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## Background

The Youth Risk Behavior Surveillance System (YRBSS) 2019 dataset contains data collected by the CDC from high schools across the United States in 2019. The YRBSS examines six categories of health-related behaviors such as behaviors that contribute to injuries and violence, sexual behaviors, alcohol and drug use, tobacco use, dietary behaviors, and physical activity [1].

### Description of project

This study explores the relationship between promiscuity and risky behaviors. The number of sexual partners were compared to alcohol and drug use prior to sex and condom use.

### Data Set

There are a total of 13,678 people surveyed included in the YRBSS 2019 data set.

The data includes responses from 6,885 females and 6,641 males; 152 of those surveyed did not include a gender.

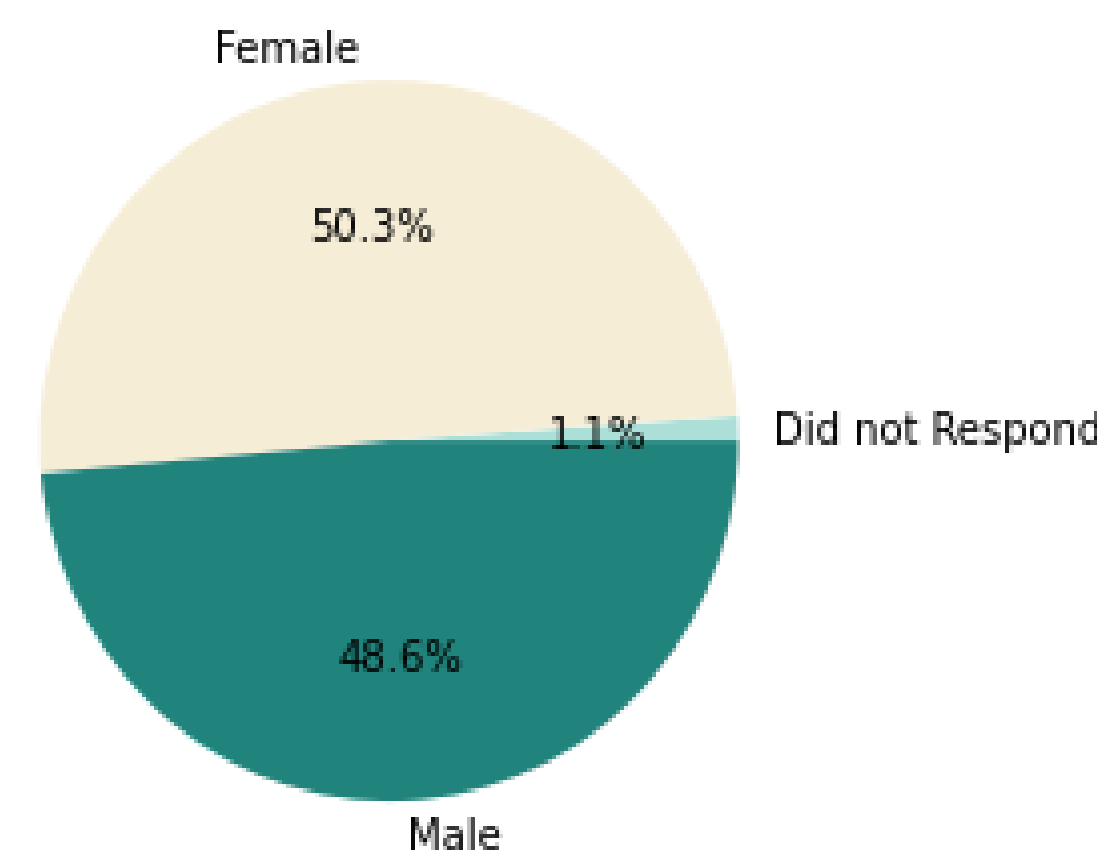


Fig. 1. 2019 YRBSS gender demographics

## Research Question and Hypothesis

The focus of this study is to determine if youth with elevated promiscuous behaviors engaged in other risky behaviors.

H0: there is no relationship between promiscuity and risky behaviors.

