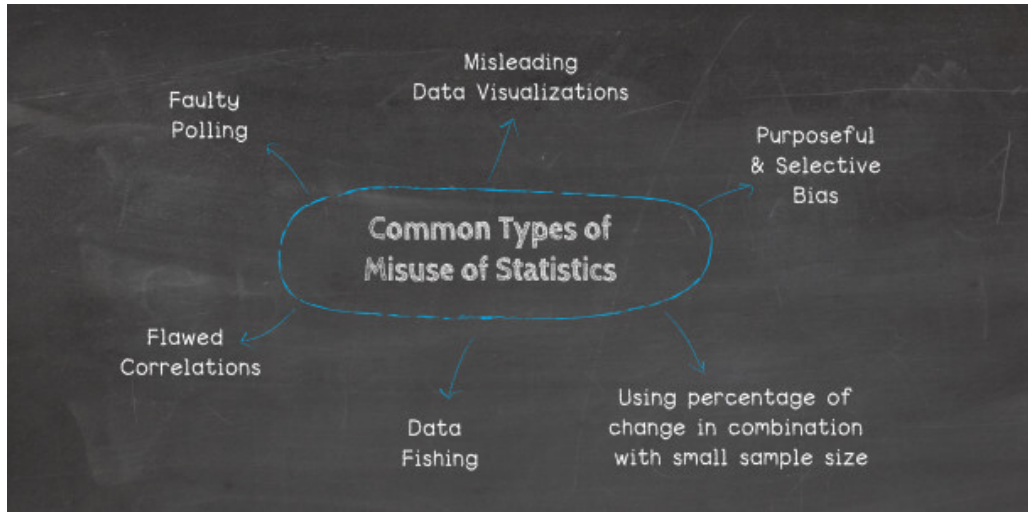


## Misleading Statistics Examples

While numbers don't lie, they can in-fact be used to mislead with half-truths. This is known as the *misuse of statistics*. It is often assumed that the misuse of statistics is limited to those individuals or companies seeking to gain profit from distorting the truth, be it economics, education or mass media.



### Fault Polling

The manner in which questions are phrased can have a huge impact on the way an audience answers them.

- Do you believe that you should be taxed so other citizens don't have to work?
- Do you think that the government should help those people who cannot find work?

A more accurate way of wording the question would be, "What is your point of view regarding unemployment assistance?"

### Flawed correlations

Let's assume that a study has found a correlation between an increase in car accidents in the state of New York in the month of June (A), and an increase in bear attacks in the state of New York in the month of June (B).

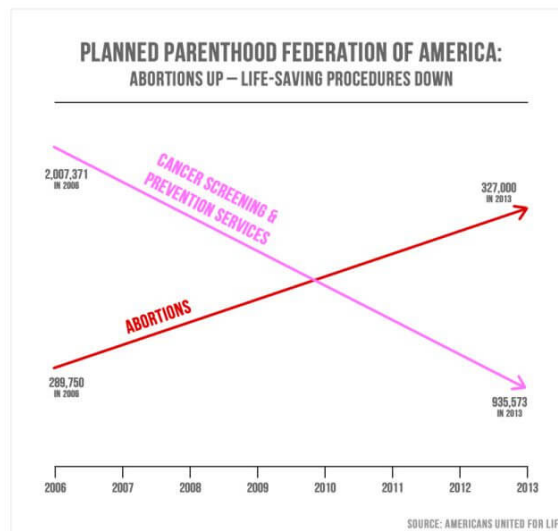
- Car accidents (A) cause bear attacks (B)
- Bear attacks (B) cause car accidents (A)

- Car accidents (A) and bear attacks (B) partly cause each other
- Car accidents (A) and bear attacks (B) are caused by a third factor (C)
- Bear attacks (B) are caused by a third factor (C) which correlates to car accidents (A)
- The correlation is only chance

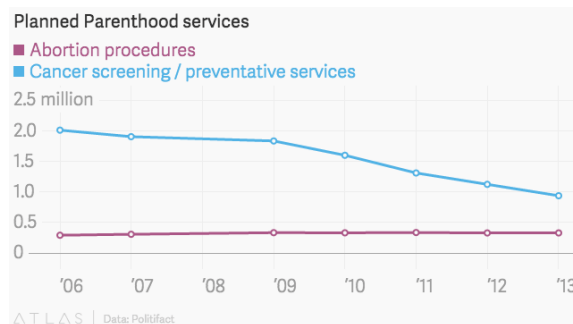
Any sensible person would easily identify the fact that car accidents do not cause bear attacks. Each is likely a result of a third factor, that being: an increased population.

### Examples of misleading statistics in the media and politics

Misleading statistics in the media are quite common.



Based on the structure of the chart, it does in-fact appear to show that the number of abortions since 2006 experienced substantial growth, while the number of cancer screenings substantially decreased. The chart points appear to indicate that 327,000 abortions are greater in inherent value than 935,573 cancer screenings. While, in fact, the unbiased chart should look like:



This is a great misleading statistics example, and some could argue bias considering that the chart originated not from the Congressman, but from Americans United for Life, an anti-abortion group.

