



# A Study On World Obesity

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# What is Obesity?

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Obesity is defined as an individual having a Body Mass Index (BMI) of 30 or higher<sup>1</sup>. BMI is a measure of a person's weight in kilograms divided by the square of their height in meters.

Obesity is subdivided into three categories<sup>1</sup>:

- Class 1: BMI of 30 to < 35
- Class 2: BMI of 35 to < 40
- Class 3: BMI of 40 or higher

Obesity is not always a negative classification. Extremely muscular people can be classified as obese without having the health disadvantages of high body fat percentage. Usually however, obesity refers to having a large amount of body fat, to which most peoples' BMI's highly correlates<sup>2</sup>.



# What causes Obesity?

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Obesity is highly correlated to individuals' inherited factors and how their environment, personal diet and lifestyle choices affects those factors. Rarely is obesity caused by genetic factors alone<sup>3</sup>.

Weight gain is cited as being caused by eating more calories than burned<sup>2</sup>.

Environmental causes include family and social habits<sup>3</sup>.

Personal diet often includes drinking calories and eating "junk food"<sup>3</sup>.

Lifestyle choices are typically related to activity or inactivity<sup>3</sup>.

Certain diseases and medications such as Prader-Willi and Cushing syndromes or prolonged use of steroids<sup>2</sup>.



# What is significant about Obesity?

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Multiple health risks are associated with Obesity

- Type 2 Diabetes
- High Blood Pressure
- Heart Disease
- Stroke
- Sleep Apnea
- Liver and Kidney disorders
- Some Cancers

Health Care Costs associated with Obesity between 2005 and 2010<sup>5</sup>:

- The amount by which obesity raised medical costs per obese adult rose from \$3070 to \$3508
- The aggregate costs of obesity of adults in the US rose from \$212.4 billion to \$315.8 billion



# Who is most likely to be Obese?

Obesity is found in all demographics regardless of sex, genetic origin, education, or level of income but some populations in the United States have a much higher prevalence than others<sup>6</sup>.

- African-origin females have the highest population percentage of obese adults (56.9%)
- The lowest prevalence of obesity is found in those of Asian origin (11.7%)
- More of the adult female population (38.3%) is obese than the male population (34.3%)
- The middle class (130% - 350% above poverty level) is most likely to be obese (40.8%)
- College graduates are significantly less likely to be obese than non-graduates (27.9%)
- People with some college are more likely to be obese (40%) than those without college (35.5%)

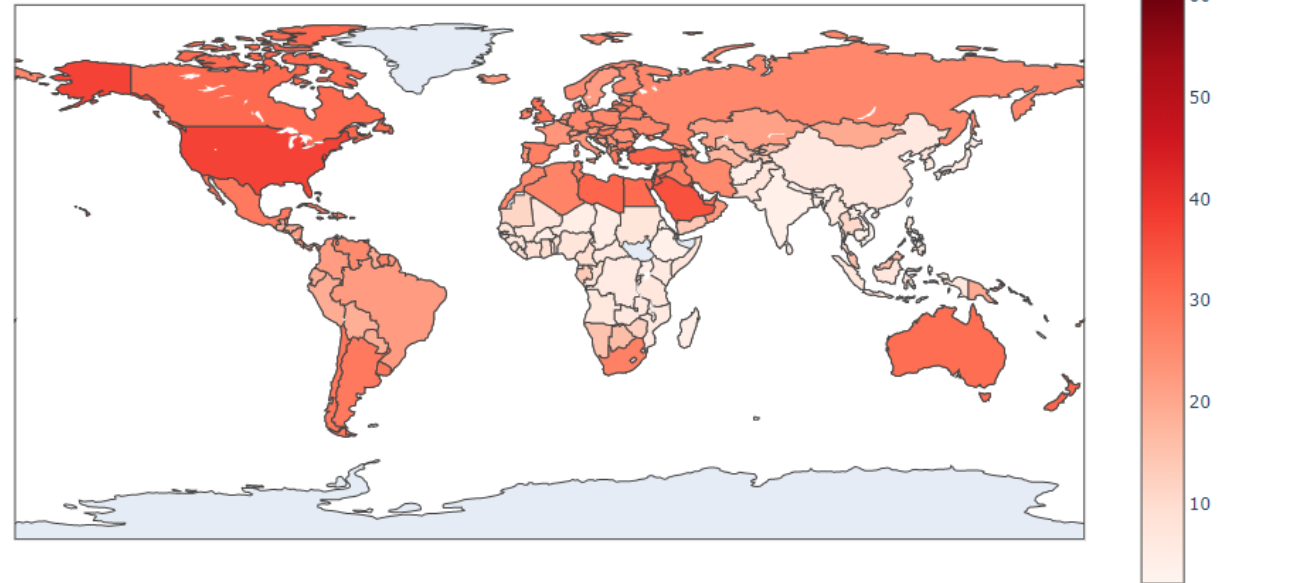
Obesity is therefore not tied to poverty but does show signs of being slightly related to sex. Education seems to have the strongest correlation to obesity. This may also be tied to level of income although African-origin females skew this number with a whopping 58.8% of the some-college population being obese.



