

Skewed

Bias, Corruption & Hypocrisy in Contemporary Science & Medicine

By

[Choctaw Doc](#)

In 2002, Dr. Roger Pielke, Jr. Director of the Center for Science and Technology Policy Research at the University of Colorado made a statement about the political currents running through the world of science that was not only astute, but almost prophetic:

"As political battles are waged through 'science', many scientists are willing to adopt tactics of demagoguery and character assassination as well as, or even instead of, reasoned argument ... science is increasingly the battlefield on which political advocates, not to mention lawyers and those with commercial interests, manipulate 'facts' to support their positions"

[Nature 416, 367-368 \(28 March 2002\)](#)

In 2006 [The Harris Poll® conducted a survey](#) to determine the most trusted occupations and professions. Scientists were in the top five. *Their ranking had actually gone up nine percentage points over what pollsters found in 2002!*

Perhaps if what Dr. Pielke shared in *Nature* had enjoyed wider circulation among the general populace scientists would not have fared so well in that 2006 Harris Poll®.

But maybe people know this but are jaded, even cynical. I mean, why should scientists be immune from the filtering of reality, bias and corruption that go hand-in-hand with the concentration of power, influence and resources in virtually all sectors of life? Perhaps people know this and just have resigned themselves to it. Or they simply harbor the deep-seated belief that scientists are, by virtue of their quest for empiric truth, less prone to the excesses and extremes, not to mention the myopia that has characterized and even animated politicians, lawmakers, and a host of others down through the ages. Or if they are not genuinely less prone than most to act out of passion, weakness, ignorance, gain or simply to do what's expedient "for the greater good," then surely scientists are at very least more likely to come to their senses and make course corrections over time (Sometimes with prompting from the public, the body politic or judiciary.)

History bears ample testimony to the fact that scientists and the scientific enterprise is not immune to corruption from within and being steered from without. The good news is that bad theories, practices and ideas as well as opposition to good ones eventually crumble in the face of contrary evidence and reason. Or at the very least wind up sidelined and held onto by only diehard zealots. The tools of science rightly used “delivers the goods,” as Dr. Carl Sagan was fond of saying. But there is a “bad news” or “dark” side. For one thing, many professional societies formulate consensus opinions or policies that they not only resist modifying, but which they seek to have treated as the final word. Some act as though they are better equipped to decide what is true or genuine or trustworthy, especially those that disagree with them. Some appear to favor playing this role at a governmental or official level or partnering up with agencies that do (Sort of like being “reserve sheriff’s deputies.”)

One very prime and recent example of this is the [International Society for Stem Cell Research \(ISSCR\)](#), “an independent, nonprofit organization established* to promote and foster the exchange and dissemination of information and ideas relating to stem cells, to encourage the general field of research involving stem cells and to promote professional and public education in all areas of stem cell research and application” (From the ISSCR Mission Statement.)

*In 2002

Judging from their Mission Statement, the ISSCR’s purpose is both noble and benign. Contrast this with this excerpt from a June 10, 2010 article titled “[Stem Cell Society to Get Tough on “Charlatans” & Unproven Treatments](#)”:

“The International Society for Stem Cell Research has had enough. When the organization of stem cell scientists met last week in San Francisco, its leaders promised to get serious about unregulated stem cell treatments.

First, society president Irving Weissman declared his intention to “smoke out the charlatans,” [New Scientist reported](#). The ISSCR is investigating its members who provide advice to clinics that offer experimental stem cell treatments (no such treatments have yet received FDA approval).

At a press briefing on 17 June, he revealed that these members are being told to explain their connections with such clinics. Expulsion from the society was a possibility for members who continue to associate themselves with unproven “therapies”, added Sean Morrison of the University of Michigan in Ann Arbor, a member of the ISSCR board of directors [[New Scientist](#)].”

A more prudent response would have been for the ISSCR to draw on the experiences and knowledge of these consultants to help determine what is of merit and what is not in terms of the treatments being done and their outcomes at these private foreign stem cell clinics. Expelling those who possess this experience and insight risks the kind of backlash that many political parties experience when they totally disenfranchise and alienate their dissident members.

