

Obesity - An exclusive cover on the United States

“Food, Shelter and Clothing” are the three basic needs of man, this was framed as a measurement of poverty in developing countries, but has this been misinterpreted in recent times?

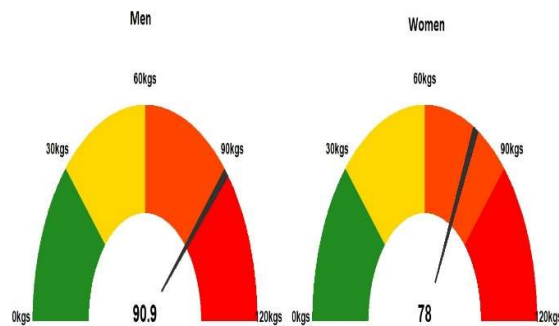


Figure 1 : Average Weight

A quick statistics on the weights of americans show that on an average male weighs 90.9 Kgs while female weighs 78 Kgs.

BMI is an universally used indicator of body fat based on weight in relation to the height of the individual. BMI is a directly propotional to mass of the body and is inversly propotional to the height. Obesity is a condition in which the Body Mass Index (BMI) is greater than 30.

Obesity is one of the major health issues that has started becoming prevalent in many countries. A quick world picture on obesity rates for 2016 shows that USA is the biggest victim of obesity among the developed nations with an obesity rate of 36.2%. On the other hand the Japan has been battling obesity so well and has only 4.3% of its population classified as obese.

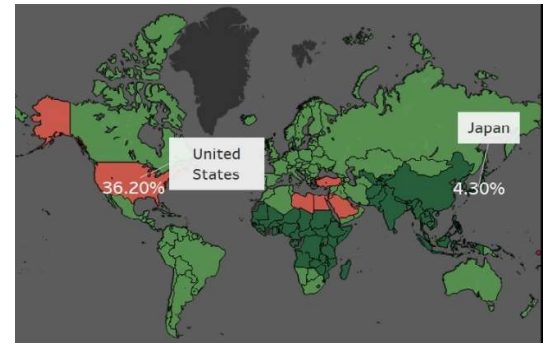


Figure 2 : Obesity – A world outlook

Poison in disguise:

Machine is a man-made bane in the form of boon. With the advent of machines, life has become easier, the concept of physical activity and hard work have got buried. Everything we ever wish for is at our door step with a phone call made and food is available instantaneously with the increase in the fast food restaurants. The question that needs to be introspected is - has this type of easy life made us very lazy and has made us blind to a state of not noticing that we are inviting more disease and health disorders?

An analysis on the trend of fast food restaurants increase over the years against the obesity rates, revealed that obesity rates and the fast food restaurant numbers are directly correlated.

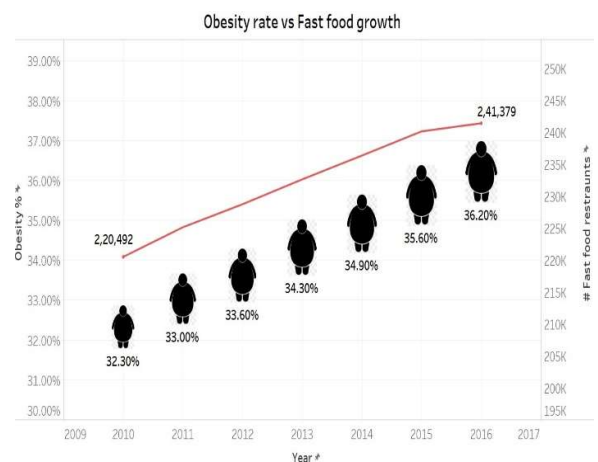


Figure 3 : Obesity rate vs Fast food growth

McDonald's ranks second in terms of number of outlets across the world, subway being first. A closer look into the cholesterol, fat and calorie content of food offered by McDonalds reveals

