Every Child Deserves to Belong
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INTRODUCTION

Over a quarter of a million children in the United States are placed in the foster care system each year. Using the 2021 National Data Archive on Child Abuse and Neglect (NDACAN) with 105 variables and 631,893 observations, the child's background, gender, race, age, length of stay in the foster care system, family structure, removal and discharge reasons were analyzed. In addition, whether the child was disabled was also considered. **With the thought in mind of Every Child Deserves to Belong, the research goal is to minimize the length of stay of children in foster care and to minimize the number of children in foster care.** To this end, this research investigates (1) why children from unmarried couples have the shortest length of stay in foster care; (2) how a child's transition to independence is affected by the presence of a clinical disability; (3) how a child's transition to independence varies by race; (4) what combinations of the child's race and the family structure from which the child was removed result in longer lengths of stay; and (5) how does a number of runaways vary by family structure from which the child was removed.

METHODS

R Packages The following packages were used to wrangle the data, perform tests and create visuals: tidyverse, ggplot2, dplyr, statar, ggpubr, broom, multcomp, car, rstatix, MASS, corrplot.

Data Wrangling was used to filter the levels of categorical variables, clear missing values from quantitative variables, reorder levels of categorical variables, and create subsets for each analysis. Transformations suggested by the Box-Cox function were created for the Multiple Linear Regression and Two-way ANOVA.

Multiple Linear Regression was used to predict the length of stay for a child in foster care based on the reason of removal from the caretaker's home.

T-test was used to create the confidence intervals for significant predictors of the Multiple Linear Regression.

Chi-Square was used to determine whether there was a significant relationship between a child's caretaker family structure and the race of the child. In addition, Chi-Squared analysis was used to determine whether there is a significant relationship between a child's caretaker family structure and the reason for discharge from foster care.

Simple Linear Regression and **Stratified Scatterplots** were used to compare the relationship between the length of stay in foster care and the age at which the child entered foster care over the variables gender and race. "facet_wrap" split the graph into individual scatterplots for each identified race. Color separated the regression lines into male and female.

ONE WAY ANOVA was used to determine whether the race of the child predicts the length of child's stay in foster care.

TWO WAY ANOVA was used to see if there is an interaction effect on length of stay in the foster care system by child's caretaker family structure and whether a child had a clinical disability.

Box-Cox Transformation was used to obtain homogeneity and normality for two-way ANOVA and Multiple Linear Regression.

CODE

RESULTS

Table 1: Two Way ANOVA after Box-Cox Transformation

Figure 1: Tukey's Post-Hoc Test
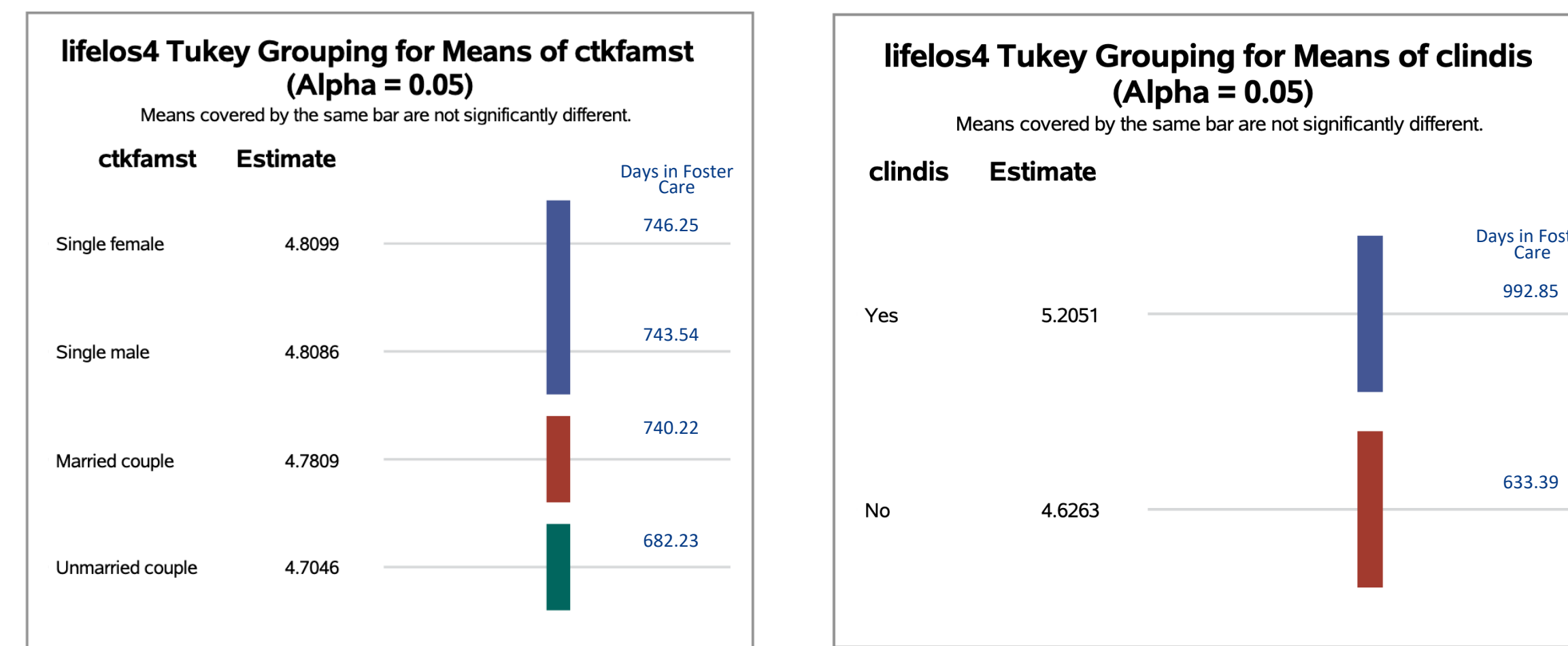
Table 2: Regression Model on Length of Stay in Foster Care After Box-Cox Transformation

