Heart Disease

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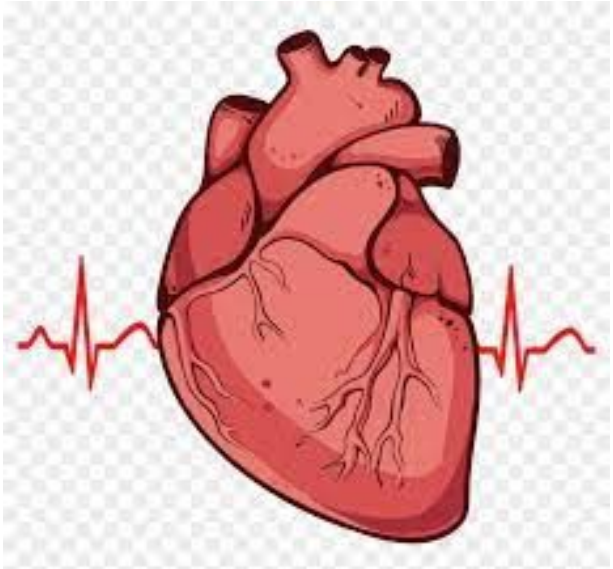
Cardiovascular disease (CVD) *- a primer*

Major causes:

- age
- smoking
- sugar / diabetes
- obesity
- depression
- hypertension
- cholesterol / dyslipidemia
- poor diet
- physical inactivity
- genetically inherited



coronary heart disease and **stroke**

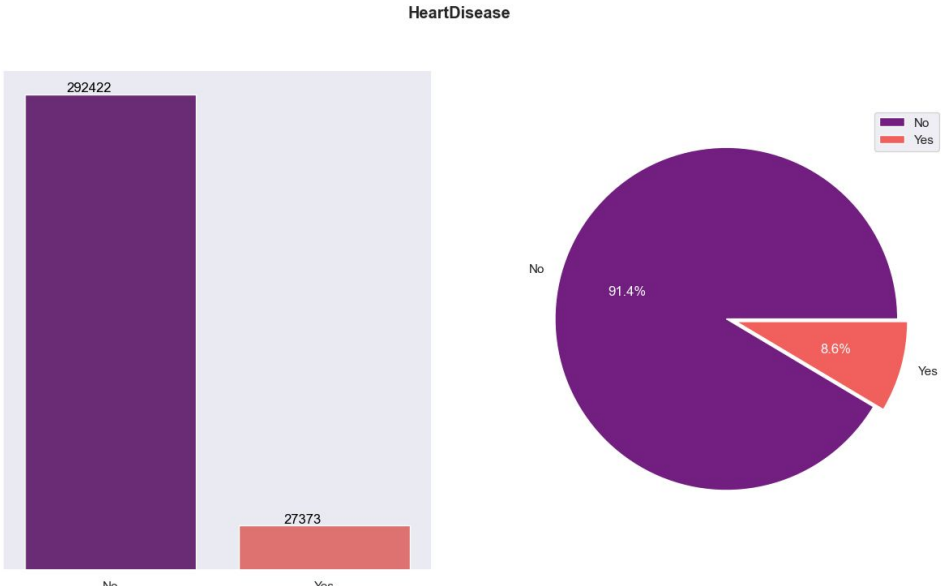
are types of **cardiovascular disease**

Heart issues not covered today due to lack of Kaggle data, e.g.:

