

Distracted driving & Fatalities

- Deborah Ashmead
- Shanel Byas
- Sony Martin
- Sarah Wilson
- * Dataset provided by Kaggle courtesy of Mike Chirico *

<https://www.kaggle.com/code/mchirico/traffic-fatalities-getting-started/data>

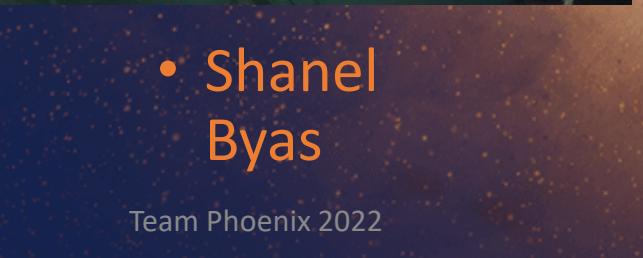




- Deborah Ashmead



- Shanel Byas



- Sony Martin



- Sarah Wilson

Deborah Ashmead

- Mother of five daughters – Two biological and three step-daughters and one grand-daughter
- Associates Degree in Criminal Justice
- Voluntary Fire Fighter/EMT – At the age of 18
- Career as a First Responder in Law Enforcement for 20 years and retired from the State of DE
- Currently EMT for several locate Fire Departments

Why Data Science

- I have always had an interest in learning more about computer technology
- I was one of three students who started the first computer programming class in high school
- I like to investigate and figure things out
- So, putting all those things together –DataScience to me is a good fit.

Shanel
Byas

Bachelor of Science in Chemistry
(2010)

Resident of Atlanta, GA

Assistant Rental Manager at Penkse
Truck Leasing

Former secondary science teacher

Lover of numbers



Sony Martin

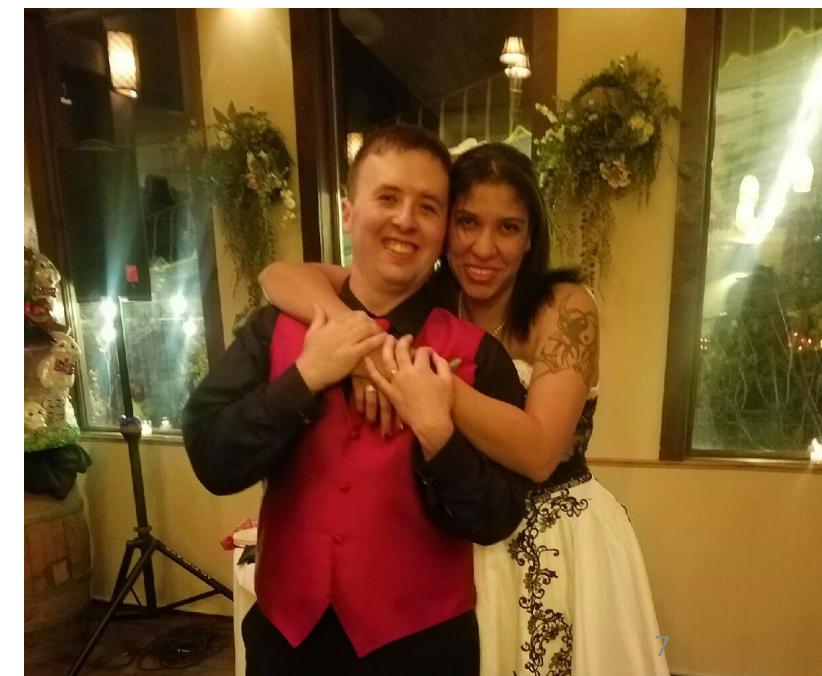
- Married 16 years
- Blended family of two one son Drake one daughter Carmen
- Dog mama to unique(black pit) mimi to tubbs jack jack and maui(the kitty)
- Former US Army 2nd generation(logistics specialist)
- Two- time navy mama
- AA criminal justice Univ Texas Arlington
- Certified google IT support tech
- Future certified data scientist



