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Pets and Problems: Exploring Community Patterns in Calls for Animal Services

An Honors Thesis submitted in partial fulfillment of the requirements of Honors Studies

in Criminal Justice and Sociology

By

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Introduction

Much of sociological studies conceptualize society as something that is uniquely human and separate from nature. Despite the existence of relevant theoretical ideas, there was until recently a lack of empirical interest in non-human animals, which will henceforth be referred to as "animals" for simplicity. Yet the last two decades have seen a growing body of scholarship that challenges anthropocentrism (Arluke and Sanders, 1996). Anthropocentrism focuses on the belief that the human is the central and most integral part of society. This research focuses on the experiences of human-pet interaction, as well as asking questions as to what our relationships with animals say about our society. That is, animals play important roles in human interactions and have undoubtedly influenced our social and physical environments. While some scholars have argued that animals deserve sociological consideration in their own right, independent of their association with humans (Flynn 2001), others have emphasized that the oppression of animals tends to imitate and even intensify the oppression of vulnerable human groups (Adams and Donovan 1995). In addition, sociologists are now asking if and how human-animal dynamics may be related to other social phenomena, including crime and violence (Arluke et al. 1999).

Sociology and Public Discourse on Animals

Sociological perspectives are useful for framing the larger public conversations regarding animals. Specifically, popular discourse on animals in society can be framed along three sociological perspectives: functionalist, conflict, and symbolic interactionist

approaches. Viewing society as relatively stable, functionalist perspectives focus on how

social phenomena persist because they perform essential functions across various social

institutions. When social phenomena become problematic and/or detrimental to social

institutions, society will recognize and respond accordingly to restore stability and

smooth-functioning. Thus, speciesism, meaning the attitude of prejudice or bias against

a member of a species that is not one's own, persists because it is advantageous to

human society. The ability of animals to provide food, labor, materials, companionship,

entertainment, and scientific advancement might justify speciesism as integral to our

current economic system. Evidence of this can be found in countermovement claims in

response to animal activism, such as among scientists, meat packers, or cattle farmers.

The conflict perspective focuses on the significant inequalities that exist between

human and non-human animals, as well as how these inequalities are reinforced by

power asymmetry and privilege. Speciesism upholds humanness as the norm and

maintains human power and privilege. Conflict approaches emphasize the appalling

exploitation of animals. Nonhumans are reduced to resources and are exploited at the

benefit of humans. Proponents advocate for social change to eradicate inequality,

specifically the human dominance over non-human animals.

Symbolic interactionalist arguments explore the concept of species as a social

construct. What can be described as "human" and what is "animal" is a subjective

categorization. That is, non-humans are conceptualized as the "other", and thus distinct

from and inferior to or "less than" humans. Symbolic interactionalists are interested in

the creation of meaning and symbols and how language normalizes inequalities to

appear natural. As such, they focus on every day, routine interactions among groups and individuals that are generally taken for granted or understood as common sense. Accordingly, this perspective also explores the power of language to reinforce oppression and inequality. In addition to the negative consequences associated with creating distinctions between humans and non-humans, symbolic interactionalists see the power of derogatory language in upholding perceived otherness, fostering stereotypes, and justifying domination in words, insults, and phrases (i.e. "rat", "scaredy-cat", "chicken", "pig", "*just* a dog"). Commonly, non-human animals are presented as mere objects: flesh, skin, or pets. Speciesism becomes a taken for granted reality.

Although this research suggests an increasingly popular view of pets as family members, animals are still legally viewed and defined as property. Specifically, this legal view of pets as property has drastic influences over animal cruelty laws and statutes in society today. The definitions of animal cruelty vary by state. Animal cruelty is considered a misdemeanor in most states but is considered a felony in only twenty states (Hensley 2005). The variation of animal cruelty definitions under the law has ignited a fight for significant strides in increasing animal rights. Multiple states in the U.S. now have laws that include pets in domestic violence protective orders in an effort to prevent aggressors from using pets as leverage against their human family members (Pallotta 2019). In 1866, the American Society for the Prevention of Cruelty to Animals, or ASPCA, was founded as the first anti-animal cruelty enforcement agency in the U.S. (Pallotta 2019). The Pet and Women Safety (PAWS) Act in 2018 expanded federal

domestic violence protections to then include companion animals, however, many of these provisions are still drastically under-enforced and rarely monitored (Pallotta 2019).

Theories of Animals in Society

Moreover, ideas regarding animals in society can be found among classic sociological thinkers. For example, Karl Marx, while not an outright advocate for the liberation of non-human animals, did not see non-human animals as inferior or deficient, but rather just as different (Wilde 2000). In addition, Marx, as an essentialist, believed that humans are defined by their conscious life activities and are inherently social beings (Wilde 2000). Therefore, the differences between humans and animals, according to Marx, do not exist solely to degrade the needs or capabilities of non-human animals (Wilde 2000). Marx also argued that the presence of animal cruelty showcases not only a lack of respect for the non-human animals, but also a lack of respect for the essence of humans because the behavior reflects an inability to acknowledge the cruel nature of the act (Wilde 2000).

Relatedly, Bekoff (2010) argues that humans should 'mind' animals by acknowledging that they have active minds that operate under their own needs. Bekoff (2010) also introduces the concept of 'redirecting nature' which refers to the tendency of humans to move into the space of non-humans without any thought or regard about how their actions may affect the animals. This lack of empathy and complete disregard

for the consequences of one's actions play a large part in creating an atmosphere that encourages and maintains animal cruelty.

Theorists also discuss how society makes distinctions across species in our perspectives regarding the appropriate treatment and concern for animals (Futterman 2012). Generally, people view all animals as property, with concern given for animals that are deemed as companions rather than as means for economic gains (Futterman 2012). Some animals are deemed worthy of affection, care, and protection ("pets", "fur babies", "man's best friend"). Yet others are considered "pork", "beef", "leather", "lab rat", and so on; their renitence and value beyond human's use of these animals is disregarded. They are regarded exclusively based on their role in human consumption, whether that be for food, products, or science. There is tolerance of animal maltreatment when it involves animals that are bred or maintained for consumption, research, or sport (Futterman 2012). In her discussion of why we "love dogs, eat pigs, and wear cows", Joy (2010) describes the belief system that conditions us to eat some animals when we would never dream of eating others. This belief system, Joy (2010) refers to as carnism, produces extensive suffering and global injustice and drives us to act against our own interests and the interests of others, often without fully realizing or acknowledging it. We feel affection and compassion for some animals and are cruel and callous to others.

Research on Animal Maltreatment

A growing empirical literature explores the correlates of animal maltreatment. Specifically, studies document how individual's treatment of animals may be an important predictor of other antisocial and/or abusive behaviors. Asymmetrical power relationships place those in vulnerable positions at risk for exploitation and abuse. Thus, one may expect that patterns of maltreatment may be consistent among women, children, and animals. Several studies suggest that animal abuse can be a pre-curser to future interpersonal violence. For example, Vrečko (2019) posits that there is a "triad of violence", including cruelty to animals, fire-setting, and bed-wetting as children; they find an association between the negative treatment of animals and future behavior that constitutes a danger to the community (Vrečko 2019). Animal cruelty was first identified as a symptom of a conduct disorder under the Diagnostic and Statistical Manual of Mental Disorders, or DSM-IV, in 1987 by the American Psychiatric Association (Hensley 2005). A conduct disorder as described by the DSM-IV refers to the repetitive and persistent act that violates the basic rights of others or the mainstream societal norms (Hensley 2005). [1]

While one area of research explores animal abuse patterns as a predictor, other research explores animal maltreatment as an outcome. That is, not only can studies link animal abuse to interpersonal violence, but research has also identified factors that are correlated with animal cruelty or abuse perpetration. Vrečko (2019) found that 60% of

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[1] Early research by Hellman and Blackman (1966) found that three fourths of prison inmates who were charged with a violent crime and sent to psychiatric evaluations also engaged in this triad of violence.

abused or neglected children in their study sample had engaged in abusive behavior toward animals. Studies have found that the earlier in their life that a child witnesses animal cruelty or abuse, the earlier they will begin to exhibit similar behaviors toward animals (Browne 2017). However, Browne (2017) documented that the existence of one act of abusive behavior toward an animal does not predict future interpersonal violence, but rather a recurrence of that behavior serves as a predictive factor. In Browne (2017), the prison population that was studied exemplified that those who had witnessed a parent abusing an animal were more likely to engage in recurrent animal cruelty than those who had witnessed a friend or neighbor engaging in that behavior. This is especially important for understanding the link between domestic violence patterns and animal cruelty or abuse.

