# Alcohol Consumption and World Happiness
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This data analysis is intended to observe how alcohol and world happiness affect one another. Kaggle is a website that provides an abundance of statistical data published, such as this one called the Happiness and Alcohol Consumption. As the name suggests, it is a report based on how alcohol consumption impacts overall happiness across the globe. It targets 122 countries, analyzes multiple categories like region, Alcohol type per-capita, Hemisphere, and Happiness score. Based on the data countries such as happy countries, medium happy countries and not so happy countries the goal is to determine which ones have the highest alcohol consumption.

Here we assess the happiness level by region. As illustrated, the western Europe and East Asia appear to have the highest happiness levels out of all the other categories.
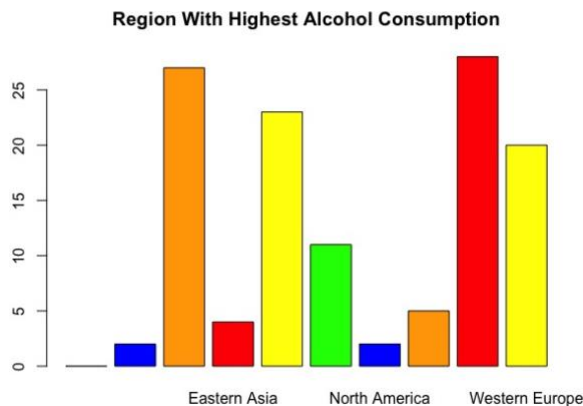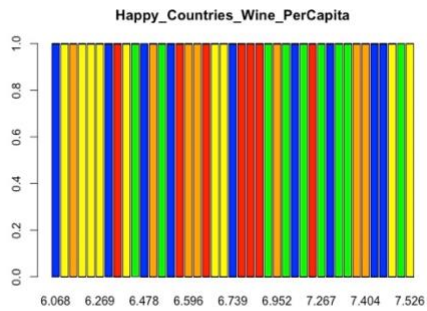

In this portion the data from happy, not happy, and moderately happy countries is aimed to see how the different types of alcohol influence their happiness levels.
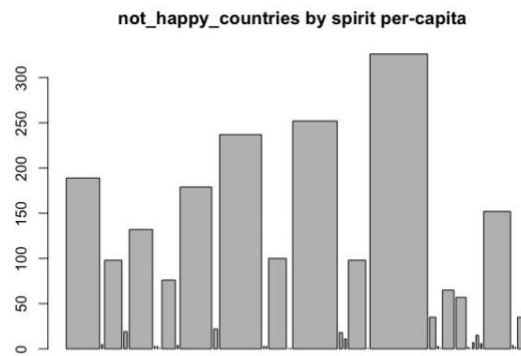
Happy Countries plot
In this category we assess countries that are most happy based on the types of alcohol consumed

Happy_Countries_Wine_PerCapita
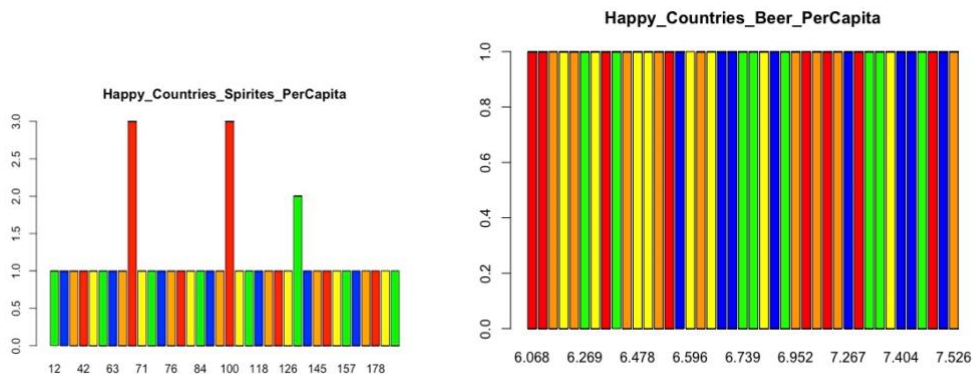
Not Happy Countries plot