Table 3: 95% Confidence Interval on Length of Stay in Foster Care (yes-no) for Significant Variables

Indicator Variables for Removal Reasons Predictor	95% Confidence Interval on Length of Stay When the Indicator Variable for Removal Reason is Present	
	Lower Bound	Upper Bound
Neglect	21	30
Child Disability	246	296
Abandonment	27	47
Housing	13	27
Sexual Abuse	6	28
Child Behavior Problem	14	33
Alcohol Abuse Parent	-47	-27
Drug Abuse Parent	-123	-115
Drug Abuse Child	-96	-63

Figure 2: Mean Length of Stay in Foster Care (yes-no) for Reasons of Removal
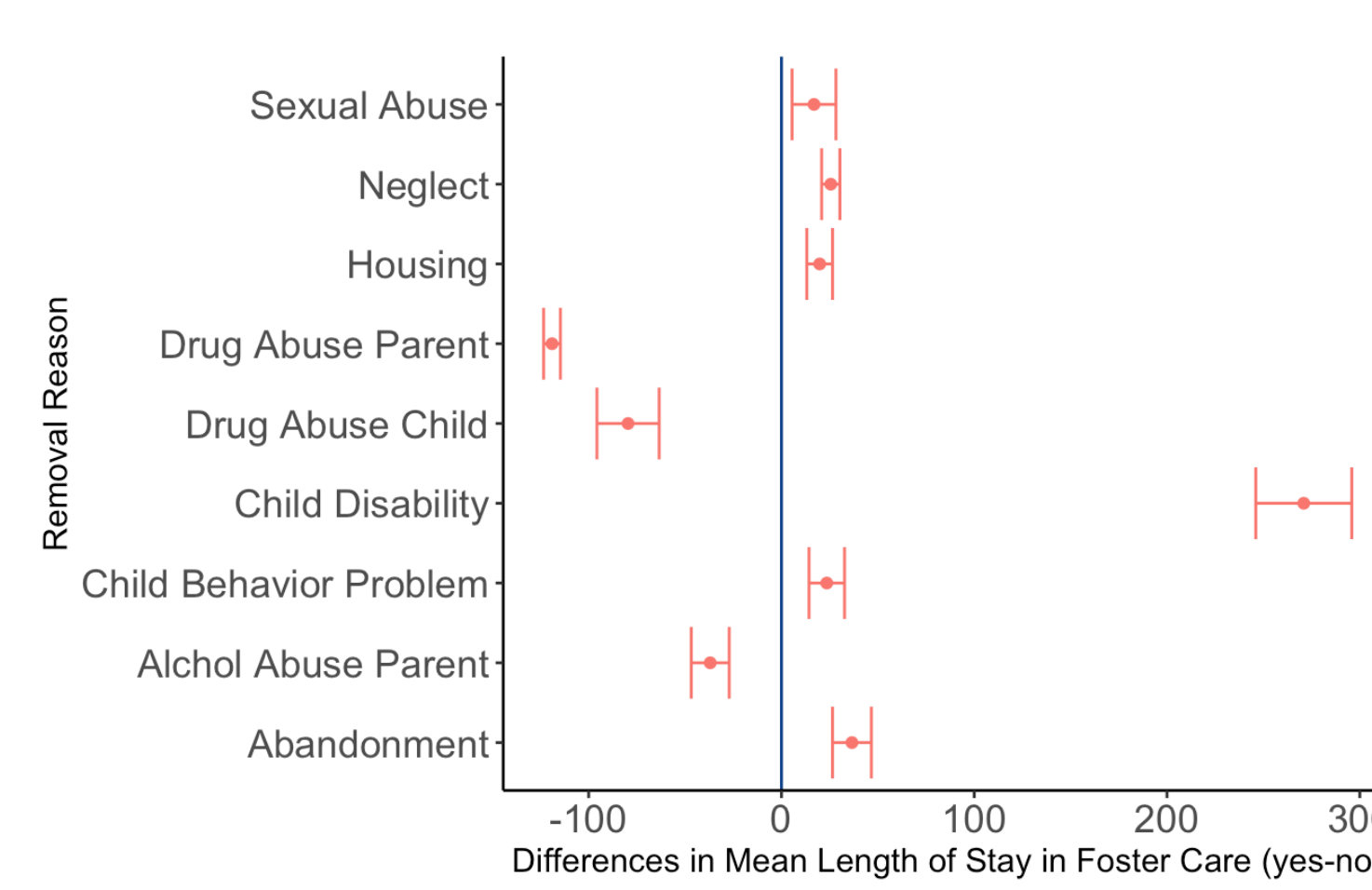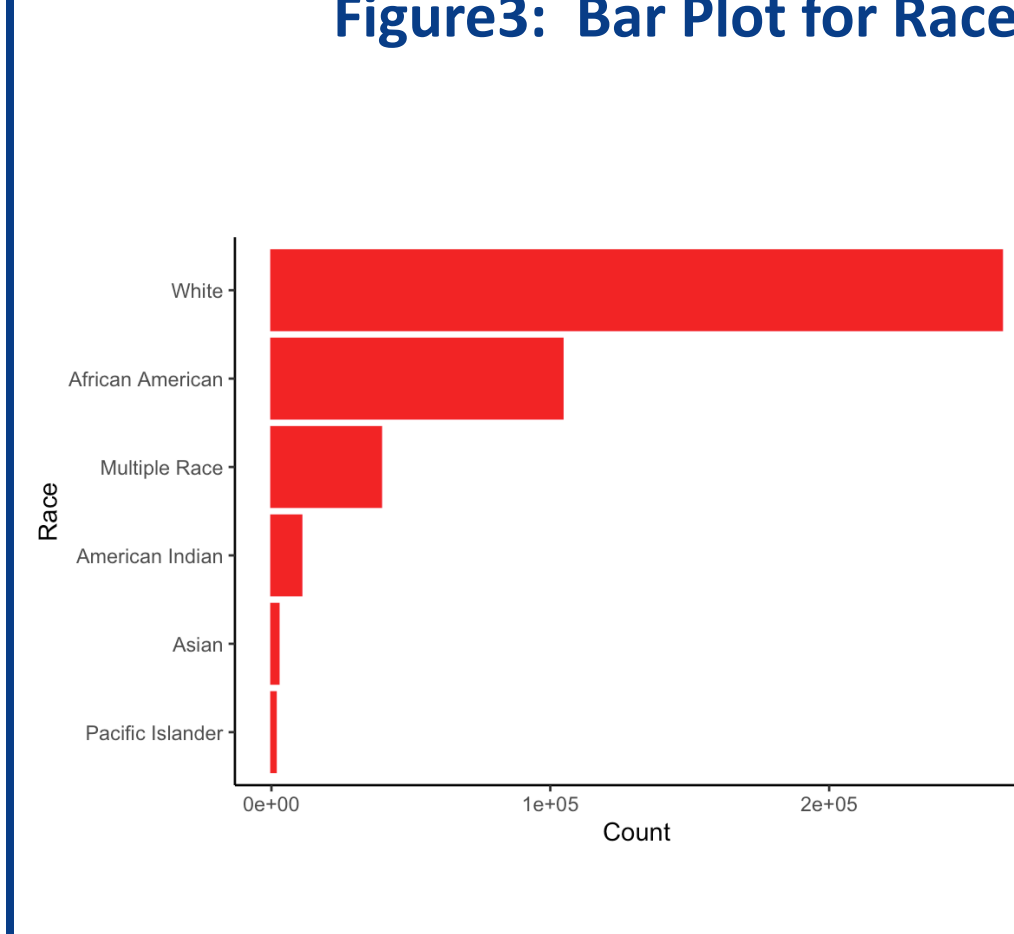
Figure3: Bar Plot for Race

