Equine Rescue Success in the United States: A Statistical Analysis

Carly J. Cave
University of New Hampshire, Durham

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Equine Rescue Success in the United States:
A Statistical Analysis

Carly Cave

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University of New Hampshire
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ABSTRACT

The high inflation that has characterized the post-pandemic period in the United States has increased the costs of horse ownership for private owners and equine rescue organizations, which are facing critical pressures. Over 200,000 equines are at risk for neglect or slaughter in the United States each year, which far exceeds the capacity to house these equines at rescue organizations. While demand on these organizations is high, their ability to afford appropriate resources for their care is insufficient. This study examined geographical and economic factors that impact equine rescues’ success in taking in at-risk equines and adopting them to forever homes. The income/outcome ratios, average percent of equine deaths, and annual adoption rates were analyzed to evaluate regional rescue success. Although the lack of record-keeping amongst equine rescues proved to be a critical limitation, national and regional inflation trends were shown to greatly decrease the number of equine adoptions from 2020-2022. Critical shortages of equine veterinarians in certain regions proved to be another equine welfare concern with observable impacts on outcomes for at-risk equines. Other factors identified as impacting equine welfare outcomes included regional human and equine populations, average median household income, poverty, estimated veterinarian distribution, estimated employment rate, and regional ranking of animal protection laws. Implementation of record-keeping incentives, educational programs on equine husbandry and business management, and foster programs are likely long-term aids, however, while they should be implemented immediately, their impacts will take time to be felt. Short-term measures are needed to provide equine welfare relief until the impacts of long-term measures can be realized.
INTRODUCTION

The humane movement in the United States began in the 1870s with the creation of the American Society for the Prevention of Cruelty of Animals, which was dedicated to improving the well-being of the urban workhorse. Today, there are thousands of animal shelters whose mission is to prevent animal abuse and neglect and to educate owners on proper care and support mitigations (Horecka & Neal, 2022). Although these organizations now serve a broad range of companion and livestock species, equine rescues face significant challenges, especially with post-COVID inflation. Public awareness of these challenges is vital, both to improve their capacity and efficiency to help animals in need and to ensure their operations continue.

Horecka and Neal’s study consisted of 10 working groups that represent over 3,000 shelter professionals associated with Human Animal Support Services. The study sought to identify the most critical problems for research in animal shelters and welfare institutions. The critical problems identified include animal behavior, adoptions and special needs populations, medical conditions, disease transmission, community, ecology and wellness, operations, and public-private-academic-corporate collaboration (Horecka & Neal, 2022). This study identifies the multitude of problems arising when animals show undesirable or dangerous behaviors. While there is continuing debate about whether the best practice for managing such animals is adopting them out or euthanizing them, more research is required to fully understand how the shelter environment impacts the animals’ level of stress and contributes to these behaviors, as well as how to diminish them. Additionally, it is important to appropriately match adopters with animals for the well-being of both parties. More issues present themselves in the adoption process when animals have medical conditions as this requires extensive resources that many shelters lack and adopters often try to avoid. This is both a financial and educational issue.
Disease transmission is a persistent problem in shelters, especially those with mixed species and unknown or nonexistent vaccination history. This is further exacerbated by high turnover rates and frequent overcrowding. Working towards improving the environment and biosecurity protocols in shelters, and continued work toward keeping animals out of shelters in the first place, are complicated yet necessary strides. The National Animal Health Monitoring System survey (1998) brought awareness that a high rate of horses throughout the U.S. do not receive regular vaccines (Roberts, 2014). This number has declined further in recent years due to veterinary accessibility and pricing. Aside from the decline in vaccinations, most rescue facilities are not appropriately equipped to follow imperative biosecurity protocols. This includes the inability to house sick or new animals away from healthy ones as well as to afford separate equipment for healthy and sick animals. Biosecurity practices are time-consuming and require many educated personnel, both of which many rescues or shelters lack.

Collaboration between animal welfare organizations and their local communities is one of the most crucial factors in continuing the success of individual organizations. Educating communities and seeking their support account for much of these organizations’ operations. However, different attitudes towards animals and varying resource distributions among geographical areas are limiting factors when it comes to collaborative support (Horecka & Neal, 2022). This concept of unequivocal attitudes and resources among different communities and geographical areas play a critical role in this study.

