

Statistics made easy

If you are anything like me, maths and statistics although I liked it was made harder by the teachers who taught it. They seemed to have "information is power" or the "don't be stupid" well and truly ingrained. It wasn't until later on in my career, I found how useful statistics would be in helping me argue for more money in the budget or just to put forward policies and procedures which meant added value to the business. I hope you find the following useful.

Descriptive vs inferential

Statistics are methods to collect, process and interpret data. It is also a method of inquiry. One of the first ever collections of data is the Domesday Book. Governments love them.

There are two types of statistics **descriptive** and **inferential**. Descriptive used to describe or summarise our observations and inferential to make predictions or estimates.

Which of the following are descriptive and which are inferential:

- 1 "It is likely to snow this winter"
- 2 "There are more women working than there were ten years ago"
- 3 "More young women smoke than young men"
- 4 "It is likely that there will be a turndown in the economy"

Answer: 1 and 4 are inferential and 2 and 3 are descriptive.

There is another piece of jargon or terminology that is the distinction between population and sample. A sample is part of the population where as the population are those who have the characteristics to fall within it. The population may be infinite. Inferential statistics is concerned with generalising from a sample. For example a trainer may report that a sample of new staff joining the organisation who attended a particular customer service programme had more positive feedback from customers than those who did not. Then the trainer goes on to say that all new employees should attend the customer service programme will receive positive feedback from customers. The first descriptive the second inferential. How safe would it be to make that statement well it will depend as we will see below.

Sampling

A sample is misleading if it does not represent the population. If the sample chooses themselves then beware. In most human resources sampling a stratified random sample is most used. This is to state the number of men, women, different grades, ethnic minorities, etc are to be represented in proportion to the total population.

Random Sample

Participants are selected totally at random.

Stratified Sample

A sample distribution in proportion to the group eg supervisors which is structured according to age, length of service, gender, ethnic minority, disability etc.

Systematic random sampling

A sample where you require a sample of 25 people and there are 100 people in the group and every 4th person is taken (100/25)

As a guide the following may be helpful in terms of sample.

Employees	Sample Band
0 - 5	100%
6 - 15	100% - 60%
16 - 50	60% - 30%
51 - 75	50% - 25%
76 - 100	40% - 20%
100+	20%

Summarising our data

Collection of data

Tally Marks

Method of Transport	Tally	Number of People
Foot		11
Bicycle		4
Motorbike		7
Moped		1
Scooter		1
Car		15
Bus		2
Train		2
TOTAL		43

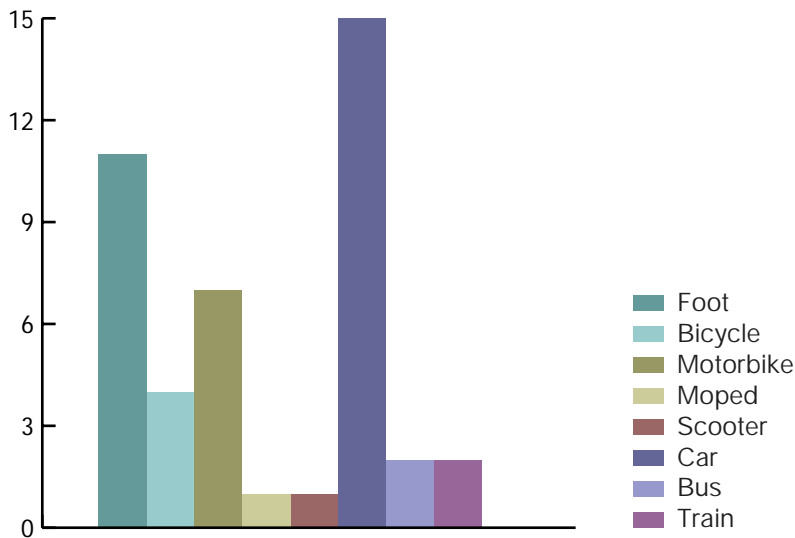
Frequency

Most frequent mode of transport unsurprisingly is the car, but interestingly in this sample the next most frequent mode of transport is foot which may have implications on recruitment in the local labour market.