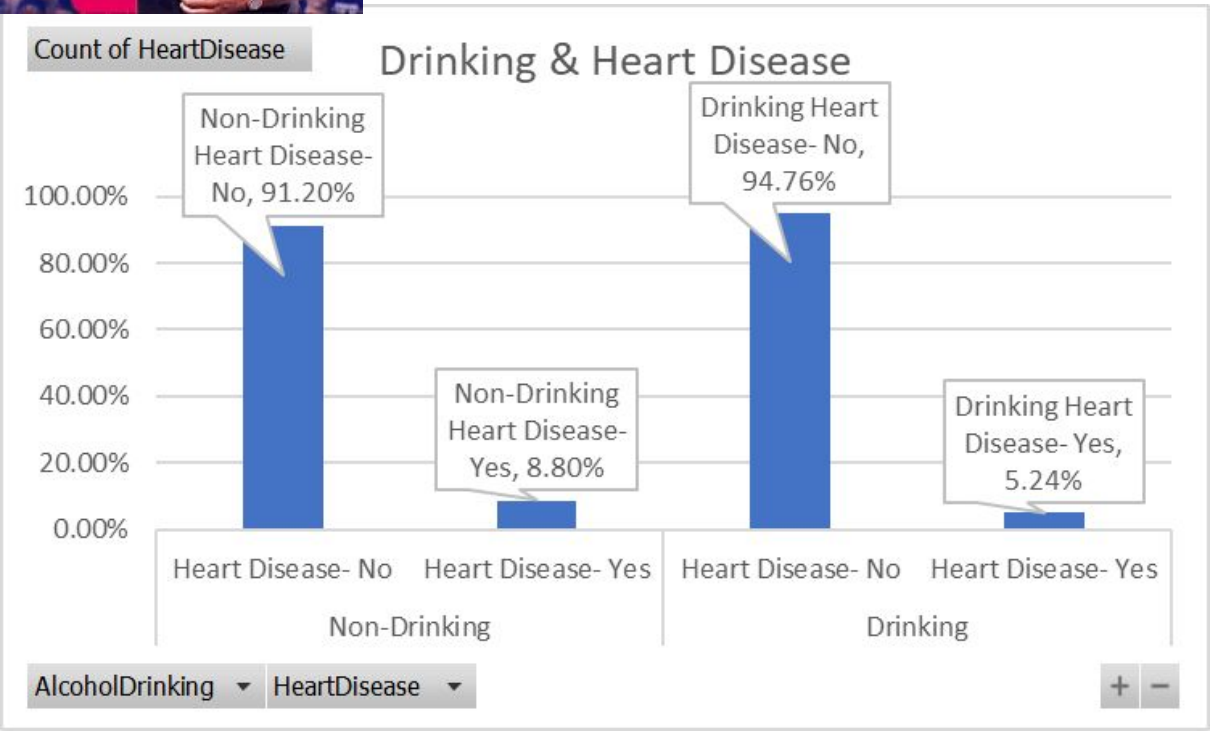
Source of data

- CDC's Behavioral Risk Factor Surveillance System (BRFSS) health-related telephone surveys
  - 2020 & 2022
  - 5.4% & 8.6% cvd
  - United States

- Cited in many scientific papers (e.g., M.M. Hossain, *et al*, "Cardiovascular disease identification using a hybrid CNN-LSTM model with explainable AI") as "70,000 Kaggle dataset"
  - Survey at the doctor's clinic
  - 49.9% cvd

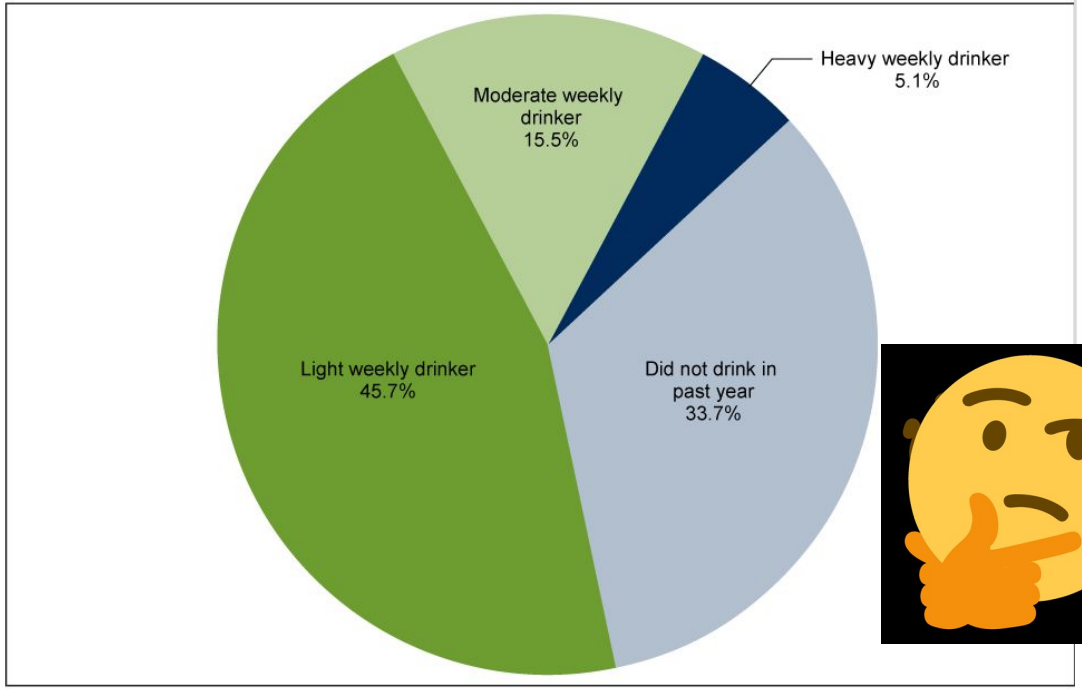


q1 Is there a correlation between alcohol consumption and heart disease?