Record-keeping is not uniform across rescue organizations because there is neither a national registration requirement nor a requirement to divulge their capacity or any other metrics. This poses a significant limitation for researchers who wish to evaluate best practices and challenges. Sample sizes are too small and there is variation in what organizations decide to
record. Uniform and transparent record-keeping would facilitate a better understanding of the problems animal welfare organizations are facing, trends and pressures impacting animal welfare, and the strategies to improve the efficiency of rescuing and caring for animals. These problems are particularly acute for equine shelters.

Despite the need for further research, several barriers exist. The first is that these shelters are typically non-profit organizations with heavy overhead due to the costs involved in equine care, property management, and veterinary care - expenses that often are overextended and dependent on donations and volunteer labor. There is also no federal mandate to register or even identify equine humane organizations, let alone to follow best practices. Another challenge is that there is no universal Key Performance Indicator to fairly assess and compare different shelters' success because of the variations in practice and the types of organizations. Therefore, it is important to establish a more diverse set of KPIs (Horecka & Neal, 2022). Horecka and Neal also identify legal restrictions that protect animals from harm and prevent them from being used in research. This barrier between animal welfare organizations and academic institutions is another constraint on research that would work to address all of the previous issues that would otherwise lead to better equine outcomes (Horecka & Neal, 2022).

Currently, 1,060 known organizations in the United States take at-risk equines (those with an increased probability of experiencing neglect, poor welfare, or transitioning between homes each year). However, only 35% of these organizations have provided data to the United States Horse Coalition (Equine Welfare Data Collective, 2024). Therefore, only a small percentage are representing the entire U.S. Equine Welfare Organization Population.

There is an overpopulation of equines in the United States. In Weiss et al.’s study to estimate the availability of potential homes for unwanted horses in the United States, they state
that The Unwanted Horse Coalition has estimated approximately 200,000 unwanted horses are in the United States each year. They define unwanted horses as “horses which their current owner no longer wants because they are old, injured, sick, unmanageable, fail to meet their owner’s expectations (e.g., performance, color or breeding), or their owner can no longer afford them” (Weiss et al., 2017). This number does not include the 83,000 wild horses and burros living on Bureau of Land Management public lands that cannot sustain them (Bureau of Land Management, 2023).

With the estimated capacity of 6,000-10,000 horses housed in U.S. horse rescues at any given time, the inability to keep up with the number of horses in need leads to equine slaughter. Fortunately, with our efforts, the estimated 82,000 to 150,000 sent to slaughter in 2017 is now down to 20,000 annually today (Weiss et al., 2017). This is in part due to the new legislation known as the Save America’s Forgotten Equines Act, preventing the slaughter of horses for consumption in the U.S. as well as the restrictions on drug use and travel distance of horses intended for consumption in other countries (American Horse Council, 2023).

The lack of access to necessary resources for equine care is a shared concern amongst rescues, sanctuaries, and owners of horses. A 2021 survey of over 7,000 horse owners/managers found that the increased cost of horse-keeping is one of the top three issues facing the industry (American Horse Publications, 2023). Feed (hay and concentrates), veterinary services, and animal health products were reported as the top contributing factors toward increased horse-keeping costs. Other indirect costs such as fuel/transportation and insurance also contribute. As for veterinary care, not only are veterinarians who work with equids a minority in the profession (only 5.7% of the total number of private practice positions in the U.S.) but costs for veterinary care have increased faster than human health care (Hansen et al., 2018). The
average American pet owner spends about 47% more on equivalent veterinary care than they did a decade ago, resulting in fewer owners providing veterinary care for their pets and leading to “the greatest current threat to companion animal welfare in the U.S” (Horecka & Neal, 2022).

There are numerous factors to consider when determining the success of organizations devoted to helping equines. There are different types of equine rescue organizations. Organizations can be categorized by funding source and by mission structure; some are local, government-run municipalities, and others are 501 (c)(3) nonprofits. These two types are run differently regarding law enforcement and their source of finances. Equine rescue operations can be divided into sanctuaries (where animals are expected to reside the remaining years of their life), and rescues (which house and rehabilitate animals on a comparatively short-term basis until they can be adopted or fostered).

The focus of this particular study is on non-profit equine rescues. Since rescues can vary in scale and budget, the most effective means of characterizing rescue success is to measure characteristics such as the average length of stay, annual adoption rate, and the income/outcome ratio. The average length of stay is the average amount of time an equine is housed at a rescue or rescue-associated foster home. It is ideal to get equines in and out as quickly as possible as it ensures room for more equines to get help and gets them to their forever homes sooner. However, this is not always possible when equines require rehabilitation, nutritional aid, and veterinary support. There is also the ongoing issue of undesirable behaviors resulting from neglect and poor husbandry techniques, that deter adoption and thus increase the animal’s length of stay and decrease the rescue’s adoption rate. The adoption rate is the proportion of equines adopted out from a rescue each year. The income/outcome ratio looks at the ratio of equines
coming into the organization or onto the property compared to the number of equines leaving. This includes adoption, euthanasia, owners regaining custody, death, and more.