Method of Transport	%
Foot	25.58
Bicycle	9.30
Motorbike	16.28
Moped	2.33
Scooter	2.33
Car	34.88
Bus	4.65
Train	4.65
TOTAL	100

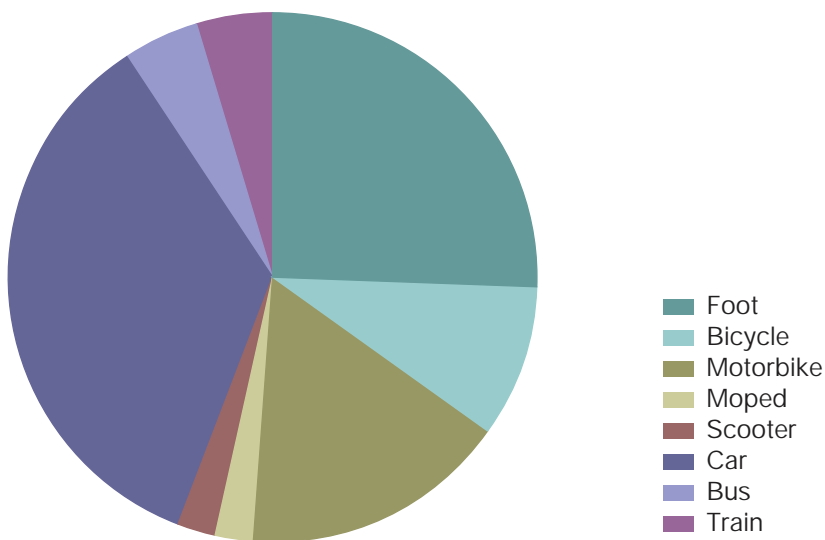
Charts

The old saying "A picture paints a thousand words and numbers" is true.



The numbers relate to the mode of transport numbers given above

The chart is a histogram and easily shows the most frequent use of transport to and from work. Once the data is entered onto an excel spreadsheet, then the rest is virtually done for you.



Another way of showing the same information is using a pie chart. Ask yourself which one you find easier to read. A pie chart is often easier if we want to see each mode of transport in comparison to the whole. Whereas the histogram is easier if we want to compare one mode of transport with another.

However the above charts and information are only looking at one point in time, more interestingly, if we look at the information over a period of time then trends may be something that can be analysed. For example, training and development evaluation of pre course, end of course and three months after.

Absence

One of the most calculated figures within organisations and often used as an indicator of staff morale as well as actual sickness.

Overall rate of absence

$$\frac{\text{Number of days / shifts / hours lost to absence} \times 100}{\text{Total number of days/shifts/hours}} = \% \text{ absence rate}$$

As always overall figures leave many questions unanswered. Will you exclude long term sick absence, or career breaks or maternity or parental leave? Or will you calculate sick absence as oppose to any other types of absence?

An alternative to bring it to a monetary figure is to take the average pay within the organisation and

$$\text{Average pay} \times \text{Number of days / shifts / hours lost to absence} = \text{Average pay lost due to absence}$$

It will give an indication of the amount of money absence is costing the organisation.

Frequency of absence

The number of times someone is absent is another way of showing absence irrespective of the amount of time. Therefore the intermittent sick absence is highlighted.

Number of people with one absence

Number of people with two absences

Number of people with three absences

Number of people with four absences etc.

On an excel spreadsheet the formula is already there.

If you want to weight the absence in terms of disruption, the Bradford formula measures the irregularity of attendance. It based on the higher the frequency the more disruption and more cost. For each absence there would be a return to work interview so if one person was absence three separate days there would be three return to work interviews.

Spell of absence in the last year x spell of absence in the last year x the number of days total absence

Take 21 days absence

$1 \times 1 \times 21 = 21 \text{ points}$

$7 \times 3 \times 21 = 441 \text{ points}$

$21 \times 21 \times 21 = 9261 \text{ points}$

The higher the number of points shows the degree of disruption to the organisation.