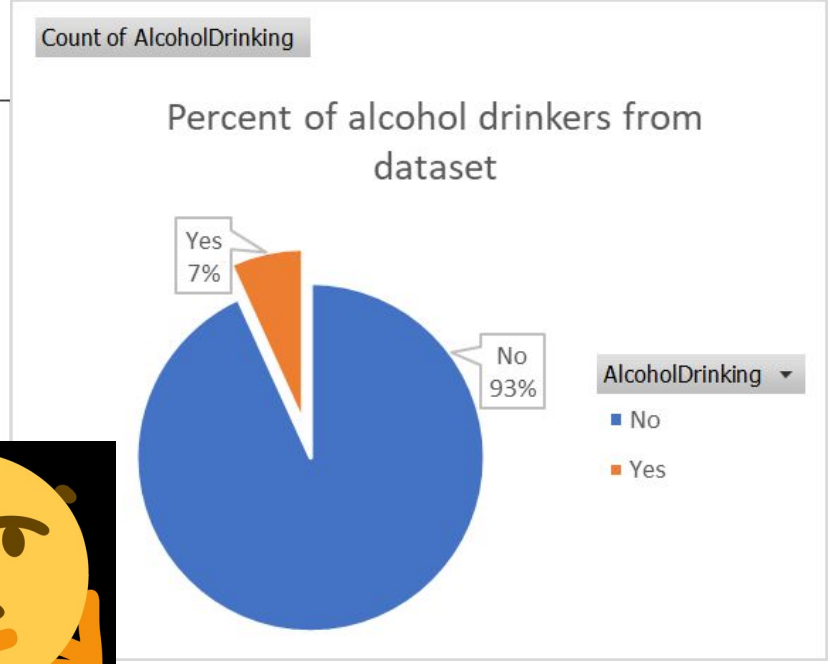


Two-sample t-test
Drink/Non_Drinker & Heart Disease
T-statistic: 18.1505142963367
P-value: 1.3853116335975745e-73
Alpha:0.05
Fail to reject the null hypothesis - There is no significant difference between the two groups

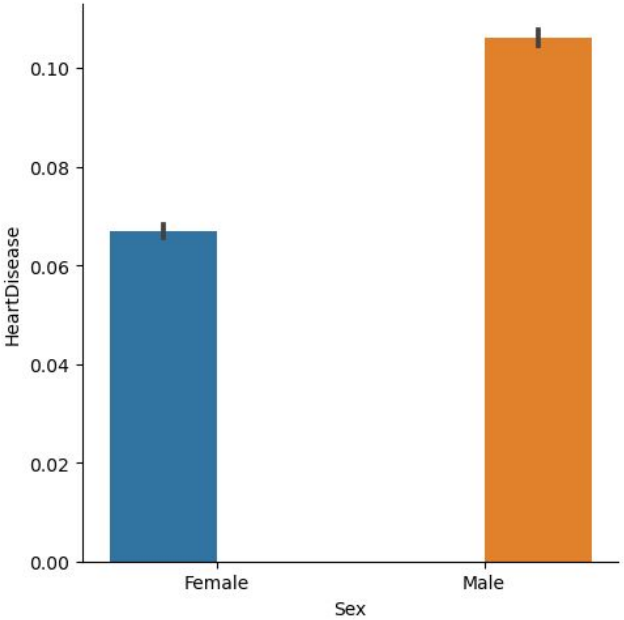
Figure 1. Percent distribution of current alcohol drinking status among adults: United States, 2018

