

How to make sense of the 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.

Stories about cancer and its risk factors are common in the media. But the messages in these stories can be confusing and it can be difficult to know which stories are accurate.

Cancer Research UK, a charity working to find new ways to prevent, diagnose and treat cancer through research, has the following advice on how you can separate fact from fiction.

Why is there confusion about scientific studies?

Not all scientific studies have equal merit and this can cause confusion. Some studies are well designed and produce accurate and reliable results. Others are less carefully designed. Their results may be down to chance and their conclusions may be incorrect. But the media may report both kinds of studies, and it can be difficult telling them apart.

In particular, studying links between lifestyle factors and cancer is very difficult. Scientists can't carry out experiments on people like they can on cells, chemicals or animals. For example, we couldn't get a group of people to adopt unhealthy lifestyles for a year and compare them with a healthy group. Instead, scientists have to look at large numbers of people and try to spot links between risk factors and disease. This is a special field of research known as epidemiology.

Spotting links between risk factors and disease

Spotting links between risk factors and disease can be difficult because all aspects of our lifestyle interact. Epidemiologists might want to see if obesity increases the risk of cancer, for example.

You might think that they could just compare cancer rates in obese people with rates in people with a healthy bodyweight. But it isn't that simple.

Obese people are more likely to be physically inactive and eat unhealthy diets, both of which can independently increase their cancer risk. So epidemiologists must be very careful to account for other factors that could affect their results.

Studies are repeated to see results

Because of these difficulties, studies need to be repeated to see if the same results are found. If lots of studies agree on a conclusion, it is more likely to be accurate. For example, the links between smoking and lung cancer have been proven in hundreds of studies since the 1950s.

Sometimes, 'one-off' pieces of research are reported in the press. Even if these studies were well conducted, the results usually need to be confirmed by other scientific studies.

What makes a good study?

So how can you tell whether a study is good and whether a risk is 'real' or not? There are a few things you could bear in mind when you read or hear a cancer news story.

- **Was the study done on cells, animals or people?** If a study was done using animals or isolated cells, scientists will have to do a lot more work to find out whether the risk factor affects humans in the same way. A story might report that a chemical found in a certain food can kill cancer cells in a lab. But this does not necessarily mean that eating lots of that food will reduce our risk of cancer.
- **How many people were studied?** The more people involved in a study, the more accurate it is likely to be. Even studies of a hundred people are considered small and their results may be due to

chance. For complex lifestyle factors, such as diet, studies often require several thousand people to produce meaningful results. Unfortunately, this is not always possible for very rare cancers.

- **Does the study agree or disagree with previous studies?** If lots of studies point in one direction, then it is likely, though not certain, that their conclusions are genuine. Likewise, if many studies say one thing, and a single, solitary study points in the other direction, its results might well be a fluke.
- **Where does the information come from?** Normally, the studies we read or hear about in the media are taken from papers published in scientific journals. These papers have been checked by other experts in that particular field before they are published to make sure that they are sound. This is called 'peer review'. Reports that are not taken from peer-reviewed sources, like most books, magazines and websites, should be treated more cautiously.
- **Could there be another explanation?** If scientists find a correlation (link) between a lifestyle factor and cancer, this does not mean that one causes the other. Usually scientists try to provide explanations for the links they find. For example, one study found that among married men, those with the longest marriages had the highest risk of prostate cancer. But this doesn't mean that marriage causes prostate cancer! The main risk factor for prostate cancer is old age, and men with the longest marriages are also likely to be the oldest!

- **Are statistics backed up by biology?** It's not enough for scientists to discover links between lifestyle factors and cancer risk. They must also understand the biology behind those links, as they now do for smoking. Scientists have shown how certain chemicals in cigarettes can damage our DNA, and how this damage can lead to cancer. These findings back up results from epidemiological studies, and help to conclusively show that smoking causes cancer.

Getting some perspective

Even if something is definitively shown to cause or protect against cancer, it is important to consider the size of its effect. For example, if you are a smoker and want to reduce your risk of lung cancer, eating more fruit may have an effect – but not nearly as big an effect as giving up smoking.

Look for information you can trust

The best way to confirm if something you have read is accurate is to check a reliable source of information.

If you see or hear a cancer story that leaves you confused or wanting to know more, check our website for more information.

You can also check the following reputable international organisations:

Cancer Research UK: www.cancerresearchuk.org

Cancer Council Australia: www.cancer.org.au

National Cancer Institute USA: www.cancer.gov