CS 8803: AI, Ethics, and Society: Assignment 2

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1 Answers to Step 2:

- Dataset chosen: Mental Health in Tech Survey: Survey on Mental Health in the Tech Workplace in 2014
- Number of items in the dataset: 1260
- Number of variables in the dataset: 27
- Since the dataset has information about the mental health of employees in the tech workplace, it might belong to the regulated domain Employment
- Variables associated with legally recognized protected classes:

Variable	**Protected Class**	**Law**
Age	Age	Civil Rights Act of 1964 (added in 1967)
Gender	Sex	Civil Rights Act of 1964
Country	National Origin	Civil Rights Act of 1964

2 Answers to Step 3:

For the plots of dependent variables with respect to Gender, I assigned numbers starting from 0 to each gender type, combining different spellings of the same gender type into one, and then used that to plot the histogram.

For the plots of dependent variables with respect to Country, I assigned numbers to the country entries starting from 0, grouping by continents, so that I had 6 bins (excluding Antarctica).

*Plots from next page onward:

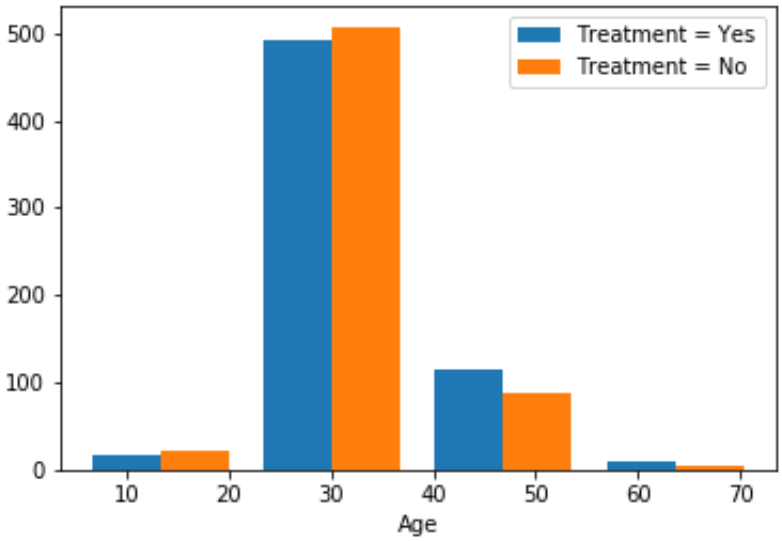

Figure 1: Relation between Treatment and Age

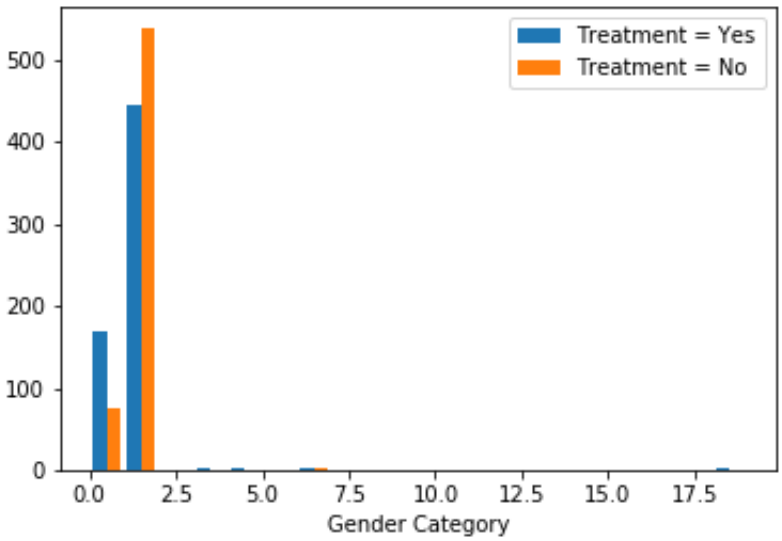

Figure 2: Relation between Treatment and Gender

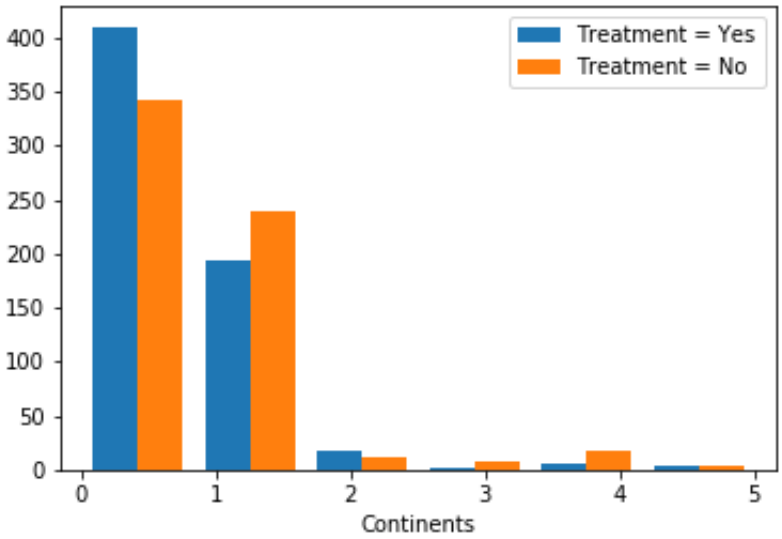

Figure 3: Relation between Treatment and Country

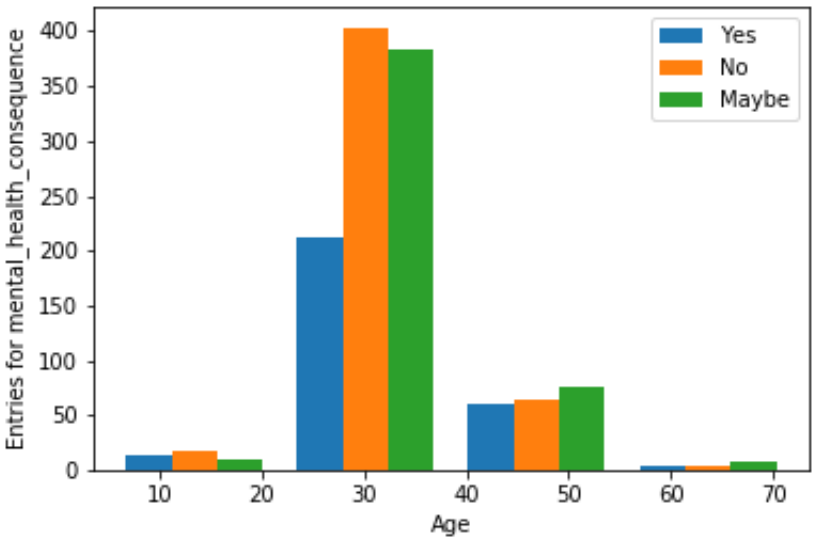

Figure 4: Relation between Mental Health Consequence and Age

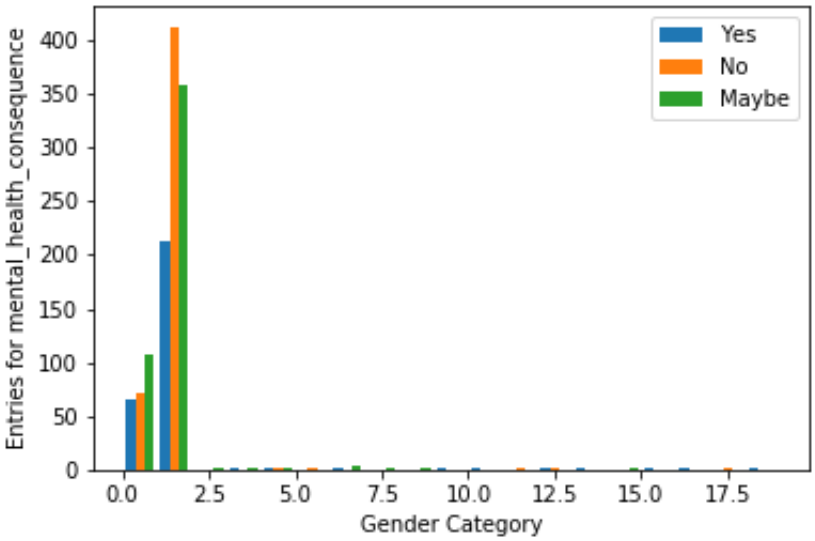