In addition, abusive patterns may be learned early on and then perpetuated later in life. In this regard, social scientists have explored the relationships between domestic violence and animal abuse. Interestingly, research suggests that children who have witnessed or experienced domestic violence early on in their lives may become desensitized to violent behaviors and are more likely to engage in animal cruelty (Vrečko 2019). In past sociological research by Tapia (1971), a correlation was found between children who had engaged in animal cruelty and other aggressive and antisocial behaviors such as destructiveness, bullying, fighting, stealing, and fire-setting. This correlation between animal cruelty and other violent behaviors may be a form of learned aggression that has resulted from observational learning of those who are

closest to the children (Browne 2017).[2] This can be applied to a larger communal

context in the sense that members of a community in which civil disorder and minor

crimes are more common, there may be a learned aggression due to the widespread

exposure to these behaviors. The concept known as identification or introjection has

been described by Vrečko (2019) as the act of identifying with an aggressor to the point

that an individual may adopt the same behaviors. Introjection, combined with the

previously mentioned observational learning, is integral in research findings about the

relationship between animal maltreatment and interpersonal violence.

Research continues to document patterns between intimate partner violence

(IPV) and animal cruelty. IPV refers to any abuse or aggression that is experienced in a

romantic partnership. In a study of IPV cases, Collins et al. (2018) details the

subcategories of animal abuse in relation to IPV: animal maltreatment as a tactic of

coercive power and control, animal maltreatment as discipline or punishment, animal

maltreatment performed by children, emotional and psychological impacts of animal

maltreatment exposure, and the use of pets as an obstacle for effective safety planning.

In IPV relationships, perpetrators will often engage in emotional or psychological forms

of coercion to achieve their goals rather than relying solely on physical or sexual means

(Collins et al. 2018). This type of coercion extends to the harm against pets due to the

bond that is often felt between pet and owner and which is readily exploited. Tallichet

(2012) found that women tend to be more opposed to animal abuse and more prone to

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[2] Observational learning refers to the act of observing and modeling the behavior or attitudes of another
individual.

experience empathy, affection, or concern for animals. While an increased sense of empathy in women may explain the exploited relationship between pets and partners in IPV relationships, it is also important to note that one of the key psychological factors for animal cruelty includes callousness and deficits in empathy (Alleyne 2017). Women in IPV relationships witness their partners engaging in animal abuse at a 54% higher rate than women who are not in IPV relationships, however 94% of domestic violence shelters do not allow the admittance of pets into their facilities (Collins et al. 2018). This increases the risk that an individual may stay in an abusive relationship for fear of further harm coming to their pets, which increases the likelihood for prolonged exposure to animal cruelty and may lead to further interpersonal violence.

Other research explores social risk factors related to abusive behavior toward animals, including societal bonds and childhood socialization (Grugan 2018). These factors appear to determine the type of animal cruelty that is perpetrated. Specifically, Grugan (2018) distinguished the differences between discrete, passive, organized, and peripheral animal cruelty. Discrete animal cruelty occurs in a single instance where the aggressive behavior is brief and spontaneous (Grugan 2018). Passive animal cruelty involves the animal having a lack of access to adequate food or water, exposure to urine or feces, abandonment, constant time outdoors, hoarding, confinement, or a lack of veterinary care (Grugan 2018). Grugan (2018) describes organized animal cruelty as being premeditated and can be either short-term or long-term, and without any provocation. Peripheral animal cruelty refers to the animal maltreatment behavior being executed at the same time as another crime (Grugan 2018). Findings indicated

that the majority of the cases in Grugan's (2018) study involved discrete cruelty; however, the animal cruelty was more often labeled as active violence such as abusive harm or killing of the animal rather than simply passive behavior (Grugan 2018).

While some of these abusive behaviors may be correlated with the view of animals as property, it may also stem from the view of animals as family members. For the perpetrator in an IPV relationship, they may be unable to discern the relationship of the animal from the relationship of the human if they are both viewed as family members. The act of anthropomorphizing one's pets, or the attribution of human characteristics or behaviors to non-human beings, can create a link between the human-pet relationship and the adult-infant interaction (Borgi and Cirulli 2016). Although this research is often used to explain the positive and affectionate behaviors between pets and humans, it may also be utilized in the context of IPV relationships. The anthropomorphism of pets may serve as an explanation for the easily exploitable relationship between pets and women in IPV relationships. Borgi and Cirulli (2016) described the similarities between the bond with companion animals and their owners with the relationship between children and their parents. Pallotta (2019) found that one in five pet owners view their pets as their children. This might serve as an additional risk factor for animal abuse in IPV relationships due to the increased commonality of displacement, meaning the transference of urges onto an object or being that has no relation to the stressor for the individual (Vrečko 2019).

In summary, various research has been found that shows the relationship between animal maltreatment patterns and interpersonal violence. Not only can animal

abuse or cruelty serve as a cause and predictor of future violence, it can also be considered a product of violence. The research suggests that individuals who engage in violent criminal behaviors are more likely to have had experiences with abusive behavior toward animals, whether that be the act of engaging in that behavior or witnessing it. The information and results from research such as these implies that animal abuse is an individually-based phenomenon. We do not yet know if animal maltreatment can also be applied to community-based indicators and whether it can be applied to understand broader community trends of crime and social disorder. There is little research addressing any possible patterns of animal maltreatment in terms of the community, and we do not know if there is a relationship between types of animal maltreatment and other community demographics or whether there is a geographic concentration of these types of animal maltreatment. Few works have empirically assessed community indicators of animal maltreatment, and many studies have focused on the possibility that animal maltreatment is solely based on the individual perpetrator.

Yet there is reason to believe that animal maltreatment is not only individually-rooted but is actually a community-based phenomenon. The literature on communities and crime can provide some insight in this regard. Social scientists have long documented how various neighborhood characteristics can correlate with crime and violence. Theories of crime and place, such as Kelling and Wilson's (1982) "broken windows" theory, assert that physical signs of crime, anti-social behavior, and civil disorder including graffiti, trash, and decayed buildings create an environment that

encourages further crime and disorder. These theories stress the importance of responding to minor crimes and disorderly behavior like vandalism, public drinking, and public dumping. While these behaviors might appear harmless, the disregard for their consequences fosters an atmosphere of unlawfulness, thereby inviting more serious crime. This also suggests that the monitoring of social disorder and minor criminal behaviors can be an important indicator of the overall health and efficacy of communities.

Animal maltreatment patterns may be related to these community indicators of overall health through the connection with issues of income inequality and poverty, geographical segregation and concentrated areas of disadvantage, or even unemployment rates. Each of these issues can be factors of overall community health, and may predict where violence is likely to occur, or be maintained. The patterns of animal maltreatment may correlate with these indicators to predict crime and violence, and overall community well-being. We have yet to see how animal maltreatment patterns relate to these measures of community health, social disorder and disorganization, and community resource and social service needs.