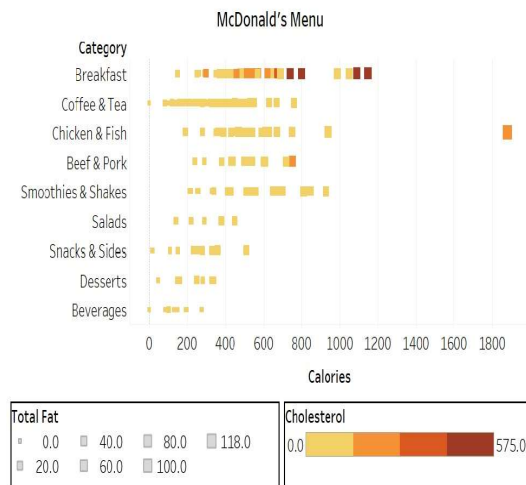


Figure 4 : An overview of McDonald's Menu their breakfast offerings top the list based on cholesterol. Also, the number of items on the breakfast varieties is more than any other category available on the menu. These items are available at an affordable price to the customers, which in turn attracts a lot of them to munch upon something along with a high calorie coffee or tea every morning to get started with work.

State View:

Tapering the analysis to understand the state level view of obesity rates has uncovered the fact that West Virginia tops the list with an obesity rate of 37.7% followed by which Mississippi ranks number 2 with a marginal difference of 0.4%.

There has been quite a buzz about new jargon of doctors equating smoking to sitting. Researches have been carried out to understand the effects of sitting and the results are scary. Sitting can cause lot of problems in human body from affecting strength of shoulder and spine to changes in muscle length [1].

An investigation on the state obesity rates, opened a new direction for exploration. One major reason for obesity apart from the food habits is physical inactivity. Physical inactivity and laziness can directly go down to the hips and thighs. Analysis of physical inactivity over 2011-2016 has showed that Mississippi has always been in top 3 ranks throughout the years under consideration. Arkansas with an obesity rate of 35.7% has constantly been within 3 ranks 5 out of the 6 years under study.

