

University of Arkansas, Fayetteville

ScholarWorks@UARK

Animal Science Undergraduate Honors Theses

Animal Science

5-2022

Pandemics and Animal Welfare: How the COVID-19 Pandemic has Affected the Companion Animal Industry in Northwest Arkansas

Sabrina Cox

Follow this and additional works at: <https://scholarworks.uark.edu/anscuht>



Part of the [Other Animal Sciences Commons](#)

Citation

Cox, S. (2022). Pandemics and Animal Welfare: How the COVID-19 Pandemic has Affected the Companion Animal Industry in Northwest Arkansas. *Animal Science Undergraduate Honors Theses*. Retrieved from <https://scholarworks.uark.edu/anscuht/57>

This Thesis is brought to you for free and open access by the Animal Science at ScholarWorks@UARK. It has been accepted for inclusion in Animal Science Undergraduate Honors Theses by an authorized administrator of ScholarWorks@UARK. For more information, please contact scholar@uark.edu.

**Pandemics and Animal Welfare: How the COVID-19 Pandemic has Affected
the Companion Animal Industry in Northwest Arkansas**

Sabrina Cox

University of Arkansas

Acknowledgements

I would first like to acknowledge and give my sincere thanks to my supervisor, Ms. Isabel Whitehead, M.S. Her guidance and advice carried me through all the stages of writing this project and I am eternally grateful for her dedication and expertise. I truly would not be at this point if it were not for her. I would also like to thank my committee members, Dr. Jeremy Powell, and Dr. Lauren Thomas, for their guidance through this process and their insight into the various aspects of the animal medical field.

I would also like to give a special thanks to my partner, Kayla DeSmet, for helping me to stay motivated and reminding me of the importance of our work. She is one of my dearest friends and I will always be thankful for her unwavering companionship through this long, arduous process.

Finally, I would like to thank my family, friends, my cat Fern, and my significant other for their continued support and source of inspiration.

This project was funded by a Bumpers College Research and Creative Project Grant.

Table of Contents

Abstract.....	4
Introduction.....	5
Literature Review.....	7
Methods and Materials.....	10
Results.....	15
Discussion.....	30
Conclusions and Recommendations.....	31
References.....	35
Appendix A.....	39
Appendix B.....	50
Appendix C.....	52
Appendix D.....	62
Appendix E.....	63

Abstract

The first cases of coronavirus reported in the United States came in January 2020 (World Health Organization, 2020). In the two years since then, countries around the world have been affected by COVID-19 and the subsequent social, economic, and mental health issues. Previous research shows that the animal healthcare field is already overrun with burnout, substance abuse, depression, and increased levels of stress (Gardner & Hini, 2006), and the pandemic has only compounded these issues (Mair et al., 2020). Observing a lack of meaningful reporting on the issues affecting veterinary staff led the researchers to investigate staff members' practices, day-to-day responsibilities, and their current mental health. In this mixed-methods study, the purpose was to investigate and report the ongoing effects of the COVID-19 pandemic on veterinary staff in the Northwest Arkansas area through online self-reporting surveys and virtual interviews with the staff. Sixteen clinics were contacted and four agreed to participate in the online survey. The survey remained open for two weeks and virtual interviews were scheduled following the survey completion. Descriptive statistic findings (n=10) showed an overall increase in staffing shortages (80%), increased volume of daily appointments (100%), an increase in work-related burnout (90%), stress (90%), depressive tendencies (70%), and anxiety (100%). Qualitative interviews (n=5) explored how maintaining a sense of community and belonging with peers was a helpful strategy to cope with the stress of these unforeseen circumstances. The results from this study align with previous studies looking into burnout, stress, and depression in veterinary medicine.

Introduction

Background and Need

The COVID-19 pandemic has brought the world to its knees since the first cases in late 2019, highlighting weaknesses in our society and bringing the most vital workers in our societies to the forefront. Essential workers—healthcare professionals, those in the food industry, small business owners, just to name a few—are some of those hit hardest by the effects of the pandemic. However, there has been a lack of focus on those involved in animal welfare. Veterinarians are busier than ever during the COVID-19 pandemic (Tompkins, 2020), and the combined financial, social, and workplace stressors are causing burnout in veterinarians worldwide (Tan, 2021). With an increase in companion animal adoptions at the beginning of ‘quarantine’ in the United States, veterinarians are swamped, and their workload has only increased over the past year. Veterinary medicine is already a difficult profession, with disproportionately high suicide and depression rates (Chan, 2019), and the constant stress of a pandemic has done more harm than good to the mental health of those we trust most to care for our animals. Due to the recent emergence of the COVID-19 pandemic, little research exists detailing the true scope of how detrimental the impact has been on the companion animal industry. These essential workers have had to adapt to many changes in how they are to interact with others, along with city, state, and federal guidelines changing frequently in order to keep up with the most current information on the virus and how it can spread.

Problem Statement

During the COVID-19 pandemic, every sector of the economy has been affected in ways the average consumer will never understand. One of those sectors that has had little to no media coverage is the companion animal industry. Veterinarians are still swamped with appointments

and responsibilities, but they have not received anywhere near the level of thanks and recognition other essential and frontline workers have received over the course of the pandemic, due to the lack of meaningful reporting on the adverse effects impacting them. CNN reported that as the number of adoptions during the pandemic rose veterinarians became overwhelmed by the increased patient volume. Veterinarians were already experiencing a labor shortage prior to the pandemic, and this was only exacerbated by the pandemic—the 32 Veterinary medical schools in the United States produce about 3,200 graduates in each class, but this number does not cover the number of veterinarians lost to burnout or retirement, nor does it account for the explosion of adoptions since the pandemic began. Researchers in 2010 found that two-thirds of the female veterinarians participating in one study in the United States showed early signs of burnout, a greater number than their male counterparts (Platt et al., 2010). Burnout in veterinarians has only increased in recent years, and this study intends to investigate and report the effects of the pandemic on veterinary staff.

Purpose Statement

This study aimed to investigate, measure, and report the effects of a global pandemic on veterinary staff in the Northwest Arkansas region. Little research exists currently on the effects of an ongoing global health crisis on veterinarians and their staff. The main objective of this study is to gather data to indicate the degree to which veterinarians and other essential veterinary staff in Northwest Arkansas have been affected—their financials, their mental health, and how they interact with their clientele.

Research Objectives

1. Identify the financial impact on veterinary clinics in Northwest Arkansas, as well as the change in the volume of clientele/patients and the frequency of their visits.

2. Investigate the effects of the pandemic on staffs' physical, mental, and emotional wellbeing.
3. Investigate how veterinary business practices adapted to city, state, and federal guidelines for interacting with clients.

Literature Review

This section contains a review of the current literature pertaining to COVID-19 and how it has affected animal welfare. The first section begins with an overview of SARS-CoV-2 and its family of viruses, as well as methods of immunization. The second section highlights the zoonotic nature of the virus and the effects this trait has had on our society. Finally, the third section describes the effects COVID-19 has had on veterinary students, veterinarians, and related professionals. The purpose of this review is to establish a baseline of the (albeit limited) research that has been performed so far, as well as give a representation of exactly which areas are lacking in comprehensive examination, which will help to give a basis for the scope of this study.

Background Information on COVID-19

Members of the *coronaviridae* family, or coronaviruses, are single-stranded RNA (ribonucleic acid) viruses. These viruses are mostly documented as affecting animals; however, three strains of coronaviruses have emerged in the past few decades that affect humans as well. SARS-CoV (severe acute respiratory syndrome coronavirus), MERS-CoV (Middle East respiratory system coronavirus), and the newly identified SARS-CoV-2 strain all cause respiratory distress in those who contract the viruses. SARS-CoV-2 and the illness it causes (better known as COVID-19) have brought to light the gravity of the effect such a small strand of genetic material can have on our society (Al-Salihi & Khalaf, 2021). The virus made its way through more than 210 countries and territories within mere months, affecting all ages and

demographics (Tiwari et al., 2020). Researchers have been trying to find a practical method of vaccination, but until we can reach herd immunity, Lawal and Onoja (2020) described innate and acquired immunity as a good step towards eradication of the virus.

Coronaviruses in Animal Practices

Research on the COVID-19 pandemic is limited, due to the novelty of the virus and the small number of coronaviruses affecting humans. Many coronaviruses we have encountered affect animals, which gives veterinarians key knowledge on how these viruses present themselves and the best treatment methods. Veterinarians have been treating coronaviruses since the early 1900s and have documented multiple instances of inter-species transmission (Decaro et al., 2020). The most promising treatment for animal coronaviruses comes from a vaccine for a respiratory CoV infection in chickens, which may give researchers a jump-start in their search for a viable vaccine.

