rural versus urban veterinary clients I distributed surveys to multiple veterinary clinics in both urban and rural areas across Nebraska. The rural areas included clinics in Arlington, Central City, Columbus, Council Bluffs, Crete, Crofton, Fort Calhoun, Louisville, North Platte, Oakland, Osceola, Seward, and Waverly. The urban areas included clinics in Benson, Grand Island, Gretna, Lincoln, Omaha and Papillion. The survey consisted of questions in the form of ranking and multiple choice to facilitate statistical analyses, with a few requiring short answers (see survey in Appendix A). Surveys were

distributed digitally via QR code (see Appendix B) and paper copies for clients who could not complete the digital survey. Multiple clinics posted the survey on social media, resulting in data from urban centers outside Omaha, and rural areas outside Columbus. Data from clients outside of Nebraska were not included in analyses. These different distribution methods allowed survey data (total sample size; $n = 211$ surveys) to be collected from multiple veterinary clinics located in urban ($n = 159$) and rural ($n = 52$) areas. Survey data were collected at all veterinary clinics for one month. Most of the surveys were completed digitally via a Google form, making data collection and organization a very seamless process. Data from surveys completed on paper were manually inputted.

Statistical analyses were conducted in JASP (JASP Team 2023). Multiple choice data were analyzed using contingency table analyses to compare urban versus rural responses with chi-squared tests. When differences between urban and rural responses were nonsignificant, chi-squared multinomial tests were conducted to compare the categories among themselves, regardless of urban versus rural designation. The short answer questions were first analyzed using keyword extraction to summarize the answers, which were then analyzed with chi-squared multinomial tests across categories. Chi-squared multinomial tests were conducted against uniform distributions. Results were considered significant at $\alpha = 0.05$.

Results

Comparing Urban versus Rural Clients

The top three barriers that limit clients from taking their animals to a provider were not significant between urban and rural clients ($\chi^2 = 5.410$, $df = 3$, $P = 0.144$).

The survey data revealed that there was no difference between urban and rural clients in their use of Additional Workups ($\chi^2 = 0.171$, $df = 1$, $P = 0.679$). Hypotheses were made that rural clients would not utilize Emergency Services at an emergency clinic. Yet, both urban and rural clients utilized Emergency Services at their usual veterinary clinic, making this question nonsignificant ($\chi^2 = 1.510$, $df = 1$, $P = 0.219$). Urban and rural clients were not significant in their response to seeking out Special Care/Specialists. Both clientele indicated that they have used Specialists ($\chi^2 = 0.313$, $df = 1$, $P = 0.576$). It was hypothesized that rural clients would not have their pets Spayed/Neutered ($\chi^2 = 0.059$, $df = 1$, $P = 0.807$), and or Up to Date on Vaccines ($\chi^2 = 2.138$, $df = 1$, $P = 0.144$). Both urban and rural clients were not significant in their responses, as they both indicated they spay/neuter their pets and have them up to date on vaccines. The use of a specialized clinic for certain species was nonsignificant between urban and rural clients. Both indicated that they would not use a species-specific clinic ($\chi^2 = 0.127$, $df = 1$, $P = 0.721$). The use of Low-Cost Clinics was nonsignificant between urban and rural clients. Both clientele indicated that they would not use one ($\chi^2 = 3.417$, $df = 1$, $P = 0.065$). Urban and rural clients were not significant in their responses to having access to a Different Veterinarian ($\chi^2 = 0.225$, $df = 1$, $P = 0.636$). They both indicated that they had access to one. Previous hypotheses were made that rural clients would be willing to travel farther than urban clients. Yet both were not significant in their responses to how far they would travel for a veterinary provider ($\chi^2 = 10.338$, $df = 5$, $P = 0.066$). Both urban and rural clientele were nonsignificant in how long they would wait for their provider ($\chi^2 = 3.868$, $df = 4$, $P = 0.424$).

Comparing Response Categories

When comparing response categories with urban versus rural designation not taken into consideration. Utilizing a Low-Cost veterinary clinic was not significant when comparing the

responses of yes and no ($\chi^2 = 0.019$, $df = 1$, $P = 0.890$). Both clientele still indicated that they would not use one.

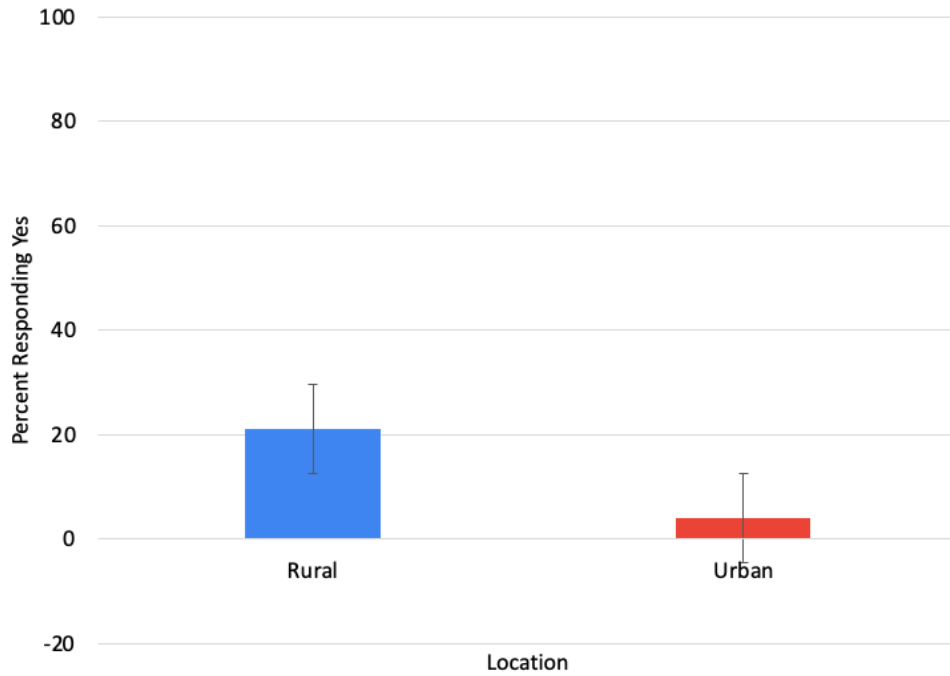


Figure 1. A client only brings their pet to a veterinary provider when they are sick. Rural and urban clients were different in bringing their pets to the provider when they are sick ($\chi^2 = 14.091$, $df = 1$, $P = <.001$).