H1: there is a relationship between promiscuity and risky behaviors.

### Data Retrieval & Winnowing

Microsoft Access (MA) was employed to winnow the 2019 YRBSS dataset down to only include questions of interest. Using MA, we created a query using the following SQL Statement:

```
SELECT q2, q3, q62, q60, q25, q26, q50, q53, q54, q63, q10  
FROM XXHq;
```

| Question # | Question   |
|------------|--|
| q2         | Gender   |
| q3         | Grade  |
| q62        | Did you drink alcohol or use drugs before you had sexual intercourse?  |
| q60        | How many people have you had sexual intercourse?   |
| q25        | Did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities? |
| q26        | Did you ever seriously consider attempting suicide?  |
| q50        | How many times have you used any form of cocaine, including powder, crack, or freebase?  |
| q53        | How many times have you used methamphetamines (also called speed, crystal meth, crank, ice, or meth)?                              |
| q54        | How many times have you used ecstasy (also called MDMA)?   |
| q63        | Did you or your partner use a condom?  |
| q10        | How many times did you drive a car or other vehicle when you had been drinking alcohol?  |

## Results

### Exploration & Analysis of data

Using the winnowed file, we created a heatmap (Figure 2) to learn which relationships to further explore.

The code used to generate the heat maps can be found in Figure 6.