Coronaviruses are notorious for being easily transmissible between species, and humans are unfortunately not exempt from contracting these viruses. Mink farms in the Netherlands are the focus of one study, as many have shown high transmission rates from humans to minks and back to humans. Many of the workers tested at these mink farms were infected with a strain containing an animal sequence signature, providing evidence of animal-to-human transmission (Oude Munnink et al., 2020). Though human-animal interactions are known to be a risk factor in places such as the wet market in Wuhan, China, where the virus was first traced back to (Tiwari et al., 2020), there is little evidence suggesting that household pets are involved in transmission of the virus to humans (Lawal & Onoja, 2020). Companion animals have been at the forefront of our attention since the very beginning of the pandemic—spending more time locked away inside led many to adopt pets for the first time, and widespread distribution of images and videos of

animals via social media have all helped in easing some of the tension and providing some much-needed humor. Unfortunately, increased adoption rates and the perceived risk of contracting COVID-19 from a household pet has also led to an increase in animal abandonment and euthanasia (Vincent et al., 2020).

Veterinarians and COVID-19

The pandemic has had adverse effects on all of society, and especially on students; they are some of those most affected by the pandemic, particularly from the isolation and quarantine. Many veterinary and medical students are experiencing increased levels of stress, anxiety, depression, and substance abuse (Jawad et al., 2020). The lack of in-person instruction has caused students of all disciplines to feel a lack of fulfillment in their instruction and in their social lives. Veterinarians already experience some of the highest rates of work-related stress and suicide, and the pandemic has caused these rates to increase. Veterinary nurses self-reported some of the lowest mental health levels, indicating fatigue, depressive mood, and a lack of meaningful connections with others (Mair et al., 2020). These preliminary findings are vital to our understanding of the long-term effects and trauma caused by the pandemic—if students and professionals are experiencing such drastic effects on their mental health mere months into the pandemic, how will the coming months (or even years) impact them?

Veterinarians are all but forgotten. The increase in animals adopted during quarantine still need to be brought to the veterinarian for health checks and concerns; they did not get the same luxury of staying home and shutting down to wait out the worst of the pandemic. Business practices also changed drastically since the start of the pandemic; many clinics do not allow clients to bring their pets into the clinic themselves. Instead, veterinary technicians and assistants are sent out to parking lots for ‘curbside’ pickup and drop-off. This has led to added stress to the

animals, the pet owners, and the veterinarians; without the owners present and available for the veterinary staff to investigate the history of the presenting problem, it is increasingly difficult to know if there are any other concerns or issues that should be addressed, and the pet owners can feel as if they are dropping off a beloved family member at the hospital only to be kept in the dark about what is going on behind closed doors.

COVID-19 is not something that will go away anytime soon. Zoonotic diseases tend to stay around longer than diseases only affecting select species, since they can be transmitted between species so easily. Mobasher (2020) calls for a collaboration between all different sectors of medicine—namely, human and animal medical professionals—in order to form a united front in order to work towards optimal health for humans, animals, and the environment. A coordinated effort is necessary to mitigate the effects of this pandemic on our society, economy, and collective mental health.

Methods and Materials

This section provides an overview of the methods and materials utilized in this study. The section provides information on the population and sample size, how the data was collected, and the methods and procedures used. This methodology was chosen as it allows for appropriate social guidelines to be followed in the wake of a global pandemic, as well as providing an accessible means of participation.

Research Design

This study employed a non-experimental, mixed-methods approach using online surveys and semi-structured interviews. Open-ended questions were used in the interviews to allow respondents to expand in-depth into their concerns and struggles concerning their work and mental wellbeing since the beginning of the COVID-19 pandemic. A self-reporting survey was

chosen for this study due to the potentially sensitive and vulnerable nature of the questions being asked. The anonymous nature of the survey allowed for the respondents to provide honest and thorough responses. In a study by Mair et al. (2020), a similar survey method was used, and the researchers found the survey design to be statistically sound while allowing their respondents to report their mental health levels at the time honestly and concisely. For the qualitative portion of the study, interview methods were used, specifically semi-structured interviews. Semi-structured and unstructured interviews are “used in an attempt to understand the complex behavior of members of society” (Fontana & Frey, 2005), without the rigidity and formality of a structured interview. This pairing of data collection methods is suitable for both quantitative statistical analysis and opening routes for the researcher to seek deeper understanding of the participants’ experiences. The semi-structured nature of the interviews conducted included some pre-created questions and some follow-up questions as appropriate, allowing the researcher to delve deeper into certain topics and gather more information.

Rigor

The survey was compiled by the researcher, using questions from the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) and additional questions created by the researcher. The survey was then distributed to the researcher’s committee members at the University of Arkansas in order to assess the face and content validity of the instrument. Three cognitive interviews were conducted to ensure the questions were relevant and the wording was clear. Once the researcher incorporated any feedback from the faculty reviews and cognitive interviews, the survey was distributed via email to four veterinary clinics in the Northwest Arkansas area.

For the qualitative portion of the project, the student researcher and supervisor formulated interview questions together, ensuring that the questions were valid and relevant to the purpose of the study. Once the researcher and supervisor were satisfied with the interview questions, three cognitive interviews were conducted. The researcher then incorporated any feedback from the cognitive interviews prior to interviewing any participants.

Once the research had concluded, the researcher and advisor met regularly to discuss the coding process of the interviews and discuss initial codes and interpretations. Three total rounds of coding were performed, which included identifying certain phrases pertaining to emotional affect or procedural changes, and identifying frequently-used words, phrases, and sentiments. After the three rounds, the categories were refined and assigned names to represent the different themes as outlined in the Results section.

Population and Sampling

This study was conducted using human participants. The population included veterinarians, veterinary technicians, veterinary assistants, receptionists, office personnel, and kennel assistants employed at veterinary clinics in the Northwest Arkansas area. Convenience sampling was used for the study. Convenience sampling is a non-probability form of sampling that involves selecting participants “based on their accessibility and/or proximity to the research” (Jager et al., 2017). The benefits of this sampling method are that it is simple, inexpensive, and efficient. Convenience sampling is not as effective as probability sampling when generalizing a large population, however, this method of sampling was suitable for the scope of the study and the population being surveyed.

Qualitative follow up interviews were conducted with participants who consented with the goal of reaching data saturation. In qualitative research, data saturation refers to the point at

which no new themes or ideas are being added, rather, there are growing numbers of the same ideas. At this point, there is no new data to be discovered. Data saturation can also refer to the point at which the population size allows for the research to be replicated and produce similar results (Saunders et al., 2017).

Instrumentation

In this study, veterinarians, veterinary technicians and assistants, receptionists, office managers, and kennel assistants at various clinics in the Northwest Arkansas were asked to self-report the issues they perceive have affected both their businesses and their individual mental wellbeing. A modified version of the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) was used to adapt the existing statements to the population being surveyed (Warwick Medical School, 2020). The survey consists of fourteen Likert-style statements, with a scale ranging from one to five indicating 'None of the Time' to 'All of the Time.' Additional items were also added to the survey, including statements such as "During the pandemic, my clinic changed the services offered" and "During the pandemic, has your workplace been affected by staffing shortages?", among other statements and questions, which followed the same type of scale of one to five, from "Strongly disagree" to "Strongly agree."

Another section was added to the survey with closed-ended questions to allow respondents to add more detailed perceptions regarding the impact of the pandemic on their profession and on their mental health. The respondents were also asked to indicate if they were willing to conduct a virtual interview with the researcher, and if so, to indicate their preferred contact information and availability. Semi-structured interview protocols were followed to allow for consistency among interviews but flexibility in discussion. This flexibility allowed for the researcher to further investigate any topics participants may have mentioned that provided better

context or benefitted the study. The initial interview questions included questions such as: “Did your clinic introduce any procedural changes or changes to services offered?”, “Describe any staffing changes you observed during the pandemic, such as layoffs, new hires, and/or understaffing”, “What changes might your facility continue to incorporate in the future?”, and “How would you describe your emotional, mental, and physical wellness throughout the pandemic?”, as well as some demographic questions. These initial questions were then followed by additional questions as the researcher saw fit, allowing for further exploration of the topics. The interview questions were developed through research into similar studies, as well as modifying sample questions outlined in an article by Leech (2003).