Figure 5: Relation between Mental Health Consequence and Gender

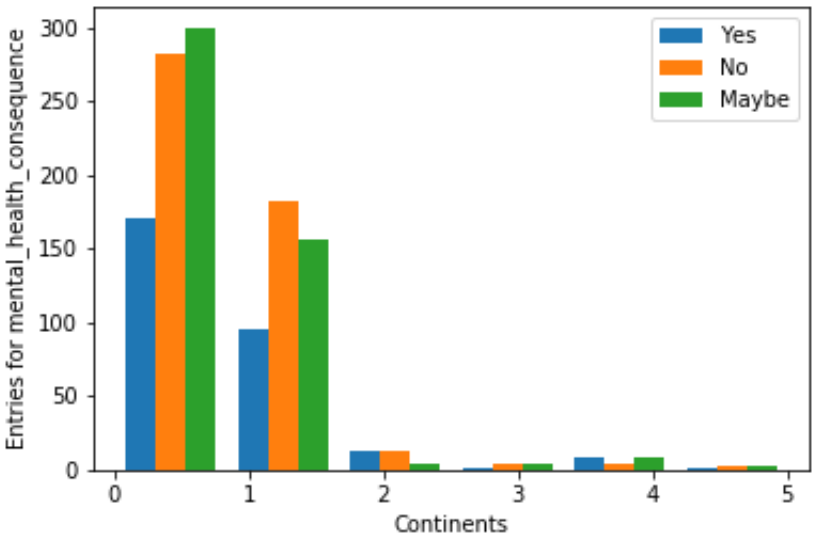

Figure 6: Relation between Mental Health Consequence and Country

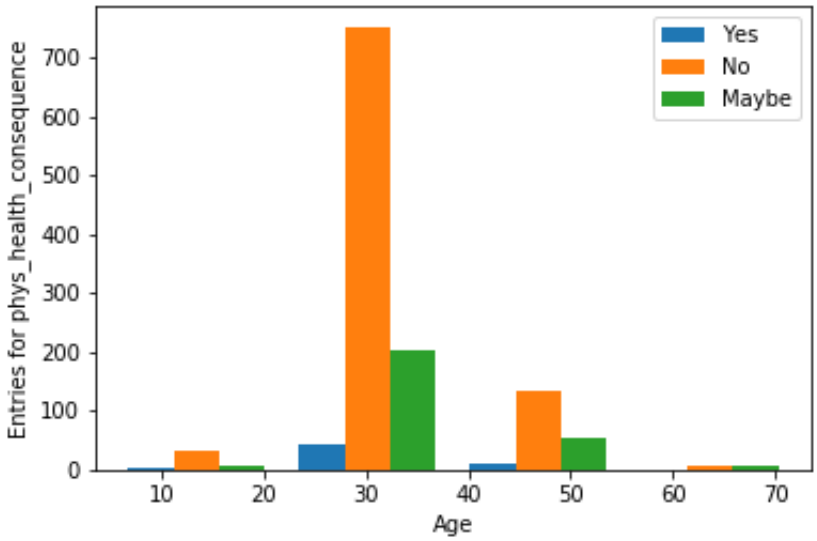

Figure 7: Relation between Physical Health Consequence and Age

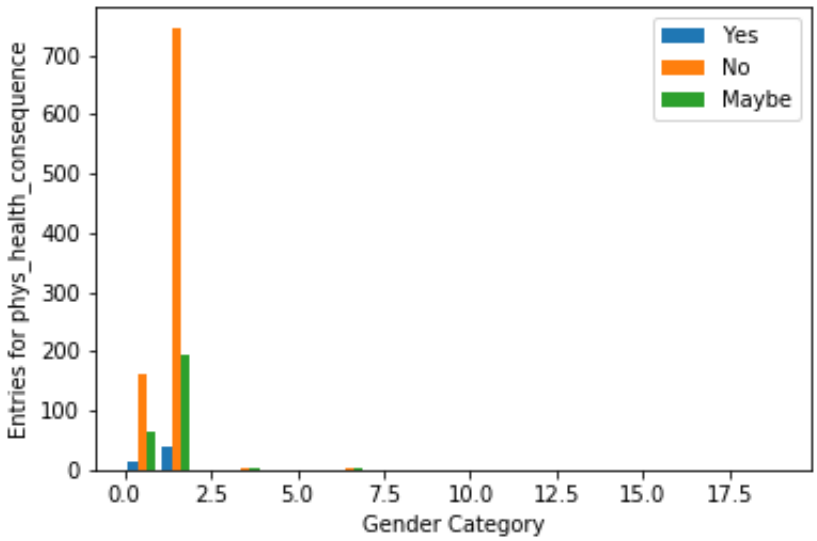

Figure 8: Relation between Physical Health Consequence and Gender

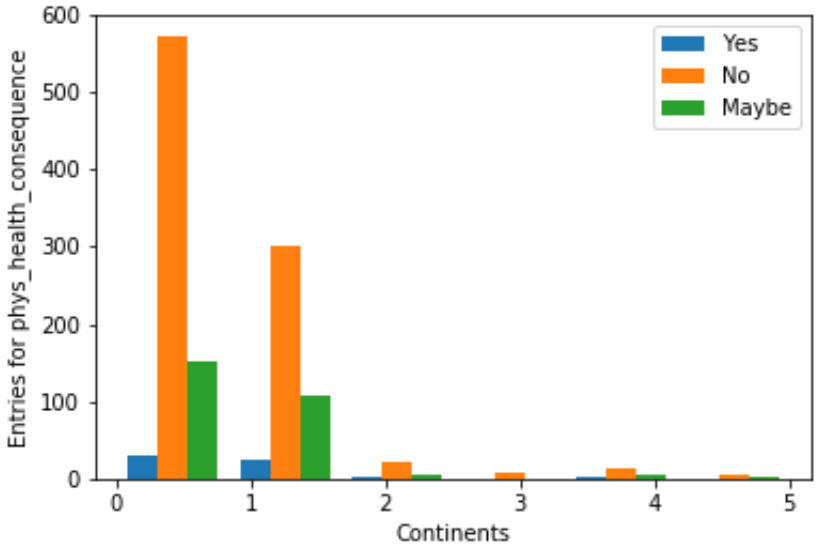

Figure 9: Relation between Physical Health Consequence and Country

3 Answers to Step 4:

For this part, I'm showing the relationship between the variables Treatment and Country.

3.1 Fairness Hypothesis

This hypothesis is supported by the graph given below, as it shows that the number of people seeking treatment is not dependent on country, as the number of people seeking