

PETLANTHROPY DATA ANALYSIS

STATISTICAL ANALYSIS TO HELP TO UNDERSTAND
PEOPLE PREFERENCE ABOUT PETS



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INTRODUCTION

Petlantry is a project which aims to understand and consequently improve the outcomes of homeless cats and dogs, and encourage more people to help shelter animals. With a limited budget, many animal shelters only have money for basic needs : food, housing, cages. So the aim of this study was to help Petlantry organization to better know people needs about pets by understanding the characteristics of people owning cats and dogs. For this study, the countries concerned was USA and Canada for Phase I. The paper will be divided into three parts. Data management and descriptive analysis will be treated respectively in the first and second section. The results of a multivariate model will be discussed in the third part.

DATA MANAGEMENT

The team was constituted by six people. The team was organized into three sub-teams. The first team worked on the data cleaning. The dataset was heavy and there were many variables. The goals of this team were to correct missing value, correct incoherent value, correct duplicated observations and propose the potential variables to use for analysis. The second team worked on the descriptive analysis by crossing « Pets » variable with the potential variables proposed by the first in order to have an overview of the situation. This part was important for the last team which worked on a multinomial model in order to explain the fact of having pets by the variables proposed by the first team.

However discussions and meetings were planned to share the work and give opinions about a team's results.

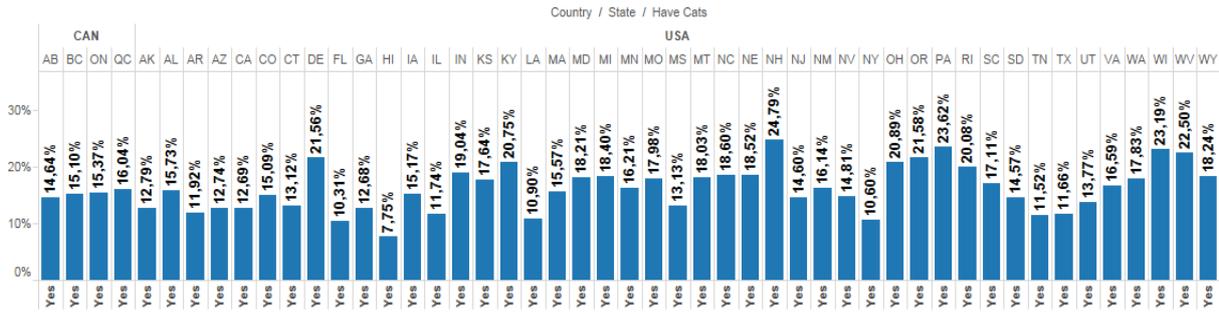
RESULTS OF THE ANALYSIS

Descriptive analysis

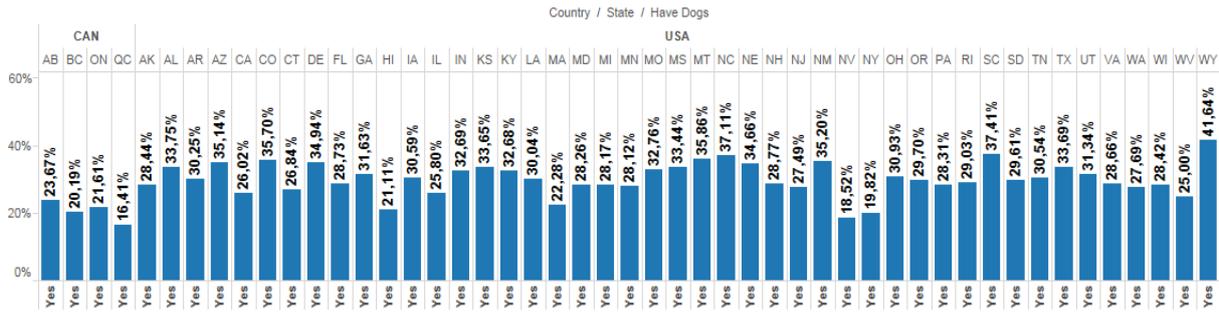
Pets and States

Cats and dogs are present in all state in USA and Canada. However they are most located in NH, PA, WI, WV, WY, HC, and NC. Sure enough there are more people owning cats in the state of NH (24.8%), PA (23.6%), WI (23.2%) and WV (22.5%). Also, about owning dogs, 41.6% of people in WY have dogs and this percentage is 37.4% in HC, 37.1% in NC, 35.9% in MT and 35.7% in CO.