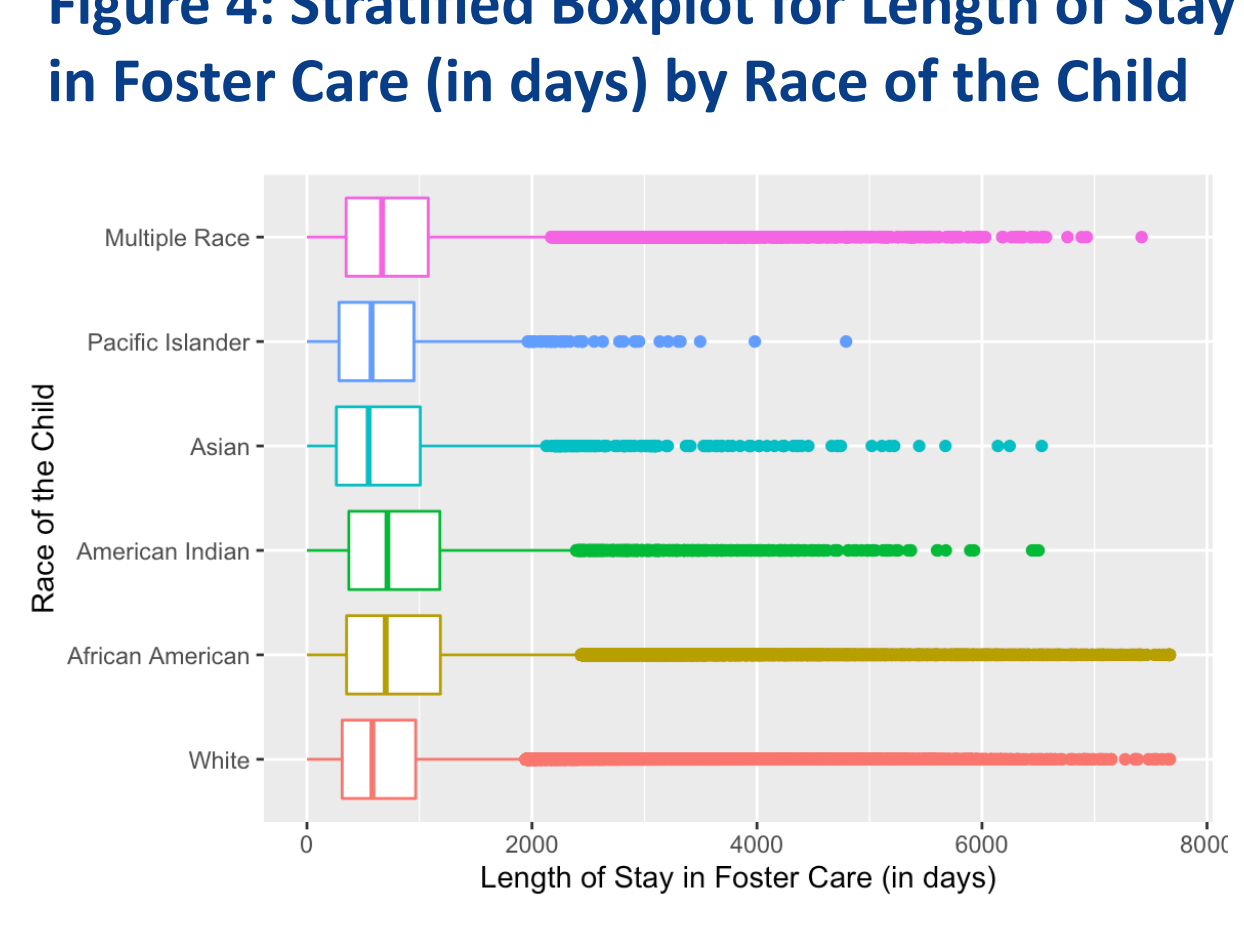**Figure 4: Stratified Boxplot for Length of Stay in Foster Care (in days) by Race of the Child**