The research on community and crime provides some insight here. Drawing from studies on community correlates of violence and crime can shed light on the relationship between animal maltreatment and geographical distributions of behavior. Community research suggests a correlation within the type of animal maltreatment, the motive behind animal maltreatment, the likelihood of recurrent abusive behavior toward animals, and the type of perceived animal cruelty witnessed based on whether

the perpetrator lived in a more rural or urban setting. Tallichet (2005) found that out of

their study population of 2,093 male inmates at two medium-security prisons and one

maximum-security prison, those that had previously lived in rural environments were

more likely to witness animal abuse perpetrated by family members. In the same study,

it was found that those living in urban environments were more likely to witness animal

abuse committed by family as well as friends (Tallichet 2005). However, the research

also insinuates that the witnessing of a family engaging in animal abuse is more

consequential than if witnessing a friend engaging in the same behavior (Tallichet 2005).

Research like this posits that certain geographical regions may view animals in differing

ways, which influences the ways that the animals are treated.

Tallichet (2005) found an existing relationship also between the geographical

distribution of the type of animal that is abused. Individuals who had lived in rural

environments mainly targeted cats while those in urban environments targeted dogs,

cats, and wild animals (Tallichet 2005). However, in a continuation of this study,

Tallichet (2012) found that individuals that had lived in an urban environment tended to

abuse pets only, which would eliminate the likelihood to target wild animals in the same

geographical area. Tallichet (2012) expanded on previous research and found that

individuals from rural environments are more likely to abuse cats, and therefore may

see them as more exploitable and expendable. Research like this suggests that those

who have grown up in rural environments may view animals as economic resources to

support their own livelihood (Tallichet 2012).

While this research identifies urban-rural differences, more detailed community indicators have yet to be investigated. The research studies provide reason to believe that there are community-related patterns in animal maltreatment, but thus far have not examined patterns at the block group or neighborhood level. In addition, much of the existing work is restricted to official crime data (Burchfield 2017) or inmate populations (Tallichet 2005;2012). This limitation may be particularly important, in that animal maltreatment may be less likely to be reported or brought to the attention of local law enforcement. Exploring animal calls more generally identified in the public, such as social service-related data, can provide a closer estimate as to the "dark figure of animal maltreatment".

The Current Study

The current study aims to contribute to the literature by analyzing and mapping publicly available 311 calls for animal service in Little Rock, AR supplemented with crime data and demographics to identify geographical and social patterns of animal maltreatment. To find these patterns, the study will be guided by the following research questions: Are there spatial patterns in the distribution of animal maltreatment? Are there geographical concentration areas? Is there prevalence of types of animal treatment differentially situated across neighborhoods? Can reports of maltreatment be linked to other indicators of community well-being?

If other social indicators of health are related to the care and treatment of a community's animals as well, it is possible that the majority of animal abuse conditions

are centered around certain communities and neighborhoods in Little Rock. I expect

that certain types of animal maltreatment may be found in more abundance depending

on the neighborhood. One factor that may contribute to this possibility is if varying

communal and neighborhood groups have different social views about animals. Certain

social views of animals, such as animals being seen as property or as family members,

may produce these geographical distributions of animal maltreatment practices. To test

these ideas, I will analyze the demographics of Little Rock as provided by the census as it

relates to the information about publicly available 311 calls for animal services.

Data and Methods

Primary Data: 311 Calls for Services

This study relies on information provided in calls for services using the 311-

phone system in Little Rock, AR between 2016-2019. The data is available through the

Little Rock Data Portal and provided for my use by Dr. Grant Drawve. The city non-

emergency phone number, 311, is a general service number for all non-urgent

community services. The dataset includes city agency data for all calls and referrals.

Community members can utilize this phone system to report physical signs of disorder,

or to make complaints such as trash build-up or about animal service recommendations.

Little Rock, AR is a useful location to examine neighborhood variation. Their data

regarding social service calls is publicly available. Little Rock also has variation both in

call volume and crime. The city has ranked consistently among the highest with regard

to crime rates, yet crime is primarily concentrated into a limited number of

neighborhoods. This community is also highly racially segregated, having experienced the well-documented "white flight" of the 1950s and 1960s in which the more affluent white population fled urban areas for the suburbs after the integration of the black population. This resulted in highly concentrated areas of disadvantage, as minority populations became congested in geographical areas that have disproportionately higher poverty rates. In 2019, almost 25% of the population in Pulaski County, AR, the county that houses Little Rock, had a household income of over $100,000 (in 2019 inflation adjusted dollars), based on American Community Survey data (using Social Explorer).

Supplemental Data

Data was collected via Social Explorer (socialexplorer.com), a popular tool used to access The American Community Survey data (5-Year Estimates) for 2014-2019. I selected all block groups for Pulaski County, Arkansas. I selected community-based estimates to add to my table including racial and age distribution, unemployment rate, and household income as adjusted for 2019 inflation dollars. The current analyses focus on Percent Black. While a more comprehensive comparison would be helpful, focusing on Percent Black is nonetheless a useful effort to better understand the broader context of the Little Rock community levels of social disorder (it is also highly correlated with the other poverty-related measures).

Poverty and income inequality are major factors to predicting social disorder and lessened overall community health. As previously mentioned, Little Rock is an exemplary city to study due to its historically documented racial divide. Historically,

roads, highways, and even railroads have been utilized as physical barriers between

races and between wealthy and poor populations. Little Rock is no exception to this.

Highway 630 runs East to West throughout Little Rock and separates the south from the

northern area of Little Rock, but more importantly separates the poorer, black

population in the south from the richer, white population in the north. I would expect

that this interstate divide is to be related to race, poverty, and crime, and therefore may

also show trends in animal maltreatment.

To supplement the data from the Little Rock Data portal where we pulled the

information for Little Rock's 311 calls for animal service, we also pulled demographic

data from the American Community Survey (ACS) and from the National Incident Based

Reporting System (NIBRS). The ACS is the leading source of information about changes

taking place in communities regarding population and housing. From the ACS, we pulled

data about the average percent of individuals per district in Little Rock that are black,

PercentBlk, and the average percent of individuals per district who had a High School

education, PercentHS. NIBRS is an incident-based reporting system for crimes that are

known to law enforcement and is run by the FBI. From NIBRS, we were able to pull data

on the violent crime rate per district in Little Rock as well as the number of homicides

and aggravated assaults, which is referred to as "ViolRate" and "CountHomAg"

respectively.

My committee member also provided information on animal-related businesses

available through InfoGroup. This is a data warehouse used to geolocate businesses,

consistent with those identified via Google Maps. From this source, I obtained the

number of veterinary practices and pet stores per neighborhood to understand the

relationship between animal service calls and access to resources for pets in any given

neighborhood.

Data collection and merging relied on geographic entity codes, otherwise known

as and referred to as GEOIDs. With the assistance of committee members, three

supplemental variables were constructed: LQCi, LQCi categories (low/medium/high),

and "pet care deserts". The LQCi corrects the call ratios of animal service calls to all total

311 calls for service in Little Rock. This measure allows us to control the data to make

sure that we do not see more calls in certain communities simply because there is a

higher population density. Population density is the number of people per unit of area

and is a common measure used in crime literature. To calculate the LQCi measure, we

first take the total number of animal calls and divide it by the total number of 311 calls

for service. These values represent the relative ratio of numbers of animal calls per

community relative to the total number of calls. The numerator is a neighborhood's

ratio of animal calls to total calls for service, the denominator represents a ratio of total

animal calls relative to total service calls for all of Little Rock. Therefore, low

communities correlate with lower numbers of animal services calls relative to all calls,

and higher communities correlate with relatively higher numbers of calls for animal

services relative to calls generally. If the LQCi is found to be less than or equal to 1, then

that would mean that there are no more animal calls than we would expect in that

district in relation to the number of total calls. If the LQCi is found to be higher than 1,

then that means that there are more animal service calls than we would expect in that community given the relative proportion of all calls.