Percentage of people who have cats by "state"



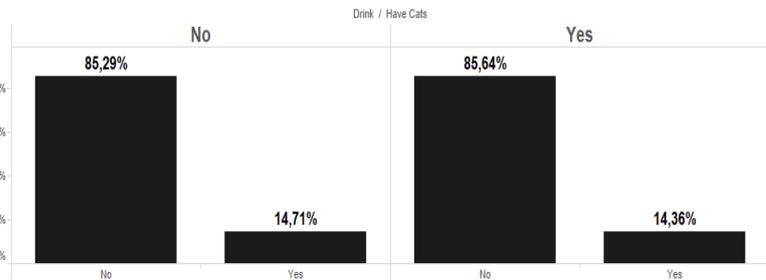
Percentage of people who have dogs by "state"



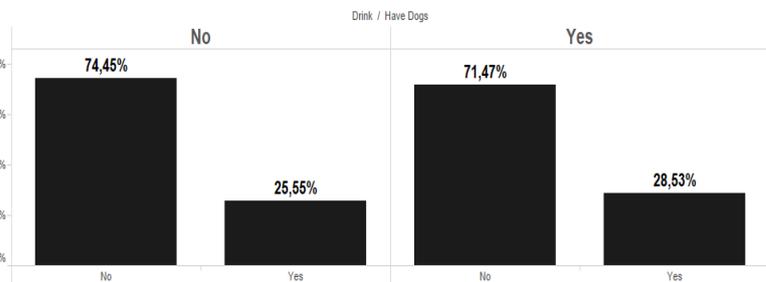
Pets and drinking

There is a link between the fact that people drink or not and the fact of owning a pet. People who do not drink are the most likely to have a cat but the difference comparing the percentage is slow. However, there are more individuals in the « drinker population » who own dogs (28.5%) than in « non-drinker population » (25.6%).

Percentage of people having cats by "drink"

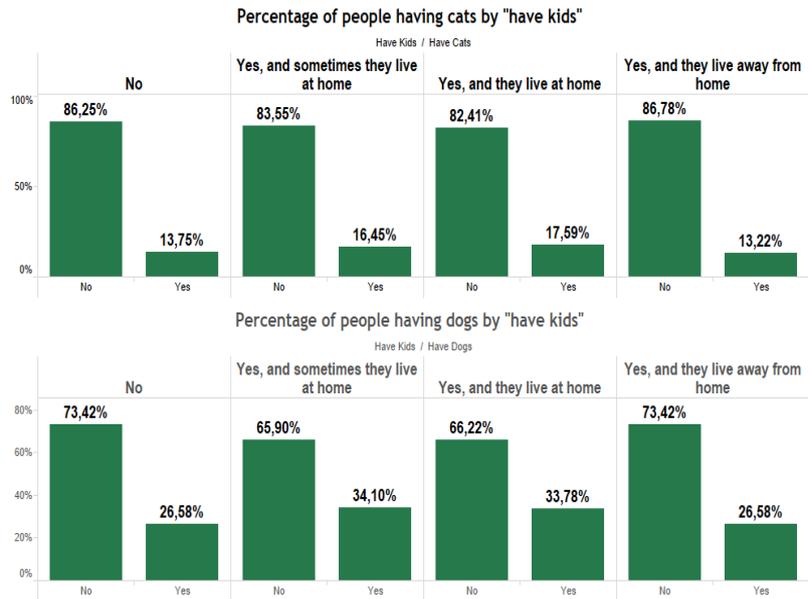


Percentage of people having dogs by "drink"



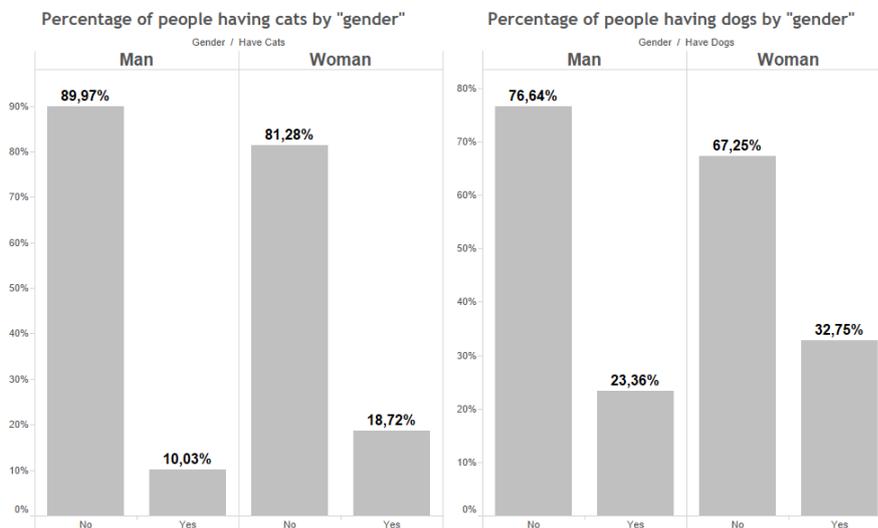
Pets and « having children »

