

# A Beginner's Guide to Judging Research Studies Tool

*From Evidence to Action Project*

Six quick tips to sort the wheat from the chaff

By John Frank\*

*The media regularly feature stories about environmental or occupational causes of disease. We hear or read on a daily basis new evidence linking a disease with exposure, often decades earlier, to a chemical, such as the mercury in dental fillings, a specific job, such as "farming", or a physical hazard, such as electro-magnetic fields. Any rational person would quickly decide never to venture outside, live hundreds of kilometers from the nearest city and certainly not go near a farm.*

*Keeping up to date with these media reports is a full-time job. In fact, there are so many of them, and the results so often contradict each other, that it has become common in conversation to poke fun at the science behind them. After all, if scientists regularly contradict each other on such important questions of public health, what are we to believe?*

✓	<b>QUESTION AND GUIDELINE</b>	<b>NOTES</b>
	<p><b>Is the researcher at a reputable institution?</b> The vast majority of scientific studies that have changed our views on how and why diseases develop come from researchers based in university-affiliated or independent, non-profit research institutes, including government-based investigators. This is not accidental. These institutions appoint scientists on the basis of the quality of their research training and accomplishments.</p>	
	<p><b>Who funded the study?</b> The evidence that smoking, for example, causes lung cancer is beyond any scientific doubt. If the media report today that a new study challenges that conclusion, I would immediately want to know who funded the study. Was it funded by a publicly funded and reputable organization like the Canadian Institutes of Health Research or by the tobacco industry? Too often, media reports do not mention who the funder is. Unfortunately, it matters!</p>	
	<p><b>What is the study reporting - an "unusual" lab reading or a real health outcome, such as death, disease or disability?</b> It pays to ask what's being studied. Sometimes researchers present their work as if they have shown a link to actual disease risk when they have not. For example, the media recently reported links between night-time exposure to light, and altered levels of melatonin (a body hormone related to our "biological clock" and sleep) which in turn were shown to promote cancer cells growing on a Petri dish. The reports suggested, therefore, a link between night-time exposure to light and cancer in real, live human beings. In fact, the study said absolutely nothing about this. Finding the smoking gun takes much more time and effort. I would demand a high-quality study showing a much higher risk of actual cancer. The study would document hundreds of accurately diagnosed cancer cases, in thousands of people definitely exposed to night-time lights over many years, compared to the rate of cancer in thousands of people without such exposures.</p>	

	<p><b>How does the current study compare with previous research on the same subject?</b>  Single studies on a given question, especially in the field of environmental or occupational health, almost never exist. And, because epidemiological science is complex and not always precise, such studies can disagree. So a new study, consistent with what other <i>high-quality</i> investigations have shown, is much more convincing than a single study that disagrees with the bulk of previous science addressing the same question. Generally, reputable scientific journals will not publish studies that fail to discuss how they fit with previous studies in the same area or why they disagree with previous findings. Likewise, media reports should address this issue.</p>	
	<p><b>Will anyone vouch for the scientific quality of the study?</b>  Disagreement amongst scientists, often the reason for the public's exasperation over whom or what to believe, is a major public concern. But, contrary to the popular stereotyping of science as black and white ("It's either true or it's not true."), scientists frequently disagree with each others' findings or interpretations until a consensus view emerges after more studies.  A good example is the link between passive smoking and breast cancer. Many good studies have confirmed a doubling of breast cancer risk for women who have never smoked themselves, but who have experienced substantial exposure to passive smoking. An extensive review of all the best studies to date recently concluded that those studies with high-quality measurements of passive smoking demonstrated this doubling of risk clearly, whereas the lower-quality studies did not. Thoughtful reports of new studies should always include an independent expert's views on how well they were done.</p>	
	<p><b>Is a balanced view presented?</b>  There's more than one side to a story.  Scientific advances in knowledge emerge from the gradual resolution of disagreements between experts in any field, by the accumulation of reliable evidence over time, supporting one view over another. Thus reports on controversial topics, where the scientists do not all agree, should always be accompanied by quotes from those who hold a different view from the study author(s).</p>	

*Media reporting on the science behind environment and health is critical to all of us, as we make choices for ourselves and our family, and to policymakers developing public policy. If you've read this entire article, you at least have a basic toolkit for assessing media reports on environment and occupation health. Good luck.*

**\*Dr. John Frank is Scientific Director of the CIHR [Institute of Population and Public Health \(IPPH\)](http://www.cihr-irsc.gc.ca/e/34192.html)**

Adapted for From Evidence to Action from CIHR Website: <http://www.cihr-irsc.gc.ca/e/34192.html>