Analysis of Animal Shelter Adoption Times

Riley Daykin & Yiying Fan, Ph.D.
Department of Statistics, College of Sciences and Health Professionals, Cleveland State University

Choose **O**hio First

Abstract

Many animals are brought in and adopted from the Lake Humane Society (LHS) each year. As there is little to no research available on adoption patterns at animal shelters, this research aims to identify and examine whether specific traits in animals result in longer times in animal shelters, and to use this analysis to provide recommendations to minimize an animal's time spent in the shelter.

Introduction

- Data consists of 2,355 *adopted* animals from the Lake Humane Society
  - 1,670 cats
  - 685 dogs
- Different statistical procedures were used to explore if associations between certain characteristics and a faster adoption time were present.
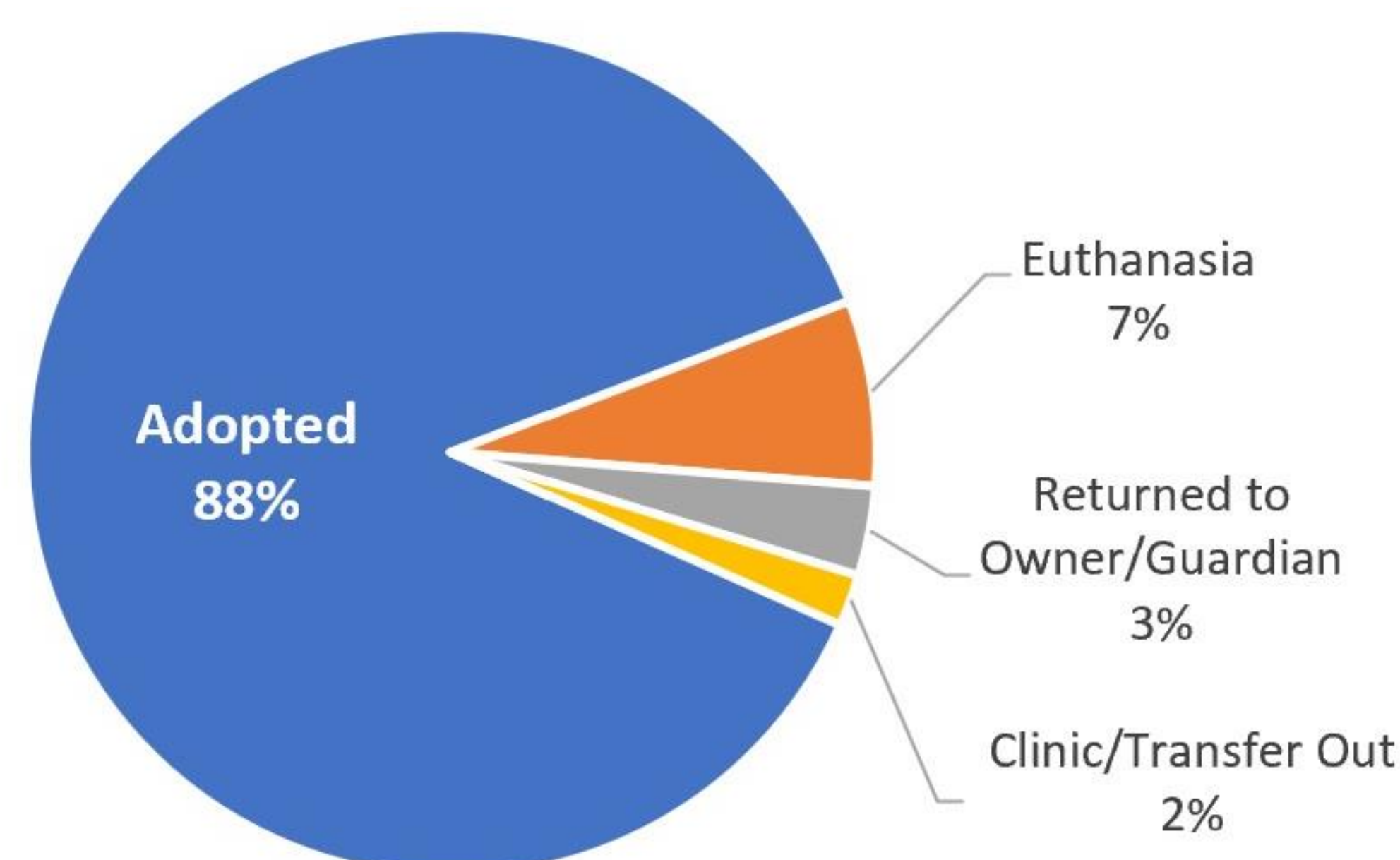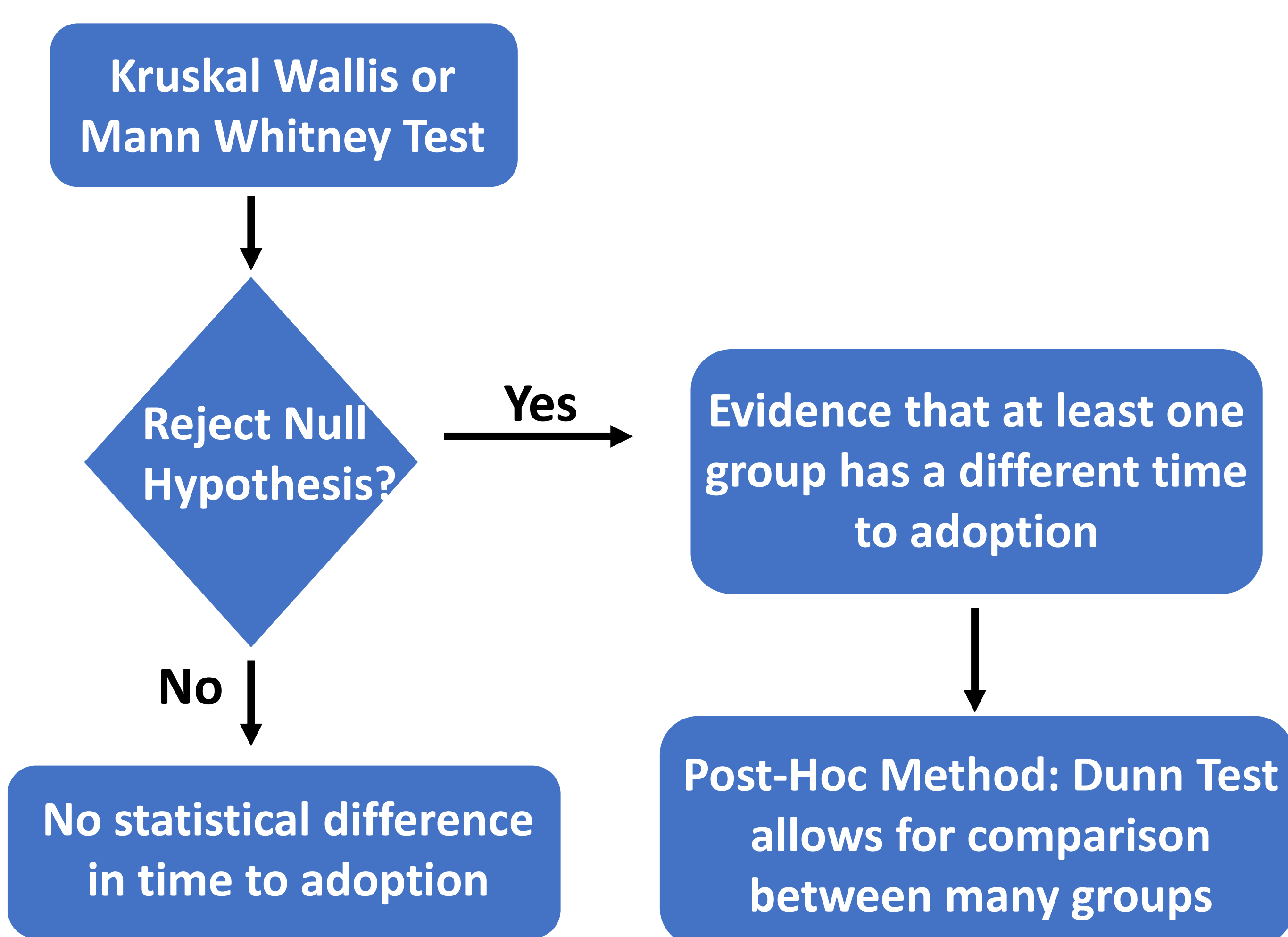
Figure 1. Adoption is the most common outcome at LHS.

(Pie chart: Adopted 88%, Euthanasia 7%, Returned to Owner/Guardian 3%, Clinic/Transfer Out 2%)

Methods

Hypothesis tests were used to determine statistical differences in adoption times between groups (α=0.05).