Team Phoenix 2022

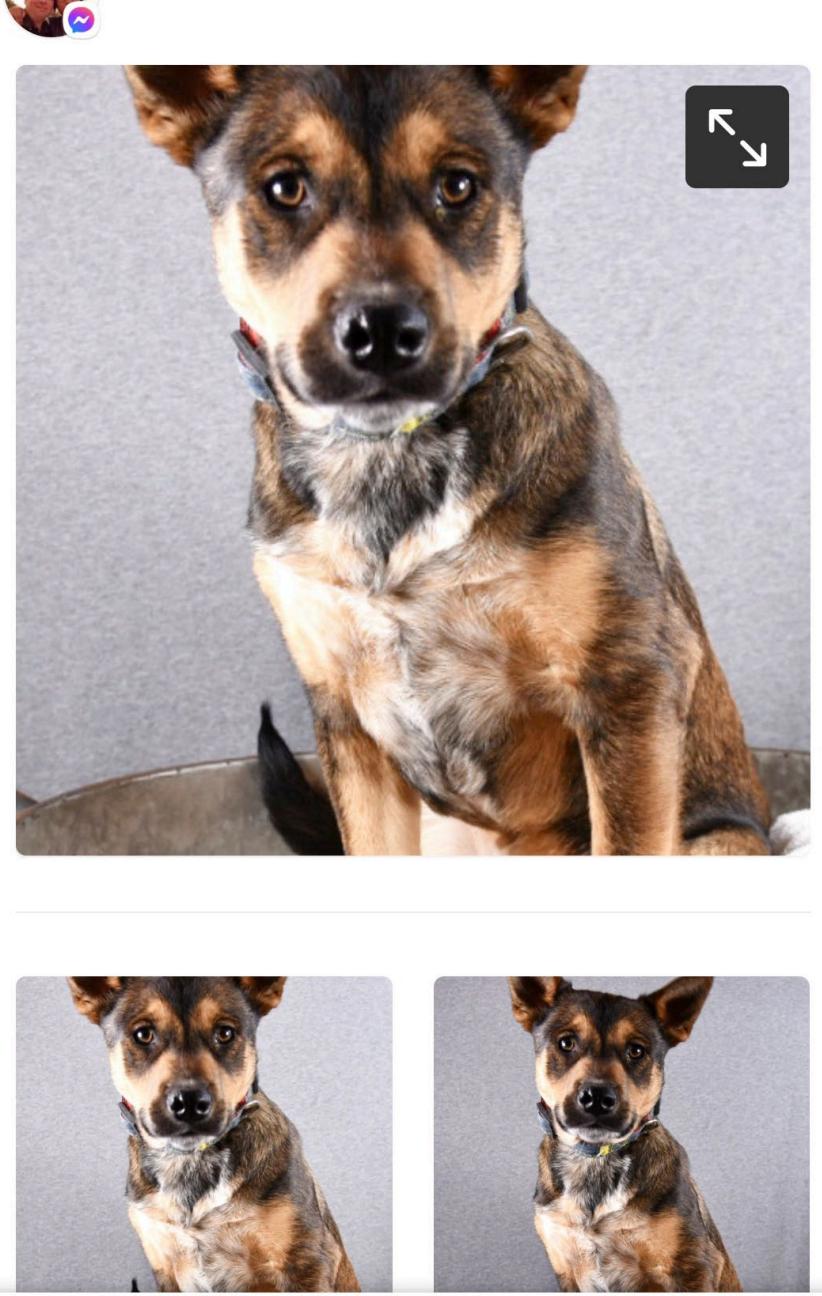


https://github.com/SWilson75/Team_Phoenix_Project

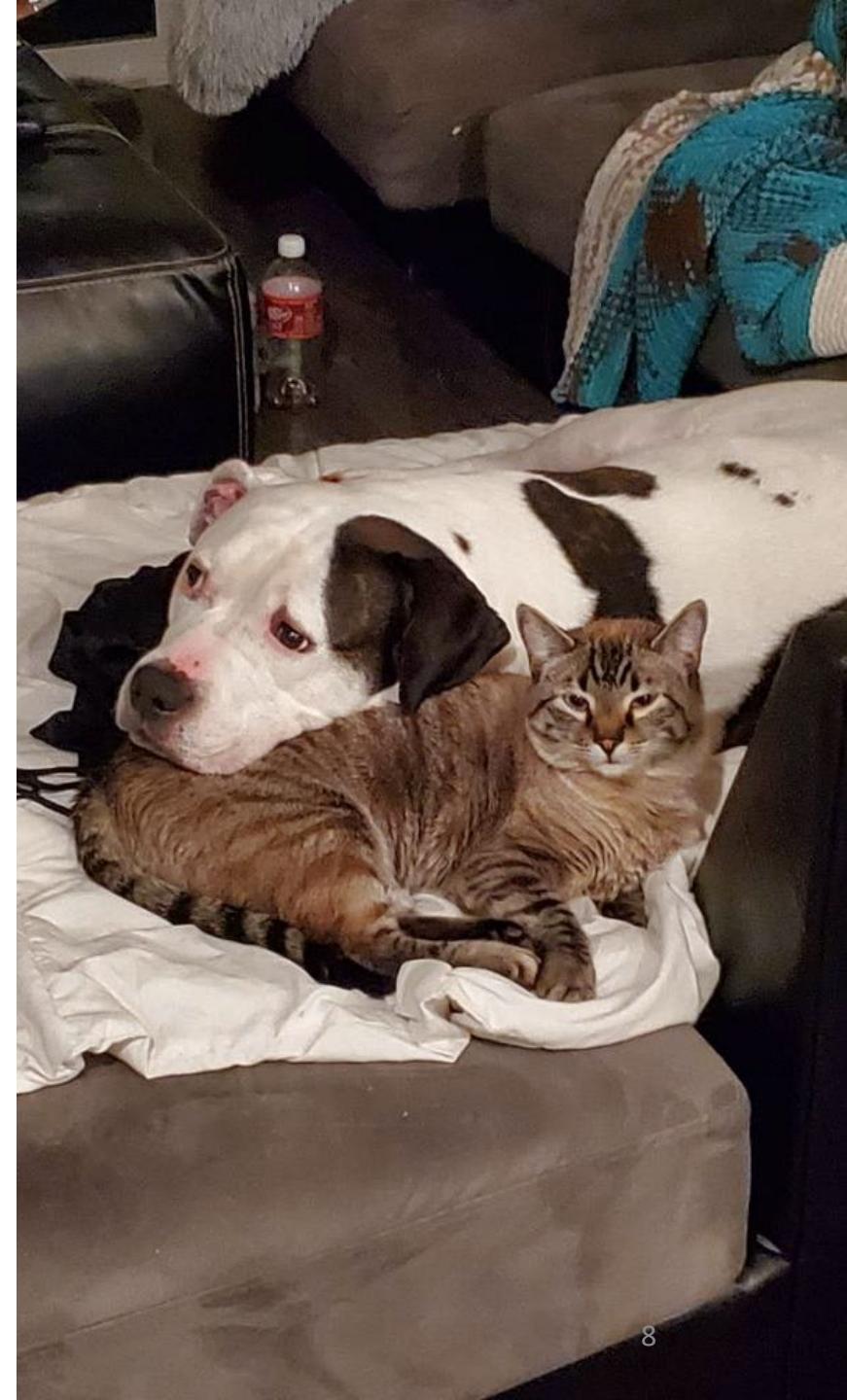




Team Phoenix 2022



https://github.com/SWilson75/Team_Phoenix_Project



Sarah Wilson

- After the Covid Lock Down was issued the company I was working for as application support on a mainframe Cobal program laid off over 100 people due to loss of contract. Having no formal certificates or degree in computer programming I was faced with the choice to go back to school to add to the knowledge I have in the computer technology field or back to start over in a new career again. I have always been interested in the data side of analytics; I knew it would be a good fit for me. This is a small part of WHY Data Science is for me.
- Newly Engaged
- I have had many endeavors along my life journey over the last 47 yrs.
 - Cosmetologist for 12 years
 - Caf  & Coffee Shop Owner for 4 years
 - Computer programmer and application support for 4 years
 - Being a Mom and Grandma is one of my greatest accomplishments



Sarah Wilson Family

- Together we have 5 children, 2 bonus in-laws (to be),
1 granddaughter.
- Breanna – 23 (Jesse – 24)