treatment and the number of people not seeking treatment is equal for all continents (the bottom and top bars look identical for each continent). I didn't do any manipulation for this part as it was supported by the data. I've used a stacked bar graph.

*Plot on next page

3.2 Bias Hypothesis

This hypothesis is supported by the graph shown below, as it seems from the graph that the number of people seeking treatment is highly dependent on country. For this graph, I'm plotting the difference between the number of people seeking and not seeking treatment in each continent, divided by the total number of people from that continent. The ratios vary a lot from continent to

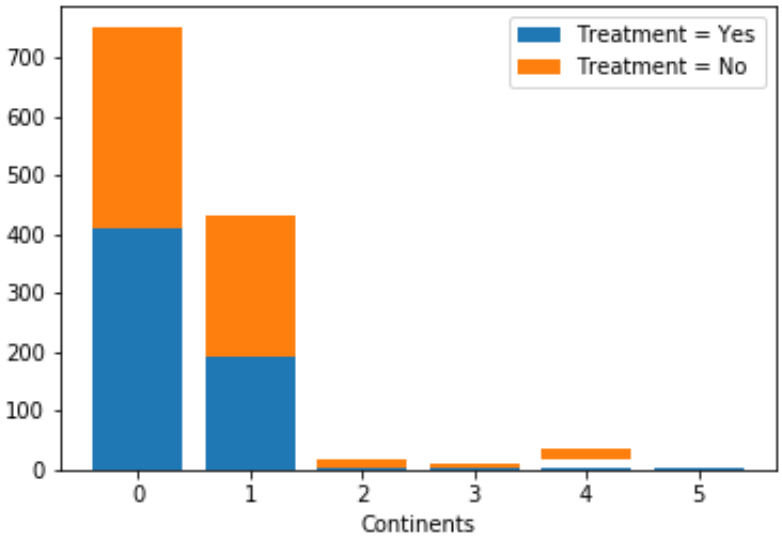

Figure 10: Fairness Hypothesis

continent. I've used a line chart here.

