Interactive Visualization in Shiny.R

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Introduction

Given what we have completed on the topic of Obesity in Mexico in the previous project, this visualization provides an interactive plot of average BMI by age group (bin width of 4-year), and it further narrows down the focus onto individual-level BMI and aims at providing users an idea of how his/her BMI compares to the average BMI of the same gender as well as the same age group in Mexico. It also provides the user summary statistics of her/his BMI and how much the user over- or under-estimates the BMI, as well as the peer-comparison.

Interaction:

This visualization offers five main user-interactions. 1) The first click is to choose the **gender** between female and male, which decides how the data would be subsetted and how the average BMI by gender will be calculated by each age group. The default setting is *male*, and the user can choose *female* according to their preference - it is associated with four background images of males or females with different body shape from under-weight to over-weight that are "plausible" estimates of body shape as a function of BMI for an individual. The four cartoon images enables users to get a sense of how a certain body type looks like in the real life. 2) The second interaction is that user needs to enter his/her **age-range**. This click decides the vertical position of user's BMI in the graph and it is used later to compare user's BMI with the average age-groups. 3) The third interaction is that the user will be asked to choose his/her **height** in meters and **weight** in kilograms by moving the button on two slide bars. These two numbers will be used to calculate user's BMI and will be plotted in yellow as a point in the graph. 4) The fourth interaction is that user will choose one from four options under-weight, normal, overweight, obese as a self-portrait. A point will be plotted in green with the median BMI in the **body-image** group and the age-group that the user has chosen. Finally, a line between the green and the yellow points will be drawn to indicate how much the user has incorrectly estimated him/herself, and also a line between one of the yellow and green points and the black point that represents the average BMI of the age group and gender indicates the difference in BMI between the user and the peers. The length of two lines provides the user a fast and straightforward visualization of comparisons. 5) The last interaction is that this other than this image, this project has two other **tablet panels**. One provides a **summary** of user's BMI and a brief analysis of if the user incorrectly estimates his/her body type, and another is an *About* section that explains the data source and a short instruction of how to use this app.

Work that will be finished on for a further study:

Due to the time constraint, I want to admit that there are still a lot of space to explore in this data and can be used to improve the visualization. For example, at this point, a user can only enter the weight and height using metric measures, but for users who are more familiar with the standard measures, this might be a problem. The visualization will be improved for the final project presentation and users will be able to choose between different measures. Besides, in the original data set there are variables about diet and exercises — if we can develop some predictive models to predict BMI and ask the user to choose some food he/she eat most often as well as his/her workout plan, we can give suggestions of if the user needs to improve his/her diet or workout plan. This will be further evaluated and included in the final project too.