Figure 5: Mean Length of Stay in Foster Care Stratified by Race Combinations
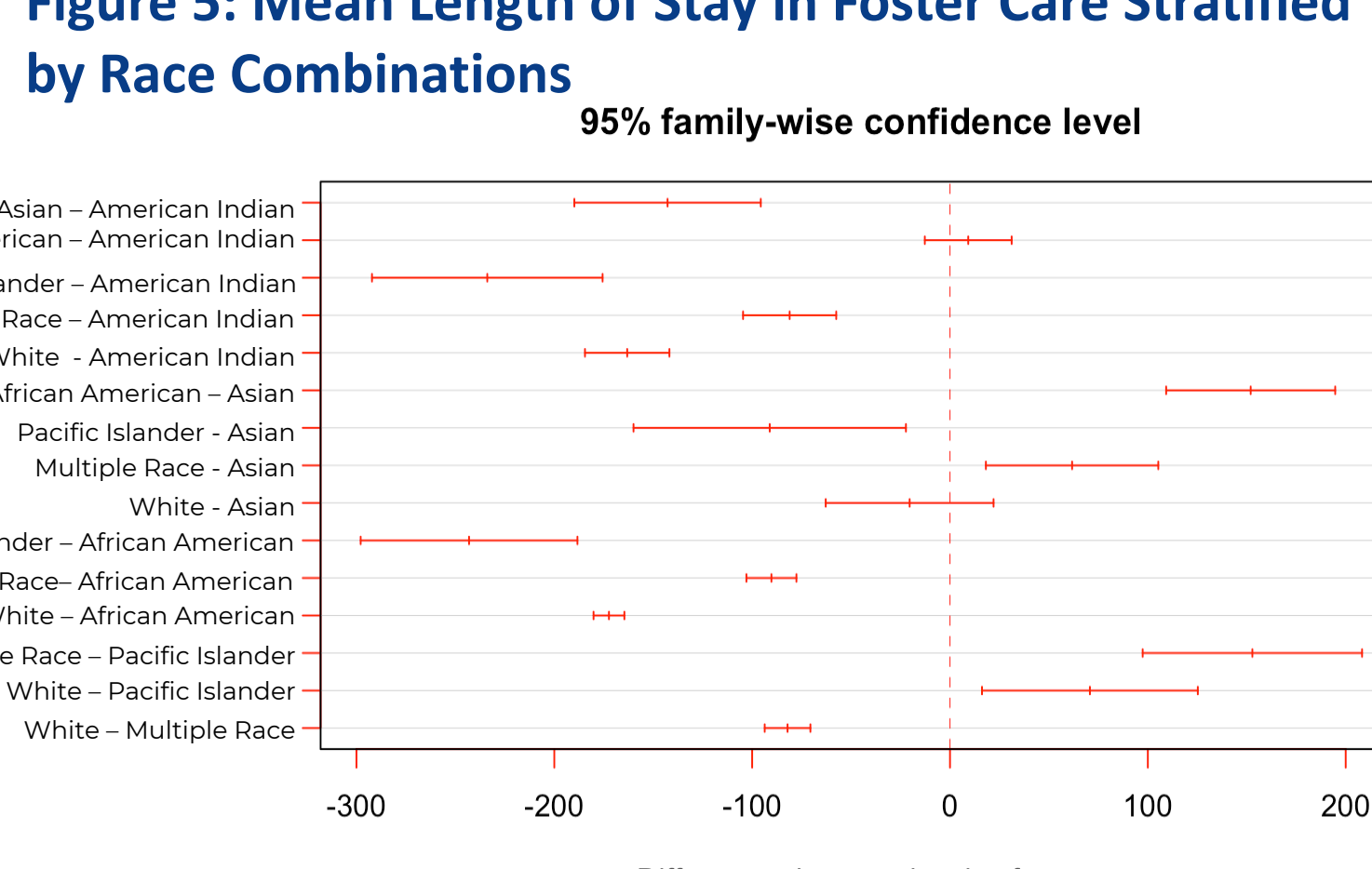
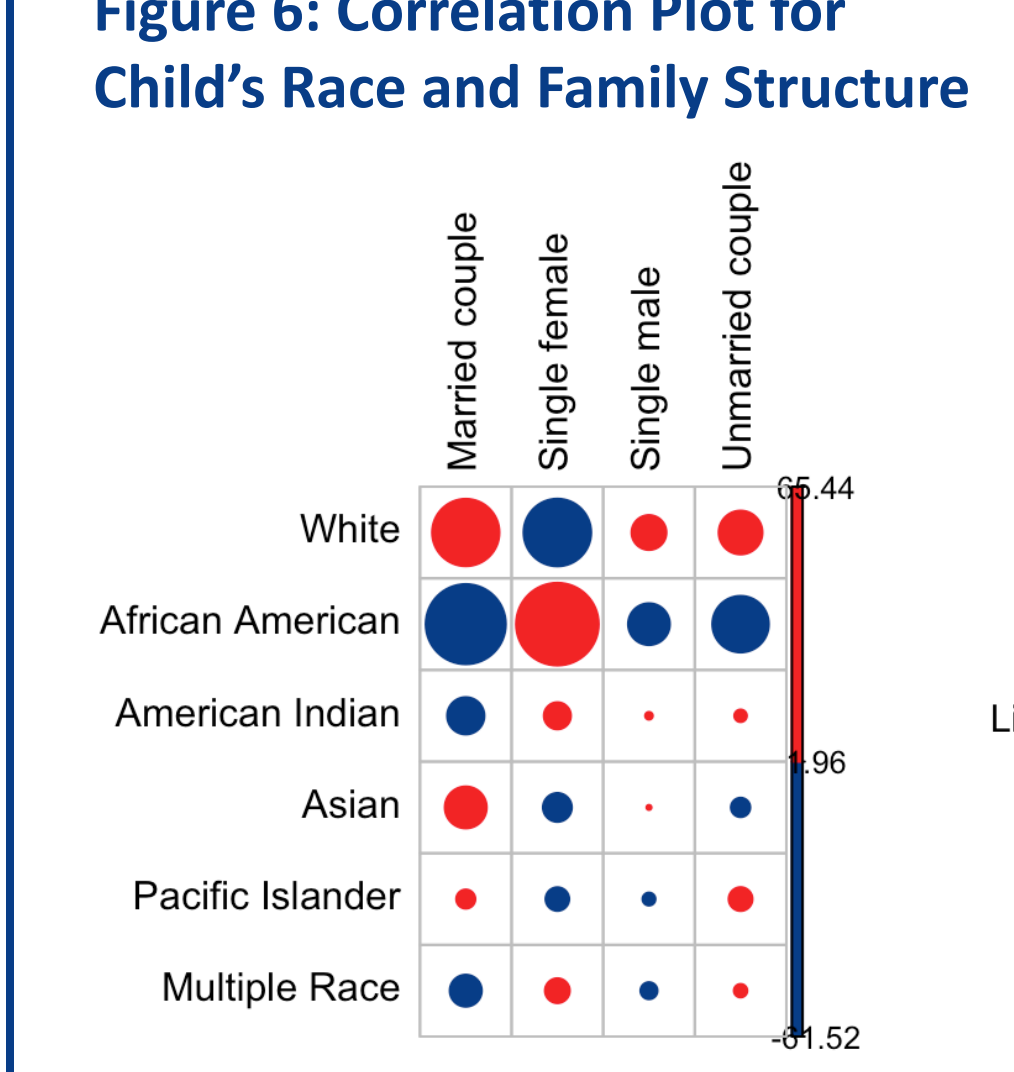**Figure 6: Correlation Plot for Child's Race and Family Structure**

