

Project Proposal: Multidimensional Analysis of Pet Care Across the United States

Introduction :

In the United States, pets are more than just animals – they are important members of countless families. Our project, "Multidimensional Analysis of Pet Care across the United States," aims to comprehensively explore the different dimensions of how each state cares for pets. This study's goal is to provide valuable insights on pet welfare management across states, illuminating pet owners, animal welfare organizations, and potentially influencing policymakers and businesses providing pet care services.

Objectives :

- To analyze pet care in the US across multiple dimensions.
- To understand regional variations and national trends in pet ownership and care.
- To present data-driven insights in an accessible and engaging format for a wide audience.

Dimensions of Analysis :

- **Adoption Rates:** Measuring the rate of pet adoptions in each state.
- **Adoption Return Rates:** Analyzing the frequency of pets being returned post-adoption.
- **Pet Expenditure:** Examining state-wise spending on pets, including a categorical breakdown of expenses.
- **Vaccine Rates:** Assessing the vaccination rate among pets for common diseases.
- **Cat and Dog Distribution:** Understanding the distribution ratio of cats and dogs in each state.

Methodology and Data Sources :

- **Data Collection:** We will seek data from the Dollar Geek survey conducted between January and February 2023, involving a representative sample of 4,782

American pet owners across all states. **Permission will be sought to access their detailed data.**

- Additional Sources:
 - <https://www.dollargeek.com/pet-insurance/pet-ownership-statistics/>
 - <https://www.shelteranimalscount.org/data-request-individuals/> (We accessed the data by completing the form on the website.)
 - <https://www.kaggle.com/datasets/valchovlev/cat-vs-dog-popularity-in-us>

Visualizations and Tools:

Interactive Maps (Adoption Rates, Return Rates, Pet Expenditure):

- Tool: `leaflet` package in R.
- Objective: To enable geographical representation of the data with interactive elements like tooltips for precise state-level statistics.

Stacked Bar Charts (Pet Expenditure):

- Tool: `ggplot2`, enhanced with `plotly`.
- Purpose: To analyze the breakdown of pet expenditure categories within each state, revealing spending patterns.

Bar Charts and Bubble Charts (Vaccine Rates):

- Tool: `highcharter`.
- Purpose: To depict vaccine rates, using size and color intensity in bubble charts to represent data variance.

Line Graphs or Pie Charts (Vaccine Rates, if historical data available):

- Tool: `plotly`.
- Purpose: To showcase trends over time or vaccination proportions.

Stacked or Side-by-Side Bar Charts (Cat and Dog Distribution):

- Tool: `ggplot2`, with `plotly` for interactive elements.
- Purpose: To display the distribution of cats versus dogs in each state.

Potential Challenges:

- **Accessibility of Data:** A primary challenge is accessing detailed survey data from Dollar Geek. An official request will be made, informing its academic use and adherence to data privacy.
- **Consistency and Integrity of Data:** Maintaining consistency and integrity of data from diverse sources is crucial to ensure its reliability and relevance to our analysis.