In this category we see which alcohol influences countries that are not happy compared to other alcohols within its categories.

not_happy_countries by Beer_per-capita

not_happy_countries by wine per-capita

not_happy_countries by spirit per-capita
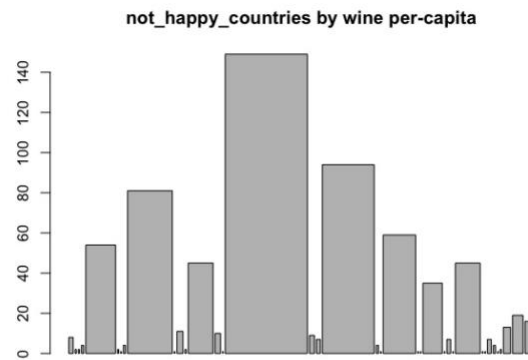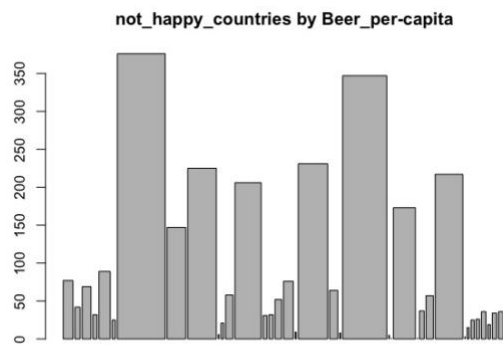
Medium Happy Countries plot

This last category we analyze the countries which are moderately happy and how the various types of alcohol consumption can influence their overall happiness levels
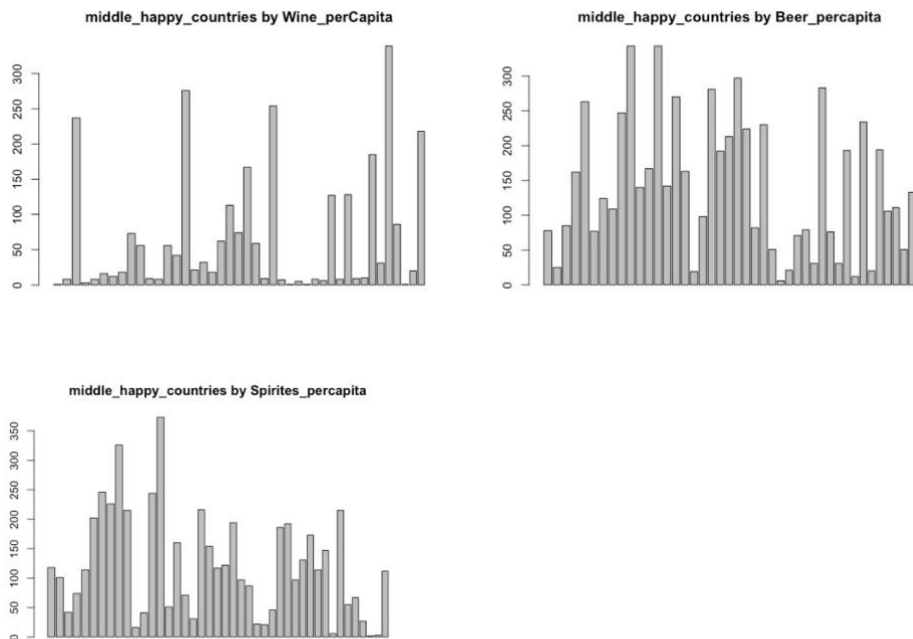
As shown here the mean for all three categories for countries that are happy, unhappy and happy show the numeric score.

```
> meanMediumHappy
[1] 329.1395
> meanNotHappy
[1] 152.2632
> meanHappy
[1] 408.6341
```

Standard Deviation And Z test:

Each category from Happy, Medium Happy and Not Happy are calculated through the use of the z test. The purpose behind this is to see if the overall null hypothesis and p-value can confirm whether or not alcohol consumption has any effect on happiness levels.