- Tony – 21 (Ashely -21)
- Daniel and Jonah – 6
- Thomas – 5
- Loraina – 3

** We also have 1 angel grandson Avery
who passed away in March 2022 **



Agenda

- Fatalities by seasons
 - Spring vs Summer
 - Fall vs Winter
- Drunk Driving Fatalities by the Month
- Distraction by state and fatalities by state



Introduction

Our county has had problems with accidents for many years from speed, disregarding stop signs/red lights, to inattentive driving. This is an issue that affects everyone, from young to old because we all travel via vehicle, walking and believe it or not it could involve someone sitting in their house (there are vehicle vs building accidents)

During our examination of the fatalities by month, we found it interesting that February has the lowest fatality rate.

We then decided to compare the season with fatalities to determine if there was a significant difference between

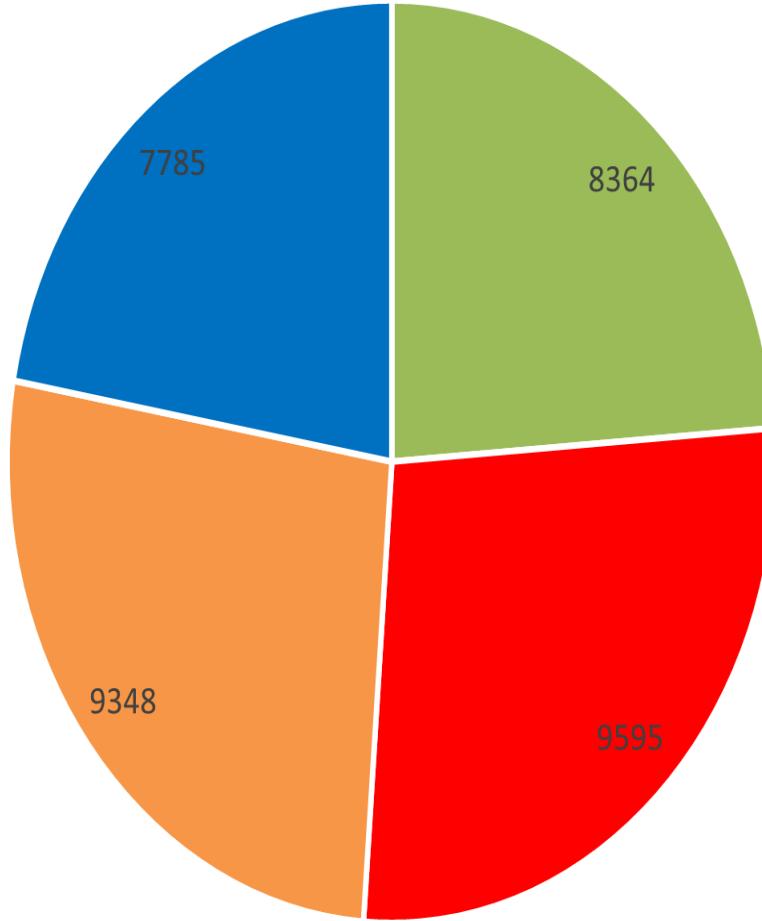
Spring vs Summer and Fall vs Winter.

There are so many varieties/branches that could be analyzed involving driving and texting, but we are going to stay with the injury side of this issue.

We are examining accident and distracted driving statistics from 2015.