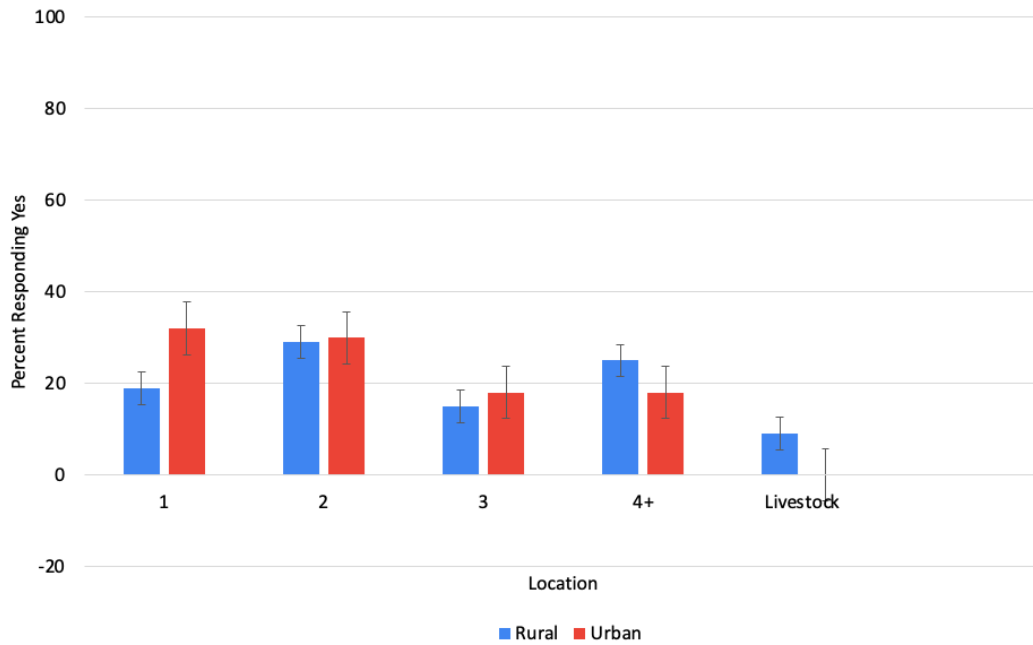


Figure 2. How many pets a client has. Rural and urban clients were different in the number of pets they had. ($\chi^2 = 18.911$, $df = 4$, $P = <.001$).

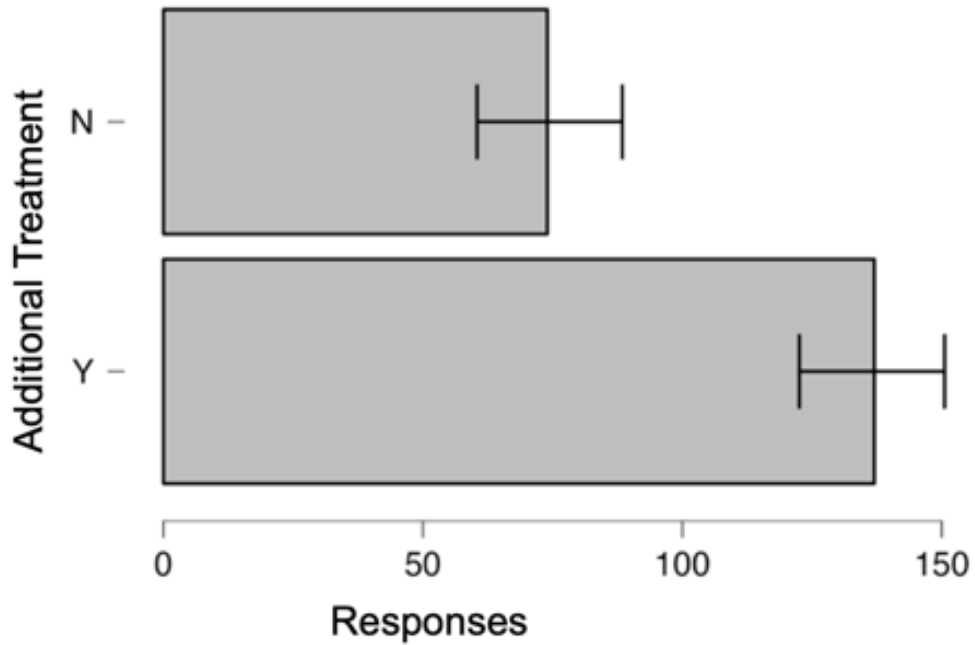


Figure 3. Use of additional treatment. Although rural and urban clients were not different in their use of additional treatment ($P = 0.679$) when assessing *ACROSS ALL CLIENTS* both urban and rural clients chose to perform additional work up on their pets ($\chi^2 = 18.810$, $df = 1$, $P = <.001$).

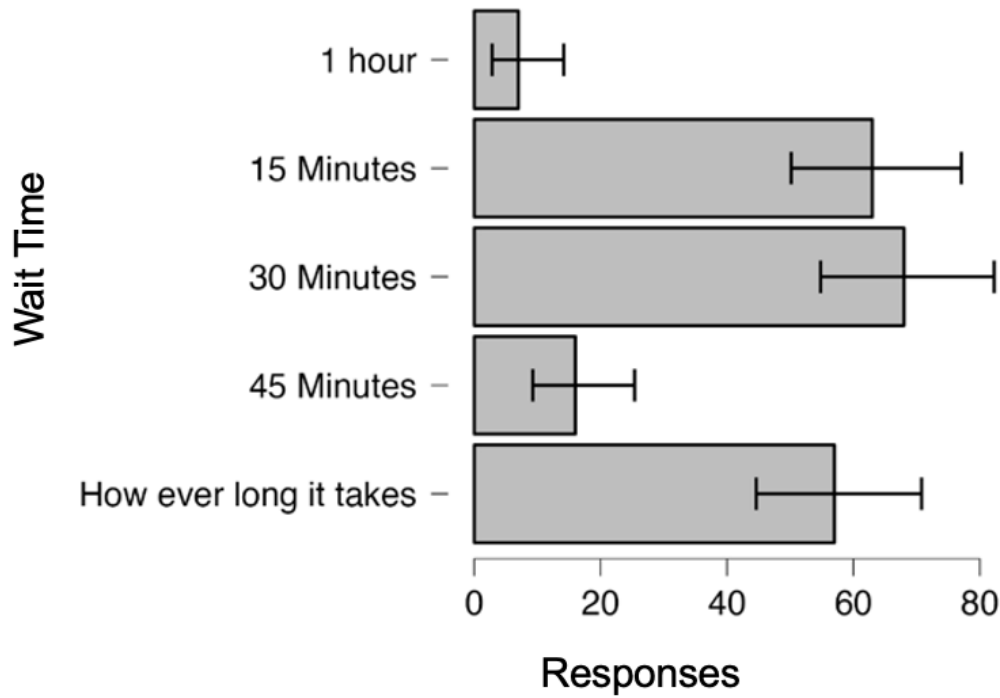


Figure 4. How long a client is willing to wait for a veterinary provider. Although rural and urban clients were not different in their use of how long they are willing to wait for a veterinary provider. ($P = 0.424$), when assessing *ACROSS ALL CLIENTS* both urban and rural clients chose that they would be willing to wait 15-30 minutes or however long it takes ($\chi^2 = 76.844$, $df = 4$, $P = <0.001$).