The first z test illustration below is for countries that are not happy compared to those that are medium happy. Obtaining a zeta of 20.70285 and a P-value of 0. It illustrates medium happy countries are not much different compared to those that are not happy.

R code:

```
> sd.NotHappy.MediumHappy <- sqrt(sd.NotHappy^2/NotHappy.length + sd.NotHappy^2/MediumHappy.length)
> zeta <- (meanMediumHappy - meanNotHappy)/sd.NotHappy.MediumHappy
> zeta
[1] 20.70285
> p<- 1-pnorm(zeta)
> p
[1] 0
```

The second z test represents the countries that are happy and those that are medium happy.

R code:
```
> sd.Happy.MediumHappy <- sqrt(sd.Happy^2/Happy.length + sd.Happy^2/MediumHappy.length)
> zeta <- (meanMediumHappy - meanHappy)/sd.Happy.MediumHappy
> zeta
[1] -2.096158
> p<- 1-pnorm(zeta)
> p
[1] 0.9819659
```

The third z test represents the countries that are not happy compared to countries that are happy
R code:
```
> sd.NotHappy.Happy <- sqrt(sd.Happy^2/Happy.length + sd.Happy^2/NotHappy.length)
> zeta <- (meanNotHappy - meanHappy)/sd.NotHappy.Happy
> zeta
[1] -6.552981
> p<- 1-pnorm(zeta)
> p
[1] 1
```

So which are the happiest Countries?

Here we calculate which region, country, hemisphere, and alcohol categories all which influence overall happiness levels. As concluded, in the north hemisphere in Europe, Denmark appears to be the happiest compared to other countries across the global. From the data we can target which countries have the highest happiness levels compared to other countries that have lower happiness levels. To get an idea of what countries are happiest it will be based on five selections to see what region and country has the highest happiness levels.

```
> Happiness_Alcohol[1,]
  Country            Region Hemisphere HappinessScore HDI GDP_PerCapita
2 Denmark Western Europe       north         7.526 928         53.579
  Beer_PerCapita Spirit_PerCapita Wine_PerCapita TotalAlcohol
2            224               81            278          583
  Level_of_Happiness
2               High


> Happiness_Alcohol[2,]
      Country            Region Hemisphere HappinessScore HDI GDP_PerCapita Beer_PerCapita
3 Switzerland Western Europe       north         7.509 943         79.866            185
  Spirit_PerCapita Wine_PerCapita TotalAlcohol Level_of_Happiness
3              100            280          565               High
>


> Happiness_Alcohol[3,]
  Country            Region Hemisphere HappinessScore HDI GDP_PerCapita
4 Iceland Western Europe       north         7.501 933          60.53
  Beer_PerCapita Spirit_PerCapita Wine_PerCapita TotalAlcohol
4            233               61             78          372
  Level_of_Happiness
4               High


> Happiness_Alcohol[4,]
  Country           Region Hemisphere HappinessScore HDI GDP_PerCapita
5  Norway Western Europe       north         7.498 951          70.89
  Beer_PerCapita Spirit_PerCapita Wine_PerCapita TotalAlcohol
5            169               71            129          369
  Level_of_Happiness
5               High


> Happiness_Alcohol[5,]
  Country           Region Hemisphere HappinessScore HDI GDP_PerCapita
6 Finland Western Europe       north         7.413 918         43.433
  Beer_PerCapita Spirit_PerCapita Wine_PerCapita TotalAlcohol
6            263              133             97          493
  Level_of_Happiness
6               High
```

Based on the results above it can be confirmed Europe has the highest happiness levels in all five plots. More specifically countries like Denmark, Switzerland, Iceland, Norway, and Finland all of which have the highest happiness levels overall despite high alcohol consumption. This is a interesting discovery as one might think countries that have higher alcohol consumption are likely to be less happy.