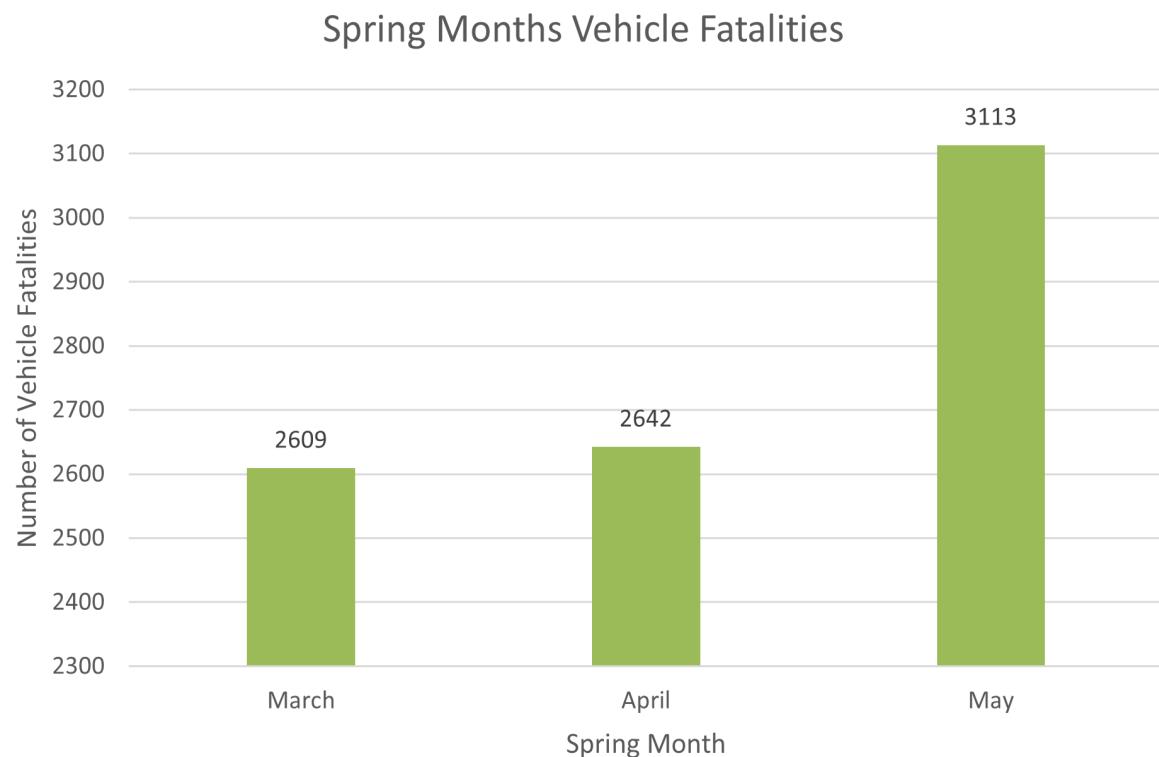
Vehicle Fatalities by Season



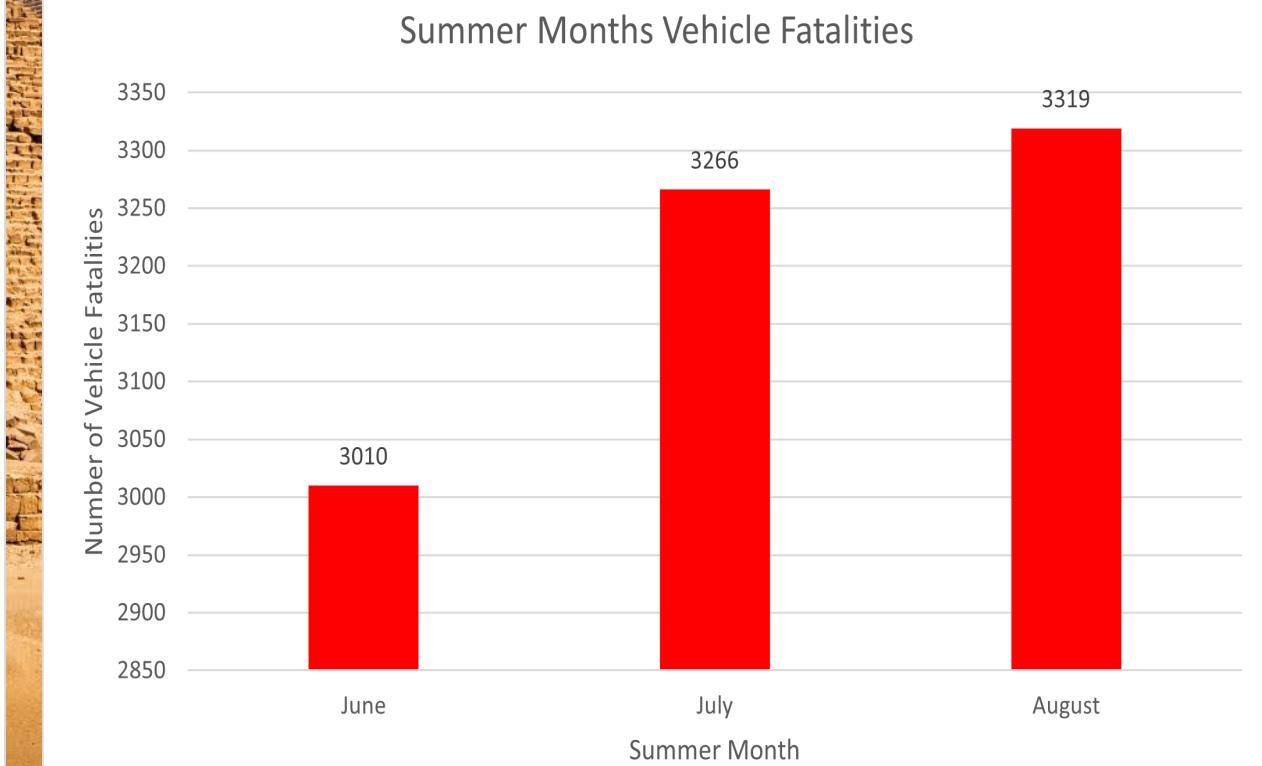
Analysis Question # 1:
Is there a significant
difference in vehicle
fatalities between the spring
and summer months?