This study is a statistical analysis of equine rescues in the United States, to determine areas requiring more research and record-keeping, to acknowledge notable trends both nationally and regionally from 2020-2022, to bring to light significant regional differences in practice or resources impacting the success of equine rescue, as well as to determine potential solutions to any of the problems discussed in past literature or newly identified.

METHODS

Data collection

Data was collected from 7 databases and websites: Equine Welfare Data Collection (EWDC) reports submitted by the United Horse Coalition provided adoption rates, income/outcome ratios, death in care, and the percentage of veterinary care and feed requests fulfilled nationally and per region from 2020-2022. Human population, average median household income, average poverty, and estimated employment rate were collected via the United States Census Bureau (U.S. Census Bureau, 2023). Other databases provided the estimated horse population per U.S. state (Basu, 2022), the inflation rates per state for 2020-2022 (USAFacts, 2023), and the national inflation rates for the corresponding years (Macrotrends, 2024). The regional ranking of animal protection laws was estimated using the Animal Legal Defense Fund website (Animal Legal Defense Fund, 2024). Lastly, the most recent data on the distribution of equine veterinarians was taken from the American Association of Equine Practitioners 2019 Economic Report (Hansen et al., 2018). Data that was compiled by assessing
Each U.S. state was then converted into regional averages to identify trends and relationships on a regional and national scale.

The sample sizes found in the EWDC reports are as follows: in 2020, data was compiled from 76 organizations in total and 3-15 organizations per region; in 2021, there were 70 organizations in total and 2-14 organizations per region; in 2022, 98 organizations reported in total and 2-16 organizations regionally.

Data Analysis

Microsoft Excel was utilized to organize data as well as to generate figures. Trends were made apparent via bar graphs and regression models. ANOVA tests and related Tukey tests were run on adoption rates, income/outcome ratios, and percent of equines who died in the care of rescues to determine significant differences between regions (Good Calculators, 2024). Each state’s designated region can be found in Table 1 and is illustrated in Map 1.

Map 1. A map of the United State’s regions (Fla-Shop, 2024).
Table 1. Region Designations for the United States and owned territories

<table>
<thead>
<tr>
<th>Region Number</th>
<th>States Designated to Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connecticut, Maine, Massachussets, New Hampshire, Rhode Island, Vermont</td>
</tr>
<tr>
<td>2</td>
<td>New Jersey, New York, Puerto Rico, U.S. Virgin Islands</td>
</tr>
<tr>
<td>3</td>
<td>Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia</td>
</tr>
<tr>
<td>4</td>
<td>Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee</td>
</tr>
<tr>
<td>5</td>
<td>Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin</td>
</tr>
<tr>
<td>6</td>
<td>Arkansas, Louisiana, New Mexico, Oklahoma, Texas</td>
</tr>
<tr>
<td>7</td>
<td>Iowa, Kansas, Missouri, Nebraska</td>
</tr>
<tr>
<td>8</td>
<td>Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming</td>
</tr>
<tr>
<td>9</td>
<td>Arizona, California, Hawaii, Nevada, American Samoa, Guam, Northern Mariana Islands</td>
</tr>
<tr>
<td>10</td>
<td>Alaska, Idaho, Oregon, Washington</td>
</tr>
</tbody>
</table>

RESULTS

National Trends

Overall sample sizes were small. Minimal information, if any, was found for the following United States-owned territories or states: District of Columbia, Puerto Rico, U.S. Virgin Islands, American Samoa, Guam, and Northern Mariana Islands.
9.3% of the nation’s custodial organizations submitted partial datasets to the Equine Welfare Data Collective (EWDC) for the year 2020, and 7.8% of organizations submitted a complete dataset. For 2021, 11.9% of custodial organizations submitted partial datasets to the EWDC, and 7.3% submitted complete datasets. Lastly, 5.3% of the nation’s custodial organizations submitted partial data to the 2022 EWDC, and 9.2% submitted complete datasets (Figure 1). Collectively, only 35% of the nation’s custodial organizations have reported to the EWDC since its commencement in 2018.