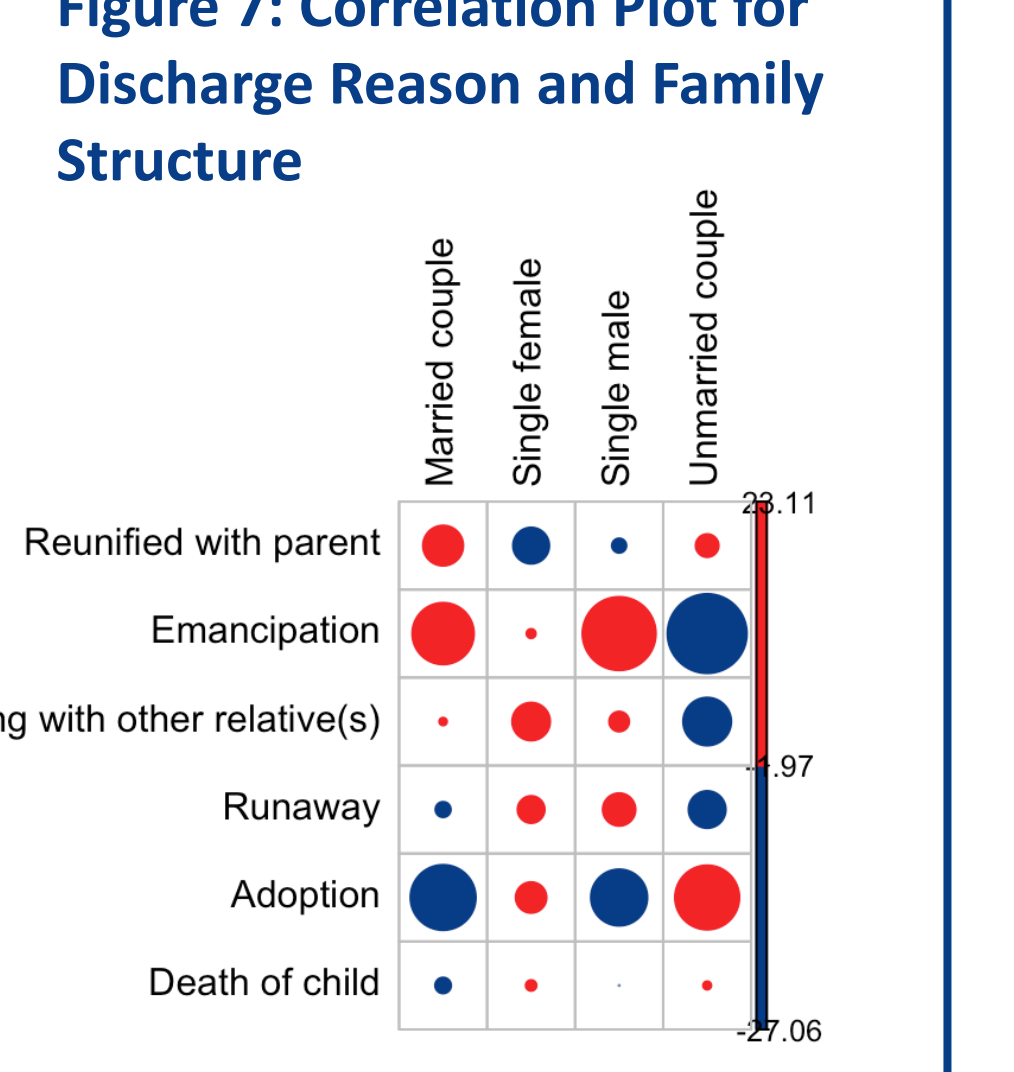**Figure 7: Correlation Plot for Discharge Reason and Family Structure**
