Paws & Patterns: Decoding Austin's Animal Shelter Data

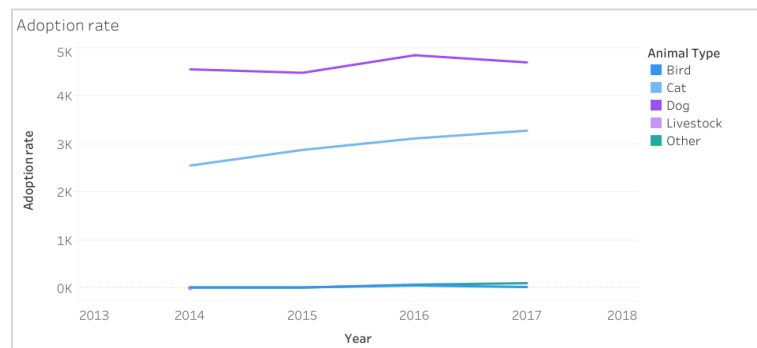By Jose Colchado, Jessica Gallardo, Lidzy Jimenez, and Chloe Roque

Introduction

First and foremost, a shelter's mission is to provide care and second chances for the animals that come through their doors, with the ultimate goal of finding them loving homes. Today, we'll be taking a close look at the data collected by Austin's Animal Shelter—information that tells the story of the shelter's work and the animals being cared for.

By examining key factors that affect adoption, we can uncover trends that will help guide your efforts in getting even more animals adopted. We did this by identifying which determinants affect their length of stay and determining which breeds need a bit more spotlight. This data can serve as a powerful tool in your decision-making process. Together, we can use this information to ensure that more animals find their forever homes, but we can only start by looking at the shelter's current status.

Current Shelter Status

Before diving into the data, it is important to understand the demographics of the Animal Shelter. There are about 78 thousand animals in our data. 94% of the animal population consists of cats and dogs. The other 3 animal categories consist of 334 birds, 9 livestock, and 4,249 "other" animals. The "other" category in our data includes animals like guinea pigs, bunnies, bats, and lizards. Knowing this information and the diversity of the animals ensures that our data is better understood and that resources, care, and adoption efforts are more appropriately directed to improve outcomes for the animals.

Nevertheless, we need to understand how the adoption rates have changed throughout the years of 2014-2017. The graph below compares the animal type with the adoption rates. We can see that there has been a very slight increase in adoption rates throughout the years but what we want for the Austin Animal Shelter is to significantly increase the adoption rates of our favorite little
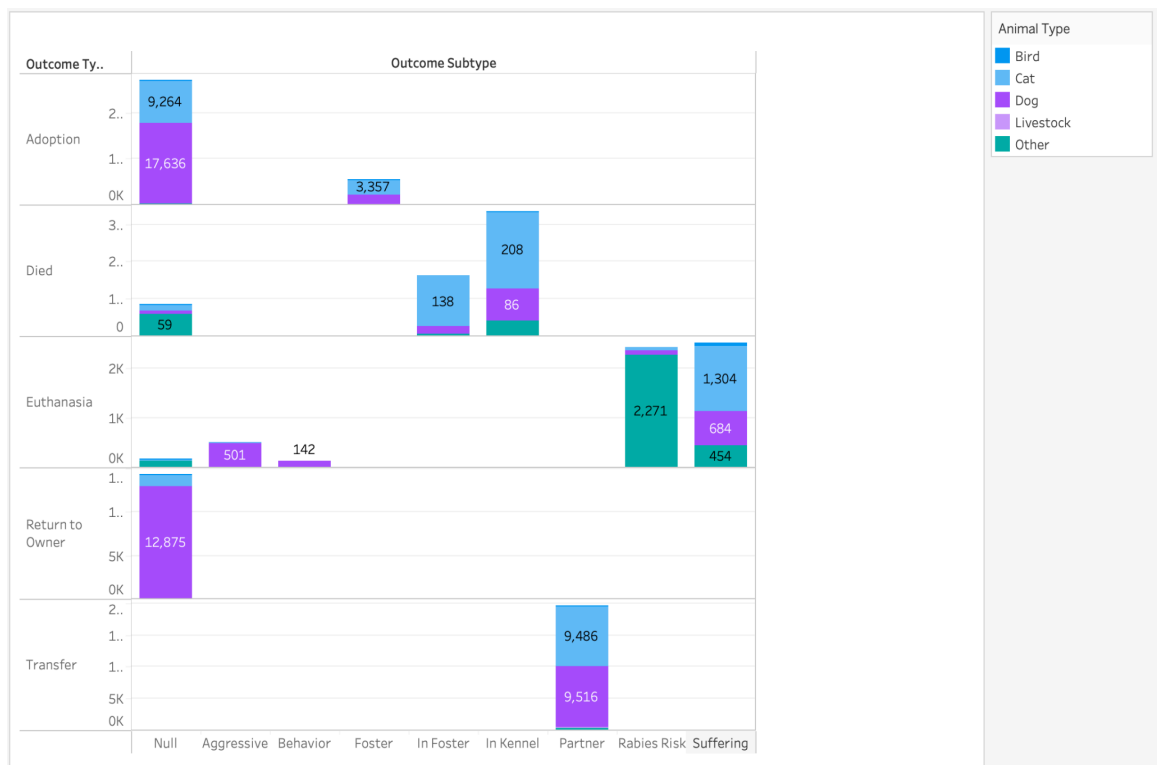
animals, cats, and dogs since they make up the majority of the population in this shelter. But first, we must look at the bigger problem at hand and analyze why animals leave.