Spring vs Summer Vehicle Fatalities

SPRING VEHICLE FATALITIES



SUMMER VEHICLE FATALITIES



Two Sample t-test

```
data: FATALS by Season
t = -0.23222, df = 16439, p-value = 0.8164
alternative hypothesis: true difference in means between group Spring and group Summer is not equal to 0
95 percent confidence interval:
-0.012538158 0.009881965
sample estimates:
mean in group Spring mean in group Summer
1.091621           1.092949
```

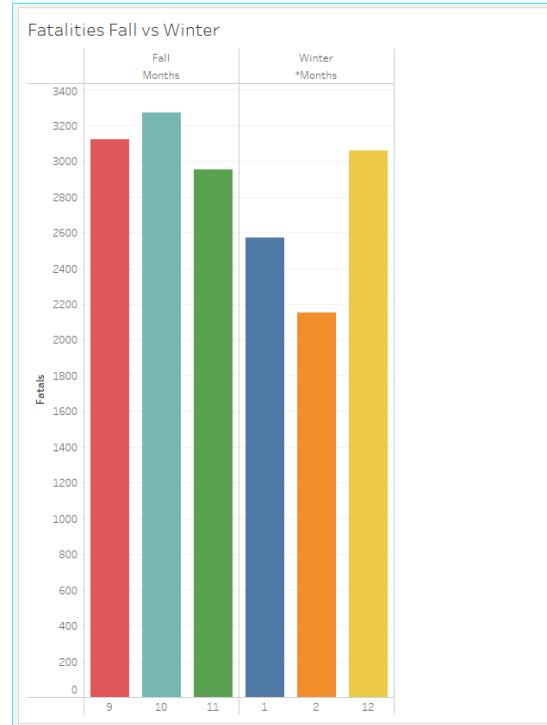
Analysis

Summary

- The p-value of vehicle fatalities for the spring and summer months is 0.864. The p-value is not significant at $p\text{-value} > 0.05$.
- **There is not a significant difference in vehicle fatalities between the spring and summer months.**

Analysis Question #2 :
Is there a significant
difference in vehicle
fatalities between the fall
and winter months?

Summary	
Count:	6
SUM(Fatals)	
Sum:	17,133
Average:	2,855.50
Minimum:	2,153
Maximum:	3,271
Median:	3,006.50



Fall vs Winter Fatal Accidents

Independent t-test Analysis

```
[21]: a_data2.groupby(['SEASON'])['FATALS'].describe()

[21]:    count    mean    std  min  25%  50%  75%  max
SEASON
Fall  8608.0  1.085967 0.350005  1.0   1.0   1.0   1.0   6.0
Winter 7117.0  1.093860 0.384001  1.0   1.0   1.0   1.0  10.0

[19]: stats.levene(a_data2['SeasonR'],a_data2['FATALS'])

[19]: LeveneResult(statistic=5431.916476149186, pvalue=0.8)

[22]: stats.ttest_ind(a_data2['SeasonR'], a_data2['FATALS'], equal_var = False)

[22]: Ttest_indResult(statistic=-110.0552883683105, pvalue=0.8)

[23]: def welch_dof(x,y):
    dof = (x.var()/x.size + y.var()/y.size)**2 / ((x.var()/x.size)**2 / (x.size-1) + (y.var()/y.size)**2 / (y.size-1))
    print(f"Welch-Satterthwaite Degrees of Freedom= {dof:.4f}")

welch_dof(a_data2['SeasonR'], a_data2['FATALS'])

Welch-Satterthwaite Degrees of Freedom= 28872.4494

[24]: def welch_ttest(x, y):
    ## Welch-Satterthwaite Degrees of Freedom ##
    dof = (x.var()/x.size + y.var()/y.size)**2 / ((x.var()/x.size)**2 / (x.size-1) + (y.var()/y.size)**2 / (y.size-1))

    t, p = stats.ttest_ind(x, y, equal_var = False)

    print("\n",
        f"Welch's t-test= {t:.4f}\n",
        f"p-value = {p:.4f}\n",
        f"Welch-Satterthwaite Degrees of Freedom= {dof:.4f}\n")

welch_ttest(a_data2['SeasonR'], a_data2['FATALS'])

Welch's t-test= -110.0553
p-value = 0.0000
Welch-Satterthwaite Degrees of Freedom= 28872.4494
```

Summary

- The p-value of vehicle fatalities for the fall and winter months is 0.0. The p-value is significant at p-value < 0.05.
- **There is a significant difference in vehicle fatalities between the fall and winter months with fall having the most accidents.**