Using this calculated measure for LQCi, we created a new measure to make distinctions across community groups. After examining the distributions of LQCi values, a three-category variable was created to classify values as low, medium, or high animal call volumes, based on 1st, 2nd, and 3rd level LQCi percentiles. Percentiles were divided on the following values: low communities have an LQCi of less than or equal to .62, medium communities have an LQCi between .62-1.11, and high communities have an LQCi of over 1.11.

Our variable is an indicator of pet care availability in neighborhoods and is particularly relevant for the current analysis. The variable, which we refer to as "pet care deserts" is a dichotomous indicator. The number of veterinary clinics/practices or pet stores per neighborhood was drawn from Infogroup data compiled by Dr. Grant Drawve. "Pet care deserts" (PCD=1) are communities with no available pet care stores or veterinary services. Communities with at least one of these resources (PCD=0) serves as the reference category.

Working with my advisor, we merged data from the Little Rock 311 calls for service, ACS, and NIBRS, into a single dataset. This data was merged using SPSS, the Statistical Package for the Social Sciences; a software program that allows researchers to quantitatively analyze data and make empirical comparisons. The current findings will focus on four different tables with the outcomes of these statistical analyses, but additional analyses are available upon request.

Table 1 represents the descriptive statistics. Table 2 shows the total numbers of each animal-related 311 call for service as well as the percentage of each type of call in relation to the total number of calls. Table 3 is a description of the means of each type of call when separated by our measure of low, medium, or high LQCi communities. Table 4 shows the means of each type of animal-related call for service as distributed among our "pet care deserts" measure. The data within these tables was taken from our statistical analyses that we ran through SPSS, and then was condensed and divided into tables in Microsoft Excel for the ease of analyzing and viewing the data. The analysis of these tables is considered Phase 1 of my research to provide empirical evidence for my research questions.

To further explore the geographic distribution of animal-related service calls, we introduced Phase 2 of the study which is exploratory in nature and we created a 3D map to view the spatial patterns of the animal service calls. With the previously held 311-call data in my Microsoft Excel sheet, I supplemented the data with information gathered from the 2019 Census. This information is utilized to understand the population number within the neighborhoods and block groups of Little Rock. A Census Block Group is a geographical unit that is used by the U.S. Census Bureau and consists of clusters of blocks to help control the data and number of the population in each dataset. The census data includes information about the age, race, income, and location of each of the responding community members.

To gather this information, I first navigated to census.gov before using the search bar on that government website to locate the section titled "census mapping files". I

then clicked on the option to view the "TIGER/Line Shapefiles". On that page, I clicked

on "web interface" to begin the process of selecting my timeframe and location for the

census data of my choosing. I chose 2019 for the year and selected the option for block

groups as the layer type for my shapefile before submitting the request. After this

submission, I selected the state of Arkansas from the dropdown menu and completed

the download of the census shapefile. The Arkansas 2019 Census shapefile downloaded

as a zip file, which is a file that has been compressed to take up less storage space. After

the download had completed, I extracted/unzipped the file, and added each of the

seven individual files from the zip into a new folder that I titled "Arkansas". The census

data will be essential in creating the map of animal maltreatment behavior as it relates

to spatial and geographic areas.

After I had downloaded and organized the census shapefile, I navigated back to

my Microsoft Excel sheet that was comprised of the data about the Little Rock 311

phone calls for animal service. To test my previous ideas and research questions, I made

a 3D map through my Microsoft Excel sheet out of the Little Rock data supplemented

with the information provided from the 2019 Arkansas Census. To do this, I first

highlighted all of the data within my Microsoft Excel sheet, clicked on the insert tab, and

then selected the option for 3D map. It is important to note that only the version known

as Excel 2016 allows this 3D mapping option and is not currently available to Apple

MacBook users even with this version of excel. 3D maps allow for three-dimensional

viewing of data to better understand the geographic distribution of the data.

Once the 3D mapping tool through Microsoft Excel had opened, I selected the option to view a flat map, simply for ease of viewing rather than as an analytical preference. The next step to create the 3D map of my data was to give the map custom regions and specify those regions. To do this, I clicked on custom regions, then selected the option to import a new set of data to provide the regions. I selected the previously mentioned unzipped/extracted folder titled "Arkansas" that I had downloaded from the 2019 Arkansas Census. Once this folder was selected as the dataset to import, I specified that I was coding for block groups by utilizing the GEOID under the option for choosing a region name. At this point, the census shapefile was ready to import into my map, and I clicked import to create the 3D map.

The first step to connect my excel table to the Arkansas census shapefile was to navigate to the location section where I chose a field location. The chosen location field is the GEOID, and next to this option, I selected the drop-down menu and chose the custom region specification. After these steps were followed, I was then able to add differing categories to the section labeled "height" on the map to split and compare the various types of animal service calls including those for aggressive animals, animal abuse, barking dogs, and stray animals. This is also where I selected my variables of the number of veterinary practices and pet stores per neighborhood as well as the number of homicides and aggravated assaults. By adding each of these categories into the height section, it allowed me to map each of these types of calls across Little Rock based on the GEOID from the census shapefile. I also made sure to choose the option on the map to show the map labels such as road and highway names to be able to better navigate the

map and understand the exact locations of the block group calls. If I wanted to change any of the physical properties of the map, I could select the layer options to adjust the color, height, and width of the bars that show the data numbers of the animal calls.

Once I had selected the categories that I desired under the height section, I was able to use the capture screen option to take a picture of my map in different times to showcase the geographical distribution of total animal calls for service in Little Rock as well as the distribution of each type of animal services call. I also was able to download a video of a tour of my map in a circular motion to better view the distribution from all angles. To do this, I chose the create video option, and selected scene options to change the scene tour duration to 30 seconds, to increase the speed of the tour, and to specify the circle effect of the tour. These captured screens and videos will be referenced in this study repeatedly to provide visual supplemental information to the findings of the research.

The National Incident Based Reporting System, or NIBRS, is an incident-based reporting system for crimes that are known to law enforcement and is run by the FBI. NIBRS is utilized as another source of supplemental data to analyze the crime rates for the City of Little Rock as well as the area of North Little Rock. Crime rates refers to the ratio of crimes in an area to the population of that same area and is often expressed as a value per 100,000 inhabitants per year. This means that to find the crime rate for a certain area, one would take the total crime and divide that by the population, and then multiply by 100,000. The crime rates as provided through the NIBRS dataset allows for the understanding of animal service calls in the broader context of overall crime in a

certain area and can allow one to see the possible correlation between animal service calls for maltreatment, and higher crime rates.

To access the Little Rock crime rates from NIBRS, I first navigated to the home page of the website for NIBRS under the government FBI website. Near the bottom of this page is an option to select the NIBRS publications to load a new page where I then was able to choose the year of 2019 to analyze. On the next page that downloaded, I had access to an interactive map that shows the map points as based on the investigating agency type such as university campus police or city police, and the crime category such as crimes against persons, property, or society. From that same website page, I scrolled down until I saw the section titled "Additional Publications" and I clicked on "crime in the United States". Once this new page loaded, I clicked on "go to offense tables" under the section "offenses known to law enforcement". This page has descriptions of the various measures that NIBRS uses under the FBI's Uniform Crime Reporting (UCR) Program which collects the number of violent crimes and property crimes that are known to law enforcement. Violent crime in described as crime that involves force or threat of force, and it includes murder and nonnegligent manslaughter, rape, robbery, and aggravated assault. Property crime is defined as crime that is theft-like in nature by the taking of money or property, but without any threat of force to the victim. Property crimes include burglary, larceny-theft, motor vehicle theft, and arson.