Data Collection

After receiving approval from the Institutional Review Board of the University of Arkansas for the use of human subjects, the survey research was conducted during spring of 2022 (Protocol #2201381633, see Appendix D). The online survey was developed using Qualtrics and was e-mailed to veterinary clinics in Northwest Arkansas, after receiving the business consent form signed by the business owner or representative thereof (Appendix E). A total of sixteen clinics were contacted, and four clinics returned the business consent form, indicating their willingness to participate. The initial email included a description of the study, as well as directions detailing how they were to complete the survey, confidentiality, and the link to the survey itself. The first screen of the survey also contained a description of the purpose for the survey, explicit instruction, confidentiality information, and a consent form. Participants were asked to click the ‘Next’ button only if they consented to their responses being used in the study. Responses were kept anonymous to the fullest extent possible. Those willing to share their contact information to participate in a follow up virtual interview were notified that their

interview responses would be associated with a number. Participants were given 14 days from the date the email was sent to complete the survey. A reminder e-mail was sent at day seven. Following the survey collection period, any participants who agreed to participate in a virtual interview were contacted to schedule individual meetings. These interviews were conducted using a semi-structured format and took approximately thirty minutes, but no longer than one hour. The interviews were scheduled and conducted using the web conferencing platform Zoom for ease of recording and transcription purposes. Each interview was audio recorded with consent from the participants and later transcribed by the researcher using a platform called Descript. The transcripts were edited in Descript to correct for transcription errors and to de-identify the transcripts of participants' information.

Data Analysis

The data collected from the closed-ended questions are quantitative and numerical and descriptive statistics were run to identify frequencies, means, and standard deviations. The data produced by the follow up interviews was qualitatively analyzed using thematic analysis. Thematic analysis is “a comprehensive process where researchers are able to identify numerous cross-references between the data the research’s evolving themes” (Alhojailan, 2012). This method of analysis allowed the researcher to both find common themes within each participant’s responses as well as provide flexibility in the analysis when reporting these common themes. The use of this method also provided a way to determine common factors in each response and the relationships between variables in the study.

Results

These sections describe the original 16 facilities contacted. Of these facilities, four consented to participating in the study, and a total of ten responses were received across all

clinics. A total of five semi-structured interviews were conducted. This section is divided into four main subsections: Participant Demographics, Business-Related Challenges, Mental Health Effects, and a final subsection including qualitative data gathered from interviews.

Participant Demographics

Most participants were in the 25-34 age range (50%), along with 10% in the 18-24 range, 30% in the 45-54 range, and 10% in the 55-64 range. All the participants were female (100%) and white (100%), with most participants identifying as not Hispanic or Latino (90%) and one declined to answer (10%). Participants' roles varied, including office managers (10%), receptionists (20%), veterinary assistants or technicians (40%), veterinarians (20%), and veterinarians/owners (10%) represented in this population. Of these participants, 10% have worked in their current position for less than one year, 30% between one and five years, 30% between five and ten years, and 30% ten years or longer. When including past jobs or positions, participants' years of experience range from between one and five years (10%), to between five and ten years (40%), to ten years or longer (50%). (See Tables C1-C7)

Business-Related Challenges

Out of the ten responses received, 100% reported that their clinic changed the services offered (Table C8). Regarding specific changes, participants were presented with a set of services in a matrix table and asked to indicate whether their clinic offered these services on a scale of *(1) already offered pre-pandemic, (2) added in response to pandemic, (3) altered in response to pandemic, (4) no longer offered, and (5) not applicable* (Table C9). This allowed the researcher to determine the mean response for each of the following services presented.

Changes in Services

1. *Curbside appointments*: Participants indicated that they added curbside appointments in response to the pandemic (100%).
2. *Phone consultations*: Participants' responses varied regarding phone consultations, including *already offered pre-pandemic* (77.78%) and *altered in response to pandemic* (22.22%).
3. *Online pharmacy orders*: The frequency of responses for online pharmacy orders indicated that this service was offered prior to the pandemic (100%).
4. *Mobile application for clients*: Participants' mean response fell between *already offered pre-pandemic* and *added in response to pandemic* with a mean of 1.50 ($sd=0.76$). Some participants also reported that this was altered in response to the pandemic (16.67%).
5. *House calls*: The mean response from participants regarding house calls falls between *added in response to pandemic* and *altered in response to pandemic*, with a mean of 2.11 ($sd= 0.99$). 44.44% of participants reported that this service was offered prior to the pandemic.
6. *Boarding/kennel reservations*: The mean response regarding boarding and kennel reservations falls between *already offered pre-pandemic* and *added in response to pandemic*, with a mean of 1.44 ($sd=0.83$).
7. *Grooming*: This option included grooming appointments, shave downs, nail trims, and any other grooming-related appointments. Participants' responses fell between *already offered pre-pandemic* and *altered in response to pandemic*, with a mean of 1.89 ($sd=0.99$).

Participants were then asked if they expect their clinic to continue to offer these new or altered services in the future, using a scale of (1) *definitely not*, (2) *probably not*, (3) *unsure*, (4) *probably yes*, and (5) *definitely yes*. Participants' responses fell between *definitely yes* and *probably yes*, with a mean of 4.30 ($sd=0.90$) (Table C10).

Perceived Impacts of Business-Related Challenges

The next question on the survey asked participants their opinion on the effect the change in services had on their business, using a scale of (1) *extremely negative*, (2) *somewhat negative*, (3) *neither positive nor negative*, (4) *somewhat positive*, and (5) *extremely positive*. The mean response fell between *neither positive nor negative* and *somewhat positive*, with a mean of 3.70 ($sd=0.90$) (Table C11).

Participants were then asked about staffing shortages in their clinics (Table C12). Of the participants, 80% reported that their workplace was somewhat or severely affected by understaffing (mean=3.70, $sd=0.90$). Of those that answered *yes, my workplace was severely affected* or *yes, my workplace was somewhat affected* ($n=7$), 42.86% reported that the quality of care at their clinic worsened slightly as a direct cause of understaffing. 57.14% reported no notable change (mean=2.57, $sd=0.49$) (Table C13).

Perceived Changes in Volume of Services Requested

The next section asked participants about any change in the volumes of clients, patients, and appointments since the start of the pandemic. Each of the participants reported an increase in the volumes of all of these, with 100% of the responses in each category falling under either *significant increase* or *slight increase* (mean=1.40, $sd=0.49$; mean=1.40, $sd=0.49$, and mean=1.60, $sd=0.49$ respectively) (Table C14).

Participants were then presented with a matrix and asked to indicate if there was a change in demand for any routine procedures, on a scale of (1) *significant increase*, (2) *slight increase*, (3) *no noticeable change/unsure*, (4) *slight decrease*, (5) *significant decrease*, and (6) *not applicable* (Table C15). Mean responses and standard deviations are listed below.

1. *Spay/neuter surgeries*: The mean response for spay or neuter surgeries fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.60 ($sd=1.43$).
2. *Dentals*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.80 ($sd=1.33$).
3. *Mass/tumor removals*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.80 ($sd=1.33$).
4. *Radiographs (with or without anesthesia)*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.50 ($sd=0.67$).
5. *New pet wellness appointments*: The mean response fell between *significant increase* and *slight increase*, with a mean of 1.90 ($sd=1.64$).
6. *Annual wellness appointments*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.50 ($sd=1.50$).
7. *Problem/ill/injured appointments*: The mean response fell between *significant increase* and *slight increase*, with a mean of 1.60 ($sd=0.66$).
8. *Vaccine appointments*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.40 ($sd=1.43$).
9. *Grooming appointments*: The mean response fell between *slight increase* and *no noticeable change/unsure*, with a mean of 2.70 ($sd=1.55$).

Next, participants were asked if their clinic had changed the prices of services offered, on a scale of (1) *yes, there was an overall increase in prices*, (2) *some prices increased but most were unchanged*, (3) *no price change*, (4) *some prices decreased, but most were unchanged*, (5) *yes, there was an overall decrease in prices*, and (6) *unsure* (Table C16). Participants' mean response fell between *yes, there was an overall increase* and *some prices increased*, with a mean of 1.80 ($sd=0.60$).

Participants were then asked to report whether their weekly average hours worked changed during the pandemic, using a scale of (1) *increased significantly*, (2) *increased somewhat*, (3) *no change*, (4) *decreased somewhat*, (5) *decreased significantly*, and (6) *unsure* (Table C17). Out of the 10 participants, 60% reported their hours increased either somewhat or significantly, and 40% reported no change (mean=2.20, $sd=0.75$). When asked about effects on their average monthly income (Table C18), 20% reported a significant increase, 40% said their income increased somewhat, and 40% reported no change (mean=2.20, $sd=0.75$). The next question asked respondents' opinion on whether they received adequate compensation for the amount of hours worked and the quality of care they provided (Table C19). For this item, 40% reported that they felt they received adequate compensation, 10% reported their compensation was neither adequate nor inadequate, 40% reported that they did not receive adequate compensation, and 10% reported that they were unsure (mean=2.20, $sd=1.08$). In the final question in this section, participants were asked if the pandemic has affected their workplace's average monthly profits (Table C20). Of the participants, 20% reported that the profits increased significantly, 50% reported the profits increased somewhat, 10% reported no change, and 20% indicated that they were unsure (mean=2.70, $sd=1.73$).