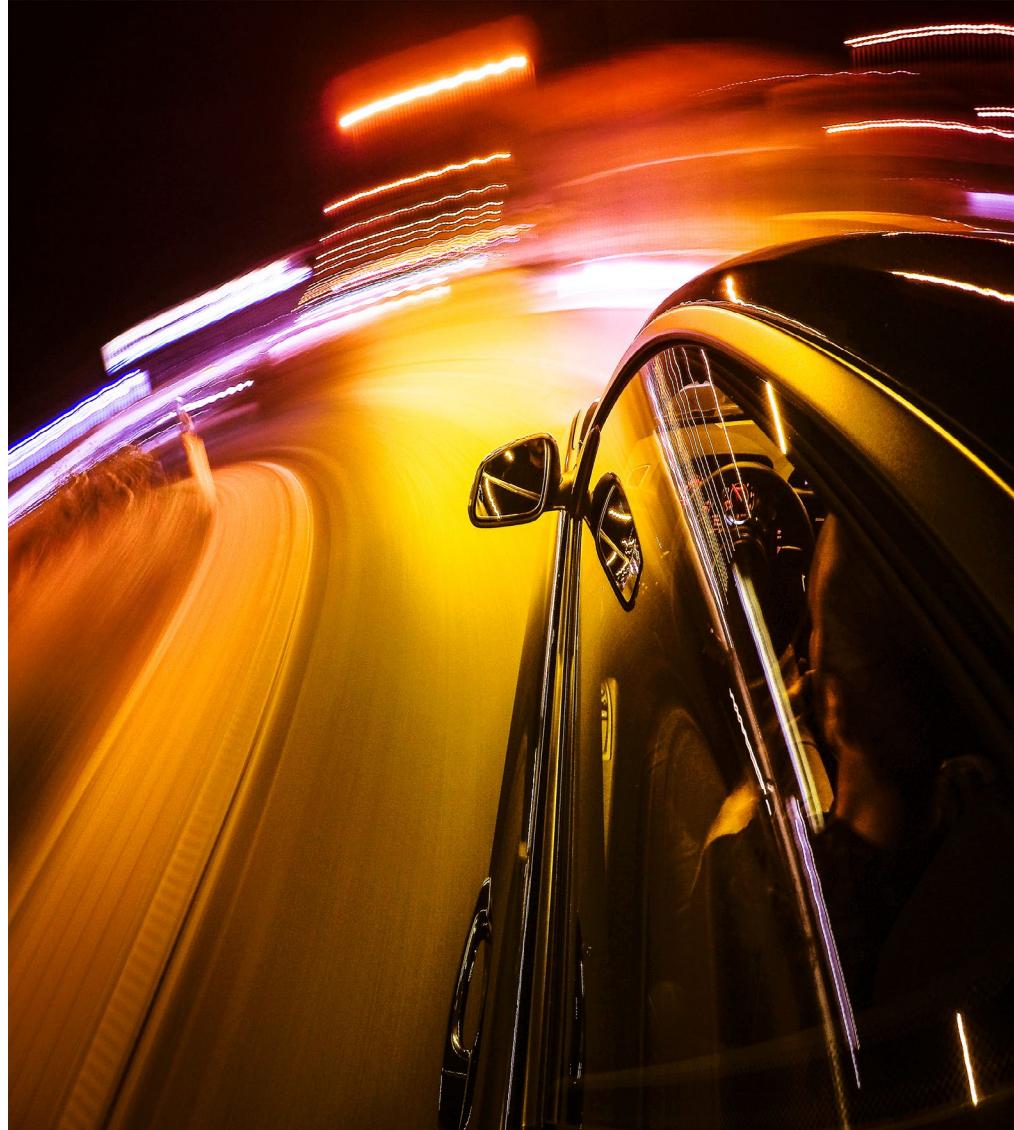


Drunk Driving by the month”

Don't drink
and drive

Drive
responsibly

Analysis Question # 3 :
Was there a relationship
between drunk driving and
fatalities by month ?