## Results (continued)

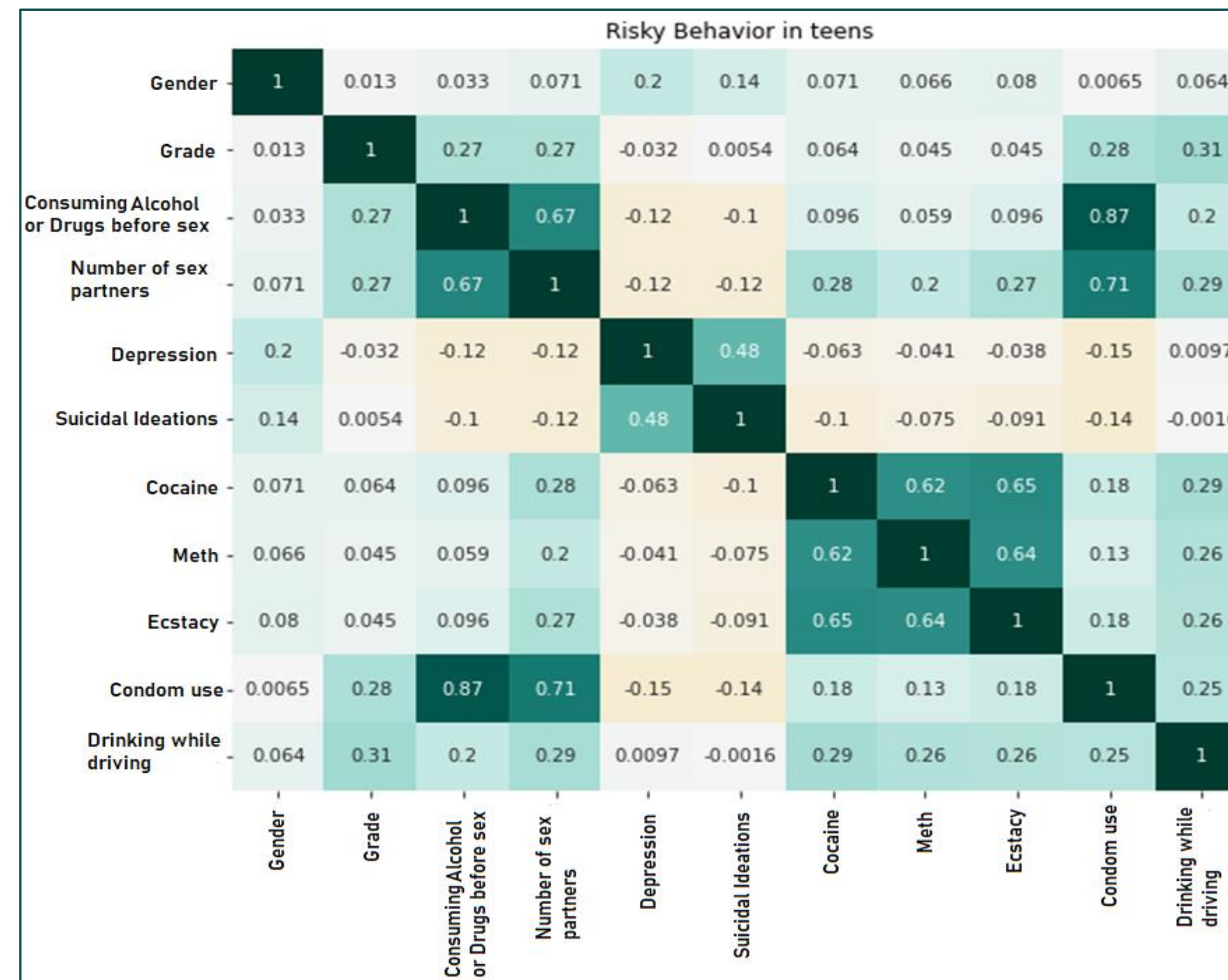


Fig. 2. Heat map exploring risky behavior relationships.



Fig. 3. Refined heat map. Strong relationship between “Number of sex partners” and “Consuming Alcohol or Drugs before s”; strong relationship between “Number of sex partners” and “Condom use”.

To examine the refined heat map, we created pie charts comparing “Number of sexual partners” with “Alcohol or Drugs before Intercourse and “Number of sexual partners” with “Condom use” and divided our results by gender.