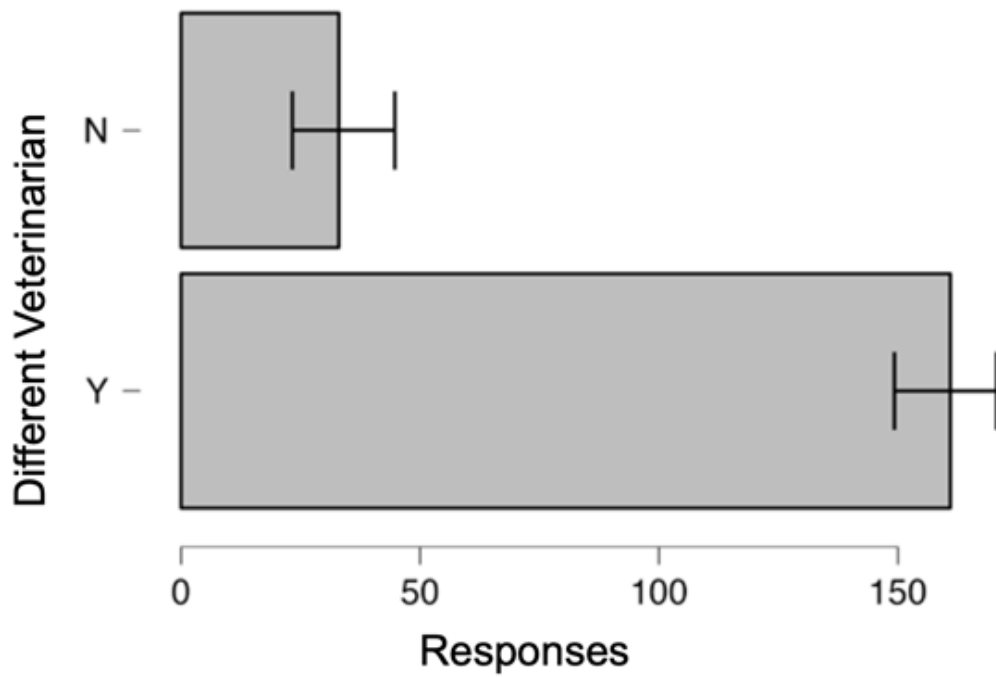


Figure 5. Access to a different veterinary provider. Although rural and urban clients were not different in their use of different veterinary providers ($P = 0.636$) when assessing *ACROSS ALL CLIENTS* both urban and rural clients chose their regular veterinary provider. ($\chi^2 = 84.454$, $df = 1$, $P = <0.001$).

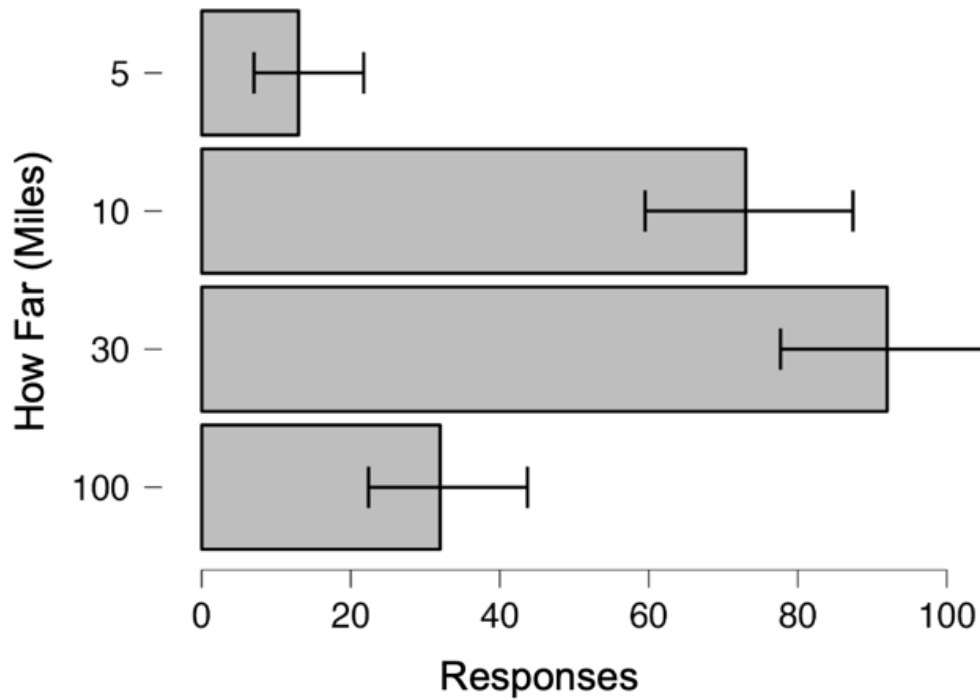


Figure 6. How far a client is willing to drive to a veterinary provider. Although rural and urban clients were not different in their use of how far they are willing to drive to a veterinary provider. ($P = 0.066$), when assessing *ACROSS ALL CLIENTS* both urban and rural clients chose that they would be willing to drive 10-30 miles for a veterinary. (10 and 15 miles were combined, and 60 was combined with 100). ($\chi^2 = 75.448$, $df = 3$, $P = <0.001$).

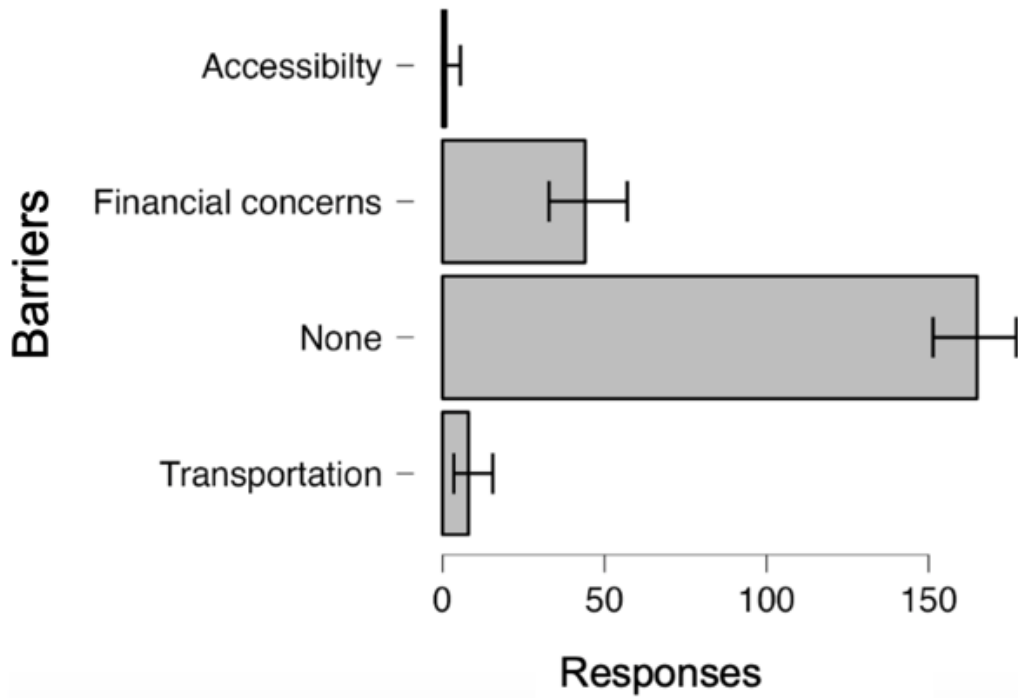


Figure 7. Three Key Barriers that often prevent people from seeing veterinary professionals. No difference was found between urban and rural. The top concern *ACROSS ALL CLIENTS* was none ($\chi^2 = 318.257$, $df = 3$, $P < 0.001$).