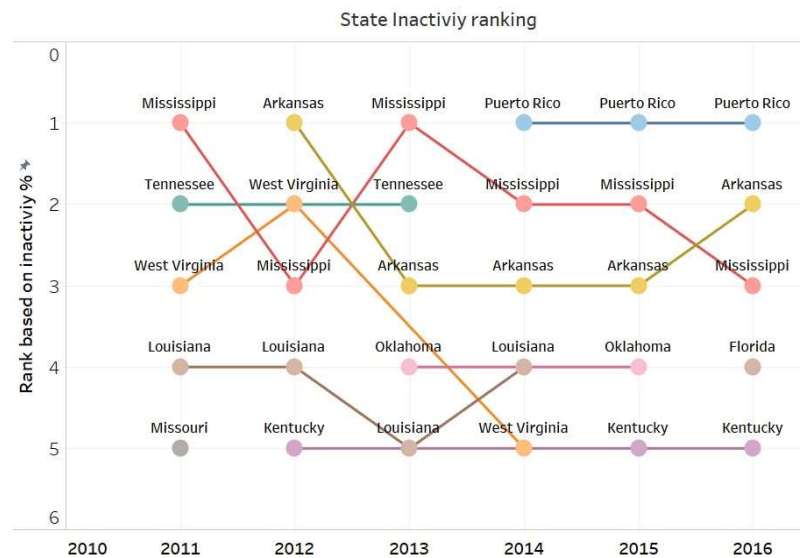


Figure 6 : Rank based on physical inactivity

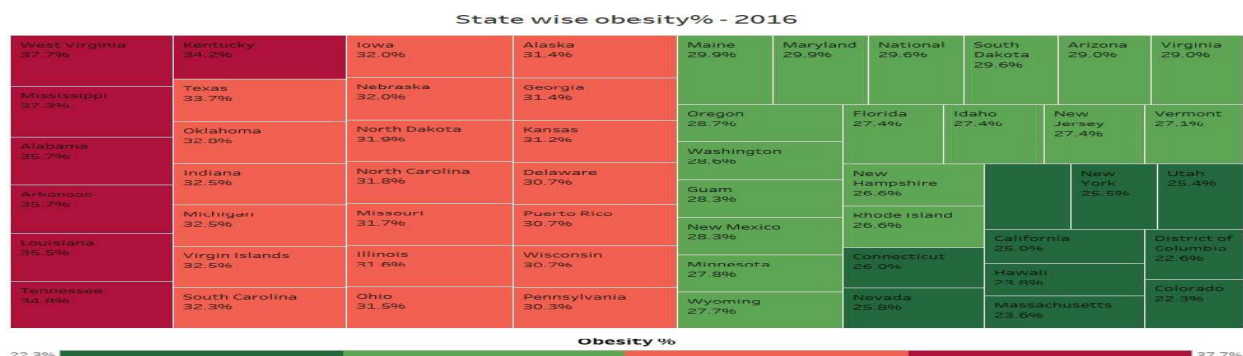


Figure 5 : State wise obesity%

Age, Education and Ethnicity drill:

Do obesity rates have any relationship with age, education or ethnicity?

People aged between 45 to 54 are the one's highly affected by obesity. Among the total population in the age 55-64 34.2% suffer from obesity. In general, the population aged between 45 to 64 are have become a prey for obesity. The bar chart rendered shows the percentage of people with obesity based on the age.

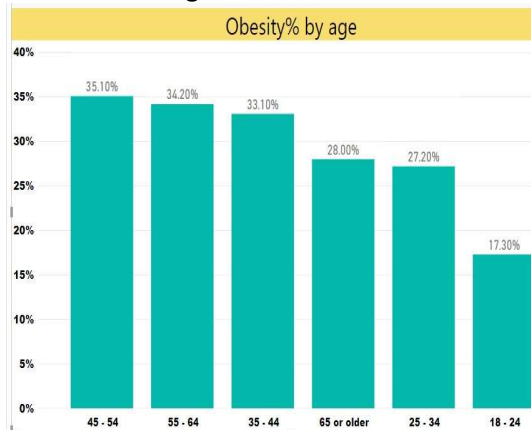


Figure 7 : Obesity rates by age

A deep dive into understanding whether education is a root cause for obesity rates seems promising. An analysis on understanding education's impact on obesity rate for years 2014 to 2016 shows that obesity people with less than high school education exhibited higher rates 2 times in 3 years of review.

The second largest were the high school graduates. The least were the college graduates.

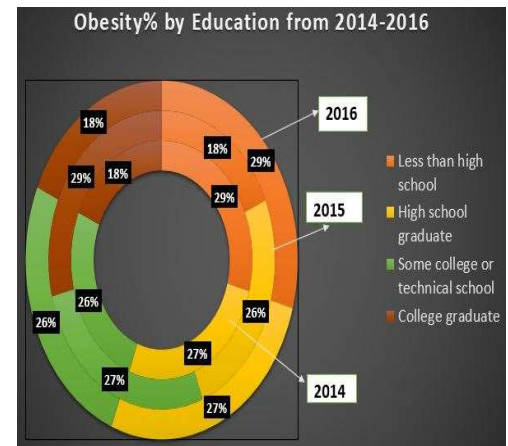


Figure 8 : Education vs obesity rate

This indeed rises a question in the minds of the reader, do educationally qualified people tend to be more aware of their health than the others? Has no sufficient information on obesity and its consequences been told to others?

Genetics can play a huge role in obesity. A study on heredity over the obesity has found that a person with a hereditary history of obesity is 2 to 8 times likely to develop obesity than a person with no history of ancestral obesity [2]. A review on the obesity rates by races in 2016, has quite interesting revelations. American Indians rank number 2 with an obesity rate of 38.1% with a marginal difference followed by Hispanic blacks.