# The World's Obese

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World Obesity Prevalence by Country



Source: World Health Organization

	country	year	population
	China	2016	74,618,250
	India	2016	36,272,590
	United States of America	2016	97,581,420



# The Data Sources

Data was acquired from two sources. Exploratory Data Analysis was conducted on both individually and the two datasets were merged, where further EDA was performed.

The World Health Organization provided obesity statistics:

[https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-obesity-among-adults-bmi=-30-\(crude-estimate\)-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-obesity-among-adults-bmi=-30-(crude-estimate)-(-))

The World Bank Open Data Project provided population statistics:

<https://datacatalog.worldbank.org/dataset/population-estimates-and-projections>



# The Data Explained

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## WHO Data Features

- 'country' – Country Name
- 'year' – Year of record
- 'pct\_obese' – Percentage of Adults who are Obese
- 'country\_code' – ISO 3166 Code for country
- 'sex' – Sex of population measured
  - BTSX (both sexes) was used, male and female were dropped
- 'latest' – Boolean indicating most recent record

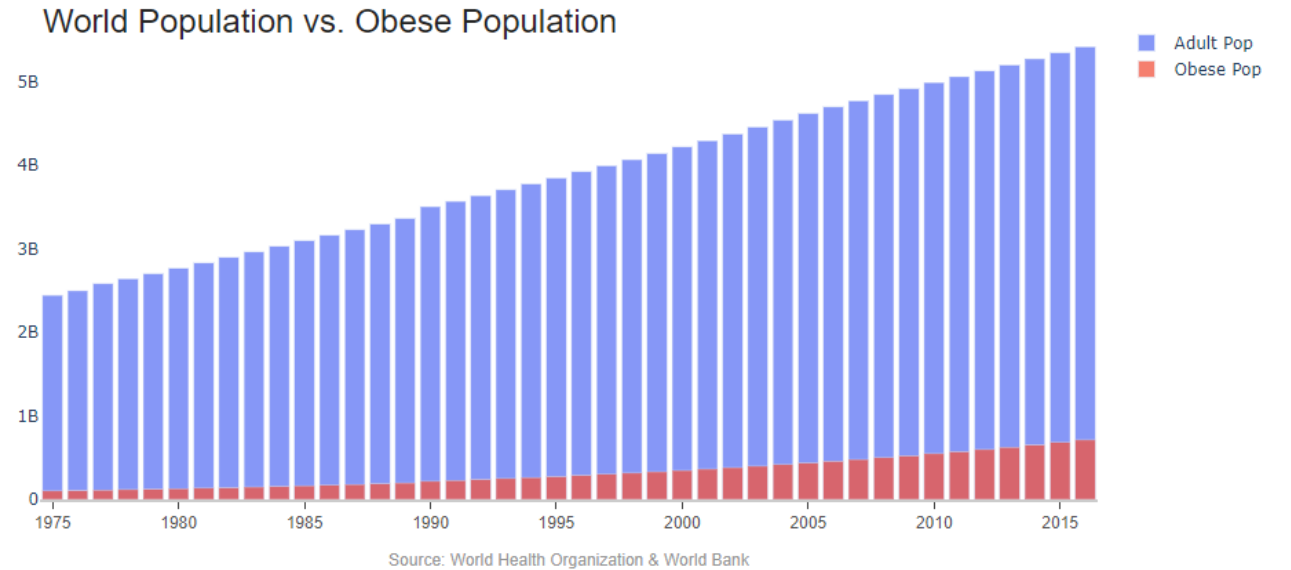
## World Bank Data Features

- 'country' – Country Name
- 'country\_code' – ISO 3166 Code for country
- 'year' – Year of record
- 'SP.POP.TOTL' – total population
- 'SP.POP.0014.TO' – population under 15
- 'adult\_pop' – Calculated adult population