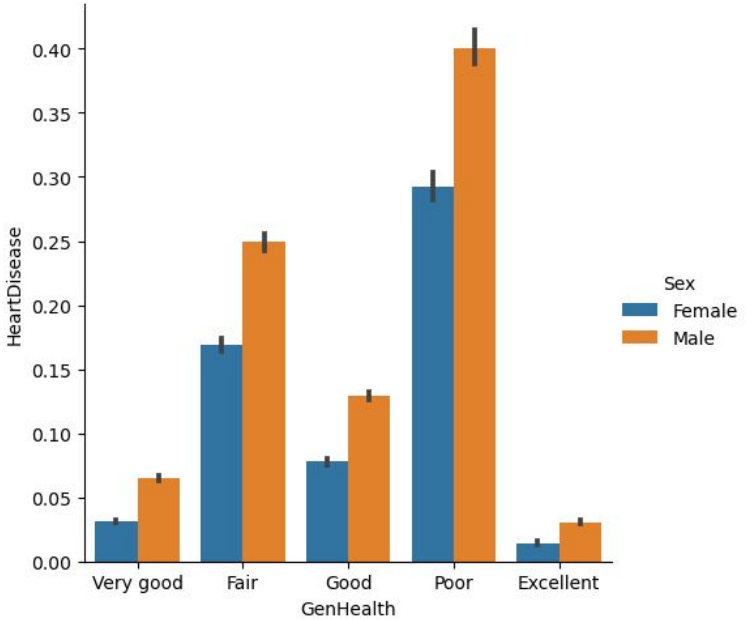


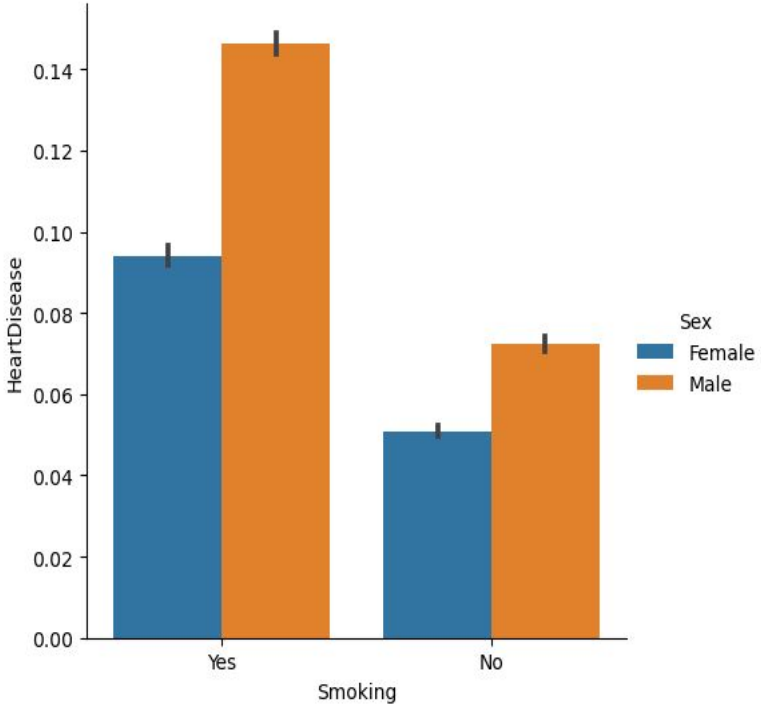
NOTES: An adult who engaged in light drinking averaged three or fewer drinks per week in the past year. An adult who engaged in moderate drinking averaged 4 to 14 drinks per week for men and 4 to 7 drinks per week for women in the past year. An adult who engaged in heavy drinking averaged more than 14 drinks per week for men and more than 7 drinks per week for women in the past year. Estimates are based on household interview of a sample of the civilian noninstitutionalized population. Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db374-tables-508.pdf#1.
SOURCE: National Center for Health Statistics, National Health Interview Survey, 2018.

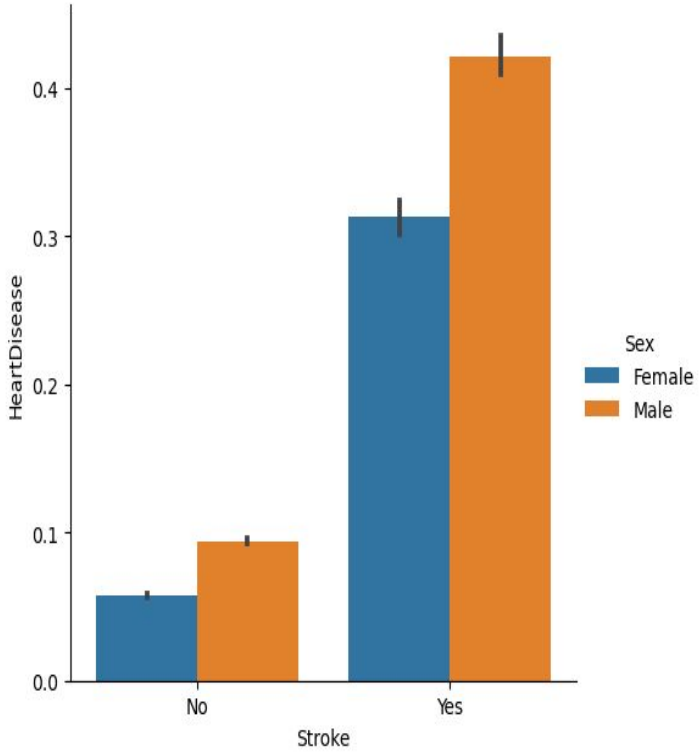


q2. How does heart disease differ by sex?