The damage being done by politics-driven, sometimes biased scientists (in both the private and government sectors), scientific and medical consumer organizations and regulatory agencies is but the tip of the iceberg according to many experts. What has emerged in many instances is essentially a “disconnect” between what is believed and even promulgated by these people and organizations and what is actually taking place or true. Some of the more prominent distortions or misrepresentations -- myths (if you will) – that have emerged over time include:

Nota bene: **Bold text** from articles & such that follows below = emphasis mine

Myth #1: Mainstream doctors, scientists and medical (consumer) advocates are champions of open-mindedness, objectivity and fairness

From “[Playing Politics with Stem Cells](#)” By Gene Tarne and David Prentice ([American Thinker website](#))

hESCR = human embryonic stem cell research

It certainly needed a boost -- very little scientific evidence supports hESCR. Nonetheless, the "scientific community" insisted there was a "consensus" that embryonic stem cells had the greatest potential to cure any number of diseases, period. **This bogus "scientific consensus" soon became the new orthodoxy, and there was to be no dissent.**

In April 2007, **Nature Neuroscience** set its sights on **Maureen Condic, professor of Neurobiology and Anatomy at [the University](#) of Utah**. **In an editorial, the journal attacked her for being "anti-scientific" and "polemical" and engaging in "disingenuous distortions of scientific arguments."** **Her crime?** In the pages of [First Things](#) (the editorial attack pointedly described it as a "conservative Roman Catholic magazine"), Prof. Condic, relying on the peer-reviewed, published literature, challenged the prevailing orthodoxy, throwing much-needed

cold [water](#) on the extravagant hESCR claims, going so far as to suggest that adult stem cells may well prove to be more efficacious in actually helping patients!

In 2002, Roger Pielke, Director of the Center for Science and Technology Policy Research at the University of Colorado, [noted in the journal Nature](#) the trend to politicize science: "**As political battles are waged through 'science', many scientists are willing to adopt tactics of demagoguery and character assassination as well as, or even instead of, reasoned argument ... science is increasingly the battlefield on which political advocates, not to mention lawyers and those with commercial interests, manipulate 'facts' to support their positions**" [ix].

...Or ignore facts altogether. In 2007, Sen. [Tom Harkin](#) waved away evidence for adult stem cells, saying, "Scientists have known about adult stem cells for forty years, and they still haven't provided the answer for juvenile diabetes." He said this on the very day that the Journal of the American Medical Association (JAMA) published [clinical trial](#) results using adult stem cells in a treatment that reversed juvenile diabetes in patients.

[From Stem Cell Society to Get Tough on “Charlatans” & Unproven Treatments:](#)

June 22, 2010

The International Society for Stem Cell Research has had enough. When the organization of stem cell scientists [met last week in San Francisco](#), its leaders promised to get serious about unregulated stem cell treatments.

First, society president Irving Weissman declared his intention to “smoke out the charlatans,” [New Scientist reported](#). The ISSCR is investigating its members who provide advice to clinics that offer experimental stem cell treatments (no such treatments have yet received FDA approval).

At a press briefing on 17 June, **he revealed that these members are being told to explain their connections with such clinics. Expulsion from the society was a possibility for members who continue to associate themselves with unproven “therapies”**, added Sean Morrison of the University of Michigan in Ann Arbor, a member of the ISSCR board of directors [[New Scientist](#)].

From [The Pro-Life Case for Stem Cell Treatment](#):

And yet, **the doctors providing the treatment that makes such a life-changing reversal possible are dismissed by the media, while their patients are characterized as “tourists.”** Reuters notes that [“the International Society of Stem Cell Research](#) has cautioned against so-called stem cell tourism,” and quotes Dr. David Scadden, co-director of the [Harvard Stem Cell Institute](#):

When these kinds of treatments are proposed, they’re being essentially marketed by virtue of the anecdotal report. I feel the danger of exploitation is extremely high.

OK, so Murillo’s story is anecdotal. But had Reuters done its fact-checking, **it would have discovered that ISSCR is hardly an unbiased source to be asking about adult stem cells; its physician-entrepreneur president is a proponent of embryonic cells.**

[Quackwatch review - Is Stephen Barrett a Quack? Is he fair, balanced, or biased, by Ray Sahelian, M.D.](#)

From [How can Quackwatch be considered a "reliable source"?](#) :

In a critical website review of Quackwatch, Joel M. Kauffman evaluated eight Quackwatch articles and concluded that the articles were "contaminated with incomplete data, obsolete data, technical errors, unsupported opinions, and/or innuendo..." and "...it is very probable that many of the 2,300,000 visitors to the website have been misled by the trappings of scientific objectivity.