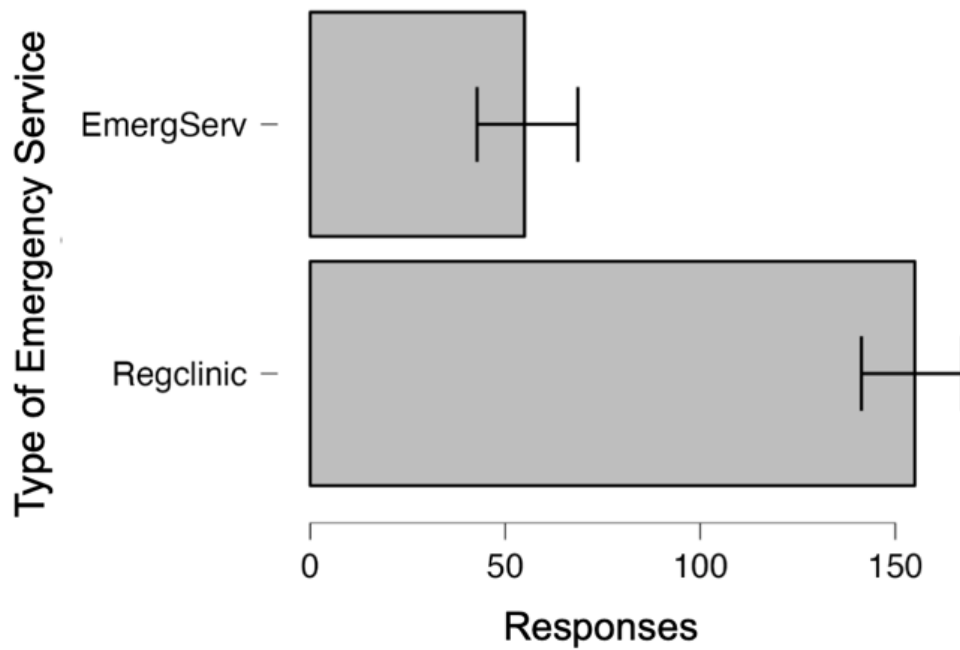


Figure 8. Use of emergency service providers. Although rural and urban clients were not different in their use of emergency service providers ($P = 0.219$) when assessing *ACROSS ALL CLIENTS* both urban and rural clients chose their regular veterinary provider over an emergency service provider for emergencies ($\chi^2 = 47.619$, $df = 1$, $P < 0.001$).

Discussion

Barriers did not prevent rural populations from seeing a provider any more than urban populations. Instead, it was found that neither rural nor urban clients perceive any barriers to the care they can access for their animals (Figure 7). Additionally, the results indicated that both urban and rural clients would use their usual veterinary provider for emergency care, instead of urban clients utilizing emergency services that are readily available as hypothesized. These results suggest that clients value an established client-patient relationship.

Comparing Urban versus Rural Clients

The results indicated that clientele in urban and rural Nebraska are not affected by the top barriers that would usually prevent a client from seeking veterinary care for their animals (Lavalle et al. 2017). Rural and urban clients were more similar than expected regarding their veterinary use (Figure 7).

Barriers are thought to be more prevalent in rural communities because of greater occurrences of poverty (McCrindle et al. 1994). Rural poverty does not only consist of a shortage of goods but also a low community status, lack of education, influence, and nonsecure sources of income (McCrindle et al. 1994). This goes along with the idea that rural clinics are not as well equipped as urban clinics, especially with regard to equipment necessary for additional workup (personal observation). The urban clientele was expected to utilize additional workups/treatments such as Bloodwork, Radiographs, Magnetic Resonance Imaging (MRI), Computed Tomography Scan (CT), and Ultrasound because urban clinics are generally more likely to have access to these diagnostic tools. The data suggest this may not be the case in Nebraska.

Recent data show a lack of veterinarians in rural areas, with few veterinarians choosing to start their careers in rural areas each year because of concerns such as lack of economic and

social opportunities, and accessibility (King and Dudensing 2022). Private clinic owners may not be interested in beginning a business in an area that will in the end not make a profit, because the clients cannot otherwise afford or may not believe in veterinary medicine (Villarroel et al. 2010; Dotinga 2012). According to the U.S. Department of Agriculture, since World War II rural veterinary clinics, mainly those practicing on large animals, have been decreasing. In 2020, under two percent of private practices were large animals only. Less than six percent were mixed-animal practices. This lack of vitality often aligns with rural clinics not being as “up to date” as urban clinics. My data suggest that this is not the case in Nebraskan rural communities, because they do not perceive barriers, especially those associated with cost. Both large and mixed animal practices can be common in rural areas, as is the case in Nebraska (Nunez 2019).

Urban and rural clientele were similar in their decisions to seek out their usual veterinarian for emergency services instead of utilizing an emergency clinic. Choosing their usual veterinarian even for emergency services may be a result of clients valuing their established patient-veterinarian relationship. This result was not expected. Because most rural communities do not have access to emergency services in the form of emergency veterinary clinics, it was expected that they would seek their usual provider. Urban clients, however, have access to emergency services that can provide care rapidly, although it is usually more costly. The fact that urban clients do not often seek emergency services offered by emergency clinics suggests that all clients (rural and urban) may value an established veterinarian-patient relationship (LaValle 2017). Alternatively, there may be too few emergency situations for this study to detect any associated preferences.

Urban clients are generally closer to veterinary specialists because the greater population sizes more easily support specialized medicine such as dermatology, ophthalmology, cardiology, orthopedics, and university care. However, based on the results, location (urban vs rural) does not prevent a client from seeking a specialist

It was originally hypothesized that rural clients would be less likely to spay/neuter their pets, not have them up to date on vaccines, not want to utilize a species-specialized clinic, and want to utilize a low-cost clinic. The data did not support any of these hypotheses. Although most clients do not have the understanding necessary to provide basic health care for their animals, these hypotheses were based on the lack of client education being greater in rural areas. Location based knowledge differences are often observed regarding general topics such as the importance of regular animal healthcare and annual routine veterinary appointments (Hodges 2012; Jennings 2009; Malcolm & McCobb 2014) and specific topics such as spay/neuter procedures, dental care, preventative medications, annual vaccines, and diets. Veterinarians are able to take on the role of educating clients on these topics in animal care (LaValle, 2017). The results of this study did not support this argument because location (urban vs rural) did not influence client preferences or utilization of veterinary services such as spaying/neutering, being up to date on vaccines, utilizing a species-specialized clinic, and wanting to utilize a low-cost clinic. Both urban and rural clients equally had their pets spayed/neutered and were up to date on vaccines. Additionally, both rural and urban clients equally would not utilize a species-specialized clinic or a low-cost clinic. Again, these data suggest clients value the already established veterinarian-patient relationship (LaValle, 2017).