In general, cats and dogs are found in individuals with children. Indeed, 17.6% of people with children have cats and 33.8% have dogs. Also in the population of « have kids », cats are mostly present in families where the children are at home. This same situation is found about owning dogs.



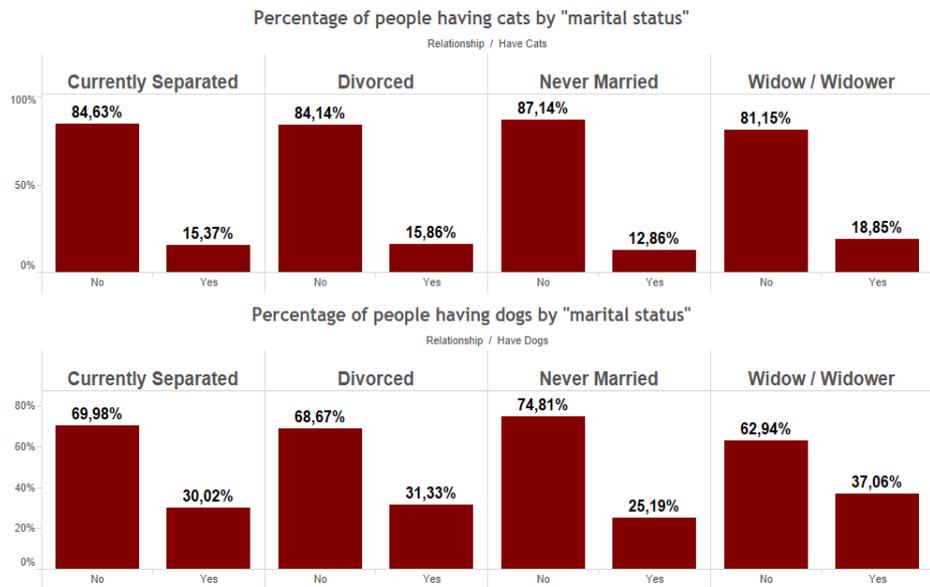
Pets and gender

Women are more likely to have pets than men. In fact, among women, 18.7% has at least one cat and 32.6% at least one dog in contrast to men with 10% having at least one cat and one dog at 23.4%.



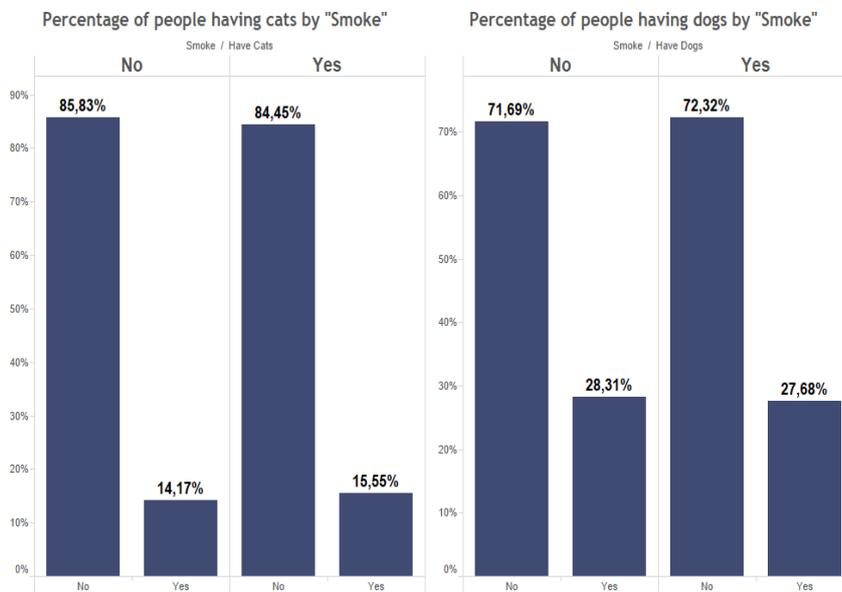
Pets and marital status

Widows and divorced are the people where pets are mostly found. Sure enough, 18.9% of widows have at least one cat and 37.1% a dog. For divorced people, 15.9% have a cat and 31.3% a dog.



