

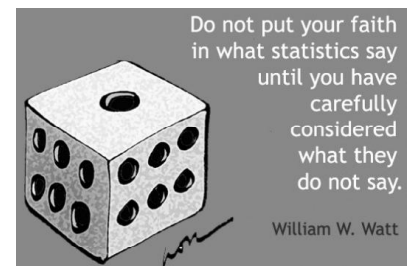
Statistics & Probability in the Media

What is the connection between statistics and probability?

Where are statistics and probability are used in everyday life?

- _____
- _____
- _____

Statistics and probability are used to provide information and often this information is meant to influence you. Graphs can be drawn and statements can be made to create false impressions. For this reason, it is important to make sure you have a good understanding of the graph or data so that you are not misled.



Things to consider when statistics and probability are used:

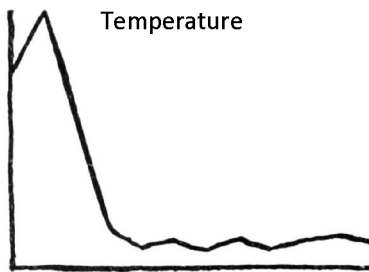
Misuse of language	<ul style="list-style-type: none"> The words <i>average</i> or <i>typical</i> are sometimes used without identifying whether the number used is the mean, median, or mode. Survey questions can be biased. Relevant information can be left out if it does not get across the desired information.
Distorted visuals	<ul style="list-style-type: none"> In some pictographs or 3-D graphs, the sizes of parts of the graph can make numbers appear greater or less than they are. When axes do not start at 0, it is easy to conclude that differences between numbers are greater than they are. Statistics can be fabricated or exaggerated and may not come from mathematical analysis.
Questionable Sources	<ul style="list-style-type: none"> Do the data come from a random, unbiased sample: What is the population? How was the sample chosen? When, where and how was the survey conducted? What were the questions in the survey - where they biased? The word <i>expert</i> implies that a person has a great deal of knowledge. Ask what may make a person an expert and whether they are an expert in the appropriate field? It is important to distinguish whether the presented data shows facts or opinions. Just because people believe something doesn't make it true.

Example 1

Examine the following statistics and determine where they try to mislead.

- a. 4 out of 5 doctors recommend *Sparkle Toothpaste* for your family.
- b. *Taylor Towels* are 30% stronger.
- c. Lee earned \$1000 a week selling our product door-to-door. You can too!
- d. CDs on sale, from \$8.99.
- e. Last year there were 55 motorcycle accidents involving people ages 16 to 30 and only 25 motorcycle accidents involving people over 30. People under 30 are careless motorcycle drivers.

f.



Example 2

GM's OnStar service is a wireless communication system between a central call centre and an OnStar enabled car, allowing drivers to call for help or ask for other services. The volume of monthly OnStar activity reported follows:

- 1,000 airbag deployment calls
- 300 crash notifications
- 11,000 emergency service calls
- 5,400 'Good Samaritan' calls; Orange Alerts; someone in trouble etc.
- 325 stolen vehicle location assists
- 41,000 remote unlock calls
- 24,000 requests for roadside assistance
- 329,000 requests for route assistance
- 412,025 total calls

Determine the probability of each type of call occurring.

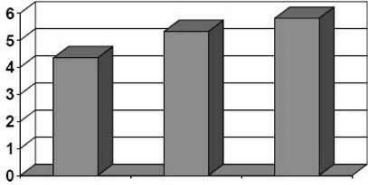
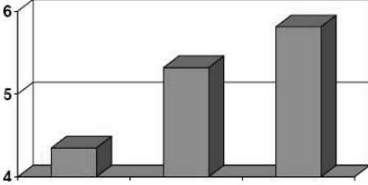
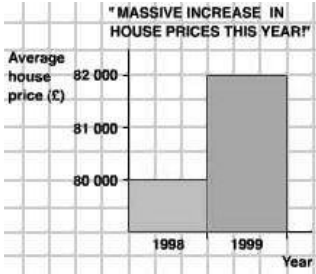
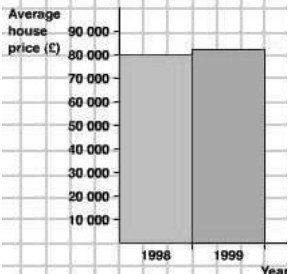
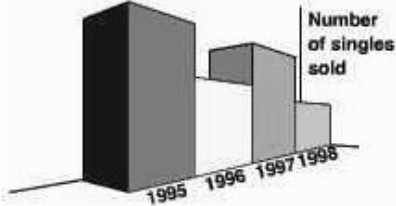
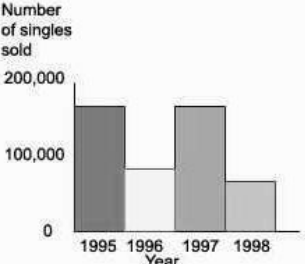
TYPE OF CALL	NUMBER OF CALLS	TOTAL CALLS	PROBABILITY OF CALL
airbag deployment		412,025	
crash notifications			
emergency service			
'Good Samaritan'; Orange Alerts; someone in trouble			
stolen vehicle location assists			
remote unlock			
roadside assistance			
route assistance			

a. Based on what you've seen in the media what type of headline might you see in a newspaper based on the statistics given above?

b. How accurate might those headlines be based on what you know about statistics?

Example 3

Compare each set of graphs. Which is each misleading? Why?

GRAPH 1	GRAPH 2	MISLEADING BECAUSE ...
<p>a.</p> 		
<p>b.</p> 		
<p>c.</p> 		
<p>d.</p> 