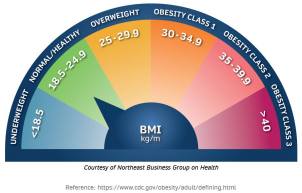


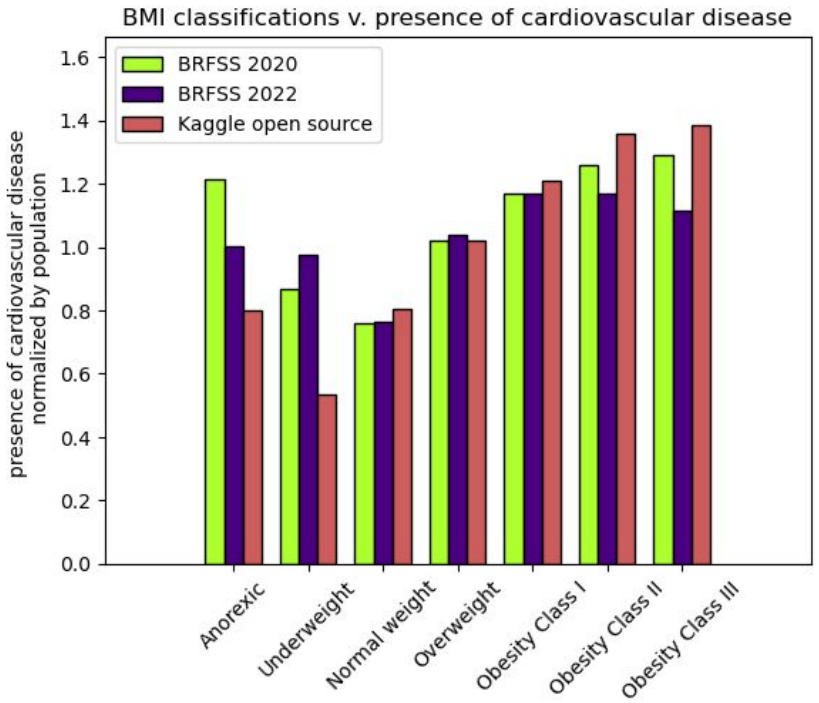

HeartDisease
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Yes
No
Smoking
Sex
Female
Male

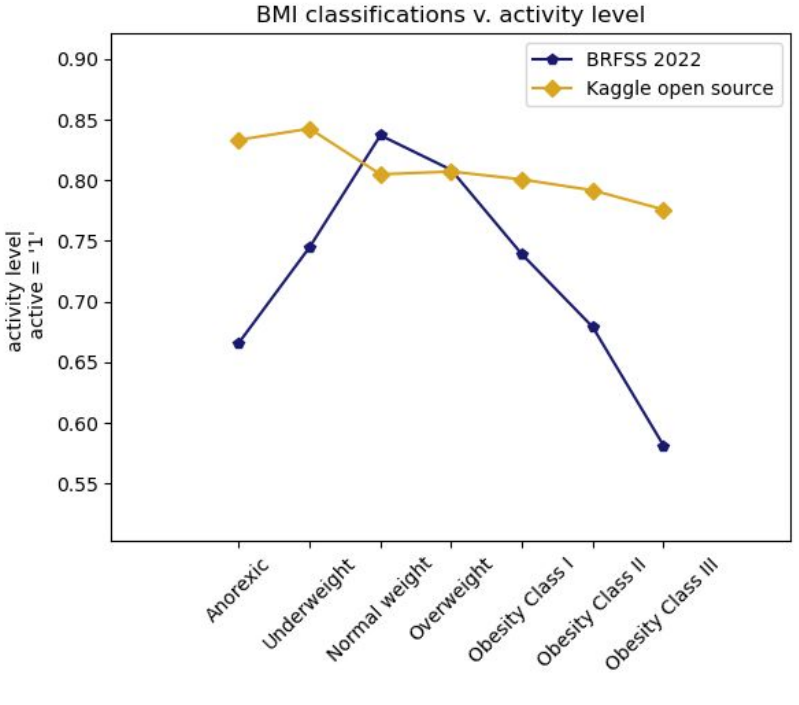

HeartDisease
0.4
0.3
0.2
0.1
0.0
No
Yes
Stroke
Sex
Female
Male

q3 How does body fat (BMI) / level of inactivity influence heart disease?