From

[http://en.wikipedia.org/wiki/Talk%3AOrthomolecular_medicine/Archive_3#REGARDING THE ALLEGED RELIABILITY OF QUACKWATCH](http://en.wikipedia.org/wiki/Talk%3AOrthomolecular_medicine/Archive_3#REGARDING_THE_ALLEGED_RELIABILITY_OF_QUACKWATCH):

A number of webpages (8) were selected arbitrarily because their topics were familiar to this reviewer, and these were examined minutely. The findings are used to make generalizations about the website. The section titles below are from www.Quackwatch.com, as accessed on 31 Oct 01, each one followed by Comments based on the most reliable evidence I have found.

[...BIG snip...] [...full text is at the URL...]

All 8 pages from www.Quackwatch.com that were examined closely for this review, which were chosen simply because their topics were familiar to this reviewer, were found to be contaminated with incomplete data, obsolete data, technical errors, unsupported opinions, and/or innuendo; no other pages were examined. Hostility to all alternatives was expected and observed from the website, but not repetition of groundless dogma from mainstream medicine, examples of which were exposed. As a close friend and colleague reminded me, the operators of this site and I may have the same motivation -- to expose fraud. It remains a mystery how they and I have interpreted the same body of medical science and reached such divergent conclusions. While Dr. Barrett may (or may not) have helped many victims of quacks to recover funds and seek more effective treatment, and while some of the information on pages of the website not examined in this review may be accurate and useful, **this review has shown that it is very probable that many of the 2,300,000 visitors to the website have been misled by the trappings of scientific objectivity.**

At least 3 of the activities in the Mission Statement:

- Distributing reliable publications
- Improving the quality of health information on the Internet
- Attacking misleading advertising on the Internet

...have been shown to be flawed as actually executed, at least on the 8 webpages that were examined. Medical practitioners such as Robert Atkins, Elmer Cranton and Stanislaw Burzynski, whom I demonstrated are not quacks, were attacked with the energy one would hope to be focused on real quacks. The use of this website is not recommended. It could be deleterious to your health.

Acknowledgment. Expert online searches and editorial aid were provided by Leslie Ann Bowman. Additional aid from other faculty at The University of the Sciences in Philadelphia was obtained from Gina Kaiser, Robert C. Woodley and Sylvia Tarzanin. Ted Pollard made valuable contributions.

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—The preceding [unsigned](#) comment was added by [216.86.90.44](#) ([talk](#) • [contribs](#)) 20:09, 28 August 2006 (UTC)

Myth #2: The big pharmaceutical companies do not unduly influence the medical profession or the conduct of scientific research

BOOK: [On The Take: How Medicine's Complicity with Big Business Can Endanger Your Health \[Hardcover\]](#)

From Reviews: <http://www.amazon.com/review/R49G9T1V9JP5K>

★★★★★ Big Pharma Out of Control, January 19, 2005

By [Joel M. Kauffman](#)

This review is from: On The Take: How Medicine's Complicity with Big Business Can Endanger Your Health (Hardcover)

Fact-dense, well referenced, yet balanced in tone and easy to read, this book is the best exposé I have ever read on the financial conflicts of the medical profession caused by the efforts of Big Pharma, which for this review will include device and test manufacturers as well as drug makers. From pens and pads to cruises and fake consulting arrangements, Big Pharma has caused financial conflicts in many physicians and others "on the take". Many of the consulting deals are to give talks, ostensibly based on good medical science, that promote a product. Much of this is shown to occur at Continuing Medical Education courses sponsored by Big Pharma in which gifts are freely dispensed, reprints of journal articles favorable to products are handed out, and financial ties of the "consultants" giving talks are minimized or concealed.

Academic researchers are tainted as well. By being encouraged by their universities to obtain grants with overhead from Big Pharma, they must do research that helps in product development. Agreements may delay, prevent or pollute the publication of results. When a product possibility from a government (usually NIH) grant is seen, federal legislation passed 20 years ago allows the researcher to patent discoveries, form a company, and do clinical trials on his own potential product. While this may have led to valuable results, the potential for bias at every step due to financial conflict is clearly laid out.