Currently, there is a shortage of rural veterinarians. One of the main barriers that prevent veterinarians from going to practice in rural areas is the financial aspect. Usually, rural clinics have lower pay points for the practitioners compared to urban areas (Schmitt 2019). To encourage newly graduated veterinary students to go practice in rural areas, the USDA started a loan replacement program in 2010. The loan repayment program aims to help refill the number of rural veterinarians in practice. It finds areas with a shortage of rural veterinarians and offers to pay off student loans if the newly graduated students accept spending a certain number of years in a specific rural area (The Veterinary Medicine Loan Repayment Program). With the shortage

of veterinarians in rural areas, it was hypothesized that rural clients would be willing to wait longer and travel farther in order to see a provider. The data revealed that the location (urban vs rural) did not influence client willingness regarding wait times, travel distance, and the opportunity to see a different provider.

Rural clients were hypothesized to experience more barriers to veterinary services. This leads to the hypothesis that rural clients would be more likely to take their animals to the veterinarian only when they are sick, compared to urban clientele. The data revealed that this is true. Rural clients were more prone than urban clients to use veterinary services only when their animals are sick (Figure 1). This data suggests that urban clients are more proactive in their care, possibly reflecting lower barriers (Figure 7), but it could also be a location-based perception of animal health (Hawes et al. 2021).

The way that pet owners see their pet, for example, as a family member or outdoor-only animal, makes a difference in what type of care they provide for them. Hawes et al. (2021) examined dog and cat owners in the U.S. and found that urban and rural clientele viewed their pet's health differently. Over 70% of urban clients agree that their pet suffers from some sort of anxiety or stress level disorder, compared to 45% of rural pet owners. Urban pet owners were more likely to buy products to help alleviate this diagnosis in their pets. Additionally, over 50% of urban clients find that their pets have a special nutrition diet or food allergies, compared to 20% of rural clients (Hawes et al. 2021).

Lastly, this study showed that rural clients had more pets (3, 4+) compared to urban clients (1, 2, 3; Figure 2). Other studies have shown similar results with rural communities having a 12% higher rate of pet ownership than urban communities (Hawes et al. 2021).

Comparing Response Categories

After comparing urban and rural client responses to the survey questions, the categories of each question were compared among themselves. This meant that the urban and rural responses were assessed as one group. Overall, clients were very unlikely to utilize a low-cost veterinary clinic compared to their usual provider.

There were differences among categorical responses with respect to additional treatment, utilizing emergency services, wait time, access to a different provider, how far a client is willing to travel, and barriers to access to care. More clients said that they would utilize additional treatment for their animals (Figure 3), meaning that despite the location, clients would want to perform additional workup on their animals. Regarding the option of using emergency services, a client's usual clinic was still the top choice, further supporting the idea that clients value the relationship between their pet and the veterinarian providing services.

More clients answered yes than no when asked if they have access to a different provider (Figure 5). This correlated to how far clients would be willing to drive to see a provider (Figure 6). 75% of answers were in the 10 to 30-mile category. In urban areas, there are more clinics for clients to access, whereas in rural areas visiting a client's provider would require a drive to the nearest town. The rural travel time can be far compared to urban areas and is likely related to the current rural veterinary shortage.

The waiting time responses indicated that a little over 50% of clients were willing to wait for 30 to 45 minutes (Figure 5) and 25% would be willing to wait as long as it takes. These results suggest that both urban and rural clients are willing to put in the time in order to get their pets seen and taken care of by their animal care provider.

There were no barriers found that would limit either urban or rural clients' access to receiving veterinary care for their animals (Figure 7). Looking at the trends in the data, the second potential barrier is financial concerns. Although veterinary services can be expensive, there are real reasons. A veterinary clinic is a business that needs to stay afloat. The American

Veterinary Medical Association (AVMA), performed a study that creates a pricing strategy for veterinary professionals. They found that there is an importance to value-based pricing. It is crucial to have the clients understand why they are paying for certain services and how the price was calculated. They found that among clientele who don't receive annual veterinary care, 25% confirm that they cannot afford it and over half do not see a reason for annual veterinary care (Pricing Strategy for Veterinary Practices).

Conclusion

Regardless of location (urban or rural), clients indicated that they were not affected by any of the most common barriers known to prevent clients from seeking a veterinary professional for their animals. Rural and urban veterinary clients were also similar in their patience to wait for services, use of additional workups and specialists, and how much they appear to value their established patient-veterinarian relationship. The lack of barriers perceived by both urban and rural clients suggests that the rural communities in Nebraska should not be considered underserved.

This study did find some differences between rural and urban veterinary clients. The data suggest that urban populations are more proactive regarding veterinary care and rural clients have more animals. Other important aspects of animal care that warrant further examination include the willingness to spay and neuter their pets or keep them up to date on vaccines.

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Appendix A: Survey Questions



Veterinary Survey: Urban vs Rural **Molly Andreasen**

My name is Molly Andreasen, and I am a student at the University of Nebraska at Omaha. I am a pre-veterinary science major and attending veterinary school at the UNL/ISU (2+2 program) this upcoming fall. This survey serves to compare client needs between rural and urban veterinary clinics and examine whether there are key barriers preventing people from seeing veterinary professionals.

Please help me collect my Honors Program Capstone Project data by completing the following short survey!

Thank you and I appreciate your time!

DEMOGRAPHICS:

1. What veterinary clinic do you go to most often?

2. How long have you been a client of your veterinary clinic?

- a. Less than 1 year
- b. 1-5 years
- c. 5-10 years
- d. 10+ years

3. How many animals do you have?

- a. 1
- b. 2
- c. 3
- d. 4+
- e. Livestock
- f. Other (*please explain briefly*)

MAIN QUESTIONS:

1. **Rank the following on how important they are to you when it comes to veterinary care for your animals: (1 - 4, 1 being most important, 4 being least)**
 - _____ Cost
 - _____ How close the clinic is to you
 - _____ Relationship between you and the veterinary professional
 - _____ If they make house/farm call visits

2. **Do you have any limits to your accessibility of veterinary care for your animals?**
 - a. Transportation
 - b. Financial concerns
 - c. Language Barrier
 - d. Cultural Barrier
 - e. None
 - f. Other (*please briefly explain*):

3. **Have you utilized any work up treatments on your animals? Examples of these treatments could be: Ultrasound, CT, MRI.**
 - a. Yes
 - b. No

4. **Have you ever utilized any specialized care for your animals? Examples of specialized care would be taking your animal to specialists such as the following services: Dermatologist, Orthopedics, Eye Specialist, Cardiac Specialist, Veterinary University Care.**
 - a. Yes, for one of the following services (*please circle*):
Dermatologist, Orthopedics, Eye Specialist, Cardiac Specialist, Veterinary University Care
 - b. Yes, for a service, but I can't recall or is not listed
 - c. No

5. **A low-cost veterinary clinic is one that provides mainly vaccinations, spay/neuter surgeries and treats minor problems with small animals. Would you utilize a low-cost veterinary clinic in your area if you had one?**
 - a. Yes
 - b. No