On this website page, I then clicked on the option to load "Table 6" under the data tables section, which is titled "Crime in the United States, by Metropolitan Statistical Area, 2019". This table shows the totals of violent crime and property crime

for the Metropolitan Statistical Areas and their estimated populations to then be able to calculate the crime rate for those areas. This information gathered from NIBRS is to supplement the previously collected data for 311 calls, data from the ACS, and the data from NIBRS used to run my statistical analyses and to create my tables.

All of these methods and data sources are utilized to answer my previously mentioned research questions for this study. To reiterate, my research questions are: Are there spatial patterns in the distribution of animal maltreatment? Are there geographical concentration areas? Is the prevalence of types of animal treatment differentially situated across neighborhoods? Can reports of maltreatment be linked to other indicators of community well-being? I will use the data from my sources, as well as my 3D map to answer these questions by thinking about the data in an analytic way to understand the trends and correlations of animal maltreatment, crime, and overall community health.

Findings Phase 1: Statistical Comparisons

Table 1 shows the overall means and the range of each type of animal-related service call located in the Little Rock communities or block groups. I had a total of 156 block groups for this analysis. Consistent with earlier descriptions of the distribution, there were large standard deviations in animal calls, indicating large variability among the data and extreme values.

It was found that the mean number of total animal calls across the 156 block groups In Little Rock was 96.28 with a standard deviation of 90.50 (see Table 1). This

suggests that there is a high variability among the data of total calls, and that these

values are not normally distributed across neighborhoods. This is supported by the 3D

map that shows the influx of animal-related calls in the certain geographic location in

Little Rock (see Figure 5). To learn more about this abnormal distribution, we can look

further into the means and standard deviations of each type of animal-related service

call. The variable known as BarkingDog had the smallest mean and standard deviation

with the mean equaling 6.21 calls with a standard deviation of 7.37 (see Table 1). This

suggests that the variable for BarkingDog has the least amount of variation from the

mean, although there is still variation present. The variable involving animal calls with

the highest variation is StrayRun with a mean of 60.52 calls with a standard deviation of

64.67 (see Table 1). This means that while the variable for StrayRun has the highest

average of calls per block group in Little Rock, there is still a high level of deviation of

number of calls between neighborhoods and communities. Table 1 also shows the mean

and standard deviation for both the percentage of individuals in each block group that

are black as well as the violent crime rate across neighborhoods. The mean of the

PercentBlk variable is 44.29 with a standard deviation of 31.28 (see Table 1). This means

that on average, each block groups contains 44.29% of their population as black, but

there is a high level of deviation from this mean in various communities. The mean

violent crime rate is 514.39 with a standard deviation of 542.06, which is an extremely

high level of deviation from the mean and suggests that various communities have

disproportionately higher crime rates than other communities (see Table 1).

It is also important to understand the data of the different types of animal-related service calls through percentages such as finding what percentage of the total number of animal service calls are comprised of each type. Table 2 provides a breakdown of animal call type. Between 2016 and 2019, there were 15,019 animal-related calls. The highest percentage of animal-related service calls involved strays or unattended animals roaming in communities. Strays or free running animals comprised 62.86% (n=9,441). Animal Abuse was the second-highest reported incident, accounting for 22.13% of all animal-related service calls (see Table 2). The lowest percentage of calls involved barking dogs, representing only 6.45% of all animal-related service calls (see Table 2). This is an interesting differentiation because stray animals and barking dogs may be seen more as a nuisance measure for the community, whereas calls reporting animal abuse are more indicative of potential animal maltreatment..

Table 3 compares call type and community indicators across relative animal call to total service call ratios groups, defined as low, medium, and high animal call areas. In communities that we labeled as high LQCi communities (significantly higher than normally expected amounts of calls), we see higher means of calls for aggressive animals, animal abuse, and stray animals. In addition, these communities had higher black populations and higher rates of violent crime (see Table 3). For example, we see that the mean number of calls for strays in low-LQCi communities is 14.27 calls, is 57.33 calls for medium-LQCi communities, and is 109.96 calls for high LQCi scores (see Table 3). Table 3 shows a similar trend of increase from low to medium to high communities among the variables for aggressive animals and animal abuse.

However, there is a different relationship between low, medium, and high communities when looking at the number of barking dog calls and number of pet care businesses. In low LQCi communities, the average number of calls for barking dogs is 9.17 calls, is 5.38 calls in medium LQCi communities, and is 4.06 calls in high LQCi communities (see Table 3). This suggests that in the communities that experience a higher level of calls than would be expected, they actually have a lower amount of calls for barking dogs in proportion to the overall number of calls. As the number of calls for other animal-related service calls increase, the number of calls about barking dogs decreases. This further shows the previously mentioned discrepancies between nuisance versus abuse calls and their geographic distribution.

In low LQCi level communities, the mean number of veterinary clinics or pet stores is .38 per neighborhood, is .31 in medium level communities, and is .29 in high level communities (see Table 3). This evidence suggests that in neighborhoods or block groups with less calls for animal services, there are more pet resources. Conversely, in the communities with disproportionately high levels of calls, they have minimal, if any, access to resources for pets. In these neighborhoods with less resources for pets, there are more calls for stray animals, which suggests that more people cannot have the opportunity to take care of their pets, which increases the likelihood for the numbers of stray animals to increase in each neighborhood.

The findings from Table 4 explore the relationship between access to pet resources, which we have termed "pet care deserts" and call type. We found that in the communities that are deemed as "pet care deserts", there is a higher mean number of

calls for animal services (see Table 4). Not only do we see an overall increase in animal-related service calls in "pet care deserts", but more specifically, there are increases in calls for aggressive animals, animal abuse, and stray animals running around in these areas (see Table 4). The mean number of stray reports varies considerably between "pet care deserts" and non-deserts, equaling 64.14 and 49.29 respectively (see Table 4). This means that in "pet care deserts", there are more calls related to stray animals, which supporting the earlier mentioned idea that the challenges and perhaps perspectives on pet care and supervision varies considerably across neighborhoods, and those living in PCD may struggle to monitor and care for animals.

We found racial composition differences in PCD status, in that communities with higher proportions of black residents were more likely to be deemed "pet care deserts" (see Table 4). In non-PCD, the average percent black was approximately 34.6; average percent black among PCD was 47.41 (see Table 4). Similarly, Violent Crime Rate in non-deserts averaged 353.1, compared to 566.34 in PCD neighborhoods (see Table 4).

Table 4 is also useful for understanding any specific patterns between the types of animal-related service calls. While the majority of these calls were more prevalent in "pet care deserts", the average number of barking dog calls was much higher among non-PCD. In the non-desert areas, the mean number of calls for barking dogs was 8.39 while the mean number of calls for barking dogs in "pet care deserts" was found to be 5.5. This shows that there is a priority for some calls over others based on geographic and demographic area. The individuals living in non-deserts seem to value peacekeeping and social monitoring over other animal maltreatment possibilities, while those living in

"pet care deserts" are not nearly as concerned with barking dogs, which is more of a nuisance measure than one that predicts animal maltreatment. Therefore, these findings suggest that nuisance calls for animal-related services are much more common and likely in areas that have access to veterinary clinics, pet stores, or other pet-related resources.