The available data does indicate several important trends in equine rescue operations and outcomes. Data shows a strong negative relationship ($R^2 = 0.9546$) between the national inflation rate and the national adoption rate of equines for 2020-2022 (Figure 2). The national adoption rate has also dropped constantly since 2020 and was only 61.9% in 2022 (Figure 3).

![Graph showing data from 2020 to 2022]

**Figure 1.** The percent of U.S. rescue organizations who submitted partial and complete datasets to the United Horse Coalition for the Equine Welfare Data Collective reports from 2020-2022.
Figure 2. The relationship between the national adoption rate of equines from rescues and the national inflation rate in the U.S. from 2020-2022.

\[ y = -0.3138x + 27.702 \]
\[ R^2 = 0.9546 \]

Figure 3. The adoption rate for equines from rescues in the United States nationally and per region from 2020-2022.
Data also indicates a weak negative relationship between the number of equines who died in the care of a rescue and the population of horses in the corresponding regions ($R^2=0.0086$) (Figure 4). There is a weak negative relationship between the number of equines who died in the care of a rescue and the adoption rate of the corresponding regions ($R^2=0.1994$) (Figure 5). There is also a negative relationship ($R^2=0.268$) between the percentage of horses who died in the care of rescues and the estimated percentage of the population employed in each U.S. region in 2022 after the removal of region 6 as a suspected outlier (Figure 6).
**Figure 5.** The relationship between the average percent of horses who died in the care of rescues and the adoption rate for equines from rescues in 2022 in each U.S. region.

![Graph showing the relationship between average percent of horses who died in care and adoption rate.](image)

\[ y = -2.6686x + 75.693 \]

\[ R^2 = 0.1994 \]

**Figure 6.** The relationship between the percentage of horses who died in the care of rescues and the estimated percentage of the population employed in each U.S. region in 2022. Region 6 was removed as it is suspected to be an outlier.

![Graph showing the relationship between average percent of horses who died in care and population employed.](image)

\[ y = -0.9702x + 40.348 \]

\[ R^2 = 0.268 \]
There is a weak negative relationship between the adoption rate and the inflation rate of corresponding regions ($R^2=0.1149$) (Figure 7). There is a weak negative relationship between the adoption rate and the average median household income for each region ($R^2=0.1363$) (Figure 8). There is a very weak positive relationship between the adoption rate and poverty of each region ($R^2=0.0402$) (Figure 9). There is a weak positive relationship between the adoption rate and the horse population of the regions ($R^2=0.149$) (Figure 10).

**Figure 7.** The relationship between the average adoption rate of equines and the average inflation rate per U.S. region in 2022.
Figure 8. The relationship between the adoption rate of equines from rescues and the average median household income of each U.S. region in 2022.

\[ y = -186.63x + 79984 \]
\[ R^2 = 0.1363 \]

Figure 9. The relationship between the adoption rate of equines from rescues and the percent of the population in poverty of each U.S. region in 2022.

\[ y = 0.0477x + 10.272 \]
\[ R^2 = 0.0402 \]
There is a weak positive relationship between the number of equines who died in the care of a rescue and the number of veterinarians in the corresponding regions ($R^2=0.2554$) (Figure 11). There is a clear negative relationship between the income/outcome ratio in 2022 with the number of veterinarians in the corresponding regions ($R^2=0.488$) (Figure 12). There is a relatively strong positive relationship ($R^2=0.4322$) between the estimated number of veterinarians and the horse population of corresponding regions after the removal of region 10 as a suspected outlier (Figure 13). There is also a relatively strong positive relationship ($R^2=0.7296$) between the estimated number of veterinarians and the estimated human population of corresponding regions with region 10 removed for being a suspected outlier (Figure 14).
**Figure 11.** The relationship between the estimated percentage of veterinarians and the average percent of horses who died in the care of rescues in each U.S. region in 2022.

\[
y = 0.2317x - 1.2082 \\
R^2 = 0.2554
\]

**Figure 12.** The relationship between the estimated percent of veterinarians and the ratio of equines taken into rescues compared to equines who left rescues for each U.S. region in 2022.

\[
y = -0.7x + 45.795 \\
R^2 = 0.488
\]
Figure 13. The relationship between the estimated percent of veterinarians and the estimated number of horses in each U.S. region in 2022 except Region 10 which was removed for being an outlier.

\[ y = 188418x - 950205 \]
\[ R^2 = 0.4322 \]

Figure 14. The relationship between the estimated percent of veterinarians and the estimated human population in each U.S. region in 2022 except Region 10 which was removed for being an outlier.

\[ y = 9E+06x - 5E+07 \]
\[ R^2 = 0.7296 \]
Regional Trends

There is no clear observable trend in the income/outcome ratios of rescues across regions from 2020-2022. Notably, Region 10 had the most consistency in ratios across the three years while Region 1 showed the greatest inconsistency over the three years (Figure 15).