6. **If No (*you would not utilize a low-cost veterinary clinic in your area if you had one*) why not?**
 - a. I don't trust them
 - b. I don't think they are cheaper
 - c. No need. I love my normal vet clinic
 - d. Other (*please briefly explain*):

7. **During a routine visit, how long would you be willing to wait in order to see your veterinary professional?**

- a. 15 minutes
- b. 45 minutes
- c. 1 hour
- d. How ever long it takes

8. Do you have access to veterinary services outside of your usual veterinary provider?

- a. Yes
- b. No

9. If Yes (*you have access to veterinary services outside of your usual veterinary provider*) who?

- a. I don't know, but at least one.
- b. I don't know, but there are many.
- c. The ones I know of include (*fill in*) _____

10. What would you utilize for emergency services?

- a. Go to your usual clinic, if available. They are not specialized in emergency medicine but there is a relationship built between the staff and your animal.
- b. Go to an emergency clinic. They are specialized in this area. There is not an established client-animal relationship.

11. Would you utilize a clinic that specialized in a certain species of animal?

- a. Yes, cat only
- b. Yes, dog only
- c. Yes, exotics only
- d. Yes, large animals only
- e. No, I would like to see my usual veterinary professional

12. Are your animals spayed/neutered?

- a. Yes
- b. Some, but not all
- c. No

13. If No (*your animals are not neutered*) why not?

- a. I don't believe in neutering animals
- b. I don't want to pay for neutering animals.
- c. I want my animals to breed.
- d. I'm just not worried about it.
- e. Other (*please briefly explain*):

14. Do you think it is important to have your animals up to date on their annual exam and vaccinations?

- a. Yes
- b. No

15. If no (you do not think it is important to have your animal up to date on their annual exam and vaccinations) why not?

- a. I don't believe in vaccinating animals
- b. I don't want to pay for vaccinating animals.
- c. I want my animals to naturally build immunity.
- d. I'm just not worried about it.
- e. Other (*please briefly explain*):

16. Do you bring your animals to a veterinary professional only when they are sick/in need of medical attention?

- a. Yes
- b. No

17. If Yes (you bring your pet to a veterinary professional only when they are sick/in need of medical attention) why yes?

- a. I don't want to pay for regular check ups.
- b. I don't see a reason unless they are obviously sick.
- c. I'm just not worried about it.
- d. Other (*please briefly explain*):

18. How far would you travel in order to receive the services provided by your veterinary professional?

- a. 5 miles
- b. 15 miles
- c. 30 miles
- d. 100 miles
- e. Other (*please briefly explain*):

Optional Demographic Questions:

1. Age:

2. Gender:

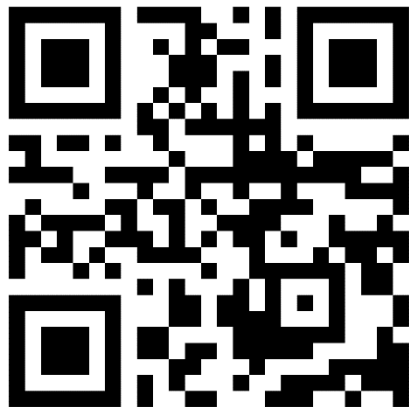
3. Ethnicity:

Appendix B: Survey QR Code Poster



**University of Nebraska at Omaha
Honors Capstone
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Veterinary Access Survey

SCAN ME TO TAKE THE SHORT SURVEY ON YOUR PHONE!

There are paper copies at the front desk if you'd prefer.

THANK YOU!



Veterinary Access Barriers in Nebraska

Urban vs Rural Clientele

College of Arts and Sciences

CONTRIBUTORS:

- Molly Andreasen
- Mentor: Dr. Travis Robbins

Introduction

I conducted a survey comparing rural versus urban veterinary clients focusing on key barriers that often prevent people from seeing veterinary professionals. Generally, common barriers include cost, accessibility, veterinary/client communications, cultural/language barriers, and lack of client education (LaVallee et al. 2017). Barriers are important to understand because they help explain the care gap in veterinary medicine by allowing us to see why clients are unable to use veterinary services for their pets. Most of the survey questions were in the form of ranking and multiple choice to facilitate statistical analyses, with a few requiring short answers.

I hypothesized generally, that clients would be more likely to use their usual clinic for emergency services because of the lack of access to an emergency clinic.

When comparing urban and rural clientele, I hypothesized that 1) barriers would be more prevalent in rural areas, and 2) rural clients would perform fewer additional workups, use fewer special services, and take their pets in only when sick.

Materials and Methods

I collected survey data at multiple veterinary clinics located in urban and rural areas. Surveys were distributed both digitally via QR code and by paper copies for those clients who could not complete the digital survey.

The majority of the surveys were completed digitally via a Google form. This made the analysis of data a very seamless process. Those that completed the survey on paper were manually inputted.

Multiple clinics posted the survey on social media, which resulted in some data from clients not located in Nebraska. These data were not included.

Multiple choice data were analyzed using a contingency table, and chi-squared analysis. Results were considered significant at $\alpha = 0.05$. Statistical analyses were conducted in JASP (JASP Team 2023). The short answer questions were analyzed by using keyword extraction to summarize the answers and using chi-squared multinomial tests across keywords against uniform distributions.

In Nebraska about two-thirds of the state is considered rural and one-third of Nebraskans living in urban Omaha or Lincoln. My final sample sizes were 52 for the Rural population and 159 for the Urban population.