Findings Phase 2: Mapping

Phase two of my study revolves around the analysis of my 3D maps in Microsoft Excel. For each of the variables of types of animal services calls, I created individual maps to show the geographic distribution of each type of call for the individual block groups as according to their GEOID. This research is exploratory in nature and is utilized to get a better understanding of each variable's spatial relationship. For the variable involving calls for stray animals, which had the highest average number of calls, we can see that the distribution of calls for stray animals is highly concentrated in the inner-city and southern areas of Little Rock (see Figure 1). This means that the majority of calls for stray animals occurred in the block groups located in these geographical locations. The calls for stray animals were not the only variables that showed this same spatial relationship and distribution.

The calls for aggressive animals, animal abuse conditions, as well as count hom ag, produced the same geographic distributions as the calls for stray animals (see Figure 2). All four of these variables showed a highly concentrated area of these types of animal service calls in the southern portions of the city of Little Rock (see Figure 2). This divide is clearly seen along the highway 630 that was previously mentioned in the study

as a strong geographical barrier between the affluent, mostly white populations of northern Little Rock, and the poorer, mostly black populations living in southern Little Rock. This division will be shown in clearer context in the video of the tour of the map provided in the presentation of the defense of the study.

However, not all of my research variables were centered in the southern areas of Little Rock. Figure 3 shows the geographic distribution of the 311 phone calls for animal services that were specified as calls for barking dogs. These specific calls were concentrated largely in the northern Little Rock area that houses the affluent and mostly white population of Little Rock (see Figure 3). Unlike the calls for aggressive animals, animal abuse, and stray animals, the calls for barking dogs are on the north side of the Highway 630 divide (see Figure 3). The differences of these distributions may provide insight into the social and cultural differences in how we view our community, animals, and people.

The variable for barking dogs was not the only one that was disproportionately concentrated in the northern area of Little Rock. Figure 4 shows the geographic distribution of the number of veterinary practices and pet stores per neighborhood as according to their block groups from the dataset. This variable shows that many of the block groups had no reports of veterinary practices or pet stores in their neighborhoods, and those that did were almost exclusively in the northern area of Little Rock (see Figure 4).

These geographical distributions of each of the variables of animal service call types shows the ability to differentiate between what types of calls are concentrated in

what areas and reveals these patterns of animal maltreatment. The types of calls that are consistently concentrated in the southern area of Little Rock, the area where there is more crime and house the poorer and mostly black population, include those for aggressive animals, animal abuse, and stray animals. Not only are these calls concentrated here, but these are the variables that had the three highest means, or averages of calls (see Table 1). This means that these calls are the most frequent as well as disproportionately representative of the south side of Little Rock. The calls for animal service involving barking dogs are located almost exclusively in the north side of Little Rock, above the Highway 630 divide between the mostly white and well-off population in the north and the poorer black population in the southern areas of Little Rock. Calls for barking dogs are the least frequent calls and are rarely seen in the same communities and neighborhoods as where the majority of the total calls for animal services are located (see Figure 3). Not only are the majority of calls for animal service located in the south side of Little Rock, but that is also where the majority of crime occurs.

According to NIBRS, the violent crime rate for the southern areas of Little Rock is about 1,516 crimes per 100,000 inhabitants. For this same area, the property crime rate is 6,122 crimes per 100,000 inhabitants. The violent crime rate in northern Little rock is 843 crimes per 100,000 inhabitants. Property crime rates, in this same northern Little Rock area, is 3,721 crimes per 100,000 inhabitants. This shows that the southern areas of Little Rock are reported to have higher crime rates, which we know from past

research and literature, and is often associated with poorer community health and social disorder, but this area also has higher rates of 311 phone calls for animal services.

From this data, it was found that certain types of calls for animal services are centralized in specific geographic and demographic areas of Little Rock. The southern and poorer neighborhoods of the city participate much more in calls for animal services, and specifically for aggressive animals, animal abuse, and stray animals. This area is also associated with much higher crime rates than those in the northern areas and neighborhoods of Little Rock where the primary calls for animal services revolve around barking dogs. These northern neighborhoods also have the luxury of much more accessibility to and availability of veterinary practices and pet stores, which is consistent with findings of fewer calls for animal services.

Limitations

While these findings are important to further acknowledge and learn about community dynamics and patterns in relation to animal service calls, there are a few topics that this research did not explore. For example, it would be informative to examine more variation across community social indicators. Other contrasts, such as between poor black communities versus affluent black communities, as well as poor white communities versus affluent white communities, would no doubt be informative. Although Little Rock is a very heterogeneous city in some ways, high levels of segregation provided little variation in race. This study focused mainly on the comparison of animal-related service calls between poor black communities and

affluent white communities due to the historical segregation of Little Rock's neighborhoods. In addition, technological crime-mapping and analysis is a sophisticated methodology. While I feel confident in the research findings presented here, there are no doubt more detailed or advanced analytical techniques that could provide even more insight. I began this project not knowing how to extract a zip file, and now understand how to create 3D maps in Microsoft Excel from raw datasets supplemented with U.S. Census Bureau data. I can only speculate as to the research questions that might be explored by a more advanced practitioner. The findings and research ideas in the current study provide valuable insight for future macro-level investigations of animal maltreatment as community-based phenomena and to the potential relationships between animal maltreatment and overall community health.

Discussion

Animal maltreatment is a public health concern. I uncover neighborhood level variation, related to other community indicators. Thus, it is clearly more than just an individual problem and has its roots in community ideologies and sentiment about animals. Examining animal-related calls allows for some of these patterns to be empirically uncovered. I found specific block group differences, in that calls from southern portions of the city of Little Rock looked very different from those in block groups in the northern areas of Little Rock. In the northern neighborhoods of Little Rock, animal service calls focused primarily on barking dogs, while calls for aggressive animals, animal abuse, and stray animals were much more concentrated in the southern

neighborhoods of Little Rock. Northern communities not only had different types of

calls, but different service call rates, and were less likely to be "pet care deserts".

This relates back to previous research by Tallichet (2005), noting certain

geographical regions often house individuals who may view animals in differing ways

that may also influence the ways that the animals are treated. Research by Vrečko

(2019) posited that certain geographical differences in animal maltreatment practices

may be better understood through the lenses of a superiority complex. Certain

individuals in specific communities may view stray animals or animals belonging to

others as less deserving than their own pets, and therefore be less likely to report on

abusive behavior toward animals (Vrečko 2019). This research by Vrečko (2019) can be

supported by my own study in the sense that the population living in the northern areas

of Little Rock engaged in very few calls to animal services, and those that did often

reported barking dogs rather than stray animals or animal abuse situations. This can be

understood through the idea of the difference between nuisance calls and abusive

behavior calls. The nuisance calls can consist of barking dogs and show a desire to "keep

the peace" and maintain a certain level of social monitoring. The idea that the wealthy

and white population living in this area may have a superiority complex could be one

way to interpret this geographical difference in the distribution of calls for animal

services across Little Rock.

Not only were there geographical differences between types of animal service

calls, but there was also a very clear distinction between which block groups and

neighborhoods contained adequate pet care resources such as veterinary practices and

clinics or pet stores. The block groups that reported having at least one veterinary clinic

or pet store were primarily concentrated in the northern, more affluent and white

communities of Little Rock (see Figure 4). There were very few block groups in the

southern neighborhoods of Little Rock that reported having access to this kind of pet

care. In these "pet care deserts", there were more calls for aggressive animals, animal

abuse, and stray animals (see Table 4). This increase in stray animals in areas that lack

adequate pet care resources may insinuate that there is an inability to care for pets in

these neighborhoods. In these "pet care deserts", unlike the communities where there

are resources for pets, the nuisance problem of a barking dog is the least commonly

occurring animal-related call for service (see Table 4).