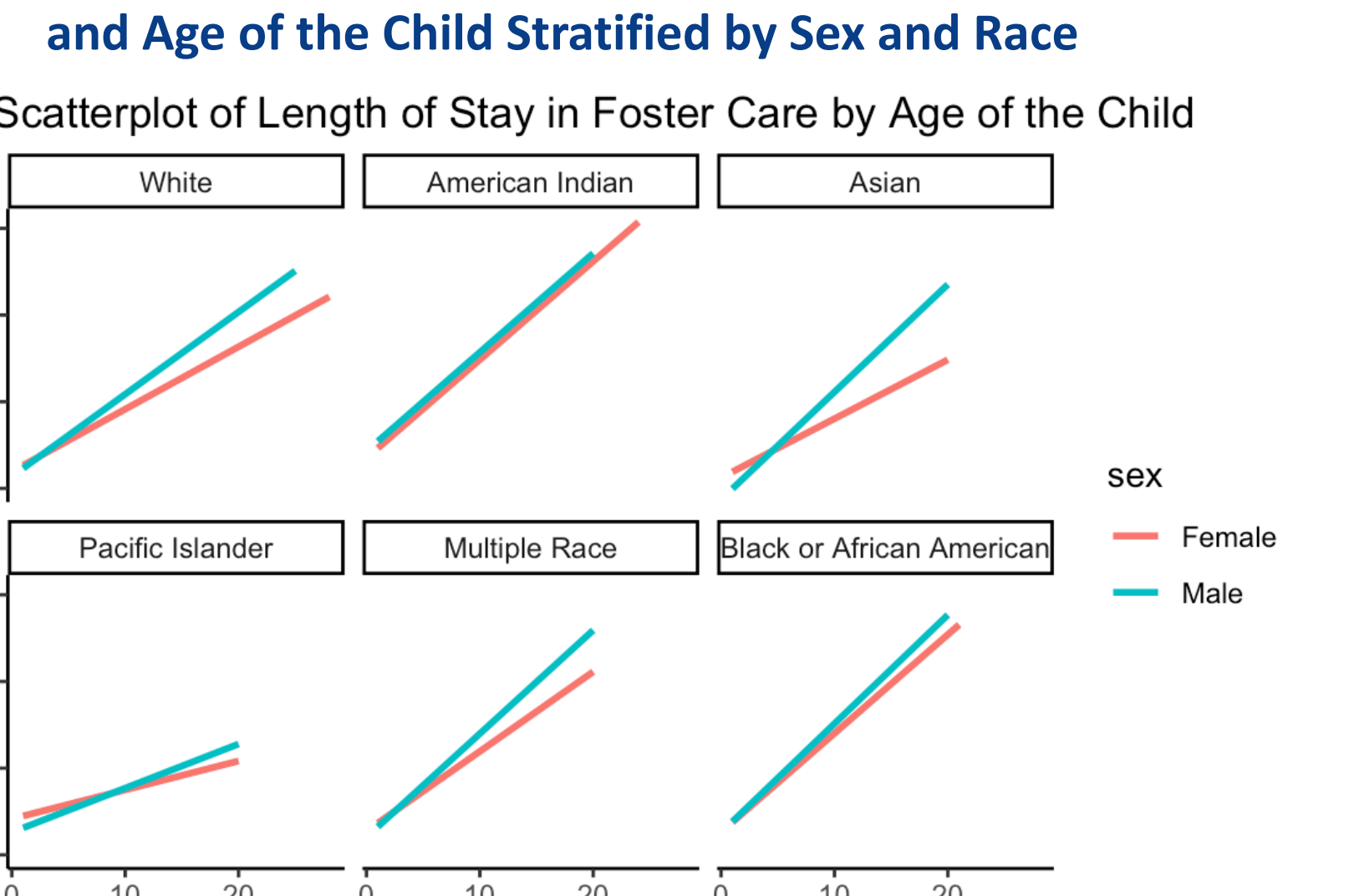
Figure 8: Scatterplots for Length of Stay in Foster Care and Age of the Child Stratified by Sex and Race