*Plot on next page

4 Answers to Step 5:

Protected Class Variable (Country	Mean	Median	Mode
Original Dataset	0.516	0 (North America)	0 (North America)
Reduced Dataset	0.545	0 (North America)	0 (North America)
Difference	0.029	No Difference	No Difference

5 Answers to Step 6:

The selected dependent variable is Treatment, and the selected independent variable is Country. Given below is the plot showing the relationship between these two variables in the reduced dataset.

The plot for the reduced dataset looks similar to the plot for the full dataset, the bars for 'Treatment=Yes' being relatively taller/shorter than the "Treatment = No' bars just like in the full dataset plot. The only difference between the plots seem to be that the difference between the height of two adjacent bars

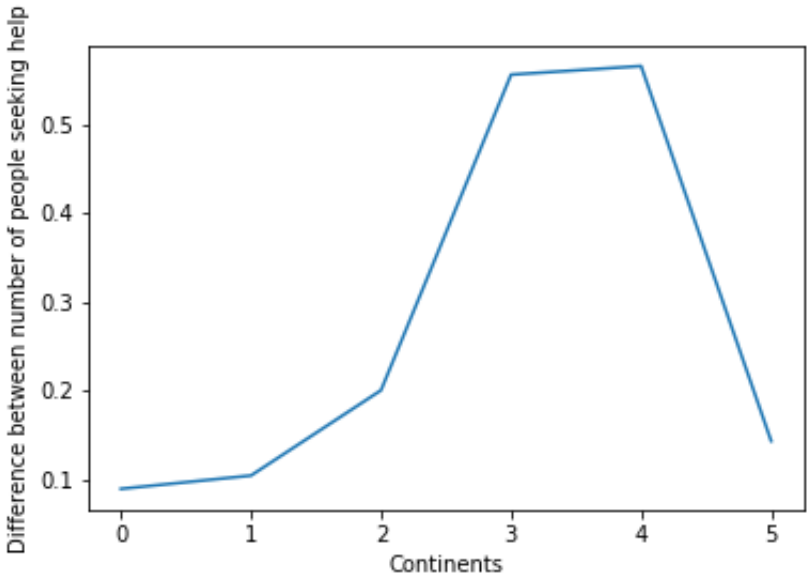

Figure 11: Bias Hypothesis

is decreased in this plot, naturally due to the reduced number of observations.

Given that the entries belonging to a protected class might be a minority in our dataset, random sampling might hurt the protected variable class and lead to a further skewed dataset, thereby hurting our analysis in the long run.

*Plot on next page

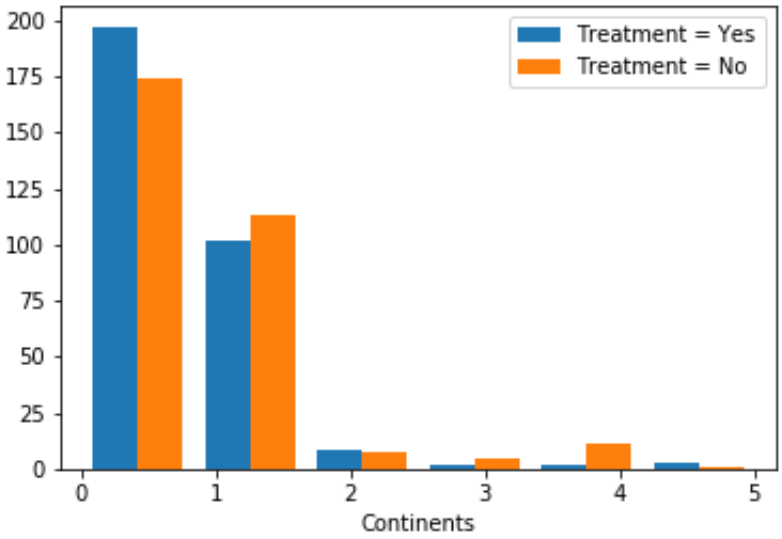

Figure 12: Relation between variables Treatment and Country in the reduced sample