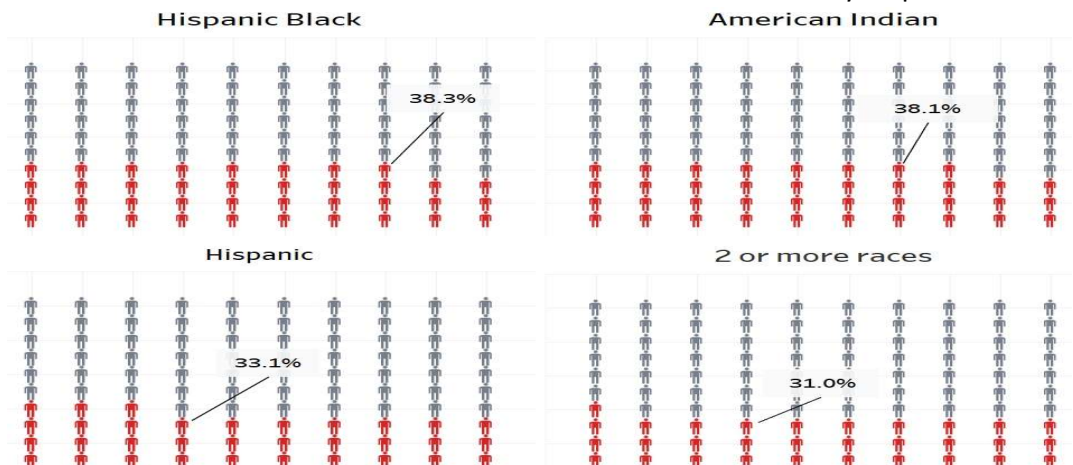


Figure 9 : Obesity rates by ethnicity

“Let food be thy medicine and medicine be thy food” says Hippocrates. Anything beyond a certain level can become an addiction finally leading to destruction.

Obesity is not a stand-alone disease it invites other major disease along with it. It brings in its pals along. Obesity can result in many diseases including increased blood pressure, diabetes, heart disease, arthritis and so on. With negligence about obesity comes the disadvantage of not noticing that the individual is becoming a magnet of all the adjoining diseases.

Sugar is called my medics as white death. Sugar when not consumed at right quantity can cause cancer, decrease in tissue elasticity, aging and affects the immune system. Soda have high level of sugar content in them. Statistics show that 1 in 5 person in the country have some kind of soft drink on a daily basis [3]. These beverages are nothing but packed water with lot of sweeteners added into them.

Consumption of beverages with high sugar content in it can affect the health of an individual. It is very similar to a slow poison. Type 2 diabetes is a condition in which the body has become immune to insulin or it no longer produces sufficient insulin to maintain a normal level of glucose. According to study, the risk of a person developing diabetes increase by 26% with an intake of soda twice a day.

Survey of diabetes among adults of age 20 and above in the states over the years has unfolded shocking figures in males vs. females diabetes ratio. The gap between women with diabetes to that of males was very wide in 2010, with women being on the lower end. But over 5 years, women tend to have developed diabetes more than men

and the gap between men and women with diabetes has seen a significant drop.

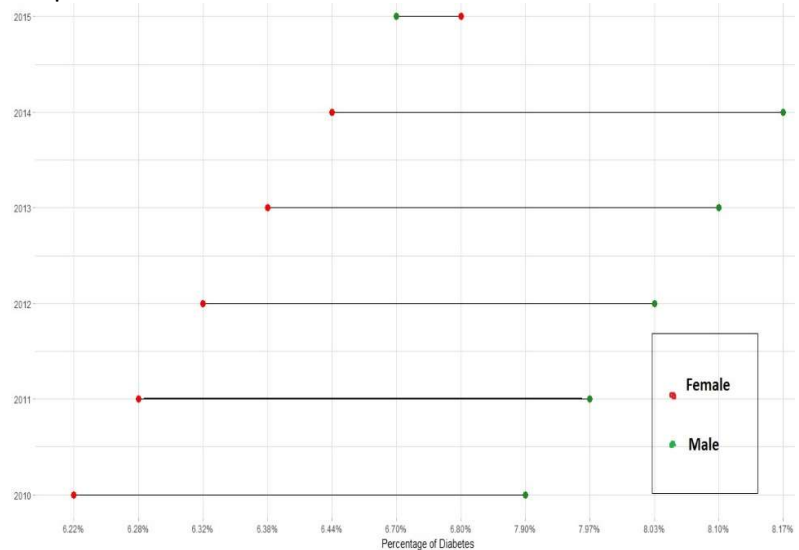


Figure 10 : Men vs Women diabetes rates

Adding on to the above mentioned problems, US is seeing a very high amount of adolescents getting into mental health issues like depression. A study by National health and nutrition examination survey has shown that the 20% of boys and 30% girls had high signs of acute depression in obese adolescent [4]. Depression along with obesity can take a toll on the individual's heart health, making them susceptible to heart related disease.