RESULTS (text)

TWO WAY ANOVA after Box-Cox Transformation Table 1 indicates that family structure and clinical disability are both significant factors when predicting length of child's stay in foster care.

Tukey's Post-Hoc Test Figure 1 indicates that children who came from unmarried couples had a significantly shorter length of stay than those from married couples, single males, or single females. Children who were clinically diagnosed with a disability stay in foster care significantly longer than children without disabilities.

Regression Model on Length of Stay in Foster Care After Box-Cox Transformation Table 2 indicates the reasons of removal that predict the length of child's stay in foster care. Children who were removed from their home due to being neglected, diagnosed with a disability, abandoned, or having inadequate housing spent more days in foster care. Children who were removed from their home due to using drugs themselves or having a caretaker who abused alcohol or drugs stayed in foster care a shorter time.

95% Confidence Interval on Length of Stay in Foster Care (yes-no) for Significant Variables Table 3 indicates the average difference in length of stay in the foster care system when the listed indicator variable is present. The largest differences in length of stay involve children who have a disability. They stay 246 to 296 days longer in foster care. Children whose parents had a drug abuse problem stay 115 to 123 days shorter in foster care. Children with a drug abuse problem themselves stay 63 to 96 days shorter in foster care. Figure 2 demonstrates the 95% confidence intervals visually.

Stratified Boxplot for Length of Stay in Foster Care(in days) by Race of the Child Figure 3 shows that children of White descent are the dominant race in foster care system at 62%, with children of African American Descent being at 25%. Figure 4 indicates that children of White and African American descents have the most variable length of stay in foster care. Children of Pacific Islander descent have the least. All races are skewed right with severe outliers. The largest length of stay in foster care system is 7670 days.

Mean Length of Stay in Foster Care Stratified by Race Combinations Figure 5 indicates that children of White descent have a shorter time in foster care system than children of American Indian, African American, Multiple Race and a longer time than children of Pacific Islander descent. Children of African American descent have a longer time in foster care system than children of Asian, Pacific Islander, Multiple Race and White descents.

Correlation Plot for Child's Race and Family Structure Focusing on the dominant races in foster care, Figure 6 indicates that the majority of children from White descent in foster care system came from couples (married and unmarried). The majority of children of African American descent in foster care system came from single females.

Correlation Plot for Discharge Reason and Family Structure Figure 7 indicates that children who come from married couples are more likely to be emancipated or reunified with parent. Children who came from single females are more likely to live with other relatives, be adopted or be a runaway. Children who came from single males are more likely to be emancipated or be a runaway. Children of unmarried couples are more likely to get adopted.

Scatterplots for Length of Stay in Foster Care and Age Stratified by Gender and Race Figure 8 displays the relationships between the age of the child and the length of stay. Older age of a child entering the foster care system is associated with a longer stay across all races and genders. For males across all races, the rate of increase in time spent in the foster care system is more severe than females. Children of White, American Indian and African American descents have children who stay in foster care past the age of 18. Children may continue to work on educational or vocational goals within the foster care system until the age of 21.

CONCLUSIONS

In order to reduce the length of a child's stay in foster care, we need to

o increase awareness about children from married couples having a low rate of adoption, and research why married couples have a low adoption rate;

o educate children about the support that the foster care system offers to reduce runaways;

o assist children with disabilities by providing them with resources about educational or vocational goals early on for a faster transition to independence;

o provide children of Pacific Islander, Asian and Multiple Race descents with information about foster care assistance after the age of 18; and

o provide single females with children of African American descent with support before their children are taken to possibly prevent their children from being removed.