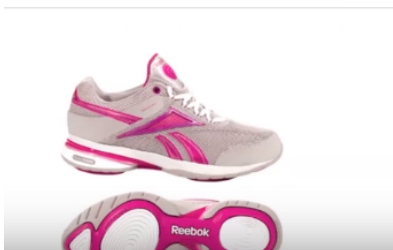
### Misleading statistics in advertising



In 2007, Colgate was ordered by the Advertising Standards Authority (ASA) of the U.K. to abandon their claim: “More than 80% of Dentists recommend Colgate.”

The claim, which was based on surveys of dentists and hygienists carried out by the manufacturer, was found to be mis-representative as it allowed the participants to select one or more toothpaste brands. The ASA stated that the claim “ would be understood by readers to mean that 80 percent of dentists recommend Colgate over and above other brands, and the remaining 20 percent would recommend different brands.” t we understood that another competitor’s brand was recommended almost as much as the Colgate brand by the dentists surveyed, we concluded that the claim misleadingly implied 80 percent of dentists recommend Colgate toothpaste in preference to all other brands.” The ASA also claimed that the scripts used for the survey informed the participants that the research was being performed by an independent research company, which was inherently false.

### Another advertisement that turns out to be a straight lie

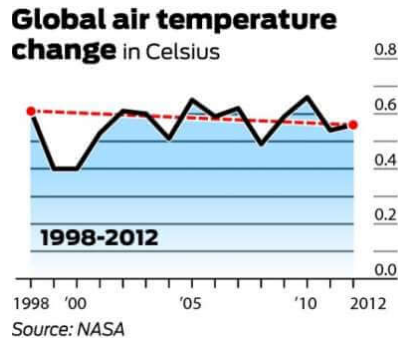


In 2009 and 2010, Reebok made the following claims about its EasyTone and Run-Tone shoes: Lab tests “proved” that the shoes work “your hamstrings and calves up

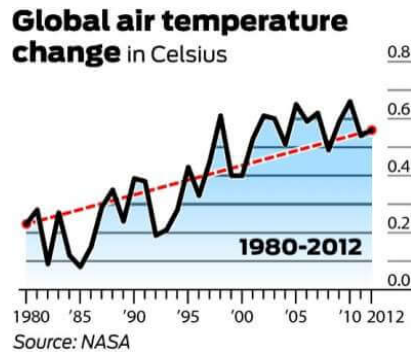
to 11% harder and tone your butt up to 28% more than regular sneakers just by walking!". The figures turned out to be complete garbage. The FTC stated that Reebok needed to pay a settlement of \$25 million for deceptive advertising.

### Misleading statistics in science

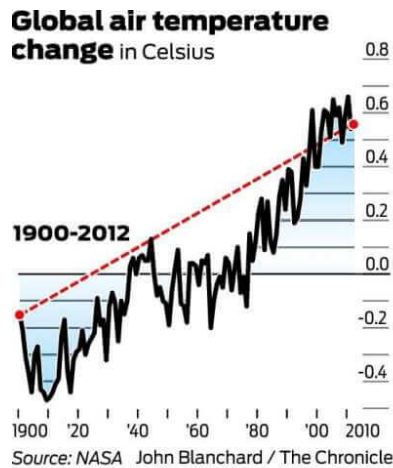
The below graph is the one most often referenced to disprove the global warming. It demonstrates the change in air temperature (Celsius) from 1998 to 2012.



Here you would be convince that the global temperature is quite stable. However, the below chart expresses the 30-year change in global mean temperatures.



And now have a look at the trend from 1900 to 2012:



### Misleading with probability

In Italy we have now a statistics that says:

“60% (or 6 out of 10) of the rapes in Italy are committed by Italians.”

This is featured in order to convince people that immigrants are not dangerous at all. But consider that now 40% of rapes are committed by immigrants/foreigners. But immigrants in Italy are 8.2% of the population (5,047,028) and Italians are 91.8% of the population (about 56,500,000 people)

Now there are about 4500 rapes per year in Italy, which means (assuming all are committed by a different offender) that 7.3 people in 100,000 are rapists overall. But it's 4.8 in 100,000 for Italians and 35.7 in 100,000 for foreigners!

Basically although the statistic they give us seems to give the information that “Italians are responsible for more rapes”, which is numerically true, it fails to mention that foreigners are over 7 times more likely to commit a rape!

### Some last words

Now that you know them, it will be easier to spot them out and question all the stats that are given to you every day (**especially on the facebook!!!**). Likewise, in order to ensure you keep a certain distance to the studies and surveys you read, remember the questions to ask yourself who researched and why, who paid for it, what was the sample.

### Sources

- *wikipedia.com*

- <https://www.datapine.com/>
- <https://www.quora.com>

## Today's activity

I would like you to form a group of 2-3 persons to present (3-5 minutes) in front of the class about the misleading/incomplete statistical data that happens around us in Thailand. This will count as 2% (out of 10%) of the attendance.