Mental Health Effects

The last section of the survey asked respondents to report their mental health levels. Participants were presented with the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), a 14-statement Likert-style questionnaire with answers ranging from (1) *none of the time*, (2) *rarely*, (3) *some of the time*, (4) *often*, and (5) *all of the time*. The individual statements and their means and standard deviations are listed below (Table C21).

1. *I've been feeling optimistic about the future*: The mean response fell between *rarely* and *some of the time*, with a mean of 2.90 ($sd=1.14$).
2. *I've been feeling useful*: The mean response was *often* (mean=4.00, $sd=1.00$)
3. *I've been feeling relaxed*: The mean response fell between *rarely* and *some of the time*, with a mean of 2.20 ($sd=0.98$).
4. *I've been feeling interested in other people*: The mean response fell between *some of the time* and *often*, with a mean of 3.20 ($sd=1.25$).
5. *I've had energy to spare*: The mean response fell between *none of the time* and *rarely*, with a mean of 1.80 ($sd=0.60$).
6. *I've been dealing with problems well*: The mean response was *some of the time* (mean=3.00, $sd=1.26$).
7. *I've been thinking clearly*: The mean response fell between *some of the time* and *often*, with a mean of 3.10 ($sd=0.94$).
8. *I've been feeling good about myself*: The mean response fell between *some of the time* and *often*, with a mean of 3.10 ($sd=1.22$).
9. *I've been feeling close to other people*: The mean response fell between *some of the time* and *often*, with a mean of 3.10 ($sd=1.30$).

10. *I've been feeling confident*: The mean response fell between *some of the time* and *often*, with a mean of 3.30 ($sd=1.10$).
11. *I've been able to make up my own mind about things*: The mean response fell between *some of the time* and *often*, with a mean of 3.80 ($sd=0.87$).
12. *I've been feeling loved*: The mean response fell between *some of the time* and *often*, with a mean of 3.40 ($sd=1.28$).
13. *I've been interested in new things*: The mean response fell between *rarely* and *some of the time*, with a mean of 2.90 ($sd=1.14$).
14. *I've been feeling cheerful*: The mean response fell between *rarely* and *some of the time*, with a mean of 2.90 ($sd=1.14$).

Finally, participants were presented with a Likert-style matrix asking them to report the answer that best describes their experience during the pandemic on a scale of (1) *increased significantly*, (2) *increased somewhat*, (3) *no change*, (4) *decreased somewhat*, and (5) *decreased significantly* (Table C22). Seventy percent of participants reported a decrease in their overall mental health, with the mean response falling between *no change* and *decreased somewhat* (mean=3.70, $sd=1.10$). Participants reported an increase in stress levels, with the mean response falling between *increased significantly* and *increased somewhat* (mean=1.40, $sd=0.66$). Respondents indicated a slight increase in substance abuse; the mean response fell between *increased somewhat* and *no change* (mean=2.90, $sd=0.30$). Participants also reported more feelings of work-related burnout, with a mean response between *increased significantly* and *increased somewhat* (mean=1.50, $sd=0.67$). All of the participants reported their anxiety levels increased either somewhat or significantly, with a mean of 1.60 ($sd=0.49$). Lastly, 70% of

participants indicated increased levels of depression, with a mean response of *increased somewhat* (mean=2.00, *sd*=0.77).

Semi-Structured Interviews

In total, five interviews were conducted. Interviews were conducted via the meeting platform Zoom and lasted between twenty minutes and one hour. These interviews were conducted using a semi-structured format, using the questions listed in Appendix B, as well as any follow-up questions at the discretion of the researcher. Each interview was recorded after receiving verbal informed consent from the interviewee. Several themes were established through coding of the transcripts. Multiple references were identified for each theme.

Research Objective 1: Identify the financial impact on veterinary clinics in Northwest Arkansas, as well as the change in the volume of clientele/patients and the frequency of their visits.

Boarding Reservations. One of the immediate challenges faced by these clinics was a sudden decrease in the volume of boarding reservations. Participant 008 stated, “all of our kennels emptied out... the kennel staff was off for two weeks.” Participant 004 elaborated on this struggle when they said:

It really hit the, the boarding for sure. Used to be, you know, totally full... and of course we weren't anymore because nobody could go anywhere... the boarding was down.

People weren't traveling.

This was a common sentiment expressed by multiple participants. Participant 005 added:

During the first year, boarding was nonexistent because no one was traveling. The second year, boarding was constantly busy every weekend. This changed our daily workflow by

taking care of boarding patients that needed veterinary services and taking care of issues that arose while boarding.

Patient and Client Volumes. Each of the participants interviewed identified an increase in workload. Participant 001 stated that:

All of a sudden it just, it just started, and it kept coming and it didn't stop...it was just complete, complete chaos... when we started COVID we had three staff doctors, and we added six... because they couldn't keep up with the patient load.

Participant 002 expressed something similar.

We also did move to a bigger clinic during the pandemic... we went from already being short staffed to a much bigger clinic, therefore more appointments, more doctors, but a smaller staff... but part of it kind of balanced out. Some people that would normally come in didn't feel comfortable coming in because of the pandemic... and then with the stimulus checks and things, some people just came out of the woodwork that we hadn't seen in years and had procedures done... with the money from that. So, it kind of balanced out, but overall, it seemed busier, but I think some of that was the inefficiencies with curbside too... so it was less efficient. I think it was busier and less efficient.

Staffing Shortages. Multiple participants also identified staffing shortages as one of the crucial issues their facility faced. Participant 001 stated:

The veterinary industry absolutely took off. And then, you know, we were completely understaffed... a lot of my experienced staff either quit and left the field entirely or just went to, like, day practice where things were a little bit easier for them... it was rough there for a while around the summer of 2020 was when we were the most short-staffed. And at that point, I was just calling it, you know, if you have a pulse, you get a job.

Additionally, Participant 002 identified similar issues at their clinic. “We’ve had the highest turnover ever in the history of our clinic... [employees were] just leaving the profession.”

Learning Curves. The sudden change in procedures affected everyone interviewed. Participant 001 states “It was a big adjustment... but we adapted... this has definitely opened our eyes to, you know, different options and different ways of doing things and made us see that we can be very flexible.” This also posed a challenge with new employees hired when these clinics were curbside-only as the clinics transitioned back into in-house appointments. Participant 004 said “I hired a new receptionist because we lost one. So, all, all she knew when she started was, uh, you know, curbside... [we] had to train her twice in two different methods.” Participant 002 shared a similar sentiment, stating “We’ve [hired] a couple experienced people, but more having to train inexperienced people. So, we had enough numbers of people, but not like an equal trade for the person that left.”

Research Objective 2: Investigate the effects of the pandemic on staffs’ mental and emotional wellbeing.

Physical Wellness. Responses varied when discussing physical wellbeing. Participants 001 and 002 expressed similar sentiments, including weight gain, turning to comfort food, and returning to familiar habits, such as drinking sodas “like I did back in high school in college” for comfort. (P002) On top of this, a decrease in physical activity as a side-effect of stress and lack of energy only exacerbated these issues. “At first, I was staying pretty active... I’ve, you know, not totally given up on being active, but I’m in way worse shape than I was just because you’re mentally drained.” (P002) Participant 001 elaborated:

I quit doing all the physical activity I liked... it was literally wake up, stress, go to work, stress, come home, drink three White Claws so that you can go to sleep and then repeat... that first year was a bad, bad year for mental, physical, emotional health.

Other participants expressed the opposite. Participant 004 attributed their stable mental and physical state to working on their farm. "I'm kind of a homebody... fresh air, being with the animals, you know, um, mow the yard, reading, watching Netflix... [the pandemic] didn't really affect me."

Mental and Emotional Wellness. Participants also reported increased feelings of work-related burnout, stress, and anxiety, across multiple positions. Participant 002 states:

I'm definitely feeling burned out more than I ever have. And this'll be... May will be 25 years for me. And I've had little periods of feeling stressed and burned out, but this is the first time where like, most days I don't want to go to work... I do sometimes fantasize about just walking away from the profession for, you know, six months and then coming back part time, which I never used to think like that... I would happily cut back to part time.

Participant 001 shared this sentiment. "At one point, I definitely did consider, like, is this what I want to do? Is it worth it?"

Though there was a significant increase in work-related mental health issues, participants commonly identified maintaining a sense of community with their coworkers and peers in the field as the main factor that helped them through the worst of the pandemic. Participant 002 states:

One of the most helpful things is just discussing it with my friends that are in the same boat so that you don't feel alone and... it's not weird that you're just thinking that you

could just, like, take off your stethoscope and drop it like a mic drop and walk out. One of the most important things of veterinary medicine is our colleagues... I feel very connected. Like I could, if I have something bad happen at work, I have a pretty good group of people that I know will understand what I'm talking about and make me feel better about it. I've never felt disconnected from the profession.