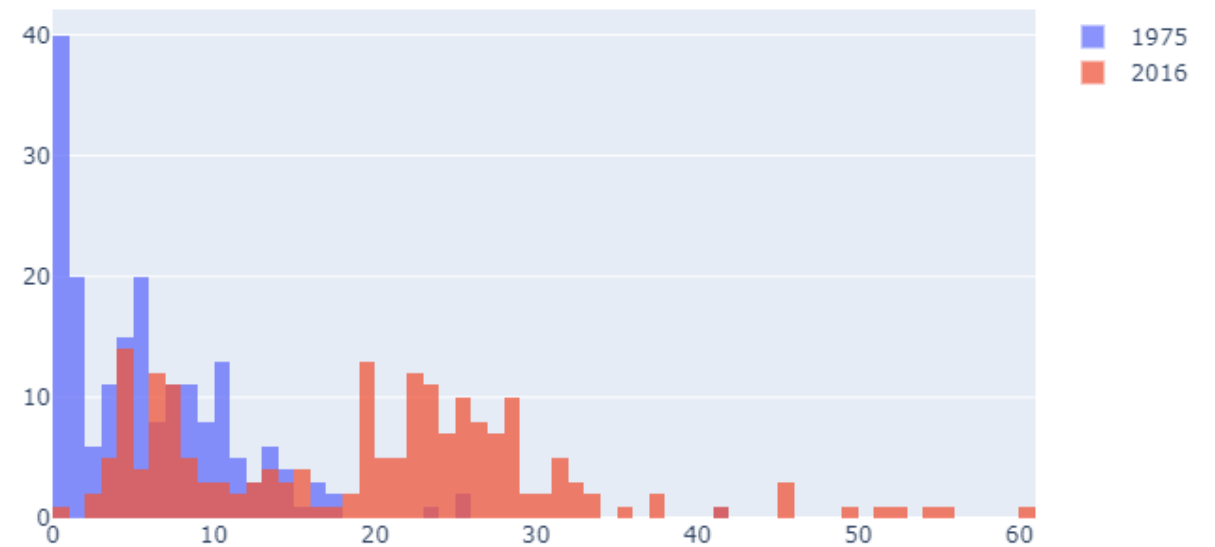
# 46 years of World Obesity

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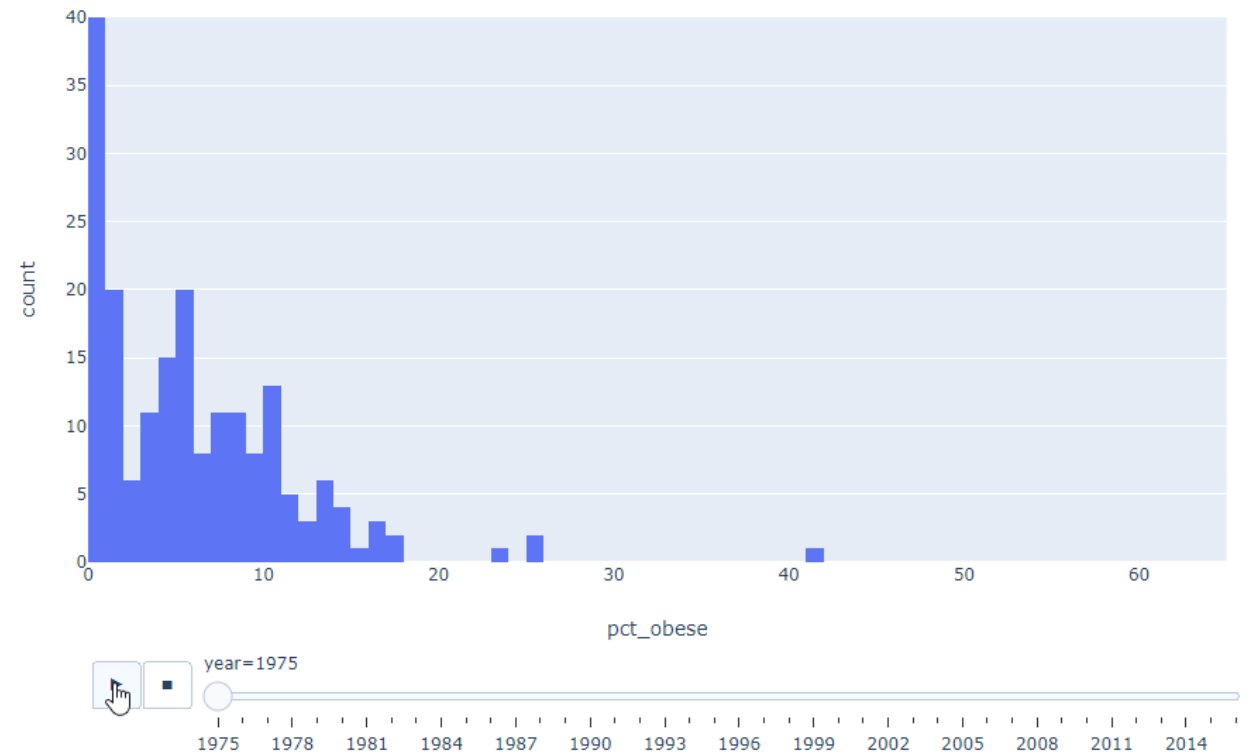
# Obesity, the basic numbers