Figure 15. The ratio of equines taken into rescues compared to equines who left rescues nationally and for all 10 regions in 2020-2022.

ANOVA tests at the alpha level of 0.05 were run on regional differences in the income/outcome ratios, average adoption rates, and average percentage of equines who died in care. The averages of income/outcome ratios from 2020-2022 between regions were not significantly different (F-stat=0.7241, P-value=0.6822). The averages of the adoption rates from 2020-2022 between regions were not significantly different (F-stat=0.7033, P-value=0.6991). A post hoc Tukey test determined that the average percent of equines who died in a rescue from
2020-2022 were statistically significant (ANOVA: F-stat=3.125, p=0.0162) between Region 10 and Regions 1, 5, 6, and 9 (Tukey's HSD: p=0.0084, p=0.0206, p=0.0284, and p=0.0333).

**Region 1**

Region 1 has the highest ranking for animal protection legislation with 4 states ranked top tier and 2 states ranked middle tier. Region 1 showed the lowest average number of equines who died in the care of a rescue from 2020-2022 at 0% (Figure 16). Region 1 also had the highest income/outcome ratio in 2021 and the highest adoption rate in 2022 (1.18 and 80.3% respectively) (Figures 15 and 17). Region 1 had the highest average median household income in 2021 of $76,899 (Figure 18), and both the highest estimated employment (42%) and the lowest poverty (9.9%) in 2022 (Figure 19). Region 1 has the smallest horse population of about 133,100 (Figure 20). Lastly, Region 1 had the lowest inflation rate (14.3%) in 2022 (Figure 21).

**Region 2**

Region 2 showed the greatest poverty (21.9%) of all regions in 2022 (Figure 19). Region 2 has the second smallest horse population of about 221,400 (Figure 20). Region 2 had the highest income/outcome ratio in 2022 at 1.07 (Figure 22).

**Region 3**

Region 3 had the lowest adoption rate (37.2%) in 2022 (Figure 17). Region 3 had the second-highest average median household income of $76,131 in 2021 (Figure 18).
Region 4

Region 4 has the third-highest estimated horse population of 1,404,300 and the highest estimated human population of 68,717,308 (Figures 20 and 23). Region 4 had the second-lowest average median household income ($57,948) in 2021 (Figure 18). Region 4 has the second highest income/outcome ratio (1.06) in 2022 (Figure 22). Region 4 has the second-highest estimated number of veterinarians at 12% (Figure 24). Lastly, Region 4 had the second-highest adoption rate (79.5%) in 2022 (Figure 17).

Region 5

Region 5 had the highest adoption rate (90.9%) in 2020 (Figure 3). This was the highest adoption rate overall from 2020-2022.

Region 6

Region 6 has the second-highest horse population of 1,424,000 (Figure 20). Region 6 had the lowest average median household income in 2021 at $56,798 (Figure 18). Region 6 had the second-highest poverty (16.5%) in 2022 (Figure 19) and the third-highest adoption rate (77.4%) in 2022 (Figure 17). Region 6 had the second-highest inflation rate (18.6%) in 2022 (Figure 21). Lastly, region 6 had 0% of equines die in the care of rescue in 2022 (Figure 25). Region 6 had the highest incidence of natural disasters since 1953 (670 disasters), including fires, drought, flooding, and severe winter storms (Hubbard, 2021).
Region 7

Region 7 has the least amount (6.6%) of estimated veterinarians (Figure 24). Region 7 had the second-greatest average of equines (1.96%) who died in the care of a rescue from 2020-2022 (Figure 16), as well as the highest rate of equines who died in the care of a rescue in 2022 (3.39%) (Figure 25). Region 7 has the second smallest human population of 14,283,547 (Figure 23). Lastly, Region 7 had the second smallest income/outcome ratio (0.75) in 2022 (Figure 22).

Region 8

Region 8 has the lowest ranking for animal protection with 1 state ranked top tier and 5 states ranked bottom tier. Region 8 had the second-lowest adoption rate (43.4%) in 2022 (Figure 17), and the lowest average adoption rate (62.9%) from 2020-2022 (Figure 14). Additionally, region 8 has the highest inflation rate of 19.1%, and the second lowest estimated number of veterinarians (7.4%) (Figures 21 and 24). Lastly, region 8 has the smallest estimated human population of 12,614,059 (Figure 23).

