

# Obesity summarised

By : [lisc](#)

This article is an overview to a forthcoming paper on the problem of western societies growing weight problem as measured by the Body Mass Index (BMI). Data is taken from the OECD, WHO, and the Australian Bureau of Statistics in the aim to provide further evidence of the causal nature of the steady increase in BMI rates of Australia.

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## Overview of overweight and obesity

Overweight and obesity are a growing concern for many western countries and countries that are becoming westernized in their approach to daily life. The general reasons for concern is due to the increasing sickness, deaths and lack of productivity caused by being overweight or obese. Some sources have quoted that overweight and obese individuals now cost health systems more than tobacco consumption. In defining overweight and obese the Body Mass Index (BMI) (as measured by an individuals weight divided by the individuals height squared) is the most common form of large scale measurement due to its ease of use for large data and will be used in this series. In the end the issue at face value is one of excess calorie requirements of an individual. That is an individual consumes more than an individual expends.

## The trend

Overweight and obese individuals have grown in numbers as a proportion to the whole of a countries population in an unprecedented fashion over the last 30 or so years in several countries. The environment overall now is termed an "obesogenic environment" due to many different factors that aid an individual in gaining weight.

## Overview of overweight and obesity hypothesized by this paper

This paper argues that the gain in weight by the population as an average is due to the stressors placed upon society. The particular stressors this paper argues are the decline in smoking rates and the increase of productivity. A person has not changed in their basic function for much of the industrialised period. Moving forward to a more appropriate time frame the 1960's persons are not too dissimilar to a person living in 2012, from the point of view of self-regulation (self control). That is that if you took a person from 1960 and placed them into todays western society that all other things being equal, they will turn into the average equivalent person now. The two key changes that this paper argues that the two main differences between then and now is 1) the decline in tobacco consumption; and 2) the increase in the level of available and accessible technology.

The affects of these two changes has been to put an increased demand on the average persons self-control ability. To compensate for this change in demand upon the "stress systems", a new drug of addiction has popped up, primarily refined sugar.

## Obesity summarised

### The assumptions (How it works)

People in the 1960's are not significantly different to than a person in 2012. Therefore the self-control of a person in 1960 is little different to today. This paper argues that self-control is like a muscle. So some people have greater self-control muscle power than others for whatever reasons being genetic or otherwise. People have the ability to strengthen and also weaken their self-control muscle similar to doing weights. That is you work it a little at a time, wearing it out each time and it grows back a little stronger each time. If that muscle is too weak, then you either need to support it through further through training, or use exogenous substances, such as coffee, tobacco, sugar or other drugs of addiction that help regulate this self-control system (just as some athletes use steroids and the likes to help their muscles).

Just as today, in the 1960's there was a certain amount of the population that regulated their emotions (our interest being primarily stress) through the use of a psychoactive drug known as tobacco (which includes nicotine). Too little or too much stress, tobacco as a stimulant drug of addiction had a solution to help you regulate your self-control. Today however, different to the 1960's tobacco consumption rates have dropped due to the lowering social acceptability of the drug. This on average leaves that portion of the population now with a void to fill in the gap between the ability of their self-control muscle and the stressors placed upon them. This tobacco consumption represents an input into the self-control system as an aid.

On the other side of the self-control system an average persons productivity has now increased from the 1960's. This is not with regard to working longer hours, but as measured by multi-factorial productivity. Technology has seen the average person produce more output given the same inputs. This increased demand through (primarily) mental exertion has placed a greater demand upon the self-control muscle.

This paper argues that through the decrease in tobacco consumption and the increase in productivity there is now a demand for a new drug that can fill this void that the self-control muscle can not immediately support. It is recognized that there are many addictive substances, however that as will be explained in the next paper, these do not conform to the same requirements as tobacco, with the exception of coffee.

### The data

Data used was a combination from the World Health Organization BMI statistics, the Organization for Economic Development for tobacco consumption rates, and the Australian Bureau of Statistics for hours worked by the average person multiplied against the multi-factorial productivity rate as estimated by the Australian Bureau of Statistics. The data used covered the period between and inclusive of 1980 to 2008.

### The model

## Obesity summarised

$$\text{BMI} = \beta_1 + \beta_2 \text{productivity} - \beta_3 \text{tobacco} + e$$

where

BMI = Body Mass Index

Beta1 = constant

Beta2 = productivity as measured by multi-factor productivity estimates against hours worked per capita per annum base year 2007

Beta3 = tobacco consumption per capita per annum

e = error term

### The preliminary results

The model produced a preliminary coefficient of determination of 99.32%, that the change in tobacco consumption and the change in productivity levels explain 99.32% of the change in Australia's average BMI. This model is still in its linear phase and has shown preliminary results in log-log form of 99.44% in explaining BMI. This model was then run against the US data on BMI and provided similar accuracy adjusting for a base change in BMI result "0.95". The two variables chosen provide further evidence for the self-control hypothesis of this paper.

### The next paper

The next paper due by November 2012 provides the hypothesized reasoning of how these two mechanisms work through neuro-chemical processes and the HPA axis. A multiple linear regression model detailing specific numbers for calculation of BMI rates for a country. Further areas for experimental research to target. Policy choice options available to governments.

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