Distribution of classifications of BMI and activity level of those with heart disease:

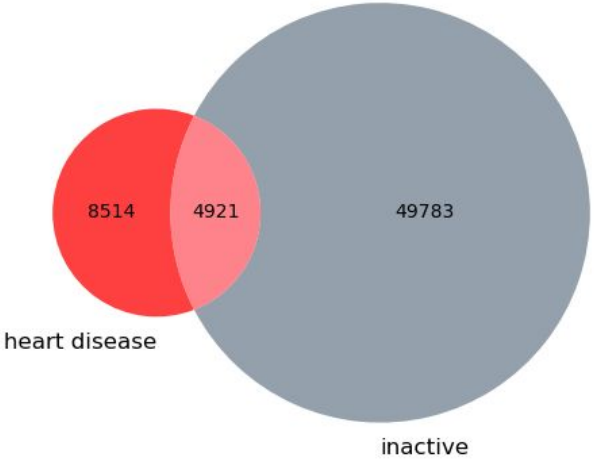




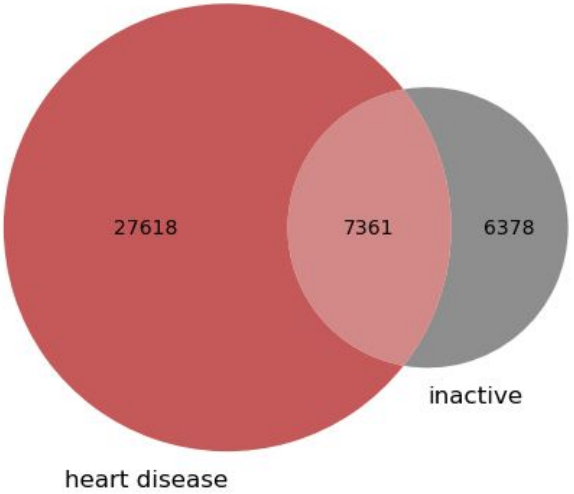


Classifications / definitions of data should be consistent across populations...what is considered ‘active’ ?

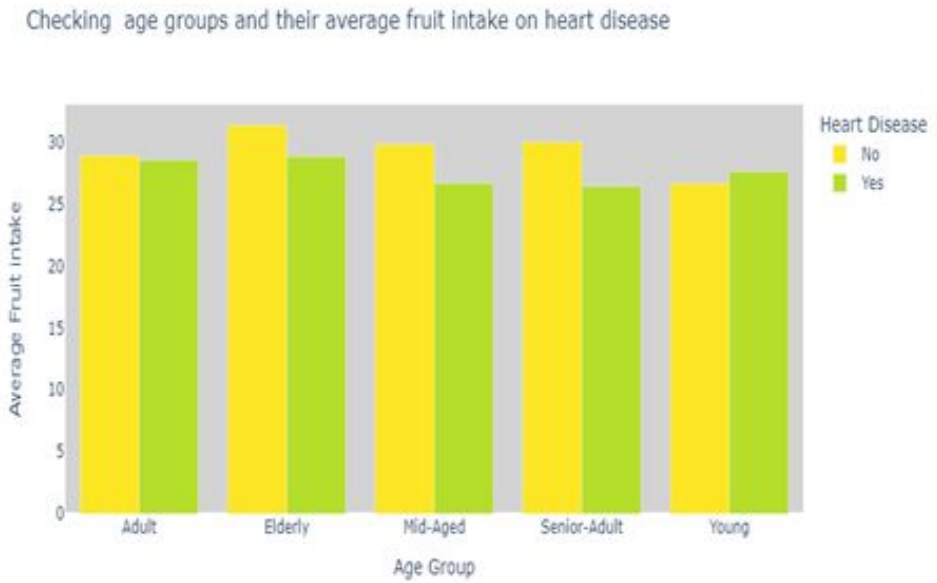
BRFSS 2022 data source
Number with no heart disease and active = 182804.



Kaggle open data source
Number with no heart disease and active = 28643.



Relationship Between Daily Food Consumption and Likelihood of Developing Heart Disease



