

## Math Internal Assessment

1.

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Is there a correlation between the availability of fast food, obesity and the health problems in relation to obesity?

## Introduction

The purpose of this project is to find out whether or not there is a correlation between the availability of fast food, obesity and the health problems in relation to obesity. The project will discuss the relationship between diet and obesity and then the correlation between obesity and heart problems. Obesity is far more common in areas where fast food is available. This may be due to low earnings, lack of time to prepare food, or sometimes just out of habit. Fast food is extremely cheap and convenient for people who have a shortage of money and, or time. As the number of fast food restaurants increases, so do levels of obesity and health problems. People with low earnings sometimes live off this low-costing, convenient food, without much thought about the damage it does to their bodies. The reason for this increase in levels of obesity among the lower classes is that fruit, vegetables and other healthy foods are becoming more and more expensive. Fast food, like McDonalds, on the other hand is becoming cheaper and cheaper. Many foods that are high in fat content are lower priced than the expensive, healthy foods. This is rapidly becoming a problem in places like the United States, Mexico and some areas of Europe. According to the Magazine of the *Pan American Health Organization*, in the US, two out of three adults are overweight and one in three is obese. Also in the Czech Republic, Finland, Germany and some countries in the Caribbean, almost half of the population is overweight and one in five is obese.

The body mass index is the calculated body fat of a person's body with regard to their height. To be considered obese, one's body mass index (BMI) would have to be of 30 or

over. Through graphs and statistical analysis, the correlation between food consumed and obesity will be investigated.

### **Hypothesis**

The expected results will be that there is a correlation between fast food consumed and levels of obesity. Certain countries will be studied in their levels of obesity and access to fast food restaurants, such as the popular McDonald's restaurant.

How does the rising popularity of McDonald's fast food restaurants correlate with the rapidly rising levels of obesity? This is the main topic under discussion in this project.

The rates of obesity are increasing rapidly within different age groups. There is a higher percentage of people who are overweight in this world than obese, as shown in the chart below. It appears that the older the age group, the higher the probability that one is overweight or obese. This is shown in fig. 1. <sup>1</sup>