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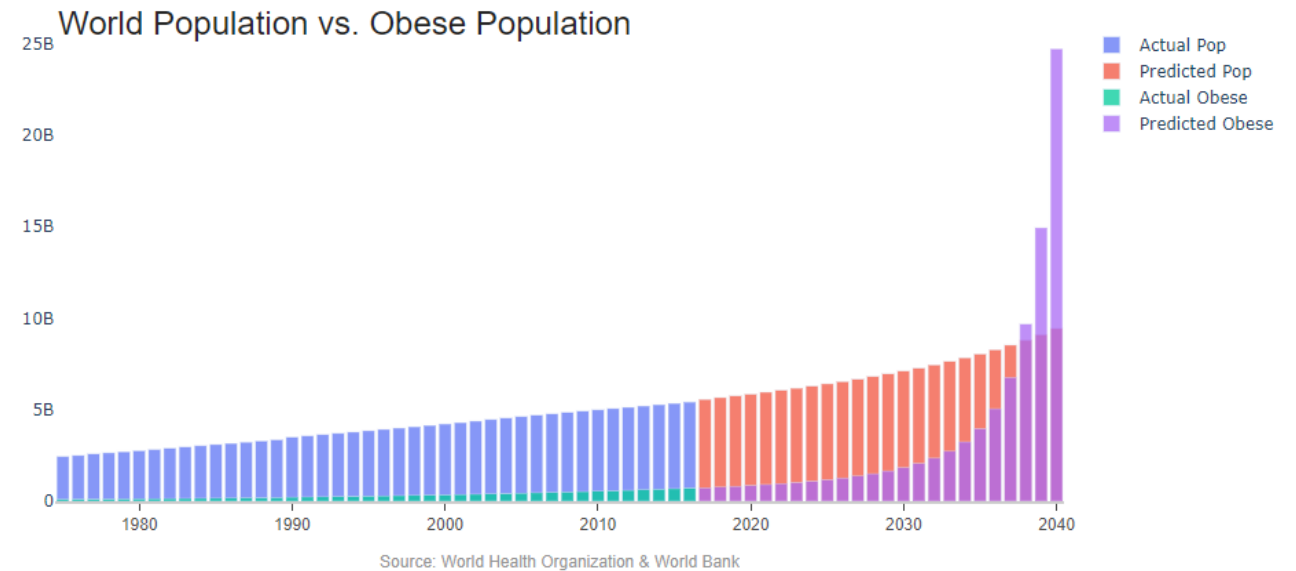
# Trends in Obesity 1975-2016

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# Where are our waistlines going?

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# Why does Obesity matter?

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Obesity will become a burden on more than just obese individuals.

Mental health issues cause effects in social and business environments through depression, disability and lower productivity<sup>2</sup>.

The more food consumed, the more obese you become. The more obese you become, the more food you need. This impacts food availability worldwide.

Accommodation of the obese will cause increases in travel costs, seated entertainment venues, typical household items such as ladders, scales, and shower floors.

Medical cost increases are shouldered by everyone to keep them down for the obese.

Medical supply shortages are already being seen in insulin and will result in global shortages<sup>5</sup>.



# What does this mean to me?

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The problems caused by obesity on the horizon are countless. From medical material availability to healthcare costs, the resources won't be able to support the population of the obese.

Obesity is almost entirely preventable if we find the cause. Causes have been suggested ranging from marketing campaigns for foods to abundance of improperly balanced macro nutrients. Food Addiction is also often cited as a source of weight gain.

If people don't take responsibility soon, it will be too late.



# References

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- 2 - Mayo Clinic. (2020, February 15). Obesity. Retrieved from Mayo Clinic: <https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc-20375742>
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- 4 - Biener, A., Cawley, J., & Meyerhoefer, C. (2017). The High and Rising Costs of Obesity to the US Health Care System. *Journal of General Internal Medicine*, 6-8. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5359159/>
- 5 - Gulland, A. (2018, November 20). Insulin supply may not meet demand as number of patients with diabetes rockets. Retrieved from The Telegraph: <https://www.telegraph.co.uk/global-health/science-and-disease/insulin-supply-may-not-meet-demand-number-patients-diabetes/>
- 6 - Ogden, C. L., Fakhouri, T. H., Carroll, M. D., Hales, C. M., Fryar, C. D., Li, X., & Freedman, D. S. (2017). Prevalence of Obesity Among Adults, by Household Income and Education — United States, 2011–2014. *Morbidity and Mortality Weekly Report*, 1369-1373. Retrieved from [https://www.cdc.gov/mmwr/volumes/66/wr/mm6650a1.htm#F1\\_down](https://www.cdc.gov/mmwr/volumes/66/wr/mm6650a1.htm#F1_down)