The graph on the right compares the animal type and the outcome type. The outcome type is how the animals are leaving the shelter, whether that be adoption, dying, euthanasia, etc. What we can get from this graph is the outcome percentages of each animal. For example, 43.28% of cats are adopted, and 45.29% are transferred to a different shelter. 45.33% of dogs are adopted, 29.10% are returned to their

Outcome Type	Animal Type				
	Bird	Cat	Dog	Livestock	Other
Null		0.00%	0.00%		0.00%
Adoption	34.13%	43.28%	45.33%	22.22%	5.00%
Died	1.20%	1.37%	0.31%		3.18%
Disposal	6.59%	0.05%	0.04%		5.94%
Euthanasia	25.45%	4.94%	3.40%		71.58%
Missing	0.30%	0.10%	0.04%		
Relocate	2.10%				0.21%
Return to Owner	2.69%	4.86%	29.10%	11.11%	0.90%
Rto-Adopt		0.11%	0.26%		
Transfer	27.54%	45.29%	21.52%	66.67%	13.20%

owners, and 21.52% are transferred. If we look at the far right column, 71.58% of the other animals are euthanized. The colors may seem a little inaccurate to the eye, but the graph is heat mapping using the number of each animal category as a total. We can look at the specifics of the animal outcomes next. Understanding the percentage of animals adopted versus those euthanized or transferred helps identify areas where improvements are needed. Adoption rates highlight how effective shelters are at finding homes for animals, while outcome types like transfers and euthanasia point to the pressures these facilities face.

Pet Outcome. The following graph dives deeper into potential relationships between animal outcomes and outcome subtypes. The outcome subtypes that we concentrate on in this graph are