Our research ideas of "pet care deserts" is consistent with findings on food

deserts where in communities there is hindered access to food that is healthy and

nourishing. These food deserts are often located in communities with extreme levels of

inequality, poverty, and crime. The "pet care deserts" that I described before can be

related to the same concept of a food desert. "Pet care deserts" are also likely to be

present in communities with high income disparities, high crime rates, and other

measures of social disorganization. This is empirically supported by my research study,

in that the locations in the southern communities of Little Rock that have little to no

access to pet care facilities or stores can be referred to as "pet care deserts".

Not having these pet care resources does perpetuate negative social views of

animals. Without adequate access to veterinary clinics or pet stores, the idea of pets as

inferior may continue to be maintained in those communities. However, what we do not

know is whether "pet care deserts" and negative social views on animals are a correlational or causal relationship. The "pet care deserts" may have come into fruition due to the negative sentiment about animals, or the negative views of animals could have been perpetuated by the lack of access to adequate pet care. This would be something that my current study could serve as a foundation for if there was future research into this topic.

Race has also shown to be a factor in how we treat animals based on the geographic distribution of the animal service calls in Little Rock. The treatment of animals has been empirically detected to be based on patterns of racial and ethnic inequality, poverty, crime, and other community measures. Previous research has included descriptions of race and ethnicity when describing their study sample, but have not explored those racial patterns and trends, especially not in relation to certain types of animal maltreatment or social views of animals.

This idea can be understood by the previously discussed conflict theory that states that inequalities are reinforced by power asymmetry, privilege, and human dominance. Considering the Little Rock population is divided based on power asymmetry and equality due to the well-documented "white flight", the conflict theory may be one way to further explore the disproportionate calls for animal services in the southern neighborhoods of Little Rock. However, there are some interesting trends that arise in these southern neighborhoods. Although there is a high concentration of 311 calls for service and high crime rates in these areas, there are also less 911 calls. In these specific block groups, there are higher calls for animal-related services in relation to the

total number of calls. To me, this indicates a desire for a community response for disorder, but without the presence of law enforcement intervention. This provides evidence that the individuals living in these neighborhoods still feel a sense of social responsibility and want services to limit social disorder even though there is a general distrust of the police.

Neighborhoods that have disproportionately higher numbers of calls for animal services also have higher black population percentages as well as higher violent crime rates (see Table 3). As shown in Figure 5, the total number of animal-related service calls are concentrated in the southern neighborhoods of Little Rock, further supporting the empirical evidence that there are race and crime patterns that animal calls contribute to. Through this data, I am looking at unofficial patterns and trends rather than legal or law enforcement issues, but this suggests that we need further exploration into animal resources and services in communities to better monitor and understand these patterns.

Evidence like this suggests that 311 calls for service can provide information about trends and patterns of social disorder than may not come to the attention of the law enforcement agencies. Crime is not the only detectable factor for social disorder and can actually be detected by analyzing and monitoring these 311 calls for service. Therefore, social service calls are extremely important to better learn about the needs of a community, and the patterns in that usage can allow us to gain knowledge about the overall health of that community. Although higher rates of calls for animal services are correlated with higher crime rates, and therefore put a community at higher risk for

social disorder, there is still a desire within that community to better their space and to increase social responsibility and efficacy.

Overall, there is a strong disproportionality across animal-related service calls in Little Rock, even when controlling for the LQCi which considers an overall volume of calls, and there are still concentrated areas of inordinate animal service calls in specific neighborhoods relative to other calls. Evidence suggests that there are community-based factors that contribute to the level of animal-related service calls as well as that can be linked to certain types of animal-related service calls.

There are alternatives to 911 that can be utilized for research purposes to better identify issues of public concerns and safety. By further researching 311 calls, specifically those for animal services, research and policy practitioners can use studies like this one as unofficial resources to provide an overview of a community in which crime is an aspect, but not a main focus. Information such as this can guide policies and resources to the communities and neighborhoods that need guidance the most to help prevent further social disorder. It is exceptionally important to monitor and analyze these social services calls that may have not been brought to the attention of law enforcement so that researchers and policy makers can have more insight into the needs of each community. This study provides a fertile ground for more research into the community-based phenomenon that is animal maltreatment and aims to provide further evidence to prevent future social disorder in various communities, not just in Little Rock, Arkansas.

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Tables and Figures

Table 1: Description of Merged Dataset of Animal Service Calls in Little Rock Neighborhoods (block groups, N=156)

Variables	Mean (Std)	MinMax
TotAnimal	96.28 (90.50)	2-490
AggAnimal	8.24 (9.91)	0-51
AnimAbuse	21.31 (18.53)	0-103
BarkingDog	6.21 (7.37)	0-39
StrayRun	60.52 (64.67)	2-331
PercentBlk	44.29 (31.28)	.00-100.00
PercentHS	10.61 (10.04)	.00-41.85
ViolRate	514.39 (542.06)	.00-2,488.99
LQCi	1.01 (.72)	.06-6.45

Table 2: Animal-Related 311 Service Calls in Little Rock from 2016-2019

Variables	N	N (%)
AggAnimal	1,286	8.56%
AnimAbuse	3,324	22.13%
BarkingDog	968	6.45%
StrayRun	9,441	62.86%
Total	15,019	100%

Table 3: Description of Merged Dataset of Animal Service Calls in Little Rock
Neighborhoods in Terms of Low, Medium, or High LQCi Call Communities

Variables	Low	Medium	High
TotAnimal	33.31	93.02	162.5
AggAnimal	1.88	7.56	15.29
AnimAbuse	7.98	22.75	33.19
BarkingDog	9.17	5.38	4.06
StrayRun	14.27	57.33	109.96
PercentBlk	15.46	56.33	61.07
ViolRate	127.28	730.94	684.96
VetPetInfo	0.38	0.31	0.29

Table 4: Little Rock Animal Service Calls Across "Pet Care Desert" Status

Variables (mean)	Non-desert (.00)	Desert (1.00)
TotAnimal	83.82	100.29
AggAnimal	6.97	8.65
AnimAbuse	19.16	22
BarkingDog	8.39	5.5
StrayRun	49.29	64.14
PercentBlk	34.6	47.41
ViolRate	353.1	566.34

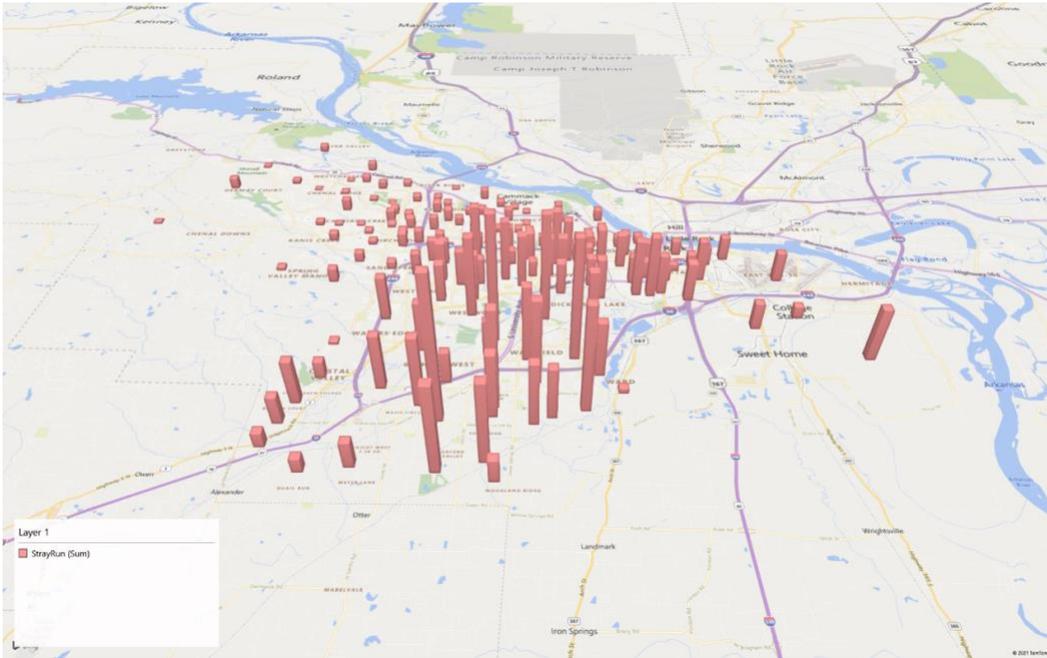Figure 1: Geographic Distribution of calls for stray animals