Pets and smokers

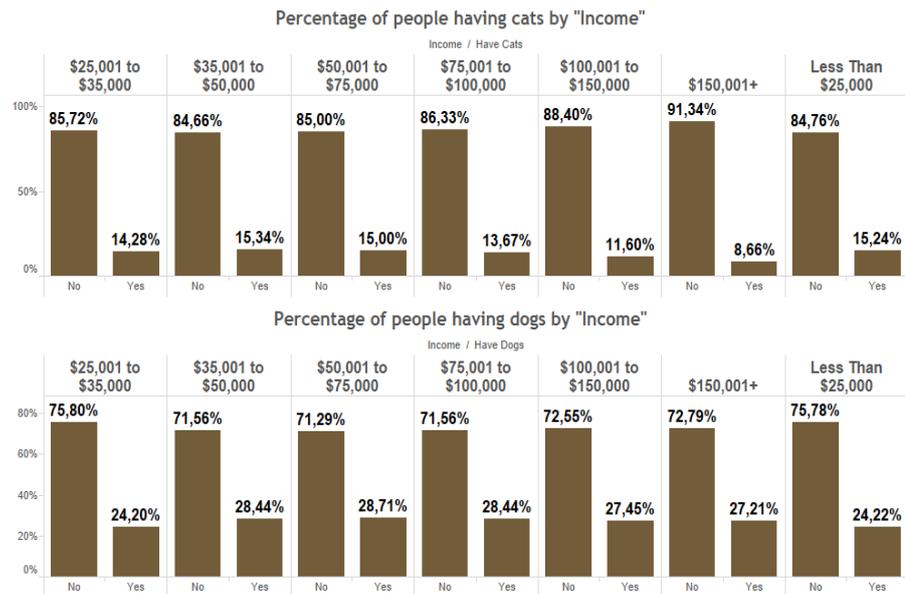
Cats are found in general at smokers house than non smokers one. However there is an opposite trend compared to dog ownership. Nearly 28.3% of non-smokers have a dog while this percentage is 27.7% for smokers



Pets and Income

Pets and income

In terms of income distribution, there are fewer people with a cat in the income class [\$ 150,001 +]. With regard to the possession of a dog, the distribution is approximately the same in the various classes.



In a nutshell.....

- Non-drinkers are more likely to have cats
- Drinkers are more likely to own dogs
- Pets are generally found in family settings
- Women are more likely to have pets and are more likely to have dogs
- Men are more likely to have a dog
- In marital status widowed and divorced are more likely to have a pet and more likely to have a dog
- Smokers are more likely to have a cat
- Nearly the same percentage of smokers to non-smokers have a dog

Owning cats and/or dogs : what is more probable ? Results of multinomial model

Comparison of Owns cats only to Owns cats and dogs

The likelihood of a person owning only cats vs. both cats and dogs increased about 2% for each year increase in age ($OR = 1.02, p < .0005$). The likelihood of a person owning only cats vs. both cats and dogs also increased for respondents who had a college degree ($OR = 1.332, p < .0005$), indicating that a respondent with a college degree was approximately 33% more likely to own only cats vs. both cats and dogs. Divorced persons were about 37% more likely to own only cats than both cats and dogs when compared to persons who were widowed ($OR = 1.37, p < .0005$). Those who were never married were about 65% more likely to own only cats than both dogs and cats, when compared to those who were widowed ($OR = 1.645, p < .0005$). Persons who reported their ethnicity as Black were about 51% more likely to own only cats vs. both cats and dogs when compared to persons who reported their ethnicity as “other” ($OR = 1.508, p = .001$).

People who smoked were approximately 13% less likely to own cats only than to own both cats and dogs ($OR = 0.874, p = .002$). Females were about 23% less likely to own cats only than to own both cats and dogs ($OR = .766, p < .0005$). Those who had kids were about 38% less likely to own only a cat than to own both a cat and a dog ($OR = 0.631, p < .0005$).

When compared to Canadians, all U.S. regions were less likely to own only cats when compared to owning both cats and dogs, with percentages of 25% (Northeast) to 59% (South) less likely than Canadians.