Dealing with Misinformation. One participant (P002) reported frustration with the common public and misinformation surrounding vaccines. They stated that, though they are not a medical professional in the human medical sector, they have received much of the same training regarding immunology, virology, and epidemiology, and they have spent their career considering the risks and benefits of vaccines day after day.

We take our role in public health very seriously... it was really frustrating being a professional that deals with vaccine risk versus benefit every day, and just seeing how stupid some people were being about it.

They also expressed their frustration with the misinformation being spread by those without the same scientific educational background. "They think it's all nonsense because the studies contradict, they don't understand how like a smaller study... the numbers might not be as accurate."

An Optimistic Outlook: The pandemic and subsequent necessary changes to business operations caused many issues in interacting with clients, as many participants have said. However, though each participant continually returned to identifying positive outcomes as a result of the pandemic. Participant 001 states:

Through it all it did teach us to work more efficiently. We had to come up with better protocols for things. We came up with a much better triage system, that way, when we do

have 30 or 40 patients waiting to be seen, we could easily establish the most critical ones from the least critical and make sure we address that appropriately. So, it definitely gave us, um, kind of more organization and we did find that the busier that we did get, um, the more efficiently we were working.

Many of the participants interviewed consistently used language that implied that they were hopeful for the future, and looking forward to future conferences, vacations, and spending time with family and friends were all contributors to maintaining an optimistic attitude.

Research Objective 3: Investigate how veterinary business practices adapted to city, state, and federal guidelines for interacting with clients

Immediate Changes. When the pandemic first began in March 2020, many clinics closed their doors to in-house services immediately. “We closed the doors to having... people come inside, um, which happened, uh, almost immediately in spring of 2020.” (P008) Clinics also began “masking” around this time—one participant stated that “shortly thereafter [beginning curbside-only service] we started... some individuals chose to start masking... at first it was a personal preference until the state mandate.” (P002) Participant 004 also indicated an increase in sanitizing measures. “Everything a hand would touch, uh, got sanitized.”

Curbside. Many participants indicated that their clinics were severely impacted by the effects of COVID-19 and the resulting changes in how they conducted their business. All the participants interviewed reported that their clinic utilized curbside service for some duration of time during the pandemic; one clinic returned to normal in-house service as soon as all employees were vaccinated against COVID-19, one clinic reopened its doors for in-house service in May of 2021 after more than a year of curbside service, and another clinic is still

functioning as a curbside-only clinic. Though this has become the new normal, one interviewee expressed their frustration with this method.

When we started doing curbside, um, I had a little bit more history taking, um, from the staff member that went out to the car and then I would try to follow up on the phone, which was very difficult because people never answered their phone... so then I would either just make do with the history I had or go running out there and try to talk to them in the parking lot.

Participant 8 expressed that, though curbside service was somewhat inconvenient, their clinic was able to perform exams “maybe even more efficiently without owners present.” Additionally, this clinic still offers curbside services on an as-needed basis, for clients who may be ill and in need of immediate veterinary services, or for clients who are still uncomfortable with prolonged face-to-face interaction. “We’re certainly open and willing to continue with curbside, if folks are... nervous about coming in, for whatever reason.” (P008)

Exceptions to the Rules. Though these clinics had to adapt to the sudden changes and alter the way they interacted with clients; they still made an effort to provide the best care possible to their patients. Each of the interviewees stated that euthanasia appointments were one of the few times that clients were allowed into the building.

We did allow people to be in the building and present with their patients or with their animals during the euthanasia as we didn’t want to, you know, sacrifice that for people... we put big, long IV lines on [the patients] so that the doctors and the staff weren’t right next to the people anymore. (P001)

Additionally, Participant 002 stated that “for anything that was emotional, like having to give bad news, I would just go out in the parking lot,” instead of following the typical procedure of

updating the clients via telephone. Even with these exceptions, “social distancing and masking [were] always there.” (P004) Participant 005 added that “outside appointments were encouraged if the owner needed to be present. House calls were required to be outside.”

Discussion and Limitations

Discussion

In the American Veterinary Medical Association’s Veterinarian’s Oath, veterinarians not only promise to use their skills to benefit society through animal health and welfare—they also swear to use their knowledge for “the promotion of public health” (AVMA, 2022). Each of the participants interviewed take this lifelong oath to heart. Though participants reported increased stress, anxiety, and burnout, along with an overall decline in mental health levels, they are still wholeheartedly dedicated to their profession and to the clients and patients they serve. “We take our role in public health very seriously.” (P002) The findings in this study pertaining to mental wellbeing align with prior research conducted by Mair et al. (2020). However, one difference between this study and Mair’s is the idea of connection to peers. In this study, participants’ responses indicated that they still felt connected to their peers (Table C21). Interviewees attributed this to a feeling of camaraderie between themselves and their peers—maintaining a sense of community with their coworkers and others in the field helped participants to avoid exacerbating the impacts of the pandemic on their mental health.

Limitations

First, some limitations to this study must be addressed. Due to time constraints, convenience sampling, and a small number of responses (n=10), the quantitative portion of this study is not generalizable to the general population. Samuel J. Stratton (2021) states “The number of persons asked to participate in the study and the number of actual participants should

be reported. An 80% or more participation rate is desirable” (p. 374). Though this participation rate was not attained, this study still provides notable information for this area of research. For data to be more significant, quantitative research should be conducted using a larger sample size and across a greater diversity of participants from a larger region.

Conclusions and Recommendations

The goal of this research was to investigate and report the effects of the COVID-19 pandemic on veterinary clinics across Northwest Arkansas. An online survey was used to obtain quantitative data, and optional follow-up interviews were used to obtain qualitative data. This study discussed the effects on business and employee finances, mental health, and business practices. The conclusions are organized and discussed by research objectives and followed by recommendations for practices and future research.

Conclusions

RO 1: Identify the financial impact on veterinary clinics in Northwest Arkansas, as well as the change in the volume of clientele/patients and the frequency of their visits

The results indicate that clinics in Northwest Arkansas were impacted by the pandemic. Participants reported an increase in the volume of appointments and expressed their frustration when dealing with problems such as understaffing. Boarding reservations also declined significantly in 2020 at the onset of the pandemic, causing a significant loss in revenue, but the opposite was true in 2021—the kennels were full each weekend. Participants also identified issues with the “learning curve” associated with new business practices and training new staff.

RO 2: Investigate the effects of the pandemic on staffs’ mental and emotional wellbeing

Participants in this study stated that the pandemic took a severe toll on their mental health—many reported lower levels of energy, increased stress, anxiety, and depressive

tendencies, and increased feelings of work-related burnout. Factors such as understaffing and increased weekly hours worked were reported as contributors to this problem. Overall, the quantitative results suggest that the mental health levels in veterinary staff decreased during the pandemic. The qualitative results show that, while mental health declined, participants found comfort in their coworkers and their peers during the worst of the pandemic. Interviewees consistently used language that implied they are hopeful for what the future will bring.

RO 3: Investigate how veterinary business practices adapted to city, state, and federal guidelines for interacting with clients

One of the main approaches clinics used to adapt to regulations was the introduction of curbside services. Some clinics still utilize curbside services currently, while others transitioned back to in-house services as soon as possible. Clinics also implemented social distancing, required masks for employees and clients, and increased sanitization measures in order to combat the spread of the virus. However, the qualitative results show that clinics still allowed clients into the building in special circumstances, namely for euthanasia visits. In order to adapt this to the state and local mandates, some clinics encouraged clients to attend these appointments outside, with social distancing and masks still utilized.

Recommendations for Practice

Veterinary practices should consider these findings when dealing with issues such as low staff morale or understaffing. Understanding the toll the pandemic has taken on the mental health and wellbeing of veterinary staff is a potential first step to combatting this problem through improved business practices, such as pay raises, or more time off.

Staff should also consider implementing some of the coping strategies participants reported using, such as planning vacations, or finding solace in community. Though the

pandemic has impacted their mental health, staff should understand that they are not alone in their struggles, and being open with friends in the animal medical field could be a helpful strategy for combatting feelings of inadequacy or a desire to leave the field entirely.

Recommendations for Research

Though this study has its limitations, it should be considered as a basis for further research to expand on. This study provides information on sound methodology to explore a sector of the medical field that is scarcely reported on. Further research should consider utilizing funding resources in order to incentivize more participation and provide more impactful data. Ideally, for the quantitative data collection, a larger sample size and a larger region should be utilized in order to ensure that the results are statistically sound. For the qualitative data collection, an increased number of participants would not only enhance thematic data, it will also enhance the demographic information for those in the veterinary profession. Researchers should consider utilizing a similar, semi-structured interview design, in order to provide both ease of thematic analysis, as well as exploring participants' individual experiences through follow-up research questions.