Region 9

Region 9 has the highest estimated horse population of 1,448,400 (Figure 20). Region 9 had the third-greatest average median household income ($75,925) in 2021 (Figure 18). Region 9 had the third greatest estimated human population 51,006,507 (Figure 23). Region 9 had 0% of equines die in the care of a rescue in 2022 (Figure 25). Lastly, region 9 has the third-highest estimated number of veterinarians (11.2%) (Figure 24). This region had 530 natural disasters, making it the region with the second most natural disasters documented since 1953.
Region 10

Region 10 has the greatest average number of equines who died in the care of a rescue from 2020-2022 (3.9%) and the highest number of equines who died in the care of a rescue from 2020 and 2021 (6.6% and 2.4% respectively) (Figure 16). Their income/outcome ratio in 2022 was also the lowest of all the regions with a ratio of about 0.50 (Figure 22). Region 10 is tied with Region 8 for the second-lowest poverty rate (11%) in 2022 (Figure 19). Region 10 has the third lowest horse population (Figure 20), as well as the greatest estimated number of veterinarians (14.8%) (Figure 24).

Figure 16. The percent of equines who died in the care of U.S. rescues nationally and per region from 2020-2022.
Figure 17. The adoption rate for equines from rescues in the U.S. per region in 2022.

Figure 18. The average median household income for each U.S. region in 2021.
Figure 19. The average percent of the population in poverty for each U.S. region in 2022.

Figure 20. The estimated population of horses in each U.S. region in 2022.
**Figure 21.** The average percent inflation per U.S. region in 2022.

**Figure 22.** The ratio of equines taken into rescues compared to equines who left rescues per U.S. region in 2022.
Figure 23. The estimated human population for each U.S. region in 2022.

Figure 24. The estimated percentage of veterinarians in each U.S. region in 2022.
DISCUSSION

The datasets submitted to the Equine Welfare Data Collective for the years 2020-2022 were from a few states from each region. Thus, the data regarding custodial rescue organizations only represent a small section of the nation’s rescue organizations (less than 20% for any given year) and therefore, cannot be used to explain or fully resolve current problems in the rescue sector of the equine industry. This data can, however, suggest potential trends and areas of concern, as well as topics that require further research. Most importantly, this data proves the importance of record-keeping and sharing on behalf of equine rescue organizations to better equine welfare in the United States.

The financial data found in this study is consistent with past literature in which the increased costs of living and increased costs of equine ownership have become the leading
deterrent of potential adopters and the cause for owners to rehome their horses. The American Horse Publications 2021 Equine Industry Survey concluded that the rising cost of feed, veterinary services, and animal health products contribute greatly to increased horse-keeping costs (American Horse Publications, 2023). Increased personal and household costs have a deleterious impact on adopting or owning horses as well. The regression between the national inflation rate and the national adoption rates from 2020-2022 strongly supports this relationship, as do the regional inflation rates and adoption rates. The regression between the proportion of poverty per region and the regional adoption rates, however, does not support the financial reasoning above. The same goes for the relationship between household income and regional adoption rates, and the relationship between regional employment and regional adoption rates. These counterintuitive results may be due to the limitations in available data and sample sizes and could be reexamined if more complete data were available.

From the Equine Welfare Data Collectives, it was apparent that the fulfillment of feed requests from owners by rescues dropped 50% in 2022 as compared to 2021. This may be in part because 501(c)(3) rescues rely on community donations as opposed to consistent government funding, and thus are subject to the same financial burden as private horse owners.

Data shows there are a greater number of veterinarians in areas where the human population is greater and a less significant trend shows that there are also more veterinarians in areas with greater horse populations, except region 10 which showed to be an outlier with a small human and horse population but a large number of veterinarians. This is likely because Region 10 has the largest average number of equine deaths in the care of rescues from 2020-2022. This could be indicative of the noticeable positive relationship between the estimated veterinarians and the average equine deaths in the care of rescues per region; however, there are
likely other contributing factors such as the affordability of veterinary school in Region 10 or other financial reasons.

Region 1 not only had the highest ranking for animal protection legislation in the United States, but also had the lowest average number of equine deaths in rescues, the highest adoption ratio in 2022, the highest average median household income in 2021, both the highest estimated employment and the lowest poverty in 2022, the lowest inflation rate in 2022, and the smallest horse population of all the regions. The rescue success of Region 1 suggests that the availability of financial resources has a large impact on equine welfare. It is also likely that having a smaller horse population makes it easier to care for them both regarding capacity and supplying other necessary resources.