null, aggression (aggressive), behavior, foster, in foster, in kennel, partner, suffering, and at risk of rabies.
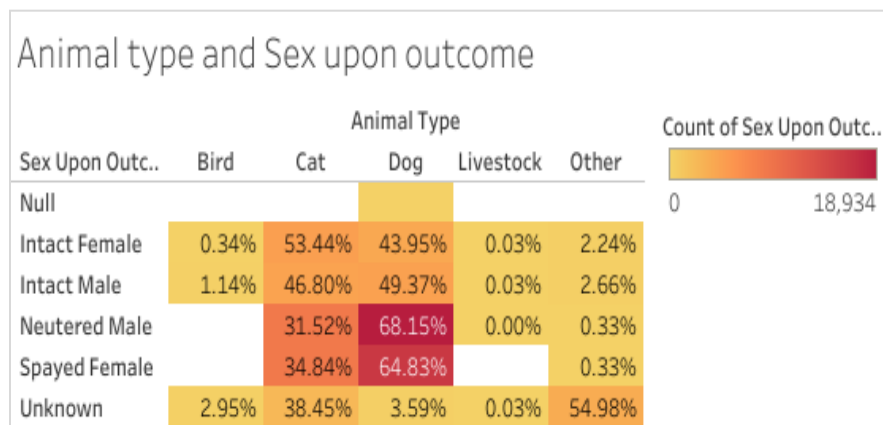
      As shown below, all animals that eventually get adopted are primarily dogs and cats that are "null", meaning they are entirely healthy. Through our data analysis, we found that dogs and cats that were fostered at one point ended up eventually being adopted. Besides adoption, there are two other ways our pets are leaving the shelter: death or being returned to their owner. Additionally, we wanted to point out that almost under 19,000 animals have been transferred out through organizations that Austin Animal Shelter partners with. Furthermore, we found a minor relationship between the small number of animals that were dying and kept in kennels.

What is Affecting Adoption Rates?
There are 5 Key Factors affecting the Adoption Rates
- Breed
- Color
- Animal Type
- Condition
- Reproductive Status

We want to focus specifically on the last factor, reproductive status because it is the most important factor that can significantly increase adoption rates in Cats. So what do we mean by this? Let's focus on the graph below that compares the Sex Upon Outcome to the Animal Type. We can see that the predominant type of animals that get adopted are Neutered Male dogs at 68.15% or Spayed Female dogs at 64.83%. The main reason that our animals should get spayed/neutered is to help prevent unplanned pregnancies, which is also a very effective way to decrease the homeless population of animals. That is why as we can see in the graph it is very important that we focus on spaying/neutering our cats to increase the adoption rates.

Animal type and Sex upon outcome

Sex Upon Outc..	Bird	Cat	Dog	Livestock	Other
Null					
Intact Female	0.34%	53.44%	43.95%	0.03%	2.24%
Intact Male	1.14%	46.80%	49.37%	0.03%	2.66%
Neutered Male		31.52%	68.15%	0.00%	0.33%
Spayed Female		34.84%	64.83%		0.33%
Unknown	2.95%	38.45%	3.59%	0.03%	54.98%