Figure 2: Geographic Distribution of count hom ag and calls for aggressive animals, animal abuse, and stray animals.
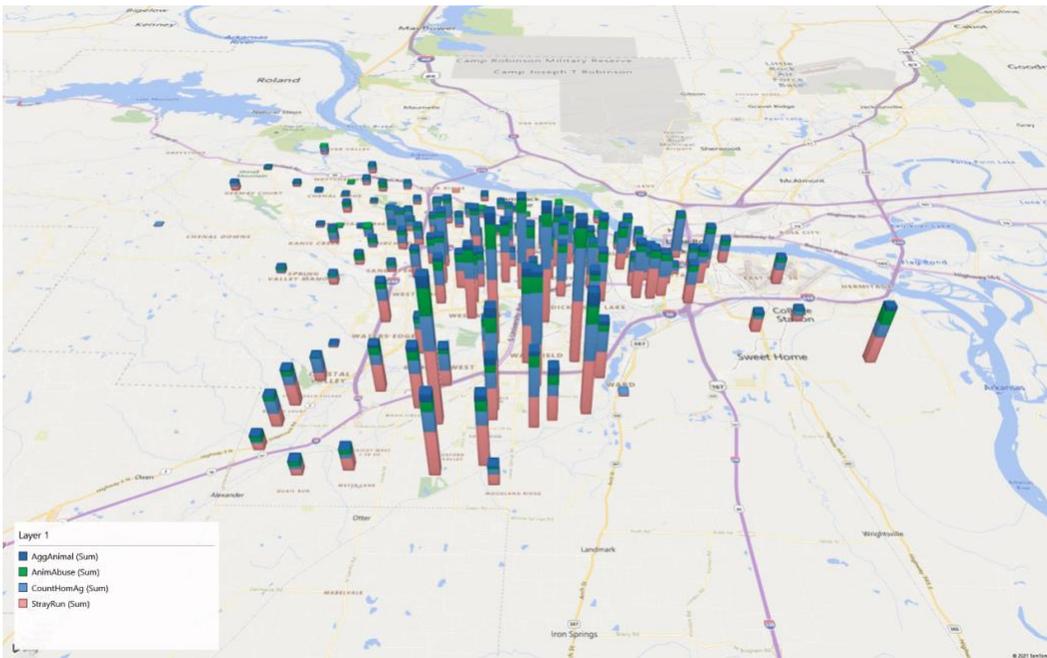
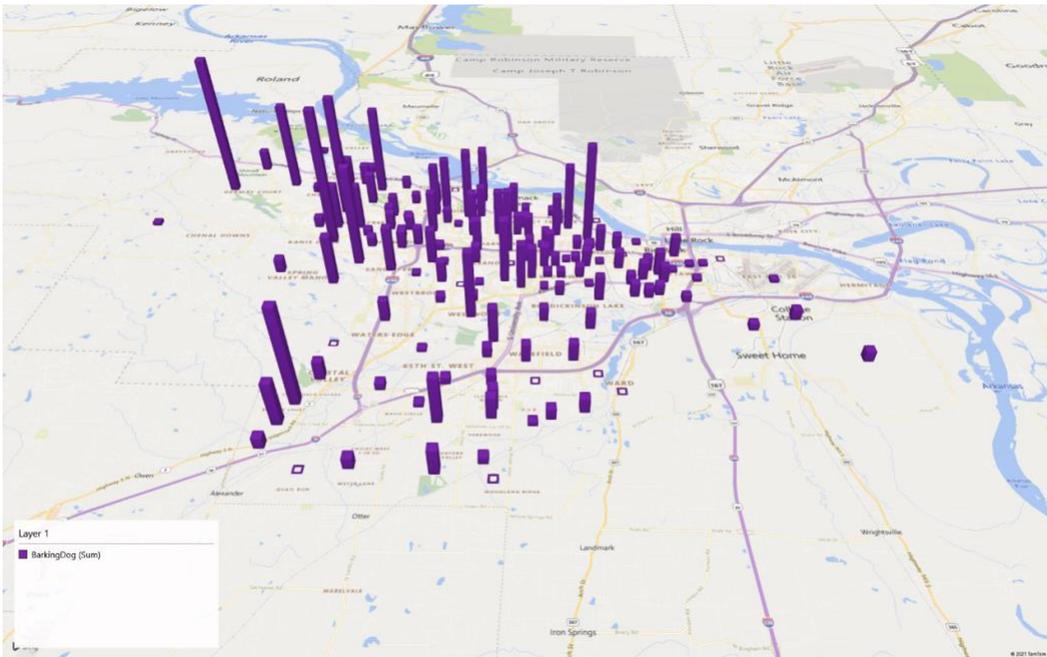Figure 3: Geographic distribution of calls for barking dogs

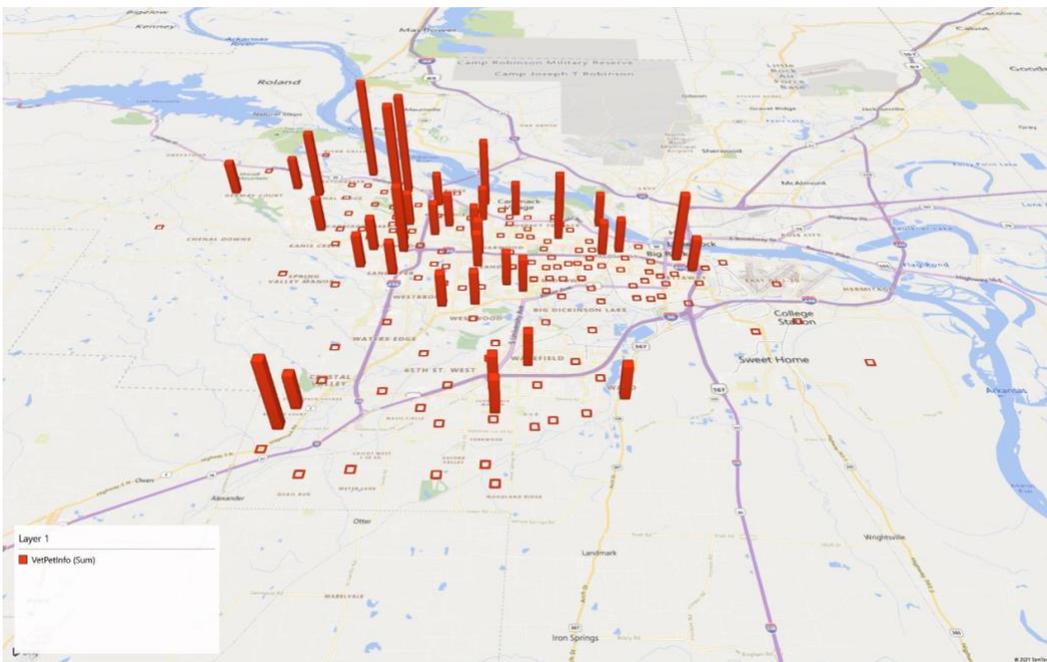Figure 4: Geographic distribution of number of veterinary practices and pet stores per neighborhood

Figure 5: Geographical Distribution of all Animal-Related Service Calls in Little Rock from 2016-2019