- Kruskal Wallis or Mann Whitney Test
- Reject Null Hypothesis?
  - Yes → Evidence that at least one group has a different time to adoption → Post-Hoc Method: Dunn Test allows for comparison between many groups
  - No → No statistical difference in time to adoption

- The sample data was divided into groups based on the following characteristics:
  - Species
  - Size
  - Gender
  - Spay/neuter status
  - Intake type
  - Age

Results – Dogs & Cats Combined

- Dogs spend shorter median number of days in shelter than cats (11 days vs. 25 days)
- Pre-altered animals spend less time in the shelter
- Intake Type
  - "Returned" & "In" have shortest time to adoption (9 days)
  - "Seized/custody" spend the longest time in shelter (38 days)
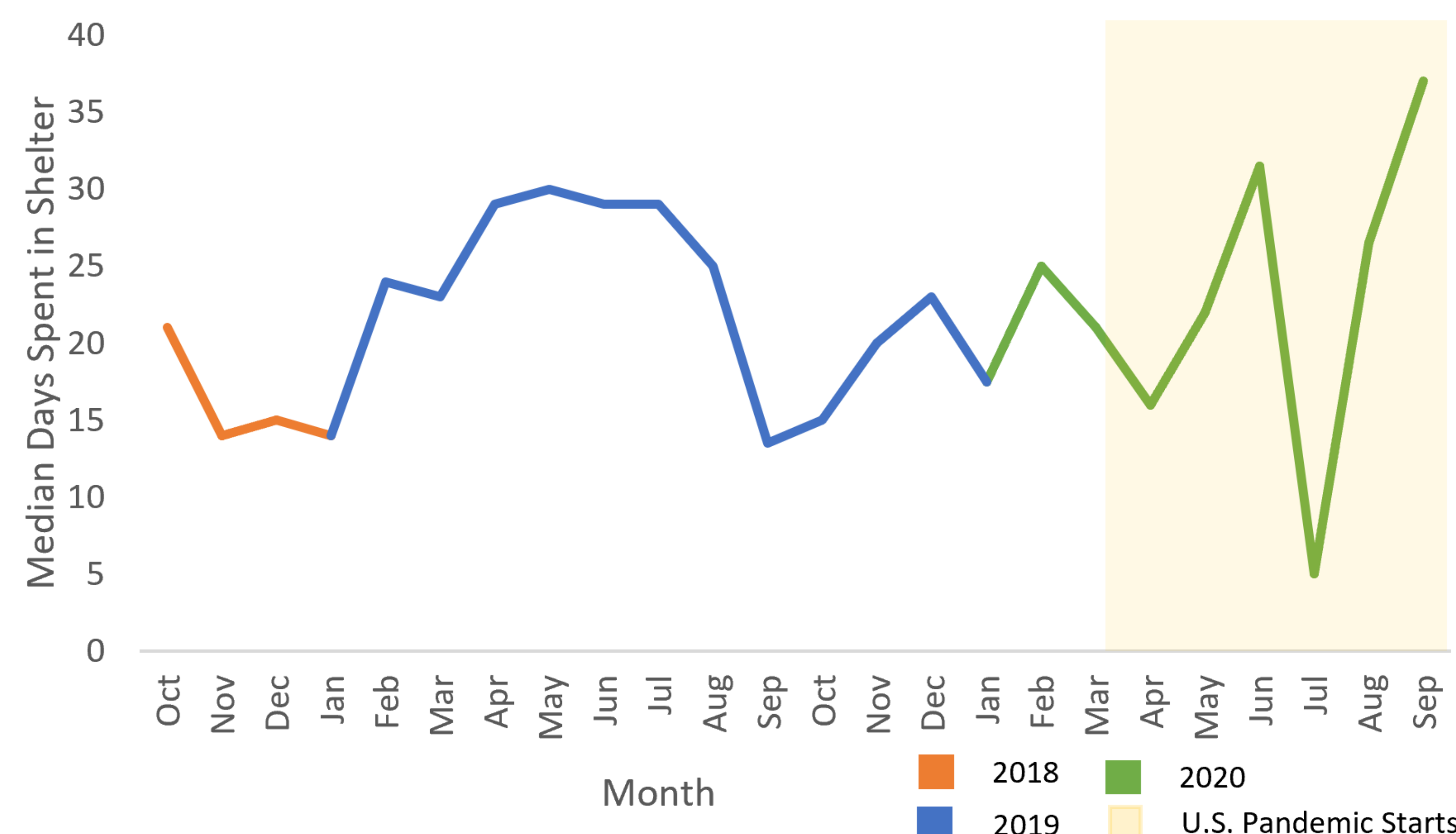- Fall/Winter appear to have shortest median adoption times