With all these complications going on since a decade, it was high time for US to be awakened and start focussing on the health issues, especially the root cause and the king of all the diseases – obesity. To fight obesity, the few state governments have started laying taxes on sugar and soda, to break the habit of the people.

A study was conducted by a group of people to understand if there was a change in behaviour of soda consumption in the Philadelphia after a brief period of tax implementation. The results of the study showed that the tax had a larger impact on the behaviour of people in 2 months of implementation.

The consumption of soda and energy drink have seen a significant dip while the buying pattern of bottled water has gone up by 58% [5]. They also have started programs like REACH (Racial Ethnic Approach to Community Health) to provide unbiased support to all the races in the country through appropriate program [6]. They have also tied up with universities to spread awareness about obesity.

Will these measures assure the behavioural change of people in a longer run? Perhaps only time can be the best answer to this.

Appendix:

References:

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Data source:

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Justification:

Figure 1 : Average Weight

A gauge chart is used to visualize the average weight of men and women. This representation is chosen because it can be visually related to a weighing machine. The chart has been made using R code.

Figure 2 : Obesity – A world outlook

A world map is used to visualize the percentage of obesity across various countries because a map is a representation that can help someone to spot the country quickly. Also the color scheme used is red for high and green for low. This is because it can help humans relate red to levels that are alarming and green for levels that are harmless.

Figure 3 : Obesity rate vs Fast food growth

This visualization was developed in Tableau. This shape of the points has been modified to a fat man and obesity rates has been used for showing the increasing size. In addition the fast food restaurant growth has been added to show that both are directly proportional and have increased over the years.

Figure 4 : An overview of McDonald's Menu

The visual was developed using the simple square symbol instead of a bar in tableau. The reason to use this is to include 3 measures in the representation, color for cholesterol, total fat for size and the calories along the x axis. The choice of color was brown because McDonald's is related to burgers and the burgers are related with brown color (visually resonant).

Figure 5 : State wise obesity%

A treemap feature of tableau has been used to draw the state obesity % in year 2016. The reason to choose this chart is because bar charts don't suit when the number of categories are more and also, they can easily convey the message on the visual. For eg. A person would look at the size and color to immediately come to a conclusion that the box on top left is the one with highest%. The choice of color is same as the one stated for figure 2.

Figure 6 : Rank based on physical inactivity

This chart was again developed in Tableau, this chart is a combination of line chart and a dot chart. It's essentially the same information that has been merged using a dual axis to make the dots overlap over the line to increase readability.

Figure 7 : Obesity rates by age

A simple bar chart has been used to visualize the obesity rate across age groups. This visual has been developed in Power BI. The data has been ordered in descending order of the obesity% so that any viewer can look at the chart and draw inferences quickly. Also, the reason to pick a vertical bar chart is that the categories are less and the labels can fit in the vertical bar.

Figure 8 : Education vs obesity rate

This chart was developed using excel. A donut chart was used because it is better than a pie chart as it doesn't draw the attention of a viewer towards the center of the circle and brain can interpret length quickly over area [13]. A concentric donut chart was used so the viewer can quickly compare the change in obesity% at one glance across all the years.

Figure 9 : Obesity rates by ethnicity

A dot matrix or waffle chart is a replacement for bar chart. The number of categories handled can be really small, but it can be a great visualization when someone has to show the % of the measure upon 100% [14]. Also the points have been replaced to men to show that the study includes humans in the study and the also a bright red and subtle grey is used to highlight the presence and absence of obesity. Tableau was used to develop this chart.

Figure 10 : Men vs Women diabetes rates

The chart in the figure is called a dumbbell or a lollipop chart. This chart was developed using R. The reason to pick the chart was that it is quickly interpretable when someone has to show the difference between 2 categories under study. Also lengths are quickly picked by human brains.

Justification References:

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Tools Used:

1. Tableau
2. Power BI
3. Excel
4. R