Jan – 2,368
drunk driving
accidents, 2573
fatalities

Feb- 1,968 drunk
driving accidents,
2,153 fatalities

Mar- 2,385 drunk
driving accidents,
2,609 fatalities

Apr- 2,430 drunk
driving accidents,
2,642 fatalities

May-2,847 drunk
driving accidents,
3,113 fatalities

Jun- 2,765 drunk
driving accidents,
3,010 fatalities

Jul- 2,998 drunk
driving accidents,
3,266 fatalities

Aug- 3,016 drunk
driving accidents,
3,319 fatalities

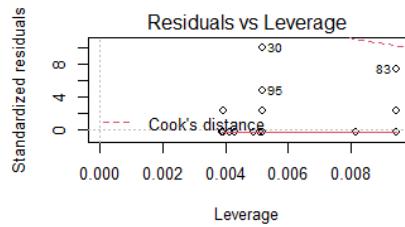
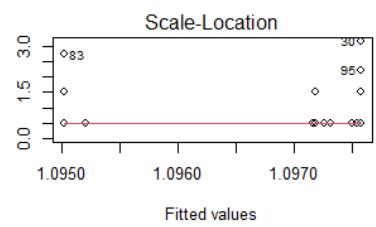
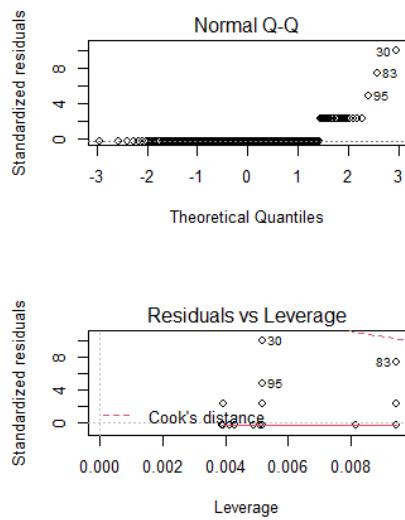
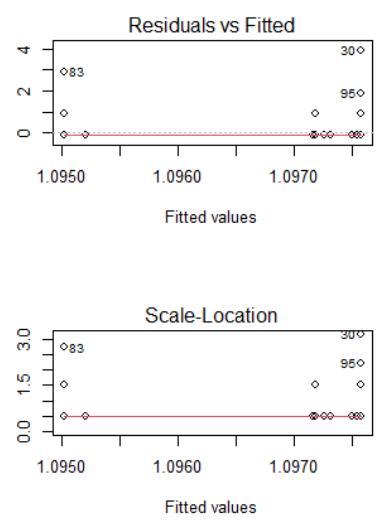
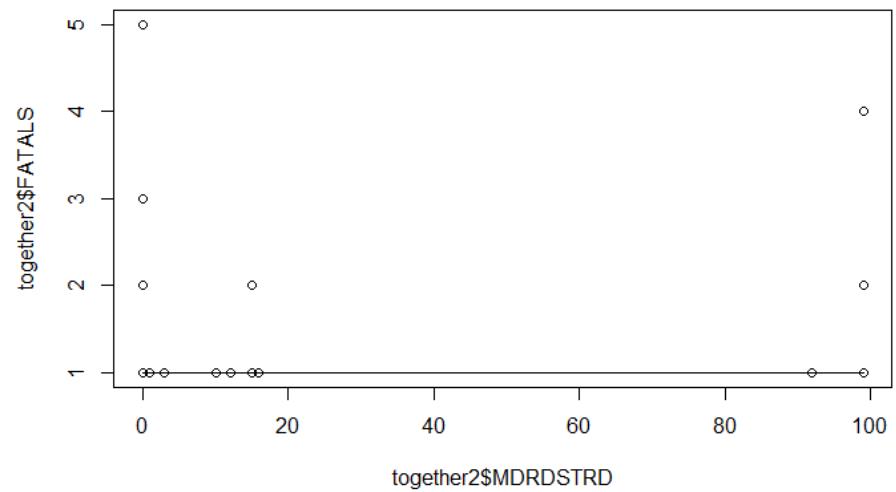
Sep- 2,865 drunk
driving accidents,
3,123 fatalities

Oct- 3,019 drunk
driving accidents
3,271 fatalities

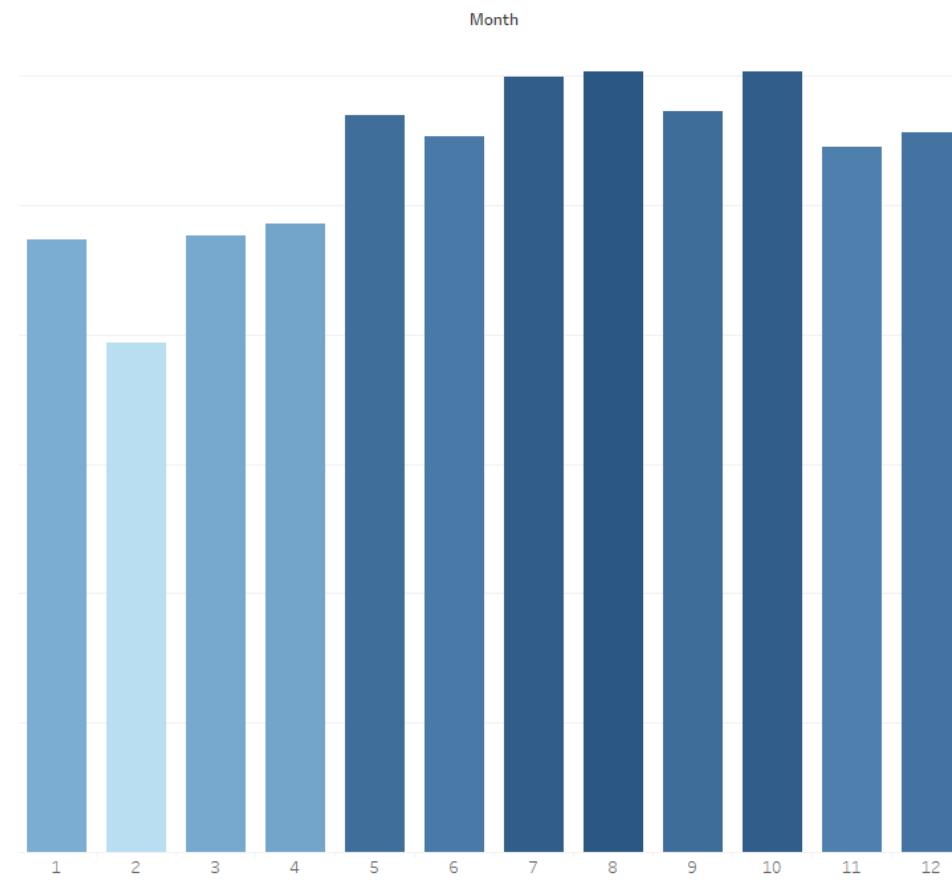
Nov- 2,724 drunk
driving accidents,
2,954 fatalities

Dec- 2,781 drunk
driving accidents,
3,059 fatalities

Fatalities by method of distraction



lr by mo



Analysis Question # 4 : What type of distractions caused accidents in the year 2015 ?