Both Christians and people who stated they were spiritual but not religious were less likely to own only cats than both cats and dogs, when compared to persons who were classified as “other” religion. Christians were about 25% less likely to own a cat than to own both pet types than “other” religions ($OR = .754, p < .0005$), and those who were spiritual were about 17% less likely ($OR = .833, p = .001$).

Comparison of Owns dogs only to Owns cats and dogs

the likelihood of a person owning only dogs vs. both cats and dogs increased about 12% for those who were drinkers ($OR = 1.12, p = .026$). The likelihood of a person owning only dogs vs. both cats and dogs also increased for respondents who had a college degree ($OR = 1.143, p = .008$), indicating that a respondent with a college degree was approximately 14% more

likely to own only dogs vs. both cats and dogs. A person was about 19% more likely to own only dogs vs. both cats and dogs for each level of increase of income ($OR = 1.185, p < .0005$). Persons who reported their ethnicity as Black were about 96% more likely to own only dogs vs. both cats and dogs when compared to persons who reported their ethnicity as “other” ($OR = 1.962, p < .0005$). Persons who reported their ethnicity as Latino were about 24% more likely to own only dogs vs. both cats and dogs when compared to persons who reported their ethnicity as “other” ($OR = 1.235, p < .010$). However, those who were classified as White ethnicity were about 24% less likely to own only a dog vs. both a cat and dog when compared to the Ethnicity of “other” ($OR = 0.761, p < .0005$). Christians were about 33% more likely to own only dogs vs. both cats and dogs than were those who were classified as “other” religion ($OR = 1.330, p < .0005$).

The likelihood of a person owning only dogs vs. both cats and dogs decreased about 0.5% for each year increase in age ($OR = 0.996, p = .025$). People who smoked were approximately 18% less likely to own dogs only than to own both cats and dogs ($OR = 0.822, p < .0005$). Females were about 41% less likely to own dogs only than to own both cats and dogs ($OR = .590, p < .0005$). Those who had kids were about 17% less likely to own only a dog than to own both a cat and a dog ($OR = 0.834, p < .0005$). Persons who did not want kids were about 14% less likely to own only a dog when compared with owning both cats and dogs ($OR = 0.858, p = .006$), and those who were not sure about wanting kids were about 13% less likely to own a dog rather than both a cat and dog ($OR = 0.867, p = .004$).

In a nutshell.....

- The likelihood of a person owning both cats and dogs increases by age, having a college degree, divorcees and Black ethnicities.
- The likelihood of a person owning only dogs to cats and dogs increased for drinkers, college degrees, increased income, black ethnicities, Latino ethnicities and Christian faith.

CONCLUSION

This project had a goal which is to encourage more people to help shelter animals. There were three phases (i) cleaning of the dataset, (ii) descriptive statistics and (iii) multinomial model building. Some visualization of the most pertinent data were produced and multinomial analysis was performed. The results of the analysis gave rise to numerous recommendations. Certain characteristics within the data suggested that certain groups were more likely to be receptive to rehoming animals. The results were split into groups that would be more likely to rehome dogs, groups that were more likely to rehome cats, and a general group that were the best to target in general for rehoming.

ABOUT THE ORGANIZATIONS

Statistics without Borders



Statistics Without Borders (SWB) is an Outreach Group of American Statistical Association. Comprised entirely of volunteers, it provides pro bono statistical consulting to organizations and government agencies, particularly from developing nations that do not have the resources for statistical services. In support of non-partisan and secular activities, SWB promotes the use of statistics to improve the health and well-being of all people, and its projects have included those in the areas of emergency and disaster management, humanitarian aid, child welfare, animal welfare, health services and education of girls in developing countries, among others.

www.statisticswithoutborders.org

Petlanthropy



Petlanthropy.org is an online charity that makes it easy for anyone to help local homeless cats and dogs. We have four simple goals: (i) Help as many homeless animals as possible by raising funds for local animal shelters ; (ii) Keep funds in the community in which they are raised to help local animals ; (iii) Provide animal care organizations with the best tools to increase donors, donations, marketing and resources ; (iv) Provide the public with high quality, transparent opportunities to help local homeless animals and shelters.

Animal shelters everywhere post projects on Petlanthropy.org to get resources they need to make their cats and dogs healthier, happier and more adoptable. Needs include beds, scratch toys, nursing bottles and milk replacer to feed orphaned kitties and puppies, toys, vaccines, grooming equipment, leashes, and so much more.

www.petlanthropy.org

TEAM MEMBERS

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Timeline of the project: *December 2014- January 2015*