Results

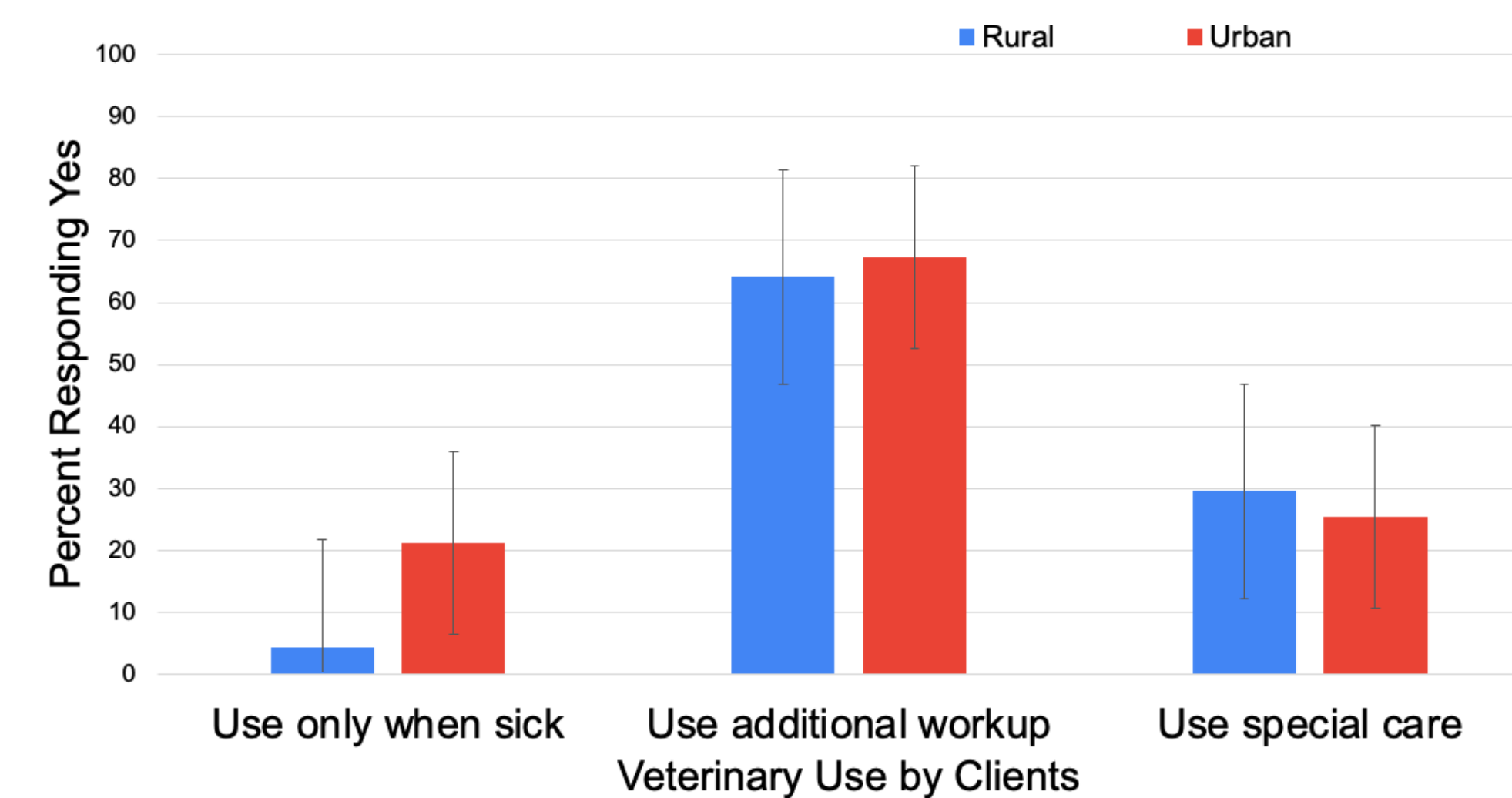


Figure 1. Comparing reasons for veterinary use between rural and urban clients. Using veterinary services for additional workups or special care was similar between clientele (additional workups, $P = 0.679$; special care, $P = 0.721$). More urban clients brought their animals to the vet only when they sick than rural clients, suggesting rural clients used more regularly scheduled visits and/or preventative care (only when sick; $P < 0.001$).

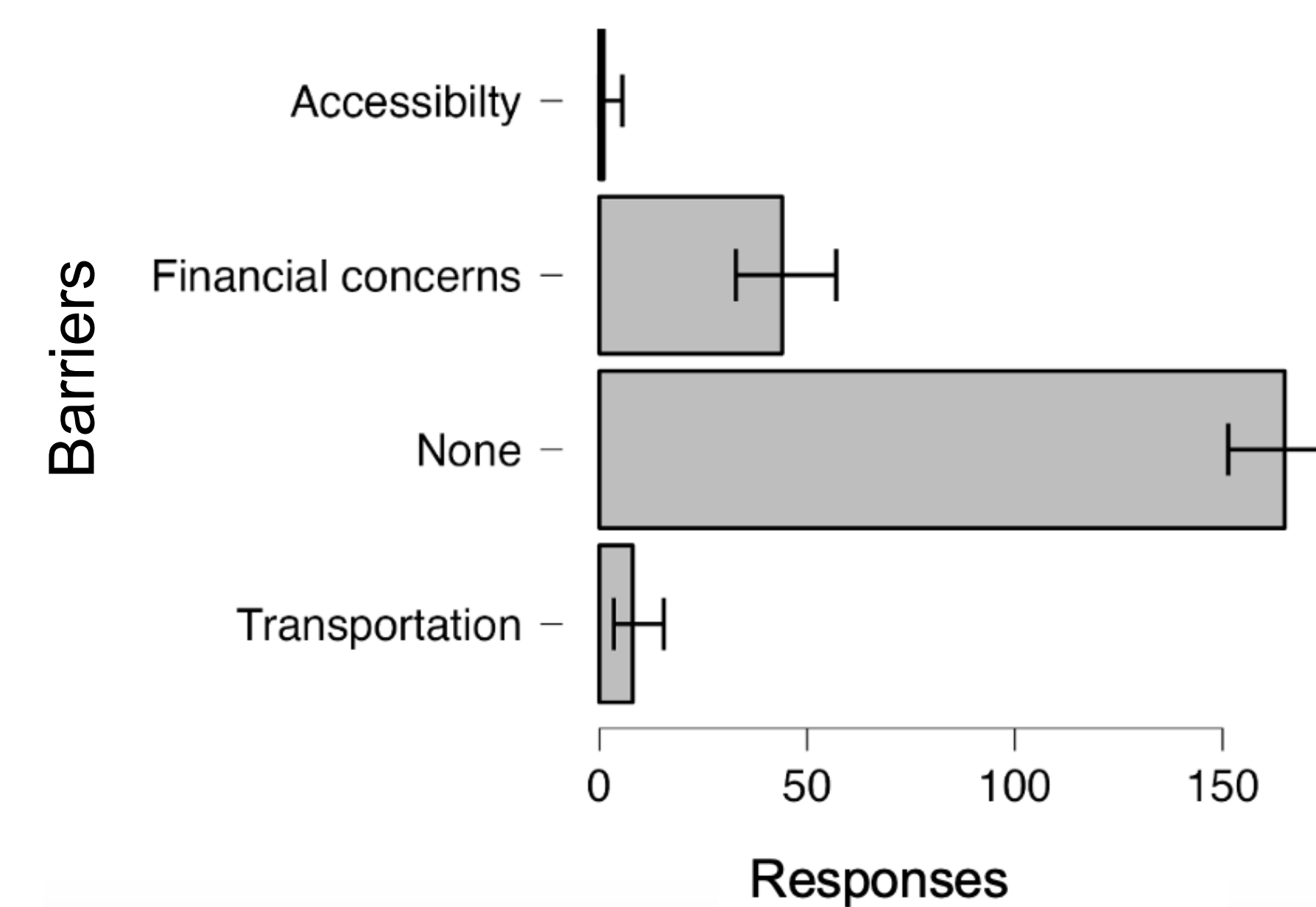


Figure 2. Three Key Barriers that often prevent people from seeing veterinary professionals. No difference was found between urban and rural. The top concern ACROSS ALL CLIENTS was none ($\chi^2 = 318.257$, $df = 3$, $P < 0.001$).

