

# Understanding Health Statistics



This Information Sheet will look at some key questions that you might find useful to ask each time you're faced with some health statistics. Statistics can be confusing; however, they are used to help us understand the world around us.

## Key Messages

- Health statistics are sets of numbers (called data) that are collected by speaking to or studying a large number of people. Health statistics are created by deciding: what to count, how to count it and what to compare it with.
- Statistics answer specific questions. Knowing the question asked to collect the statistics, how it was asked and how the answers were collected will help us know if the 'numbers' given as the results are likely to be true.
- This Information Sheet explains the terms 'relative risk' and 'absolute risk'. Knowing whether the information is a 'relative' or an 'absolute' change will also help you to understand the real size of the possible benefit or harm the statistics claim to support.
- Whenever information is given as a percentage, asking the question "a percentage of what?" will help you understand what the numbers are really saying.
- We need to understand where the information has come from so we can judge how true the results may be.
- A study will be more useful for you if the people in the study are, in most ways, similar to you, such as the same sex, a similar age, and the health aspects studied similar to yours.
- For results to be truly meaningful (useful) studies need to be published in a reputable, peer-reviewed journal.

- Questioning what you read in the media will, hopefully, help you assess and judge the latest 'breaking-news' study about cancer.

## What are statistics?

Health statistics are sets of numbers (called data) that are collected by speaking to or studying a large number of people. Statistics are created by deciding: what to count, how to count it and what to compare them with. The results give us a set of numbers that, hopefully, help answer the questions we are asking.

## What can statistics tell us?

Statistics answer specific questions. Knowing the question asked, how it was asked and how the answers were collected will help us know if the 'numbers' given as the results are likely to be true. For example, statistics may tell us that for a specific group of people a particular treatment (A) gave fewer side effects than another type of treatment (B). It doesn't say what might happen to someone who was different to the group studied; for example was older than the study group, or had other health problems. Also we do not know whether it helped people to live longer or was better than any other possible treatments. We only know that for that specific group of people, treatment (A) had fewer side effects than treatment (B). While these results can guide doctors in making choices between these two treatments, they can't say what will happen to you as an individual. You may or may not have the same results as the people in the trial. The decision to have any treatment has to be made by you and your doctor who can take into account your unique characteristics.

## What do the numbers mean?

The following is an example to help explain what the different numbers might mean in a story about bowel cancer.

We know five in 100 New Zealanders will get colon cancer during their lifetime (most people live into their 80s). In our pictographs below each square represents a New Zealander.

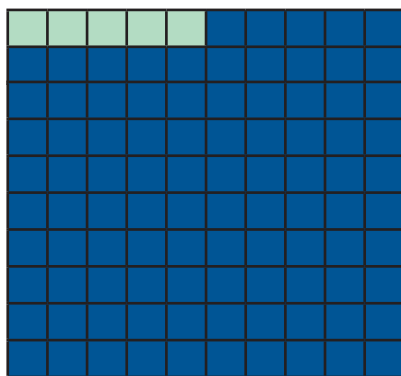
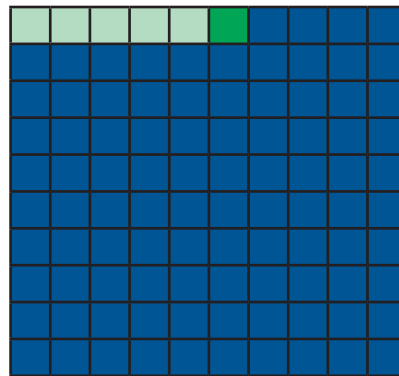
The green squares represent the New Zealanders (out of 100 people) that will get colon cancer.

We also know 95 in 100 New Zealanders will not get colon cancer during their lifetime.

The blue squares represent the 95 New Zealanders out of 100 people that won't get colon cancer.

New Zealanders have a 5 percent risk of getting colon cancer during their lifetime (5 people in 100 will get colon cancer).