Further research should:

- Continue investigating the long-term effects of COVID-19 on business practices.
- Continue investigating the long-term effects of COVID-19 on mental health in veterinary professionals.
 - Additionally, investigate the coping methods employed by veterinary professionals in order to combat these mental health effects.
- Continue investigating the long-term effects of COVID-19 on finances (both for the businesses and individual employees).

- Investigate clients' perspectives on these changes—how did they perceive the changes in business practices?

References

- Al-Salihi, K. A., & Khalaf, J. M. (2021). The emerging SARS-CoV, MERS-CoV, and SARS-CoV-2: An insight into the viruses' zoonotic aspects. *January-2021, 14(1)*, 190–199.
<https://doi.org/10.14202/vetworld.2021.190-199>
- Alhojailan, M. (2012, December). Thematic analysis: A critical review of its process and evaluation. *West East Journal of Social Sciences, 1(1)*, 39-47.
<http://www.westeastinstitute.com/journals/wp-content/uploads/2013/02/4-Mohammed-Ibrahim-Alhojailan-Full-Paper-Thematic-Analysis-A-Critical-Review-Of-Its-Process-And-Evaluation.pdf>
- American Veterinary Medical Association. (2022). *Veterinarian's Oath*.
<https://www.avma.org/resources-tools/avma-policies/veterinarians-oath>
- Chan, M. (2019, September 12). *Here's why suicide among veterinarians is a growing problem*. Time. <https://time.com/5670965/veterinarian-suicide-help/>
- Decaro, N., Martella, V., Saif, L. J., & Buonavoglia, C. (2020). COVID-19 from veterinary medicine and one health perspectives: What animal coronaviruses have taught us. *Research in Veterinary Science, 131*, 21–23.
<https://doi.org/10.1016/j.rvsc.2020.04.009>
- Fontana, A. & Frey, J. (2005) The interview: From neutral stance to political involvement. In Denzin N, Lincoln Y (Eds.) *The Sage Handbook of Qualitative Research*. Third edition. Sage, Thousand Oaks, California CA, 695-728.

- Jager, J., Putnick, D. L., & Bornstein, M. H. (2017, June). II. More than just convenient: The scientific merits of homogeneous convenience samples. *Monographs of the Society for Research in Child Development*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5606225/>
- Jawad, H., Qasir, H., Iqbal, N., Azhar, J., Mubeen, A., & Affaq Azhar, M. (2020). Wellbeing of veterinary and medical students during COVID-19 pandemic. *Acta Scientifica Veterinary Sciences*, 2(7), 31–34. <https://doi.org/10.31080/asvs.2020.02.0077>
- Lawal, N., & Onoja, A. B. (2020). The veterinary perspective of COVID-19. *Sokoto Journal of Veterinary Sciences*, 18(2), 53–66. <https://doi.org/10.4314/sokjvs.v18i2.1>
- Leech, B. L. (2002). Asking questions: Techniques for semi-structured interviews. *Political Science & Politics*, 35(04), 665–668. <https://doi.org/10.1017/s1049096502001129>
- Mair, T. S., Mountford, D. R., Radley, R., Lockett, E., & Parkin, T. D. (2020). Mental wellbeing of equine veterinary surgeons, veterinary nurses, and veterinary students during the COVID-19 pandemic. *Equine Veterinary Education*, 33(1), 15–23. <https://doi.org/10.1111/eve.13399>
- Mobasheri, A. (2020). COVID-19, Companion animals, comparative medicine, and one health. *Frontiers in Veterinary Science*, 7, 0. <https://doi.org/10.3389/fvets.2020.00522>
- Oude Munnink, B. B., Sikkema, R. S., Nieuwenhuijse, D. F., Molenaar, R. J., Munger, E., Molenkamp, R., van der Spek, A., Tolsma, P., Rietveld, A., Brouwer, M., Bouwmeester-Vincken, N., Harders, F., Hakze-van der Honing, R., Wegdam-Blans, M. C. A., Bouwstra, R. J., GeurtsvanKessel, C., van der Eijk, A. A., Velkers, F. C., Smit, L. A. M.,

- ... Koopmans, M. P. G. (2020). Transmission of SARS-CoV-2 on mink farms between humans and mink and back to humans. *Science*, *371*(6525), 172–177.
<https://doi.org/10.1126/science.abe5901>
- Platt, B., Hawton, K., Simkin, S., & Mellanby, R. J. (2010, December 23). Suicidal behaviour and psychosocial problems in veterinary surgeons: A systematic review. *Social Psychiatry and Psychiatric Epidemiology*. <https://link.springer.com/article/10.1007/s00127-010-0328-6>
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2017, September 14). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality & Quantity*.
<https://link.springer.com/article/10.1007/s11135-017-0574-8>
- Stafford, E. G. (2020). Highlighting the role of veterinary pharmacists in zoonotic diseases including COVID-19. *Journal of the American Pharmacists Association*, *60*(6), e84–e87.
<https://doi.org/10.1016/j.japh.2020.06.021>
- Stratton, S. J. (2021). Population research: Convenience sampling strategies. *Prehospital and Disaster Medicine*, *36*(4), 373–374. <https://doi.org/10.1017/s1049023x21000649>
- Tan, J. (2021, January 14). *Puppies & burnout: The economic impact of the coronavirus on vets*. The conversation. <https://theconversation.com/puppies-and-burnout-the-economic-impact-of-the-coronavirus-on-vets-141964>
- Tiwari, R., Dhama, K., Sharun, K., Iqbal Yattoo, M., Malik, Y. S., Singh, R., Michalak, I., Sah, R., Bonilla-Aldana, D. K., & Rodriguez-Morales, A. J. (2020). COVID-19: Animals,

...veterinary and zoonotic links. *Veterinary Quarterly*, 40(1), 169–182.

<https://doi.org/10.1080/01652176.2020.1766725>

Van Beusekom, M. (2021, January 29). *COVID-19 antibodies transmit from moms to babies during pregnancy*. University of Minnesota CIDRAP. <https://www.cidrap.umn.edu/news-perspective/2021/01/covid-19-antibodies-transmit-moms-babies-during-pregnancy>

Vincent, A., Mamzer, H., Ng, Z., & Farkas, K. J. (2020). People and their pets in the times of the Covid-19 pandemic. *Society Register*, 4(3), 111–128.

<https://doi.org/10.14746/sr.2020.4.3.06>

Warwick Medical School. (2020, November 3). *The Warwick-Edinburgh Mental Wellbeing Scales - WEMWBS*. <https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs>

Appendix A

Survey Instrument

Q2 During the pandemic, my clinic changed the services offered.

- Yes, there was a change in services.
- No, my clinic did not alter, add, or remove any services.

Q3 Please indicate if any of the below services were implemented, altered, or removed.

	Already offered pre-pandemic	Added in response to pandemic	Altered in response to pandemic	No longer offered	Not applicable
Curbside Appointments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Phone Consultations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online Pharmacy Orders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mobile Application for Clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
House Calls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boarding/Kennel Reservations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grooming (shave downs, nail trims, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 Do you expect to continue to offer these services in the future?

- Definitely not
- Probably not
- Unsure
- Probably yes
- Definitely yes
- Not applicable

Q5 In your opinion, did the change in services (if any) have a positive or negative effect on your business?

- Extremely negative
- Somewhat negative
- Neither positive nor negative
- Somewhat positive
- Extremely positive
- Not applicable

Q6 During the pandemic, has your workplace been affected by staffing shortages?

- Yes, my workplace was severely affected by understaffing
- Yes, my workplace was somewhat affected
- Unsure
- No, my workplace was not affected
- Not applicable

Q10 Since the start of the pandemic, has your clinic changed the prices of any services offered?

- Yes, there was an overall increase in prices
- Some prices increased, but most were unchanged
- No price change
- Some prices decreased, but most were unchanged
- Yes, there was an overall decrease in prices
- Unsure

Q11 Did your weekly average hours worked increase or decrease during the pandemic?

- Increased significantly
- Increased somewhat
- No change
- Decreased somewhat
- Decreased significantly
- Unsure

Q12 Has the pandemic affected your average monthly income?

- Increased significantly
- Increased somewhat
- No change
- Decreased somewhat
- Decreased significantly
- Unsure

Q13 In your opinion, did you receive adequate compensation for the amount of hours you worked/the quality of care provided?

- Yes, I received adequate compensation
- Neither adequate nor inadequate
- No, I did not receive adequate compensation
- Unsure

Q14 Has the pandemic affected your workplace's average monthly profits?

- Increased significantly
- Increased somewhat
- No change
- Decreased somewhat
- Decreased significantly
- Unsure

Q16 Please select the answer that best describes your experience during the pandemic.

