

# EVALUATING INFORMATION:

## WHAT YOU SHOULD KNOW

With terms like “alternative facts” and “fake news” being used more frequently, it is important to know how to evaluate information presented in different settings, especially if the information is used to make decisions about the health of your children, yourself or others in your family. As we live in a time with a 24-hour news cycle and a variety of sources of information, let’s look at some different types of information.

### EVALUATING MEDIA REPORTS

Most of us get our information about topics related to science through media outlets. Sometimes it can seem like new studies are being reported every day, and at times they directly conflict with other reports. When evaluating a media report, whether on the Internet, in print or on TV or radio, check for the following:

- Is the organization providing the information reliable?
- Is the report based on a scientific study or a personal anecdote? If the report is about a scientific study, evaluate the information provided about the study using the criteria outlined in the “Evaluating scientific studies” section. A good media report will not only include information about where the study was published, but also information about the study format and size.
- Who is interviewed or quoted? Is the person an expert? How much information is provided about the person being interviewed?



- Are the people being interviewed sharing anecdotes or talking about the data? While it is sometimes good to hear from people who are personally affected by the topic, it is important to distinguish between an opinion based on someone’s experiences or biases, and a scientific evaluation of the strengths and limitations of the study. If you have ever read a scientific paper, you might recall that the paper not only included the findings of the study, but also its limitations. As a result, a study author or scientist being quoted in a media report will typically be quite specific in what he or she is willing to state and will typically reference the data, whereas someone voicing an opinion, especially if he or she has a personal bias, tends to speak broadly, sometimes delivering more inferences than facts.

For example, speaking about the same study, a scientist might say, “This study shows that drinking 100 cups of coffee every day for 10 years leads to a two-fold increase in the risk of developing stomach cancer.” Whereas, a person from the anti-coffee drinker’s club might say, “This study confirms that drinking coffee causes cancer.”

Journalists often talk about presenting a balanced story. However, a few caveats are important to remember:

- An expert and a parent might be represented as presenting a balanced story, but if one person is motivated by data and the other by a personal experience, this is not balance. It is scientifically based versus emotionally based information.
- Consider the size and expertise of the group supporting each side of a story. Which position is supported by scientific bodies or other researchers in the field?

The goal of a journalist is to appeal to a large audience. One of the tools that allow for ratings or skyrocketing readership in the industry is controversy. Painting an accurate picture may be secondary to the goal of “getting a reaction.”

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## EVALUATING WEBSITES

Because virtually anyone can establish a website, it is important to evaluate information found on websites before relying on it as being accurate or representative of sound science. Many of the same considerations of media reports can be applied to online information:

- Who is presenting the information? Is it an organization or an individual? Are the people behind the information clearly identifiable and have credentials that qualify them as experts? If not, is there any expert review of the information?
- Is the information based on science or anecdote? If the latter, does the website link to reliable sources of scientific information?
- Is the website presented in a professional manner? Does the navigation make sense? Is it updated regularly? Do links work? Is the information reviewed regularly (are review dates posted)?

Because of the number of websites related to vaccines that provide inaccurate and biased information, the World Health Organization (WHO) created the Vaccine Safety Net (VSN) project. The project outlines criteria important for evaluating websites in terms of quality and content. Find out more about their complete list of criteria at [who.int/vaccine\\_safety/initiative/communication/network/vaccine\\_safety\\_websites/en/](http://who.int/vaccine_safety/initiative/communication/network/vaccine_safety_websites/en/).

## EVALUATING SCIENTIFIC STUDIES

Often information in media reports or on websites relates to scientific studies, so it is important to also be able to evaluate whether the study was completed according to established scientific methodology.

### What constitutes a good scientific study?

Sound scientific studies have the following characteristics:

**Random** – A study is randomized when participants are separated into control and test groups in a random manner, such as by a pre-determined formula or software. By randomly assigning study participants, scientists decrease the possibility for biased results.

**Multiple studies** – Study results must be repeatable in order to be widely accepted. If a researcher tries to replicate a study's findings and fails, it is possible that an intentional or unintentional difference was introduced that caused the different findings. Many researchers will look at similar questions in different ways; only when a finding has been reproduced many times in a variety of populations is it widely accepted.

**Double-blind** – In double-blind studies, both the study participants and the scientists are unaware of whether the participant is in the control or test group. For example, in some clinical trials, neither the researchers giving the treatment nor the study participants receiving it know if they are receiving a placebo (the control group) or the drug (the test group). Double-blind studies are the most reliable because they eliminate potential for bias on the part of both the researchers and the participants.

Sometimes, however, it is impossible to perform a double-blinded study. An example would be a study evaluating the best way to provide a patient with verbal instructions for taking a medication. In this case, the researcher will know which version of text was used, but the patients will not know whether they are in the test or control group. When only the study participants are unaware of the group to which they've been assigned, it is called a single-blinded study. Sometimes, it's unethical to do a double-blind, placebo-controlled study, such as the evaluation of Ebola vaccines during the 2014 outbreak of Ebola in West Africa. In rare instances both the researcher and the participant know the group to which the patient has been assigned, such as when testing a new cancer treatment in someone who has no other options for treatment.

While the double-blind study design is considered the gold standard, this format may not always be an ethical or technically possible option. In these instances a single-blinded or unblinded study format may be employed. As you read media reports about studies, it is important to determine the study method used.

**Large sample** – Large sample sizes allow researchers to account for individual differences such as genetics, income, race and environmental or lifestyle choices.

### Studies and the scientists who conduct them

Because some scientists have biases — and might doggedly stick to those biases — not all scientific publications are accurate. However, the strength of the scientific method is that it is self-correcting. Over time, studies with incorrect conclusions will not be reproducible; therefore, it is important not to rely on the conclusions of a study based on the reputation of the scientist who conducted it, but rather based on the study design and over time, reproducibility.

### Studies and the outlets that report them

The best way to determine the strength of a study is to read the original paper. However, because most of us do not have the time or expertise to evaluate all scientific studies that are published each week, we rely on others, such as news outlets, to share accurate assessments with us. Therefore, these organizations should be held to high standards, and as consumers, we should assess each statement made in reports of scientific topics.

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