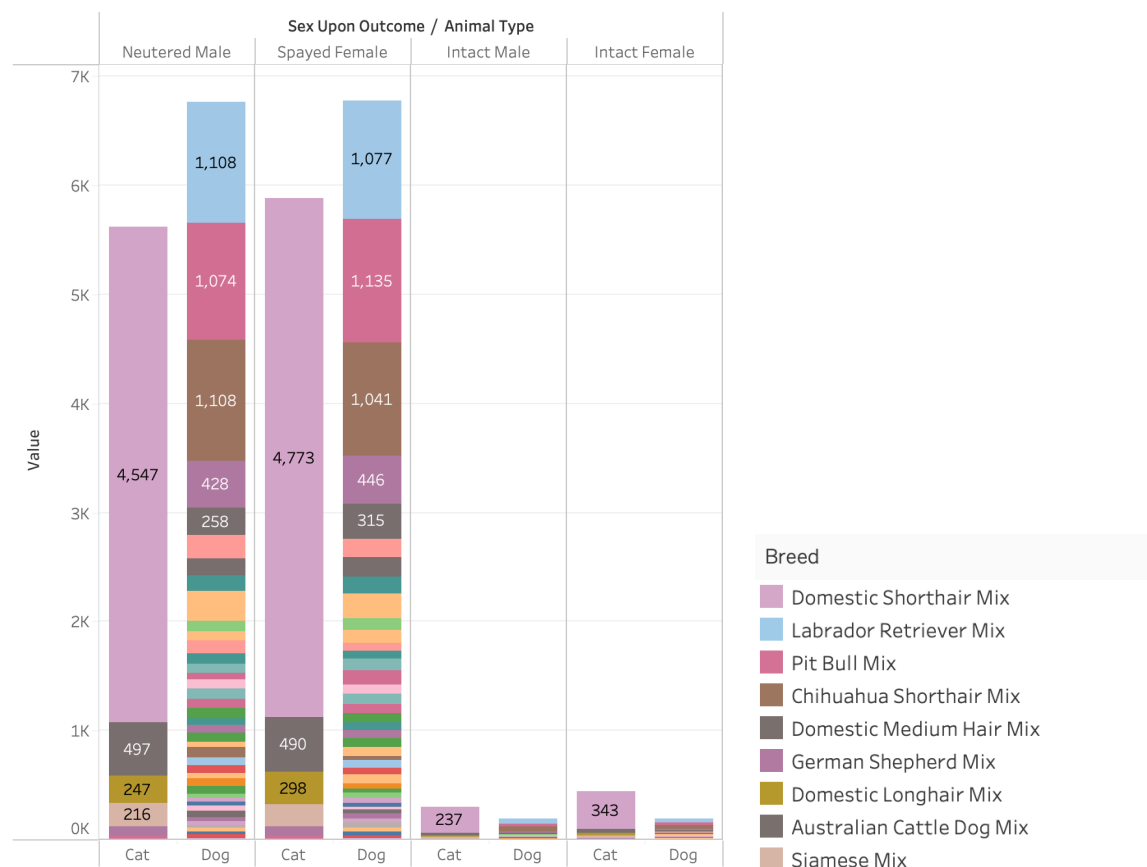Count of Sex Upon Outc..   0 — 18,934

-Breed and Neutering Pets

        The following graph highlights again the enormous difference between adopted animals that were spayed/neutered and those that were not. Nevertheless, the graph explicitly demonstrates that the top dog and cat breeds are being adopted at higher rates. Due to the great variety of breed types that this dataset accounts for, we only concentrated on breeds where more than 150 were adopted. The most popular cat breeds being adopted are the Domestic Shorthair Mix, Domestic Medium Hair Mix, Domestic Longhair Mix, and Siamese Mix. As for dogs, the top adopted dog breeds are Labrador Retriever Mix, Pit Bull Mix, Chihuahua Shorthair Mix, German Shepherd Mix, and Australian Cattle Dog Mix.

        We tried to see if there were any significant patterns between mutts and purebred pets, but we found that the animal shelter does not often receive purebred animals.

Sex Outcome of Animals Matters: Breed Differences

The Unanswered Questions

In our analysis of shelter data, we've identified several key factors that impact the duration of stay and adoption rates for animals. We can continue to do this by asking the following, more in-depth questions:

- *How and why are the animals staying for so long?*

- *Does age affect outcomes?*
- *How can pets get adopted quickly?*

These questions can only be answered, however, by recording more data regarding the length of the animals' stay. With the additional data, which would be crucial for improving shelter operations and animal welfare, we can develop more data-driven recommendations, and implement more effective strategies to ensure that more animals find their forever homes more swiftly, particularly those who are typically at a disadvantage in the adoption process.

Getting Pets Adopted, A Conclusion

After analyzing our respective dataset from the Austin Animal Shelter, we found that we had three main recommendations:
1. Increasing the number of adopted animals is our primary goal. We believe that there is great potential and opportunity for fostering to be a critical pipeline into eventual full adoption. Increasing the foster program by offering welcome kits or workshops for potential foster families could help these families to learn how to work with animals that have suffered from various stressful conditions and help them integrate into their homes more seamlessly.
2. We recommend that the animal shelter continue to spay and neuter their pets to further prevent unplanned pregnancies, thus decreasing the amount of animals that end up in shelters and on the streets. The difference between the adoption rate of animals not neutered/spay versus animals that are is significant, allowing us to believe that this could be a great way to continue on this path of increasing adoption rates.
3. To continue exploring this data and providing more data-driven recommendations, we recommend that the Austin Animal Shelter start logging how long these animals are staying at their shelter.