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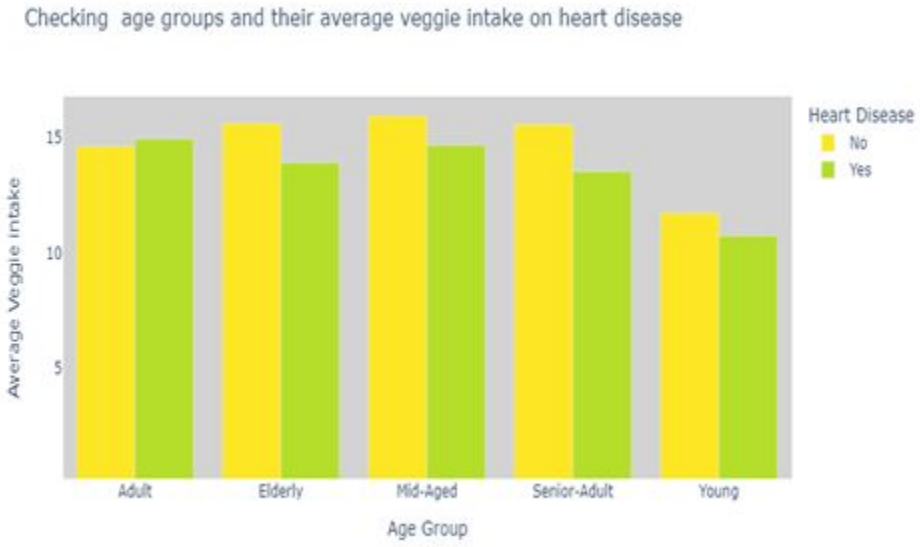
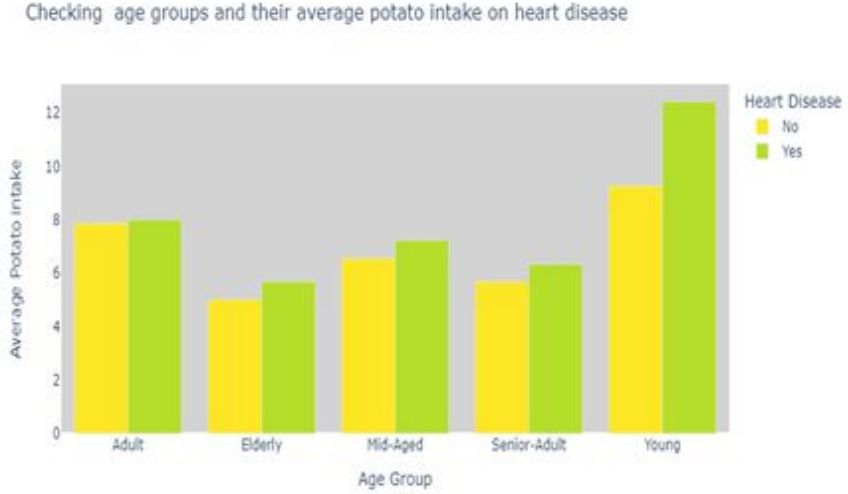
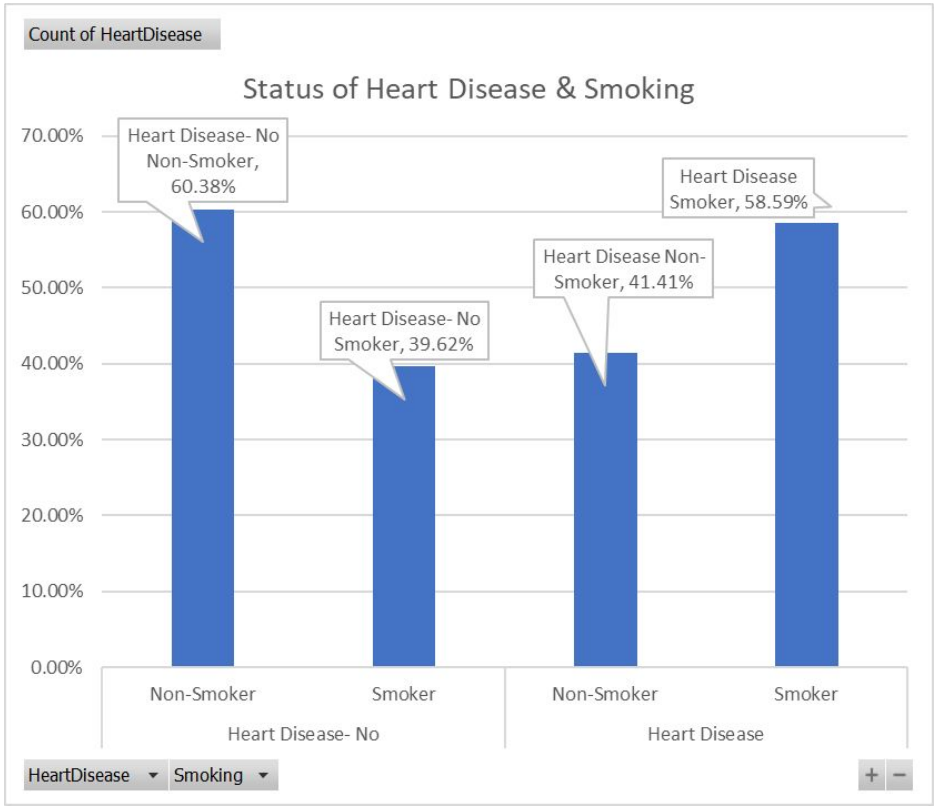




Trying to review and sort through the thousands of rows of data

q4 Is smoking the leading cause of heart disease?