	Increased significantly	Increased somewhat	No change	Decreased somewhat	Decreased significantly
Overall mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feelings of work-related burnout	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17 Please indicate your age range.

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or older

Q18 What is your gender identity?

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Q19 What is your race?

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White
- Two or More Races
- Prefer not to say

Q20 What is your ethnicity?

- Hispanic or Latino
- Not Hispanic or Latino
- Prefer not to say

Q21 What is your current position?

- Office manager
- Receptionist
- Veterinary assistant/technician
- Veterinarian
- Kennel assistant
- Other (please specify) _____

Q22 How long have you been in your current position?

- Less than one year
- Between one and five years
- Between five and ten years
- Ten years or longer

Q23 How long have you worked in an animal medical setting in general (including past jobs/positions)?

- Less than one year
- Between one and five years
- Between five and ten years
- Ten years or longer

Q24 Are you open to meeting virtually with the researcher for a short (approximately thirty minute) interview?

- Yes
- No

Q25 If you answered yes, please provide your first and last name and an email address that can be used to contact you directly. Please note--this email will not be shared with anyone. You will be assigned a number for reporting purposes.

Q26 Please enter your first and last name followed by your email if you would like to be entered into a raffle for one of ten e-gift cards, valued at \$25 each. Your identifying information will be deleted after the raffle and not linked to your survey response in any way.

Appendix B

Semi-Structured Interview Questions

Introductions: Student (and faculty researcher, if attending): My name is Sabrina Cox, and I am an undergraduate honors student at the University of Arkansas. Thank you for signing up for a follow up interview with me/us.

Purpose and Verbal Consent: I will now describe the purpose of study and review the verbal consent procedures, and the format this interview will take.

This study is part of my ongoing honors research thesis project at the University of Arkansas. Its purpose is to explore, investigate, and thoroughly report the impacts of the COVID-19 pandemic on the companion animal industry in Northwest Arkansas from early 2020 to present day. Many sectors of the companion animal industry have been overlooked throughout the course of the pandemic, including but not limited to: veterinary clinics, animal shelters, animal day-care centers, and animal boarding facilities. This study aims to investigate specific effects of the pandemic on veterinary clinics, including financial impacts, business practices, their employees, and employees' mental wellbeing.

IRB protocol #2201381633 was approved for this study by the University of Arkansas review committee.

This 30-minute follow up interview will be audio recorded and the transcription will be downloaded for analysis. If you choose to move forward with the interview, you will be assigned a numeric identification number for reporting purposes. Any quotes included in the results will be associated with the numeric identification number. Data will be kept anonymous to the fullest extent possible. Participation is voluntary and you may opt to stop the interview at any time. By continuing with the interview this serves as your verbal consent to the study.

The results of this study may be used to inform external organizations about the study's findings through poster or oral presentations, or journal article submissions. If you have questions or concerns about this study, you may contact Isabel Whitehead at (479) 575-3345 or at iwhitehe@uark.edu, or the student researcher Sabrina Cox by email at sgcox@uark.edu. For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by email at irb@uark.edu.

Do you consent to continue with the interview?

Your numeric identification will be: State the number

Begin the interview:

- Did your clinic introduce any procedural changes or changes to services offered? If so, can you please describe the types of changes that were implemented?
 - o Describe how your daily duties changed after implementing procedural changes.
- What changes might your facility continue to incorporate in the future? Why or why not?

- Describe any staffing changes you observed during the pandemic, such as layoffs, new hires, and/or understaffing?
 - How do you view these changes?
 - Describe your experiences responding to staffing challenges at your facility.
- Describe the daily volume of clients/patients/appointments. Did you notice changes to the daily volume at any time?
 - If you noticed a change in volume of clients/patients/or appointments, describe your experience responding to the change.
- Describe your perspective on your role in the workplace throughout the pandemic.
- The following few questions will cover different aspects of wellness, such as emotional, mental, and physical wellness.
 - How would you describe your physical health and physical activity throughout the pandemic?
 - What about your mental wellbeing?
 - How about emotional wellbeing?
 - Describe your sense of workplace belonging and connection to your peers throughout the pandemic.
 - Describe your coping strategies during the pandemic. What activities do you do to care for your emotional, mental, or physical wellbeing?

Conclude the interview: Thank you again for your time. With your permission, we may contact you in the two weeks after the interview is transcribed to allow you to confirm that the transcript reflects your words and ideas during the interview, and to make any edits for accuracy. Additionally, we may reach out within the two weeks following data analysis to share the identified themes.

[Please note, due to the semi-structured nature of the interview, each interview will also include follow-up questions to the questions listed above, as the researcher sees applicable.]

Appendix C

Tables

Table C1

Participants' Age

Item	Frequency	Percent
18-24	1	10.0%
25-34	5	50.0%
35-44	0	0.0%
45-54	3	30.0%
55-64	1	10.0%
65 or older	0	0.0%

Note: n=10

Table C2

Participants' Gender Identity

Item	Frequency	Percent
Male	0	0.0%
Female	10	100.0%
Non-binary / third gender	0	0.0%
Prefer not to say	0	0.0%

Note: n=10

Table C3

Participants' Race

Item	Frequency	Percent
American Indian or Alaska Native	0	0.0%
Asian	0	0.0%
Black or African American	0	0.0%
Native Hawaiian or Pacific Islander	0	0.0%
White	10	100.0%
Two or more races	0	0.0%
Prefer not to say	0	0.0%

Note: n=10

Table C4***Participants' Ethnicity***

Item	Frequency	Percent
Hispanic or Latino	0	0.0%
Not Hispanic or Latino	9	90.0%
Prefer not to say	1	10.0%

Note: n=10

Table C5***Participants' Current Position***

Item	Frequency	Percent
Office Manager	1	10.0%
Receptionist	2	20.0%
Veterinary Assistant/Technician	4	40.0%
Veterinarian	2	20.0%
Kennel Assistant	0	0.0%
Veterinarian and owner	1	10.0%

Note: n=10

Table C6***Participants' Length of Time Spent in Current Position***

Item	Frequency	Percent
Less than one year	1	10.0%
Between one and five years	3	30.0%
Between five and ten years	3	30.0%
Ten years or longer	3	30.0%

Note: n=10

Table C7***Participants' Length of Time Spent in the Animal Medical Field***

Item	Frequency	Percent
Less than one year	0	0.0%
Between one and five years	1	10.0%
Between five and ten years	4	40.0%
Ten years or longer	5	50.0%

Note: n=10

Table C8***During the Pandemic, my Clinic Changed Services Offered***

Item	Frequency	Percent
Yes, there was a change in services	10	100.0%
No, my clinic did not alter, add, or remove any services	0	0.0%

Note: n=10

Table C9***Services Implemented, Altered, or Removed***

Item	Already offered pre-pandemic	Added in response to pandemic	Altered in response to pandemic	No longer offered	Total
Curbside Appointments	0.00%	0	100.00%	0	10
Phone Consultations	77.78%	7	0.00%	2	9
Online Pharmacy Orders	100.00%	9	0.00%	0	9
Mobile Application for Clients	66.67%	4	16.67%	1	6
House Calls	44.44%	4	0.00%	5	9
Boarding/Kennel Reservations	77.78%	7	0.00%	2	9
Grooming (shave downs, nail trims, etc.)	55.56%	5	0.00%	4	9
Other (please specify)	0.00%	0	0.00%	0	0

Table C10***Opinion of Continued use of New Services***

Item	Frequency	Percent
Definitely not	0	0.0%
Probably not	1	10.0%
Unsure	0	0.0%
Probably yes	4	40.0%
Definitely yes	5	50.0%

Note: n=10

Table C11***Perceptions of the Impact of Changing Services***

Item	Frequency	Percent
Extremely negative	0	0.0%
Somewhat negative	2	20.0%
Neither positive nor negative	0	0.0%
Somewhat positive	7	70.0%
Extremely positive	1	10.0%

Note: n=10

Table C12***Perceptions of the Impact of Staffing Shortages During the Pandemic***

Item	Frequency	Percent
Yes, my workplace was severely affected by understaffing	3	30.0%
Yes, my workplace was somewhat affected	5	50.0%
Unsure	0	0.0%
No, my workplace was not affected	2	20.0%

Note: n=10

Table C13***Perceptions of the Impacts of Understaffing on Quality of Care***

Item	Frequency	Percent
The quality of care worsened significantly	0	0.0%
The quality of care worsened slightly	3	42.86%
No notable change	4	57.14%
Unsure	0	0.0%
The quality of care improved slightly	0	0.0%
The quality of care improved significantly	0	0.0%

Note: n=7

Table C14***Perceptions of the Change in Volume of Appointments, Clients, or Patients***