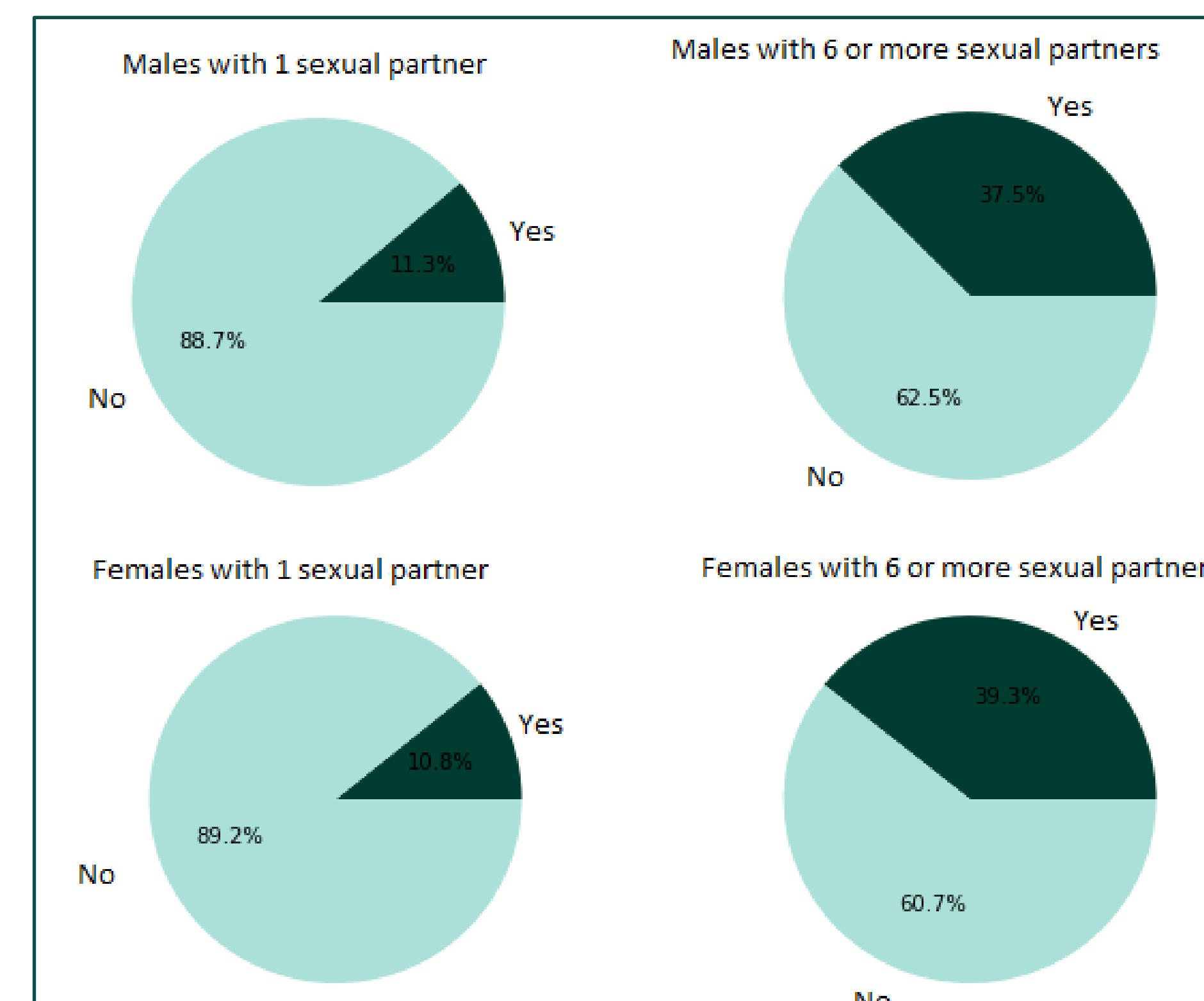


Fig. 4. Alcohol or Drug use before sex based on the number of sexual partners.