Figure 2. Adoption Patterns over Time: Oct 2018 – Sept 2020

(Line chart: Median Days Spent in Shelter vs. Month. Legend: 2018, 2019, 2020, U.S. Pandemic Starts)

Results – Dogs Only

- "Stray" and "seized/custody" spent longest time in shelter
- No statistical difference in adoption times between different sizes or gender
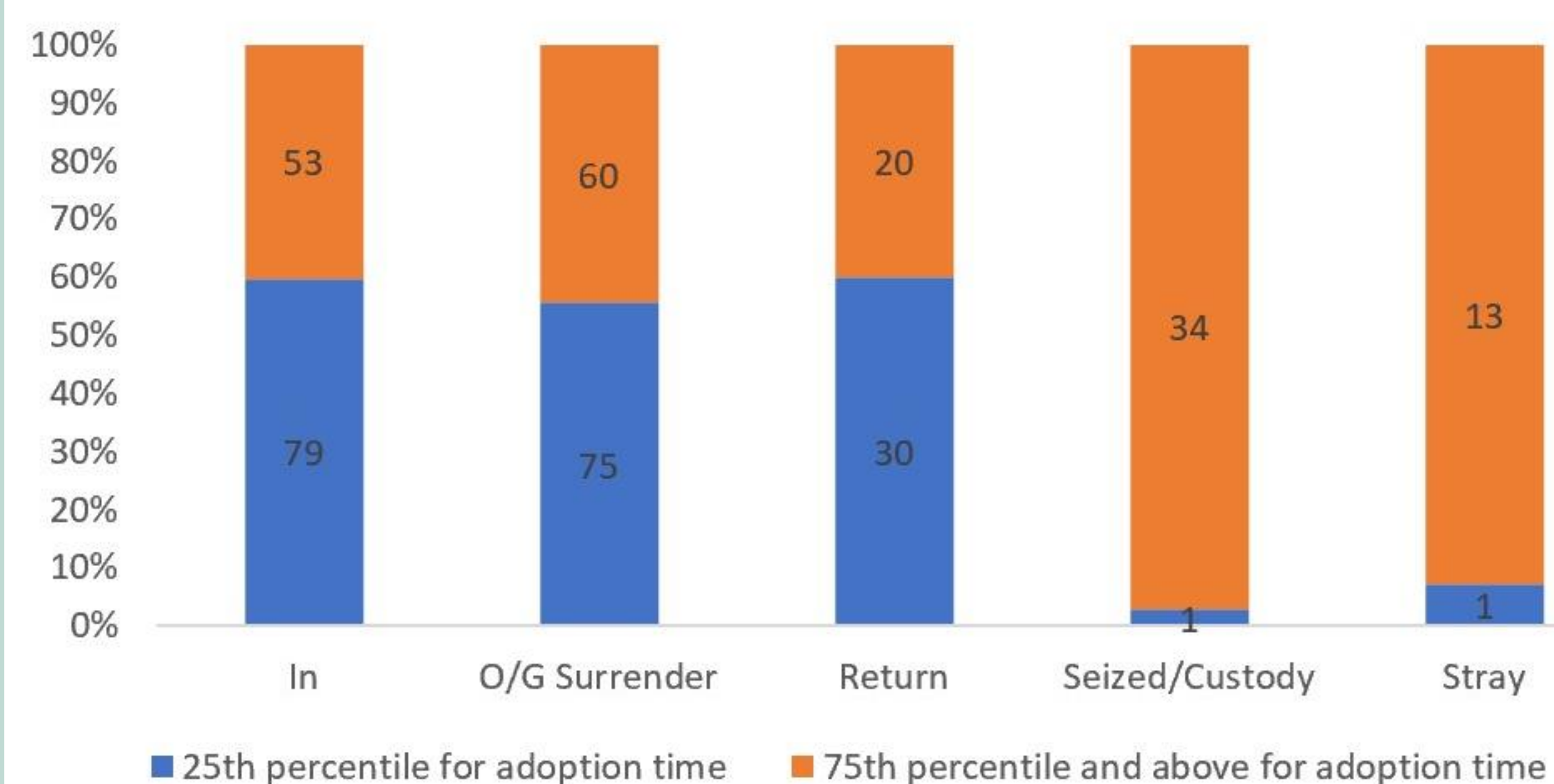
Figure 3. Comparing the shortest 25% of adoption times to the longest 25% of adoption times

(Stacked bar chart. In: 79/53. O/G Surrender: 75/60. Return: 30/20. Seized/Custody: 1/34. Stray: 1/13. Legend: 25th percentile for adoption time, 75th percentile and above for adoption time)

- The sporting, hound, and working group spent the least amount of time in the shelter. Dogs of the "mixed" type spent the longest.