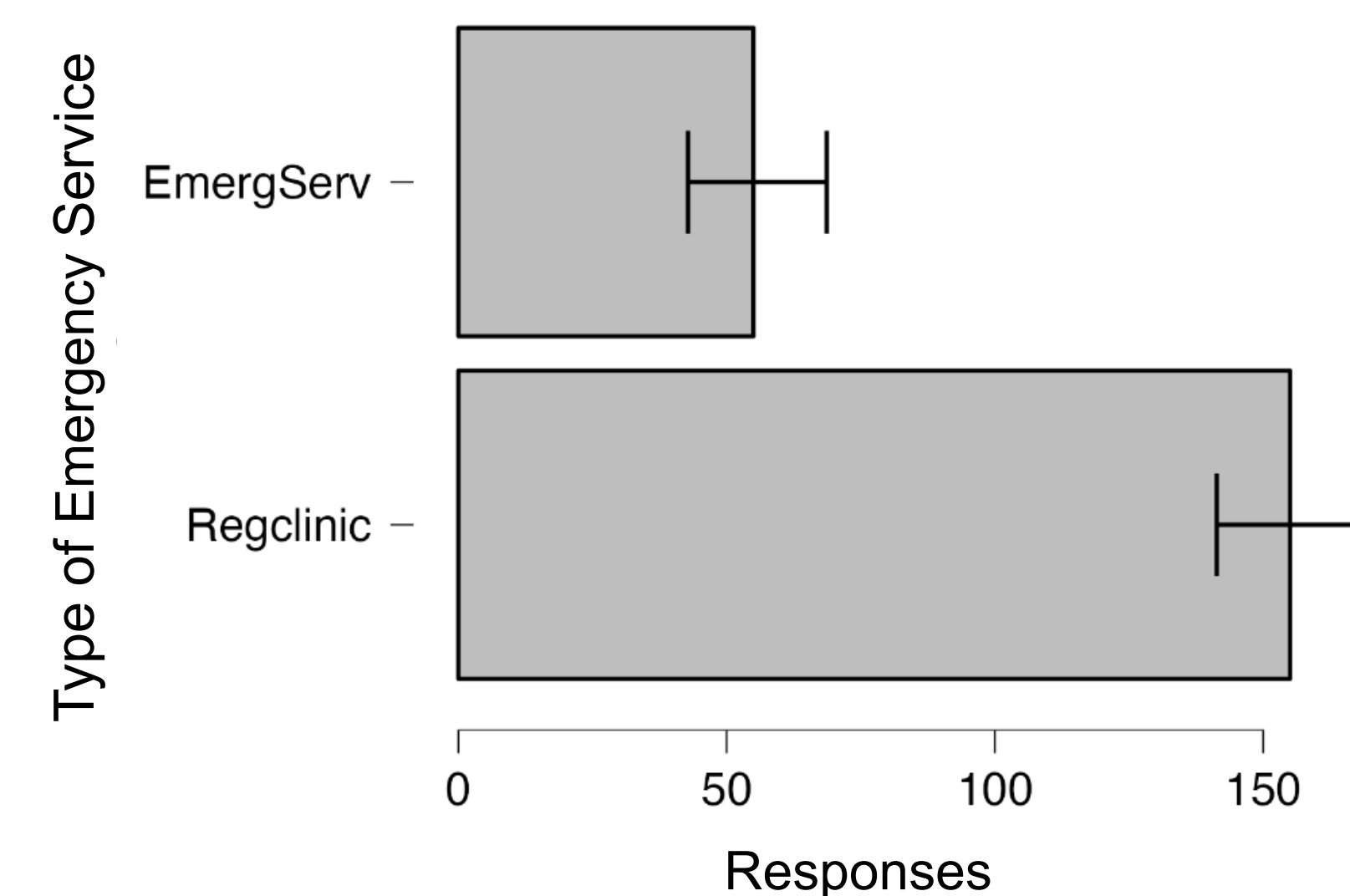


Figure 3. Use of emergency service providers. Although rural and urban clients were not different in their use of emergency service providers ($P = 0.219$), when assessing ACROSS ALL CLIENTS both urban and rural clients chose their regular veterinary provider over emergency service provider for emergencies ($\chi^2 = 47.619$, $df = 1$, $P < 0.001$).

Discussion

Rural and urban animal owners were more similar than expected regarding their veterinary use (Figure 1). For instance, I expected barriers to be more prevalent in rural communities but found that urban and rural clients experienced similar barriers. Most unexpectedly, they equally experienced a lack of barriers (Figure 2).

It was expected that urban clientele would be more likely to utilize additional workups such as bloodwork, X-rays, MRI, CT, and Ultrasound. In my experience coming from a relatively rural area, rural clinics often do not have the equipment found at urban clinics to perform these additional workups. The data suggest this may not be the case (Figure 1).

Urban clients are generally closer to veterinary specialists because the greater population sizes more easily support specialized medicine such as dermatology, ophthalmology, cardiology, orthopedics, and university care. However, based on the results, location (urban vs rural) does not prevent a client from seeking a specialist (Figure 1; $P = 0.576$).

Because rural clients were hypothesized to experience more barriers to veterinary services, it was also hypothesized that rural clients would be more prone than urban clients to taking their animals to the veterinarian only when sick. However, the data revealed the opposite trend. Urban clients were actually more prone than rural clients to use veterinary services only when their animals are sick (Figure 1). These data suggest that rural clients are more proactive in their care and further reflects the lack of barriers for rural clientele (Figure 2).

Urban and rural clientele were equal in their decisions to seek out their usual veterinarian for emergency services instead of utilizing an emergency clinic (Figure 3). Choosing their usual veterinarian even for emergency services may be a result of clients valuing their established patient-veterinarian relationship.

How long clients were willing to wait during visits not was not different between urban and rural populations ($\chi^2 = 3.868$, $df = 4$, $P = 0.424$). Clients showed an equal split in their willingness to wait, with approximately 30% willing to wait 15 min, 30 min, or however long it takes ($\chi^2 = 76.844$, $df = 4$, $P < 0.001$).

Lastly, I did find that rural clients were willing to travel farther (30 - 100 miles) than urban clients (10 - 30 miles; $\chi^2 = 9.817$, $df = 3$, $P = 0.020$).

Conclusions

Nebraska is overall a rural state with few urban centers. Regardless of location, clients indicated that they were not affected by any of the most common barriers known to prevent clients from seeking a veterinary professional. Rural and urban veterinary clients were also similar in their patience to wait for services, use of additional workups and specialists, and in how much they value their established patient-veterinarian relationship.

This study did find some differences between rural and urban veterinary clients. The data suggest that rural populations are more proactive regarding veterinary care and are willing to travel farther for veterinary services.

Other important aspects of animal care include the willingness to spay and neuter their pets or keep them up to date on vaccines. I am currently in the process of analyzing survey data on these topics to include in the publication.

Acknowledgements

I would like to thank the following Veterinary clinics for putting up posters and distributing surveys to their clients in order to help with my data collection: Rockbrook Animal Clinic, Westgate Animal Hospital, Papillion Animal Hospital, All Creatures Veterinary Clinic, Tender care Animal Hospital, Twin Rivers Veterinary Clinic, Columbus Small Animal Hospital, and Columbus Pet Care Specialists.

Sources

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