

## WHAT IS ECONOMETRICS? (CHAPTER 1, 1.1)

The main questions econometrics studies are about *causal effects* – what would happen to some variable  $Y$  if we change some other variable  $X$ , and everything else remains unchanged (causal effect of a variable  $X$  on an outcome variable  $Y$ ).

**Q: What is the effect of variable  $X$  on a variable  $Y$ ?**

$Y \leftarrow X$

$Y \leftrightarrow X$  (consuming artificial sweeteners ( $X$ ) leads to obesity, diabetes ( $Y$ ))

By MICHELLE CASTILLO / CBS NEWS / July 10, 2013, 4: 28 PM

### Artificial sweeteners could lead to obesity, diabetes



Packages of Equal and Splenda artificial sweeteners are displayed at a coffee shop April 9, 2007 in San Rafael, California. Merisant, the maker of Equal filed a lawsuit today against McNeil Nutritionals, the maker of Splenda, citing that Splenda's advertising is misleading consumers to believe that the sweetener is all natural and made from sugar. McNeil Nutritionals claims that Splenda does originate from sugar. / JUSTIN SULLIVAN/GETTY IMAGES

Y X (brushing your teeth regularly (X) lowers the risk of heart attacks and strokes (Y))

↖ ↗

Z

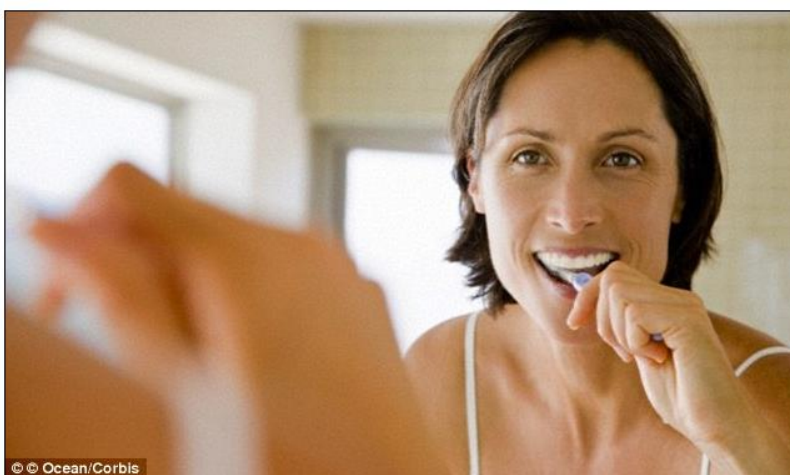
MailOnline



Home | U.K. Home | News | Sport | U.S. Showbiz | Femail | **Health** | Science | Money |

Health Home | Health Directory | Health Boards | Diets | MyDish Recipe Finder

## Regularly brushing your teeth lowers the risk of heart attacks and strokes



© Ocean/Corbis

Life-saving: Brushing at least twice a day could help lower your risk of heart attacks and strokes, researchers have found

### BRIEF TOPICS OVERVIEW

Throughout this course we are going to cover important topics in economics, such as: the gender wage gap (using data from the U.S.), the immigrant-native wage gap (using data from Canada), as well as the racial wage gap in the U.S. We are going to start our analyses by revising and applying the fundamentals of statistics you learnt in STATS250, namely – we'll start by looking at the sample averages, and then proceed to testing hypotheses about the population averages. We are going to use these results as a stepping stone to further sophisticate the analyses by asking the question: *are some of the pay gaps we observe due to discrimination, and if so, what is the degree of discrimination on the labour market?* In order to answer these question, we would need to be able to look at workers who are the same in terms of all characteristics affecting wages, other than race/gender/immigrant status. In order to reach this goal we would need to study econometrics, starting from the fundamentals – the simple linear regression model and the ordinary least squares estimation method, then gradually complicating our tools to the multiple linear regression model, and more advanced tools such as random and natural experiments, and the instrumental variable estimator.

We are also going to cover some state-of-the-art papers from the economics literature, as well as tackle some fun topics such as “*what is the causal effect of hours of study on college GPA?*”, “*what is the effect of skipping classes on college GPA?*”, “*what is the effect of compulsory seat belt law introduction on traffic fatalities?*” or “*is there a monetary return to beauty?*”

The single most important implication of this analysis, as well as the **key implication** of this course is that **the conclusions of our not-so-advanced tools early on would generally not survive the introduction of more compelling econometrics tools later on.** This is also going to be my ultimate **goal** in the course – to help you develop the tools to critically analyze economics research, and to be able to make stronger arguments when devising research of your own.