When Region 1 is compared to Region 7 and Region 10, the importance of financial status for equine rescue becomes more apparent. Region 10 had the highest average number of equine deaths in the care of a rescue and Region 7 had the second-highest average. Both Region 7 and 10 had low 2022 adoption rates and larger horse populations than Region 1. Most notable is how both Region 7 and 10 have higher proportions of poverty and greater inflation in 2022 than Region 1.

The comparison between Region 1 and Region 8 is also notable. Region 8 received the lowest ranking in animal protection legislation and had low adoption rates from 2020-2022. This region also experienced the greatest inflation rate and has few veterinarians compared to other regions. Between the poor animal welfare legislation, the increased financial burden of owners, and the small human population with a moderately sized horse population, the capacity for adoptions is difficult for this region.
The inaccessibility and lack of affordability of veterinary care have a significant impact on equine welfare in a given region. Lack of veterinary care increases wait times and costs of services, thus increasing the likelihood of animal surrender by financially burdened owners. Once equines are surrendered or confiscated by law enforcement and placed into rescues, it then becomes the rescue’s responsibility to afford veterinary care and compete for access. With fewer people seeking veterinarian care for their pets, the resulting issue, as referred to by Horecka and Neal, is the greatest current threat to companion animal welfare in the United States (Horecka & Neal, 2022).

Data suggests that equine rescue capacity nationwide is inadequate. While roughly 200,000 horses are considered unwanted annually in the U.S. there are only just over 1,000 identified rescue organizations with the majority reporting a maximum capacity of 11-50 equines. Thus, the current rescue capacity of equines in the U.S. is about a quarter of the total population in need. The inability to rehome equines leads to the 82,000-150,000 horses annually shipped to Mexico or Canada for slaughter estimated in Weiss et. al’s 2017 study (Weiss et al., 2017). The passage of the Save America’s Forgotten Equines Act (SAFE Act) prohibiting the slaughter of equines for human consumption reduced the slaughter of equines since its establishment in May of 2023. However, slaughter has not been eradicated, and the numbers remain high. Aside from slaughter, horses that end up in rescues or sanctuaries exceeding their capacity, often end up neglected due to the limited help and resources that rescues have to begin with. Rescues in this position are often forced to shut down and their animals are confiscated due to unintentional neglect and financial debt.

Despite the known issue of overpopulation, horses are still being bred at high rates in certain disciplines or breeds. In 2022, The Jockey Club shows about 17,300 thoroughbred foals
were registered during that year alone (The Jockey Club, 2024). Not to mention the 10,000 standardbreds and thousands of other breeds purposefully bred for sport or monetary gain each year, who end up unwanted after they peak in their athletic career at a young age.

Other potential contributing factors not addressed in this study include geographical implications such as climate, landscape, natural resources, and the incidence of natural disasters. The quality and quantity of horse feed and its associated price is an example of a resource required for horse-keeping that has a high geographical influence. Other considerations include general education regarding running a business as well as caring for equines. Most importantly, the lack of record-keeping is the biggest limitation to the reform of equine welfare. Although certain regions provided more complete datasets than others, the participation rate is far too low across the whole nation.

CONCLUSION

Despite limited data, current and past studies suggest that multiple problems contribute to the nation’s equine welfare crisis. Past studies and current databases show an overpopulation of horses both domesticated and wild. There are far more unwanted horses than there are homes or rescues for them. Rescues that exceed the boundaries of their resources to accommodate more equines are typically forced to shut down.

The number of veterinarians in the U.S. is on the decline. With the accessibility to veterinary services decreasing, and thus prices increasing, fewer owners can afford veterinary care for their animals. Rescues are subject to this burden as well. The most noticeable trends found in this study suggest that inflation may be a contributing factor to the national and regional decline in equine adoptions from rescues as well as the decline in veterinary care. With feed and
veterinary services being the most requested support from owners, the reduction of the fulfillment rate of feed requests by half in one year also supports the ideology behind finances as a main cause of concern for equine welfare in our country.