Sporting Hound Working	Terrier Herding Toy Non-Sporting	Mixed Breed
7-8 days	11-16 days	22 days

Figure 4. Difference in shelter time by dog group

Results – Cats Only

- Medium size cats spend less time in the shelter than large or small cats. (XL cats made up < 1% sample)

(Bar chart: Small 29, Medium 22.5, Large 29, Extra Large 17)
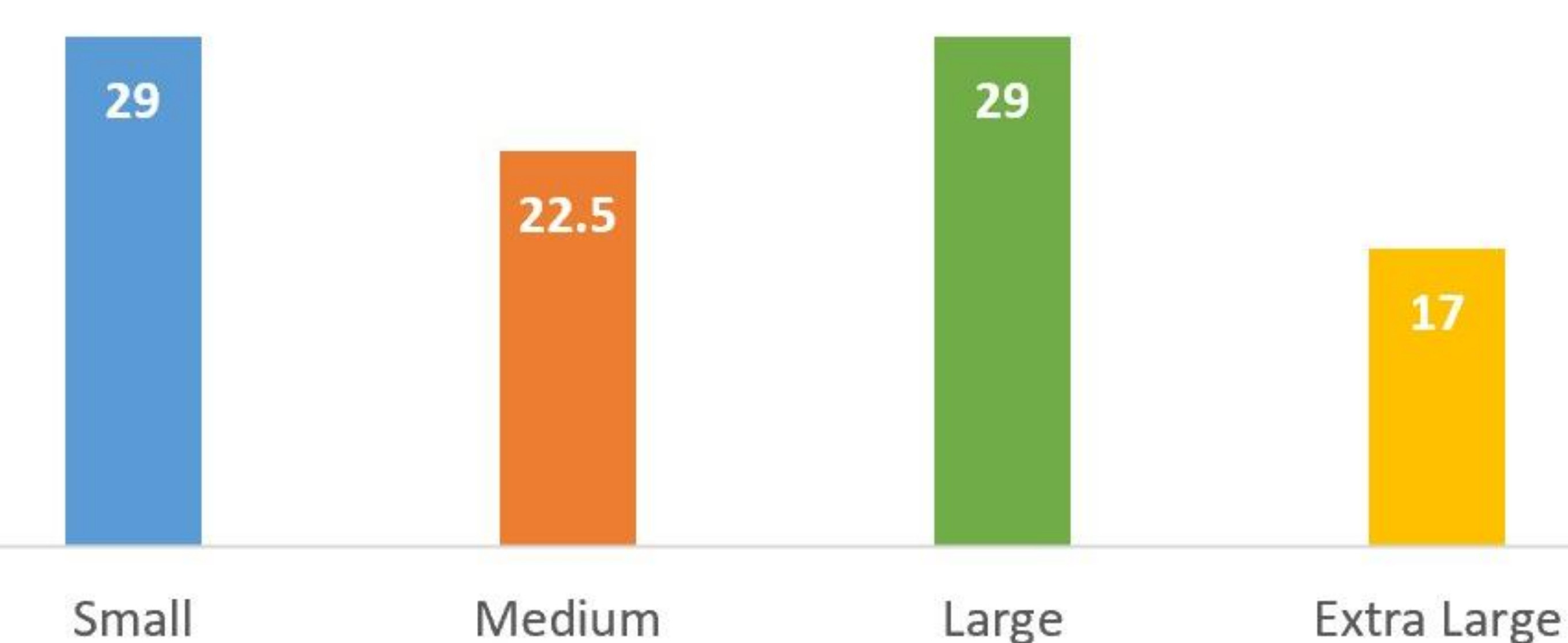
Figure 5. Median days in the shelter by cat size

Recommendations & Future Work

- Increase promotional events for cats and mixed breed dogs: more virtual advertising or dedicating specific adoption events for these groups
- Look into why seized/custody and strays have such long adoption times
  - → Suggestion: provide more socializing or enrichment activities for these animals
- Elderly animals (≥15 y.o.) had some of the shortest adoption times. More data is needed to form conclusions due to small number of elderly animals.
- Further investigate impact of COVID-19.

Acknowledgments