How do the least happy countries compare?

```
> Happiness_Alcohol[111,]
        Country              Region Hemisphere HappinessScore HDI
112 Cote d'Ivoire Sub-Saharan Africa      north         3.916 486
    GDP_PerCapita Beer_PerCapita Spirit_PerCapita Wine_PerCapita
112         1.535            37                1              7
    TotalAlcohol Level_of_Happiness
112           45                Low
> Happiness_Alcohol[115,]
    Country              Region Hemisphere HappinessScore HDI
116    Chad Sub-Saharan Africa      north         3.763 405
    GDP_PerCapita Beer_PerCapita Spirit_PerCapita Wine_PerCapita
116           651            15                1              1
    TotalAlcohol Level_of_Happiness
116           17                Low
> Happiness_Alcohol[113,]
    Country              Region Hemisphere HappinessScore HDI
114  Angola Sub-Saharan Africa      south         3.866 577
    GDP_PerCapita Beer_PerCapita Spirit_PerCapita Wine_PerCapita
114         3.309           217               57             45
    TotalAlcohol Level_of_Happiness
114          319                Low
> Happiness_Alcohol[102,]
    Country              Region Hemisphere HappinessScore HDI
103 Senegal Sub-Saharan Africa      north         4.219 499
    GDP_PerCapita Beer_PerCapita Spirit_PerCapita Wine_PerCapita
103           953             9                1              7
    TotalAlcohol Level_of_Happiness
103           17                Low
> Happiness_Alcohol[97,]
   Country                   Region Hemisphere HappinessScore HDI
98 Ukraine Central and Eastern Europe      north         4.324 746
   GDP_PerCapita Beer_PerCapita Spirit_PerCapita Wine_PerCapita
98         2.186           206              237             45
   TotalAlcohol Level_of_Happiness
98          488                Low
> |
```

From the R code shown we can fully see the countries which are least happy. More specifically in Africa, countries such as Cote d'Ivoire, Chad, Angola, Senegal show the lowest levels in happiness based on alcohol consumption. Now, an interesting observation is while western Europe has a higher level of happiness, eastern Europe appears to have a low level in happiness.

Permutation Test:

Histogram of D_null
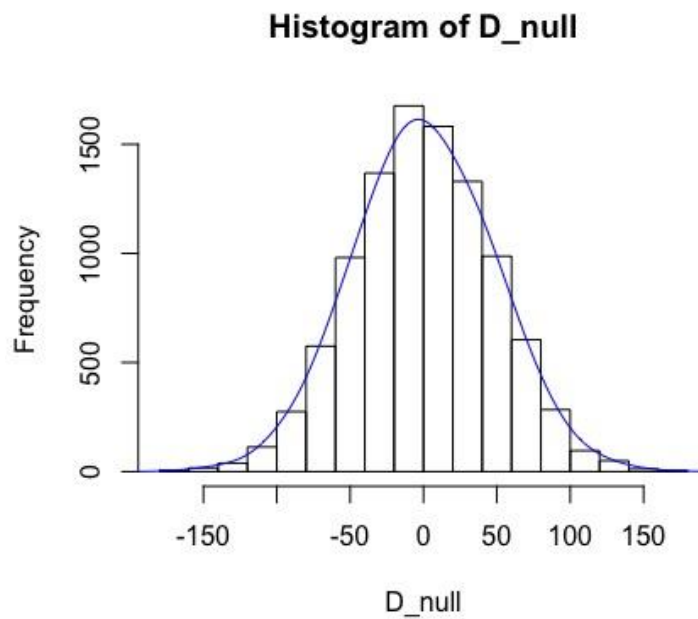
Based on the permutation test we can assess alcohol does influence overall happiness for countries that are happy, not happy and moderately happy.

What does this tell us?

In conclusion this tells us that with the p-value resulting as zero and the z test essentially confirm alcohol does influence the overall happiness levels in each country category. However, the substance in this dataset is limiting as there are other external factors which influence happiness level and alcohol consumption. One could argue it could be countries who are not happy could be in a country with stagnated economic growth or lack of employment opportunities. Its important to note that the data is not factual based, but merely based on general observation from the dataset provided.

Resource: https://www.kaggle.com/marcospessotto/happiness-and-alcohol-consumption