Because most rescues are 501(3)(c), their budget is dependent on the community and their donations. This requires fundraising and tactful budget choices. Jennifer Williams, in an American Association of Equine Practitioners (AAEP) article, states that the primary reasons causing many rescues to be unsuccessful despite their efforts are as follows: poor understanding and management of a nonprofit structure, lack of knowledge of equine care, insufficient funding, and over-commitment such as not being able to turn a horse away. She then suggests good practices such as maintaining transparency with the IRS, keeping good husbandry techniques, handling fiscal responsibilities (such as having a savings account and separate people handling both the deposits and checks), and establishing good adoption policies (Williams, 2016).

Despite the urge to address fundraising as the most apparent issue, the ultimate first step in improving equine rescue and welfare is to increase record-keeping in both quantity and quality. Although finances are likely the main problem with horse-keeping, there is no way to confirm where the root of the problem lies when there is an insufficient amount of data to analyze. It is impossible to completely identify issues such as fundraising, disease spread, veterinary inaccessibility, or any other concerns that have not been established due to the lack of records. Furthermore, it is impossible to then address these potential problems by implementing legislation or other practices because the true flaws of equine rescue remain theories.

Improving record-keeping practices in rescues will pave the way to true reform of our current flawed equine welfare system. The issue remains of how to increase honest record-keeping, as well as establishing what factors to record. Although the concept of
standardized and required records seems most desirable, there are several legal and empirical limitations to this. As Horecka and Neal have established, no one set of Key Performance Indicators fairly represents the success of every rescue. Additionally, there are legal restrictions to using shelter animals in research, both protecting them and creating a research barrier for better shelter/rescue practices (Horecka & Neal, 2022). A monetary or marketing incentive may increase record-keeping participation. This incentive could be implemented by organizations such as the American Horse Council or one of its funding partners: The American Society for the Prevention of Cruelty to Animals (ASPCA), the Foundation for the Horse, and the US Equestrian Trust.

In addition to incentivized record-keeping and sharing, other potential steps include the implementation of foster programs. The construction of an effective foster program has its own set of problems and limitations, however, it may help with the current capacity restraints in rescues, thus reducing the stress on the animals and the caretakers. Weiss et al. estimated that 1.25 million U.S. households have a strong interest in and perception that they could house a horse and 0.72 million households with past horse ownership experience could house a horse (Weiss et al., 2017). Although this is an estimate, it is predicted that there are enough people in the United States who could potentially house a horse, and therefore the issue with fostering lies more in education and outreach by rescues and sanctuaries.

Studies have been conducted on the impacts that temperature and climate have on a horse’s ability to thermoregulate (Lenz, 2023 and Kang et al., 2023). Dr. Tom Lenz, DVM, MS, DACT suggests that horses require a caloric increase of 15-20% for every 10-degree drop in temperature below 30 degrees Fahrenheit (Lenz, 2022). In their literature review, Kang et al. describe a horse’s thermoneutral zone (the range of temperatures in which a horse can easily
maintain their internal body temperature) as 5-25 degrees Celsius (Kang et al., 2023). A horse’s ability to regulate their internal temperature can, however, be impacted by circumstances like strenuous exercise in hot and/or humid weather and can lead to heat stress (the body accumulates more heat than it can get rid of). In severe or untreated cases, heat stress can lead to heat stroke which is life-threatening and impacts the central nervous system. This suggests climate also may impact equine rescues including the accessibility and affordability of feed, as well as equine health, and bears further formal examination. Other geographical considerations that require more research on how they impact equine welfare include taxes, housing and boarding rates, land topography, and more.

The impact of inflation on horse owners and rescues, and its role as a primary factor in decreasing equine adoption and increasing rescue closures, has created an urgent need in equine rescue. This must be addressed using both short-term solutions to provide immediate relief and long-term strategies to ameliorate the crisis. Increased grants from governing bodies may be a temporary necessity, however, more long-term logistical solutions need to be implemented to increase capacity and improve the sustainability of equine rescues henceforth, which will lead to better outcomes for the welfare of the animals. Long-term strategies will require time for promotion, training, and widespread implementation, thus, urgent and decisive action is necessary to effect future change on a meaningful scale. Implementation of record-keeping incentives would require little preliminary work and would encourage participation and organizational buy-in. Public awareness campaigns and educational programs on equine handling, business management, and training for the establishment of foster programs would be similarly high returns for low effort. Data collected through this initial phase of implementation would allow for expanded research on the contributing factors of animal rescue success. These
include geographical and climate impacts on animal care and welfare, as well as the maldistribution of resources. This would also pave the way for further strategic reform, leading to a holistic renewal in the systemic management of equine rescue. Such a comprehensive and panoramic approach to the industry at large would improve its sustainability and its capacity to aid more equines in need.

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