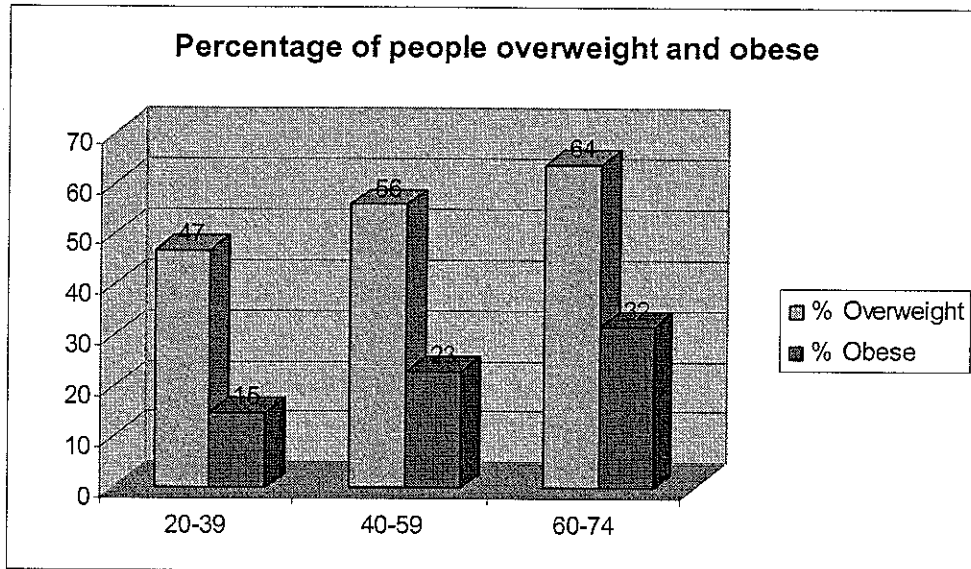


Fig. 1

These vary slightly from country to country and between the sexes. <sup>2</sup>

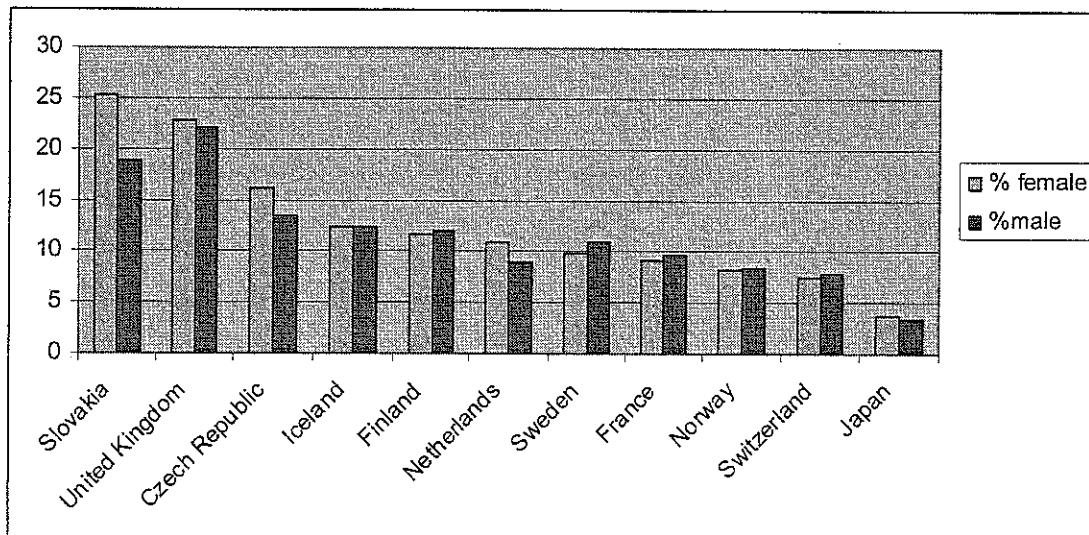


Fig. 2

As shown in the graph Fig.3, there is a higher probability that a women should be overweight than a man, however this is not the case in the Scandinavian countries shown above. The Slovakia and the U.K. have the highest levels of male and female obesity in Europe. In Slovakia, the percentage of women obese is 25.4% and men are 18.8%. The percentage of women who are obese in the UK is 22.8% and men are 22.1%. Japan has the lowest levels of obesity, with just 3.8% of women obese and 3.4% of men that are obese.<sup>3</sup>