This is called the 'absolute risk': "which is a measure of the risk of a certain event happening". (<http://www.cancer.gov/dictionary?Cdrid=618613> accessed 18/06/2013)



We could read, for example, that eating a bacon sandwich every day will increase your risk of cancer by 20 percent. This sounds like a lot more people getting colon cancer because they eat bacon every day. However, they are talking about a 'relative risk' which is "a measure of the risk of a certain event happening in one group compared to the risk of the same event happening in another group". (<http://www.cancer.gov/dictionary?Cdrid=666196> accessed 18/06/2013)

In our example in the next column, 20 percent of the 5 percent (the 5 people out of 100 that will get colon cancer) is 1 percent. An increase of 20 percent of the 5 percent is an increase of 1 percent (or one square) which is an increase in the absolute risk from 5 percent (5 people in 100) to 6 percent (6 people in 100). The blue squares in the pictograph in the next column represent the now 94 out of 100 people who will not get bowel cancer in their lifetime.

Whenever information is given as a percentage, asking the question "a percentage of what?" will help you understand what the numbers are really saying. Knowing whether the information is a relative or an absolute change will also help you to understand the real size of the possible benefit or harm.

### When would a study be useful for you?

The people in the study would have to be, in most ways, similar to you, such as the same sex, a similar age, and the health aspects studied similar to yours. For example, breast cancer in women younger than 40 years is often very different to that found in women older than 60 years. Therefore, a study of a new type of treatment may not be useful for all women with breast cancer. It will only apply to women who are the same as those in the study.

### Who are the researchers?

It is important who funds research. Health is big business. Billions of dollars are spent on health care and research. Universities, hospitals, specific research organisations or health-related companies employ researchers. As an example, drug companies do most research for new drugs, not independent research organisations. Companies may only publish results that give the most favourable view of their products. Independent researchers are more likely to publish all their results. We need to understand where the information has come from so we can judge how true the results may be.

### Where have the results been published?

Many headlines report results from conferences. Doctors and other researchers go to conferences to hear about their colleagues' work. However, for results to be truly meaningful (useful) studies need

to be published in a reputable, peer-reviewed journal. In a study that has been peer-reviewed, doctors and researchers not involved in the study will look (peer-review results) at it carefully. They check the study was well run and the published results are true and objective findings. Information that is not peer-reviewed is really a ‘work in progress’ and may not be a true reflection of the final results.

Statistics are a complex way to measure and make sense of the world. They can be extremely helpful. However, they can also be very misleading, confusing and cause anxiety. Questioning what you read in the media will, hopefully, help you assess and judge an article or study about the latest ‘miracle cure for cancer’. It will also help you get the best information which will help you make choices that are right for you.

*For more information:*

**“How to make sense of mixed cancer messages in the media”**

This Information Sheet discusses why there is confusion about scientific studies, the science of epidemiology, why studies need to be repeated, what makes a good study and where to look for reliable information.

**Know Your Chances: Understanding Health Statistics.** Woloshin S., Schwarz L. M. and Welch H. G. Berkeley: University of California Press 2008.

A book that will help you understand what the news stories, advertisements and articles you might come across, are really saying behind all the hype.

**NHS Choices: Behind the headlines, UK**

A website that looks at what the science really is behind the headlines.

**Cancer Research UK website**

General information about statistics and the language used to describe them.

**Sense about Science website**

This guide provides the questions to ask and identifies the pitfalls to avoid, helping us understand news stories that use statistics.

**Cancer Council Australia**

A web site helping to dispel the many myths, rumours and fanciful claims about cancer that are often seen in the media or on the internet.

**Healthnewsreview.org**

A US website that independently reviews health related news stories from media around the States. This page provides information on how to critically review a news story

**National Cancer Institute website**

A US website with detailed information on a range of topics related to cancer

McConway. Kevin (2012). The Royal Statistical Society, Vol 9, Issue 5. “Score and ignore: A radio listener’s guide to ignoring health stories”.

“Do you shout at the morning radio when a story about medical “risk” is distorted, exaggerated, mangled out of all recognition? Does your annoyance ruin your breakfast? You are not alone.”

The Cancer Society would like to thank Statistics New Zealand for reviewing this sheet for us.