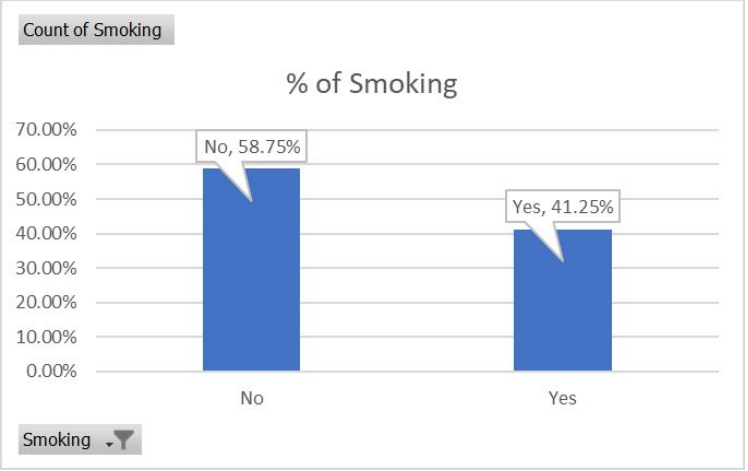
Two-sample t-test Smoker/Non-Smoker & Heart Disease

T-statistic: -61.297861168863285

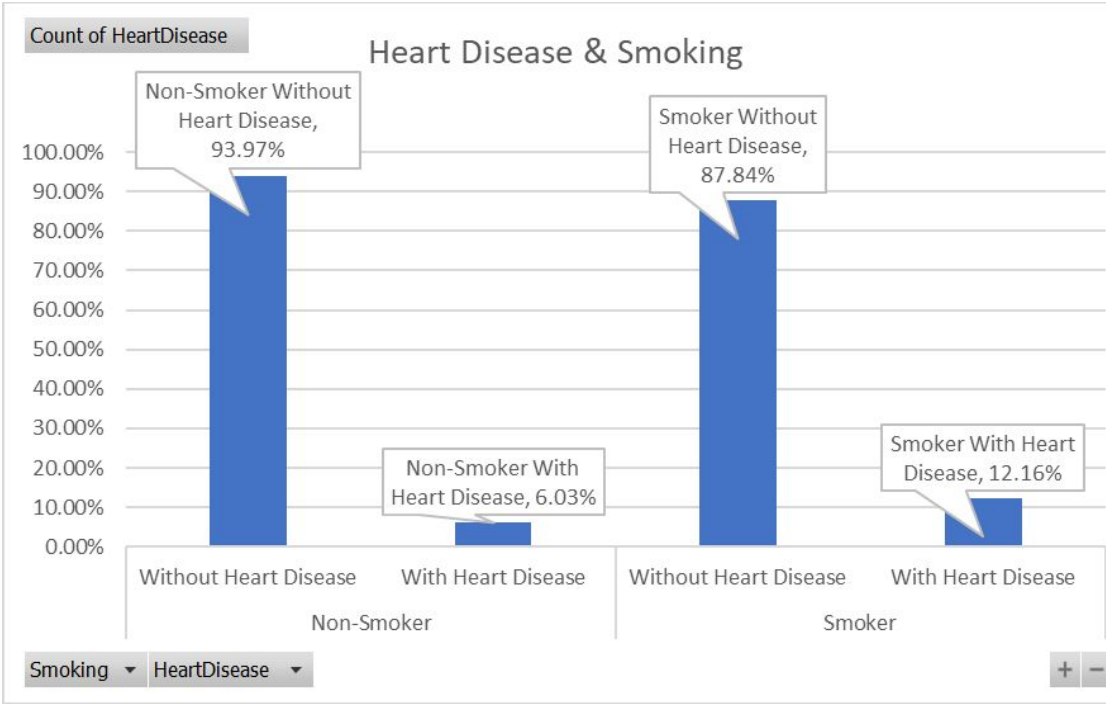
P-value: 0.0

Alpha: 0.05

Reject the null hypothesis - There is a significant difference between the two groups.



Kind and frequency?



Conclusion

- Alcohol
- Male v Female
- Physical Activity
- Food Consumption
- Smoking
- Limitations of the data
    - Measuring consumption levels compared to Yes/No
        - Alcohol
        - Smoking
        - Physical Activity
    - Self-reporting