- Independent Variable – Distraction Levels – Categorical
- Dependent Variable –Continuous - Distractions broken down: Not Distracted, Unknown if Distracted, Not Reported, Inattention (Inattentive) Details Unknown , Distraction/Inattention, Looked But Did Not See, Other Distraction, No Driver Present/Unknown if Driver Present, Distraction (Distracted) Details Unknown, Other Cellular Phone Related, Distracted by Outside Person Object or Event, By Other Occupant(s), While Manipulating Cellular Phone, While Talking or Listening to Cellular Phone, While Using or Reaching For Device/Object Brought Into Vehicle, Careless/Inattentive, Eating or Drinking, While Adjusting Audio or Climate Controls, While Using Other Component/Controls Integral to Vehicle, Lost In Thought/Day Dreaming, Smoking Related, By a Moving Object in Vehicle, Distraction/Careless

Types Of Distractions

By Other Occupant(s) – 3 By a Moving Object in Vehicle – 4
While Using or Reaching for Device/Object Brought Into Vehicle - 10

While Talking or Listening to Cellular Phone – 5 While Manipulating Cellular Phone – 6
Other Cellular Phone Related - 15

While Adjusting Audio or Climate Controls – 7
While Using Other Component/Controls Integral to Vehicle – 9

Eating or Drinking – 13 Smoking Related – 14
Lost in Thought/Day Dreaming - 97

Looked But Did Not See – 1 Distracted by Outside Person, Object or Event - 12

Distraction/Inattention – 17 Distraction/Careless – 18 Careless/Inattentive - 19

Inattention (Inattentive), Details Unknown – 93

Other Distraction – 98 Distraction (Distracted), Details Unknown - 92

No Driver Present/Unknown if Driver Present – 16 Unknown if Distracted – 99
Not Distracted – 0 Not Reported - 96

Distractions - Total Number

Totaling
1,336,693



Drunk Driving – Totaling 13065

Alabama-309 Alaska-30 Arizona-374 Arkansas-196 California-1139
Colorado-256 Connecticut-128

Delaware-52 District of Columbia-6 Florida-967 Georgia-453 Hawaii-39
Idaho-90 Illinois-415 Indiana-202

Iowa-104 Kansas-90 Kentucky-267 Louisiana-353 Maine-102
Maryland-222 Massachusetts-103

Michigan-392 Minnesota-189 Mississippi-178 Missouri-297 Montana-
108 Nebraska-98 Nevada-162

New Hampshire-41 New Jersey-126 New Mexico-126 New York-318
North Carolina-556 North Dakota-68

Ohio-447 Oklahoma-235 Oregon-205 Pennsylvania-447 Rhode Island-
26 South Carolina-419

South Dakota-52 Tennessee-369 Texas-1253 Utah-68 Vermont-18
Virginia-322 Washington-238

West Virginia-90 Wisconsin-256 Wyoming-64

Fatal Totals By State – Totaling 54,494

- Alabama-1316 Alaska-101 Arizona-1394 Arkansas-844 California-4881 Colorado-868
- Connecticut-402 Delaware-199 District of Columbia-30 Florida-4631 Georgia-2267
- Hawaii-146 Idaho-308 Illinois-1508 Indiana-1302 Iowa-490 Kansas-522 Kentucky-1208
- Louisiana-1090 Maine-217 Maryland-807 Massachusetts-437 Michigan-1558 Minnesota-662
- Mississippi-992 Missouri-1362 Montana-303 Nebraska-385 Nevada-507 New Hampshire-165
- New Jersey-827 New Mexico-434 New York-1639 North Carolina-2136 North Dakota-203 Ohio-1773
- Oklahoma-988 Oregon-65 Pennsylvania-1861 Rhode Island-65 South Carolina-1570 South Dakota-207
- Tennessee-1543 Texas-5641 Utah-463 Vermont-82 Virginia-1095 Washington-895 West Virginia-396
- Wisconsin-882 Wyoming-239

Always Think Before You Do

- Distractive driving is not just drunk driving or cell phone usage
- Anything that takes your eyes away from the roadway for a split second can cause an accident
- There is nothing that important to have to divert your attention when driving
- There are millions of accidents in the USA every year -no one wants to get hurt and/or hurt others so always think before you do

Change your ways of driving

Do not drink and drive – get a cab, uber, or friend to drive you home

Make sure you are in the right frame of mind to drive - having plenty of sleep, not driving when upset/mad, and attempt from wondering about other manners while driving

If you need to adjust something, eat, drink, or just moving things around in the vehicle – pull over and complete your task

Do not use your cell phone while the vehicle is in motion

HOW ONE BAD CHOICE AFFECTS ONE'S LIFE

The way to get
started is to quit
talking and begin
doing.

WALT DISNEY

Thank you from Team Phoenix!

Deborah Ashmead

Shanel Byas

Sony Martin

Sarah Wilson