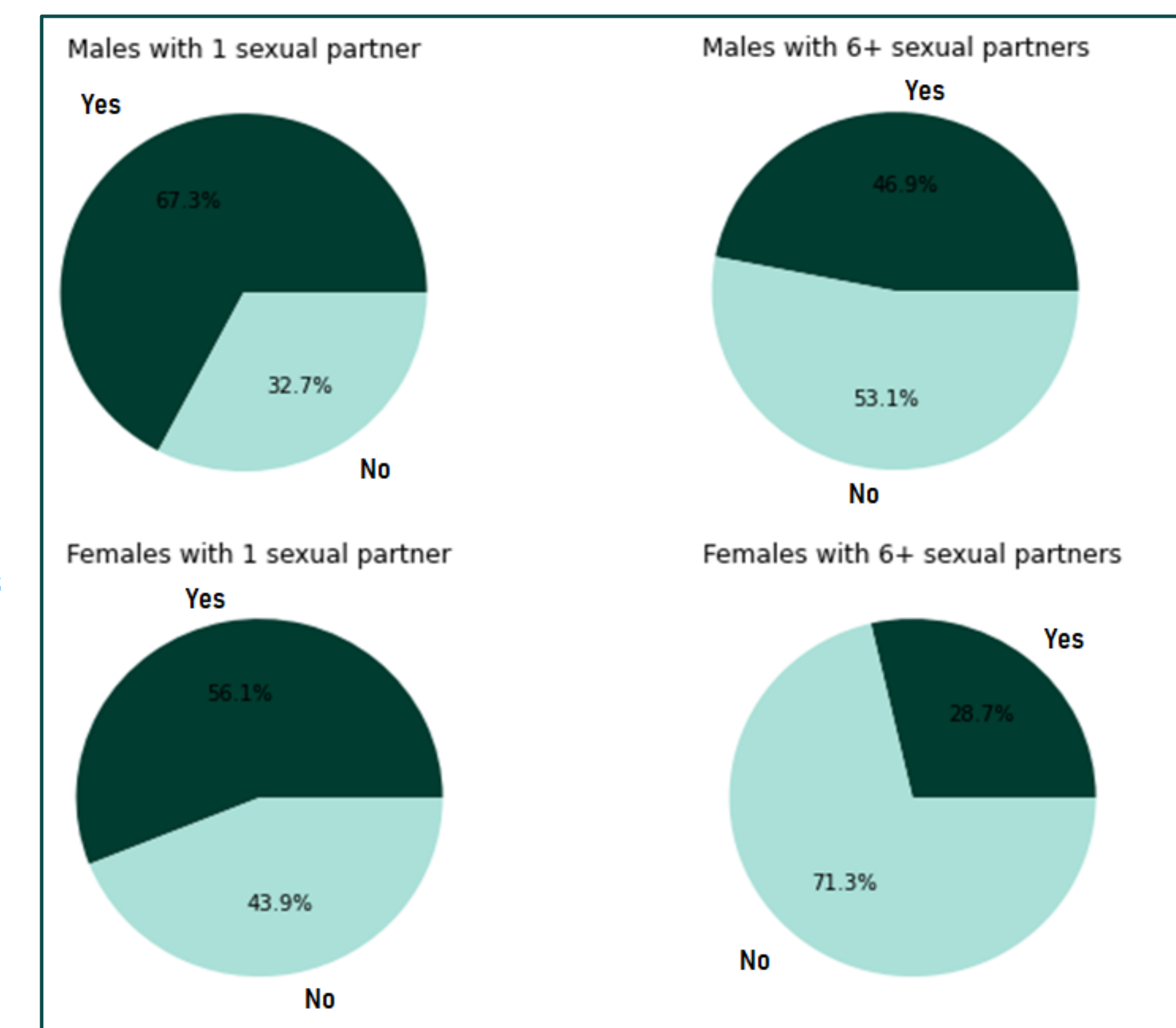


Fig. 5. Condom usage of teenagers based on the number of sexual partners.

```
#Programmers Yessenia Bledsoe-Becerra and Kayla Johnson  
import pandas as pd  
import matplotlib.pyplot as plt  
import seaborn as sns  
  
#Pie chart program  
df = pd.read_csv('FrequencyTables.csv')  
  
Colors = ['#ABDFD7', '#F6EDD7', '#21847C']  
sums = df.groupby(df["Gender"])[ "Respon"].sum()  
plt.axis('equal')  
plt.pie(sums, labels=sums.index, autopct='%1.1f%%', colors=Colors);  
plt.show()  
  
#Heat map program  
HM = pd.read_csv('Risk.csv')  
  
fig, ax = plt.subplots(figsize=(12,8))  
sns.heatmap(HM.corr(), center=0, cmap='BrBG', annot=True)  
ax.set_title('Risky behavior in teens')  
  
#Data compiling program  
data = pd.read_csv('ProjectQuestions.csv')  
data.head()  
dc = data['q62'].value_counts()  
print(dc)
```

Fig. 6. Code used create heatmaps and create pie charts.

## Discussion

- A heatmap is a type of chart that shows the relationship between two seemingly independent variables. It is measured on a scale of 1 to -1. See table to the right.
- 11.3% of males with one sexual partner consumed drugs or alcohol before sexual intercourse compared to 37.5% of males with 6+ sexual partners.
- 10.8% of females with one sexual partner consumed drugs or alcohol before sexual intercourse compared to 39.3% of females with 6+ sexual partners.
- 32.7% of males with one sexual partner did not use a condom before sexual intercourse compared to 53.1% of males with 6+ sexual partners.
- 43.9% of females did not use a condom before sexual intercourse compared to 71.3% of females with 6+ sexual partners.

### Conclusion

There is a relationship between promiscuity and risky behaviors. Teens who have more sexual partners are more likely to consume alcohol or drugs before sex. Teens who have more sexual partners are less likely to use condoms.

| Score | Indication  |
|-------|---|
| 1     | As one variable increases, the other increases        |
| 0     | There is no linear relationship between the variables |
| -1    | As one variable increases, the other decreases        |

### References

- "Youth Risk Behavior Surveillance System (YRBSS)," Centers for Disease Control and Prevention, 27-Oct-2020. [Online]. Available: <https://www.cdc.gov/healthyyouth/data/yrbs/index.htm>. [Accessed: 10-Apr-2022].
- A. Luc, "Python data visualization - heatmaps," Medium, 30-Apr-2019. [Online]. Available: <https://medium.com/@rokaandy/python-data-visualization-heatmaps-79fa7506c410>. [Accessed: 11-Apr-2022].