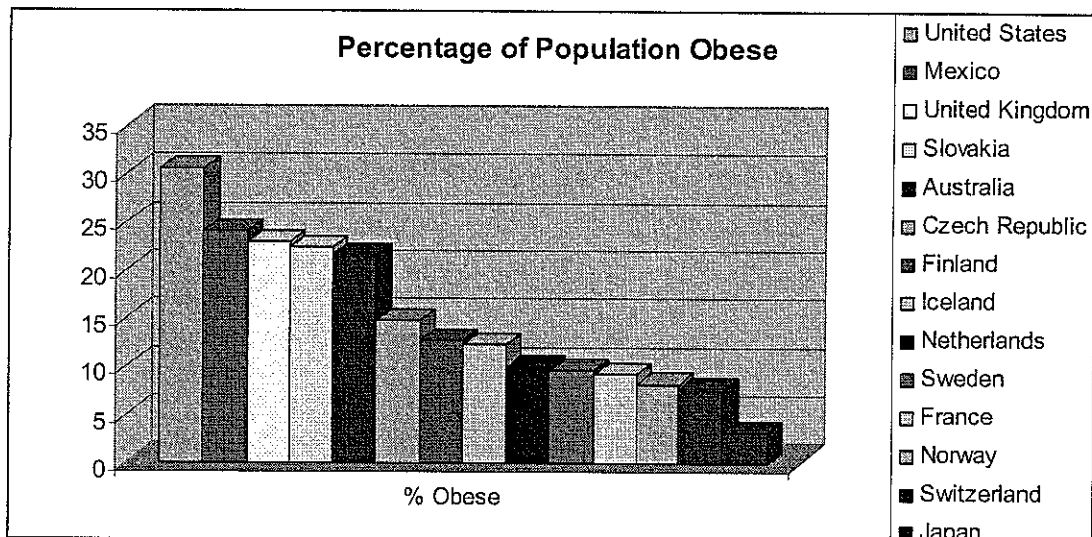
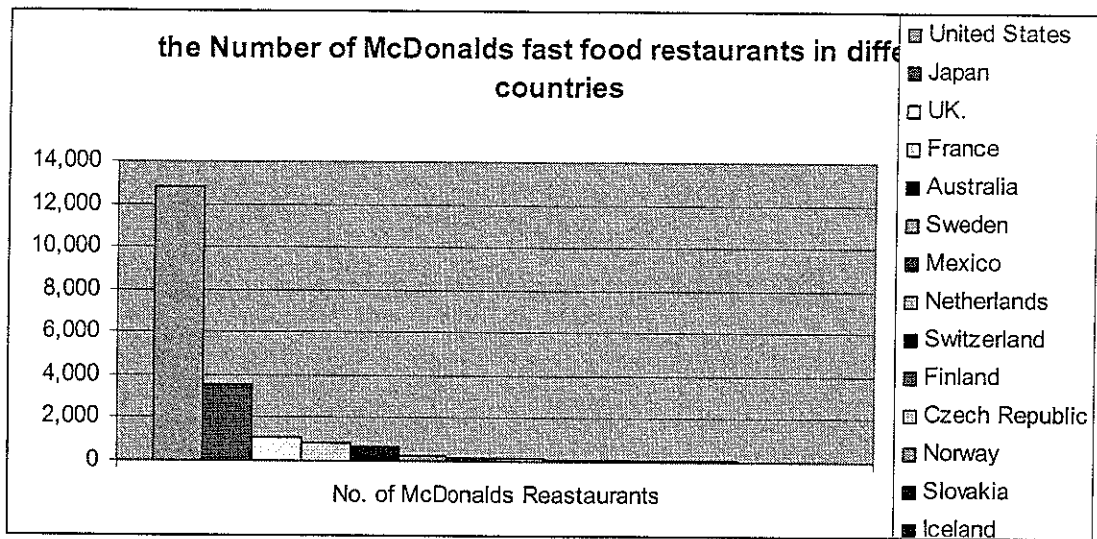


Fig. 3

To investigate whether or not there is a correlation between fast food consumption and global obesity levels, the number of McDonald's fast food restaurants (possibly the most popular fast food) in some sample countries was recorded.<sup>4</sup>



Unsurprisingly, the United States had the highest number of McDonald's restaurants in the world. What was surprising was that Japan had the second largest number of McDonald's restaurants, as shown in the chart. This seems strange as Japan also has the lowest percentage of overweight or obese population. Also, Slovakia has one of the smallest numbers of McDonald's restaurants, but also happens to have one of the largest rates of obesity. This may be evidence that the availability of McDonald's restaurants does not correlate with levels of obesity.

Calculations

The correlation of the data: 0.707535

The standard deviation: 0.627206

### **Limitations of the Investigation**

The number of McDonald's restaurants available in one country does not always correlate with the levels of obesity in that country. An example of this would be Japan. With the lowest rates of obesity, Japan surprisingly has the second largest number of McDonald's fast food restaurants in the world. Slovakia also goes against the predicted results, with one of the lowest number of McDonald's restaurants in the world. The reason why there is little correlation, in some cases, between the numbers of McDonald's restaurants in certain countries and the levels of obesity in the same countries is that, while McDonald's may be the most popular fast food restaurant, it is relatively unknown in some countries of poverty, despite the fact that it is low-costing. To achieve more accurate results on the correlation between fast food consumption and levels of obesity, more than one franchise of fast food restaurants should be investigated.

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<sup>1</sup> Statistics for fig. 1 were received through [www.nationmaster.com](http://www.nationmaster.com)

<sup>2</sup> Statistics for fig. 2 were received through [www.nationmaster.com](http://www.nationmaster.com)

<sup>3</sup> Statistics for fig 3 were received through [www.nationmaster.com](http://www.nationmaster.com)

<sup>4</sup> Statistics for fig 4 were received through [www.nationmaster.com](http://www.nationmaster.com)