Smoking, Drinking and Drug use habits in 2015-16: Proposal

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1 Introduction

Smoking tobacco/cigarettes, the chronic use of alcohol, and drug usages are few of the major risk factors affecting health in the United States (Lushniak, 2014; Jha P, 2015; of Health and Services, 2004). Smoking has a direct impact on chronic drinking. Also, many interactions between tobacco smoke and drugs have been identified (Karila, 2013; eff, 2020) and the effects of use of these substances together with drinking (Koppisetti and Loka, 2011; Dunham, 2007; smo, 2016; Verplaetse TL, 2017). Various studies analyse the effects of tobacco, cigar, e-cigarettes, smokeless tobacco on health (Institute, 1998; Organization, 2007; Verplaetse TL, 2017). Alcohol and smoking roughly cause 3 million deaths in the United States annually, which includes 0.7 million deaths of women (of Health and Services, 2001) and 2.3 million deaths of men(for Disease Control and Prevention, 2013). More than $932,000$ people have died since 1999 from a drug overdose. In 2020, $91,799$ drug overdose deaths occurred in the United States (Lushniak, 2014).

2 Objectives

Smoking, drinking, and drug use are key public health concerns(Lushniak, 2014; Jha P, 2015; of Health and Services, 2004). According to the National Health and Nutrition Examination Survey, there is a positive association between current smoking status and alcoholic drinking per day. Through this study, we want to answer questions like: If a person starts consuming one or more of such substances, how likely are they to consume the other substances. Additionally, if a person consumes multiple such substances, which ones did they start consuming first? Is there a correlation between the drinking, smoking or drug use behavior (such as frequency of use and current status)?

3 Data

We intend to use the data from the National Health and Nutrition Examination Survey (NHANES), 2015-16[1]. NHANES is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. Findings from this survey are used to determine the prevalence of major diseases and risk factors for diseases. Information is used to assess nutritional status and its association with health promotion and disease prevention. NHANES findings are also the basis for national standards for such measurements as height, weight, and blood pressure. From the survey, we are going to use three questionnaires:

- Alcohol use (ALQ_I)[2]: A survey of 5735 males and females aged 18-150 years, 10 columns and 7 questions regarding alcohol use over past 12 months.

- Smoking: Cigarette use (SMQ_I)[3]: A survey of 7001 males and females aged 18-150 years, 42 columns and 27 questions regarding smoking habits.

[1] https://www.cdc.gov/nchs/nhanes/about_nhanes.htm

[2] https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/ALQ_I.htm

[3] https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/SMQ_I.htm

- Drug use (DUQ_I)[4]: A survey of 4843 males and females age 18-69 years, 44 columns and 37 questions regarding drug use and history.

Taking the intersection of the above datasets (inner-join on sequence number), we get the final dataset with 4843 rows and 92 columns.

4 Proposed Experiments

In the above mentioned datasets, the relevant columns are the ones corresponding to the following questions:

- Have you ever smoked, ever consumed marijuana / methamphetamine / hashish / cocaine / heroine or ever had more than 4 drinks in a day?
- What was your age when you first consumed these products and when you started consuming these regularly.
- How many times in recent days/months have you consumed these substances?

4.1 Proposed Visualizations

We intend to use at least the following visualizations in our project:

1. A histogram of age when people started consuming different types of drugs.
2. A bar graph comparing the proportions from the first graphs (age when they started consuming drugs and cigarettes). This will show which age groups are more susceptible to these habits. For instance, whether youngsters are more likely to smoke than to consume cocaine or vice versa.
3. A histogram of the average number of alcoholic drinks consumed per day in the past 12 months.
4. A confusion matrix or density plot of whether or not people consume alcohol and drugs, alcohol and cigarettes, and cigarettes and drugs. This will show how many people consume both, one or none of these things and help understand the correlation among these variables.
5. A scatter plot of the number of cigarettes smoked in the past month and number of alcoholic drinks consumed in the past 12 months.
6. A scatter plot of age when started smoking with the number of alcoholic drinks consumed to observe the correlation between smoking and drinking habits.

4.2 Proposed Predictive analysis

We plan to use the following predictive analytics methods in our project:

1. Linear regression to understand the relationship between the number of cigarettes smoked and the number of drinks consumed in the past 30 days and past 12 months. This will help us understand the association between drinking and smoking habits of people.
2. Linear Regression to understand the relation between the age when people started smoking or consuming drugs and the number of alcoholic drinks consumed in the past 12 months or past 30 days. The hypothesis is that the people who started consuming drugs and cigarettes at a younger age might have bad drinking habits as well, and might consume more alcohol than the others.

[4] https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/DUQ_I.htm

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