Item	Significant increase	Slight increase	No change	Slight decrease	Significant decrease	Unsure	Total
Clientele	60.00%	6	40.00%	4	0.00%	0	10
Patients	60.00%	6	40.00%	4	0.00%	0	10
Appointments	40.00%	4	60.00%	6	0.00%	0	10

Table C15

Perception of Change in Demand for Routine Procedures and Services

Item	Significant increase	Slight increase	No noticeable change/Unsure	Slight decrease	Significant decrease	Not applicable						
Spay/Neuter Surgeries	20.00%	2	40.00%	4	20.00%	2	10.00%	1	0.00%	0	10.00%	1
Dentals	10.00%	1	40.00%	4	30.00%	3	10.00%	1	0.00%	0	10.00%	1
Mass/Tumor Removal	10.00%	1	40.00%	4	30.00%	3	10.00%	1	0.00%	0	10.00%	1
Radiographs (with or without anesthesia)	10.00%	1	30.00%	3	60.00%	6	0.00%	0	0.00%	0	0.00%	0
New Pet Wellness Appointments	70.00%	7	10.00%	1	0.00%	0	10.00%	1	0.00%	0	10.00%	1
Annual Wellness Appointments	30.00%	3	30.00%	3	20.00%	2	10.00%	1	0.00%	0	10.00%	1
Problem/Ill/Injured Appointments	50.00%	5	40.00%	4	10.00%	1	0.00%	0	0.00%	0	0.00%	0
Vaccine Appointments	20.00%	2	60.00%	6	0.00%	0	10.00%	1	0.00%	0	10.00%	1
Grooming Appointments (including nail trims)	20.00%	2	40.00%	4	20.00%	2	0.00%	0	10.00%	1	10.00%	1
Other (please specify)	0.00%	0	0.00%	0	10.00%	1	0.00%	0	0.00%	0	90.00%	9

Note: n=10

Table C16***Changes in Cost of Services Since the Start of the Pandemic***

Item	Frequency	Percent
Yes, there was an overall increase in prices	3	30.0%
Some prices increased, but most were unchanged	6	60.0%%
No price change	1	10.0%
Some prices decreased, but most were unchanged	0	0.0%
Yes, there was an overall decrease in prices	0	0.0%
Unsure	0	0.0%

Note: n=10

Table C17***Perception of Changes in Average Weekly Hours Worked***

Item	Frequency	Percent
Increased significantly	2	20.0%
Increased somewhat	4	40.0%
No change	4	40.0%
Decreased somewhat	0	0.0%
Decreased significantly	0	0.0%
Unsure	0	0.0%

Note: n=10

Table C18***Effects of the Pandemic on Participants' Average Monthly Income***

Item	Frequency	Percent
Increased significantly	2	20.0%
Increased somewhat	4	40.0%
No change	4	40.0%
Decreased somewhat	0	0.0%
Decreased significantly	0	0.0%
Unsure	0	0.0%

Note: n=10

Table C19***Perceptions of Income Adequacies or Inadequacies***

Item	Frequency	Percent
Yes, I received adequate compensation	4	40.0%
Neither adequate nor inadequate	1	10.0%
No, I did not receive adequate compensation	4	40.0%
Unsure	1	10.0%

Note: n=10

Table C20***Perception of Changes in Business Profits***

Item	Frequency	Percent
Increased significantly	2	20.0%
Increased somewhat	5	50.0%
No change	1	10.0%
Decreased somewhat	0	0.0%
Decreased significantly	0	0.0%
Unsure	2	20.0%

Note: n=10

Table C21

Warwick-Edinburgh Mental Wellbeing Scale

Item	None of the time		Rarely		Some of the time		Often		All of the time		Not Applicable	
I've been feeling optimistic about the future	10.00%	1	30.00%	3	30.00%	3	20.00%	2	10.00%	1	0.00%	0
I've been feeling useful	0.00%	0	10.00%	1	20.00%	2	30.00%	3	40.00%	4	0.00%	0
I've been feeling relaxed	20.00%	2	60.00%	6	0.00%	0	20.00%	2	0.00%	0	0.00%	0
I've been feeling interested in other people	20.00%	2	0.00%	0	30.00%	3	40.00%	4	10.00%	1	0.00%	0
I've had energy to spare	30.00%	3	60.00%	6	10.00%	1	0.00%	0	0.00%	0	0.00%	0
I've been dealing with problems well	20.00%	2	10.00%	1	30.00%	3	30.00%	3	10.00%	1	0.00%	0
I've been thinking clearly	10.00%	1	10.00%	1	40.00%	4	40.00%	4	0.00%	0	0.00%	0
I've been feeling good about myself	10.00%	1	20.00%	2	40.00%	4	10.00%	1	20.00%	2	0.00%	0
I've been feeling close to other people	20.00%	2	10.00%	1	20.00%	2	40.00%	4	10.00%	1	0.00%	0
I've been feeling confident	10.00%	1	10.00%	1	30.00%	3	40.00%	4	10.00%	1	0.00%	0
I've been able to make up my own mind about things	0.00%	0	10.00%	1	20.00%	2	50.00%	5	20.00%	2	0.00%	0
I've been feeling loved	10.00%	1	20.00%	2	10.00%	1	40.00%	4	20.00%	2	0.00%	0
I've been interested in new things	10.00%	1	30.00%	3	30.00%	3	20.00%	2	10.00%	1	0.00%	0
I've been feeling cheerful	10.00%	1	30.00%	3	30.00%	3	20.00%	2	10.00%	1	0.00%	0

Note: n=10

Table C22

Participants' Changes in Mental Health Since the Start of the Pandemic

Question	Increased significantly	Increased somewhat	No change	Decreased somewhat	Decreased significantly	Total					
Overall mental health	10.00%	1	0.00%	0	20.00%	2	50.00%	5	20.00%	2	10
Stress levels	70.00%	7	20.00%	2	10.00%	1	0.00%	0	0.00%	0	10
Substance abuse	0.00%	0	10.00%	1	90.00%	9	0.00%	0	0.00%	0	10
Feelings of work-related burnout	60.00%	6	30.00%	3	10.00%	1	0.00%	0	0.00%	0	10
Anxiety levels	40.00%	4	60.00%	6	0.00%	0	0.00%	0	0.00%	0	10
Depression	30.00%	3	40.00%	4	30.00%	3	0.00%	0	0.00%	0	10
Other (please specify)	0.00%	0	0.00%	0	55.56%	5	0.00%	0	44.44%	4	9

Appendix D

IRB Approval Letter



To: Isabel M Whitehead
From: Douglas J Adams Justin R Chimka, Chair
IRB Expedited Review
Date: 02/15/2022
Action: **Exemption Granted**
Action Date: 02/15/2022
Protocol #: 2201381633
Study Title: Pandemics and Animal Welfare: How the COVID-19 Pandemic has Affected the Companion Animal Industry in Northwest Arkansas

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Sabrina Grace Cox, Investigator

Appendix E

Business Consent Form

Business Consent Form

Purpose

This study is part of an ongoing honors research thesis project at the University of Arkansas. Its purpose is to explore, investigate, and thoroughly report the impacts of the COVID-19 pandemic on the companion animal industry in Northwest Arkansas from early 2020 to present day. Many sectors of the companion animal industry have been overlooked throughout the course of the pandemic, including but not limited to: veterinary clinics, animal shelters, animal day-care centers, and animal boarding facilities. This study aims to investigate specific effects of the pandemic on veterinary clinics, including financial impacts, business practices, their employees, and employees' mental wellbeing.

This survey should take no longer than 10-15 minutes. IRB protocol #2201381633 was approved for this study by the University of Arkansas review committee. Data will be gathered using Qualtrics, an online survey platform, or the facility may opt to submit paper based survey responses. If completing the online survey, we anticipate that your business' participation in this survey presents no greater risk than everyday use of the Internet. Completion of the survey will represent participants' implied consent to participate in this study. Data will be kept anonymous to the fullest extent possible. Participants will have the opportunity to sign up to participate in a 30-minute follow up interview through Zoom. Participants who opt into an interview will be assigned a numeric identification number. The results of this study may be used to inform external organizations about the study's findings through poster or oral presentations, or journal article submissions.

If you, as the business owner or office manager have questions or concerns about this study, you may contact Isabel Whitehead at 479-575-3345 or iwhitehe@uark.edu or student researcher Sabrina Cox at sgcox@uark.edu for additional information. For questions or concerns about you or your employees' rights as research participants, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by email at irb@uark.edu.

Statement of Consent

I have read the above information and have received answers to any questions I asked. I consent to the researchers forwarding me the survey link or printable survey to forward to my employees on the researchers' behalf.

Business Name:

Your Name (printed):

Your Signature:

Date:

Signature of person obtaining consent:

Date:

Printed name of person obtaining consent:

This consent form will be kept by the researcher for five years beyond the end of the study.