Journals fare little better, even the prominent JAMA, NEJM and Annals of Internal Medicine. Papers that may have been ghost-written by Big Pharma on clinical trials with selectively favorable results are published [see Joel M. Kauffman, Bias in Recent Papers on Diets and Drugs in Peer-Reviewed Medical Journals, J. Am. Physicians & Surgeons, 9(1), 11-14 (2004)]. Editors

and peer-reviewers may have ties to Big Pharma. Editorials and comments in medical journals may be written by authors with financial conflicts of interest. Revealing such conflicts is mostly on the honor system at present.

Clinical guidelines for physicians are promulgated by committees whose members often have close ties to Big Pharma. The products included in formularies of HMOs, Medicare and other insurers, the only products that will be paid for, are influenced by Big Pharma, whose general lobbying efforts are already legendary.

Dr. Kassirer gives many specific examples of financial conflicts. Far from quitting with the devastating description of how bad things are, he goes on to make specific suggestions for reform, while being very realistic about their success without federal action for certain conflicts. He lists many desirable changes, such as no gifts from Big Pharma at all, boycotting meetings sponsored by Big Pharma, disclosure mandated for all financial ties, and selection of journal editors, officers of medical societies and leaders of medical schools who have no financial conflicts. He did not seem to indicate the degree of influence of Big Pharma on the FDA.

Trying not to alienate most of the medical profession, Dr. Kassirer wrote that most MDs are basically ethical and went into the profession for non-financial as well as financial reasons. Reductions in income with increased workloads due to inadequate compensation from HMOs and Medicare is one of the reasons so many MDs have looked outside normal practice for income.

He dropped a few hints that most major classes of drugs are more beneficial than they actually are [see Joel M. Kauffman, "Drugging Cardiovascular Disease", J. Am. Physicians & Surgeons, 9(4), 98-99 (2004)], and that alternative practices are not worth much [see Joel M. Kauffman, "Alternative Medicine: Watching the Watchdogs at Quackwatch", Website Review, J. Scientific Exploration 16(2), 312-337 (2002)].

This is a very minor blemish on one of the great exposés of all time, the "Unsafe at Any Speed" of the medical madness in the USA today.

Daniel Haley's "[Politics in Healing](#)" describes the squashing of alternatives.

Charles T. McGee's "[Heart Frauds](#)" exposes the mythology behind so much medical advice.

H. Gilbert Welch's "[Should I Be Tested for Cancer?](#)" gives the evidence for the harm in excessive testing.

John Anderson's "[Overdosed America](#)" reveals the extent of perverted clinical drug trials.

Merrill Goozner's "[The \\$800 Million Pill](#)" give the lie to Big Pharma's claim that high prices are

needed for the discovery of breakthrough drugs, as does...

Marcia Angell's "[The Truth About the Drug Companies](#)", which also suggests how the perversion of drug trials can be halted.

[Sponsoring by the Pharmaceutical Industry Can Bias the Results of Drug Studies, Study Suggests](#)

EXCERPT:

In the current issue of *Deutsches Ärzteblatt International* (Dtsch Arztebl Int 2010; 107(16): 279-85), a research group headed by the Chairman of the Drug Commission of the German Medical Association, Prof. Wolf-Dieter Ludwig, describes the influence of sponsoring on the results, protocol and quality of drugs studies.

The authors conclude that pharmaceutical companies exploit a wide variety of possibilities of manipulating study results. Apart from financing the study, financial links to the authors, such as payments for lectures, may tend to make the results of the study more favorable for the company. Not only the results themselves, but also their interpretation are significantly more often in accordance with the wishes of the sponsor.

In some publications, the authors detected evidence that sponsors from the pharmaceutical industry had influenced study protocols. For example, placebos were more frequently used in drug studies than was the case with independently financed studies. On the other hand, some favorable effects were linked to financial support from the pharmaceutical industry. The methodological quality of studies with industrial support tended to be better than with independent drug studies

[Docs Not Immune to Drug Marketing, Study Finds](#)

“Pharmaceutical promotion may cause some doctors to prescribe more expensively, less appropriately and more often, according to a new study.”

[How Doctors Rationalize Acceptance of Industry Gifts](#)

“Despite heightened awareness about the undue influence that gifts from pharmaceutical companies can have on doctors' prescribing practices, and despite expanding institutional conflict-of-interest policies and state laws targeted at preventing such practices, companies continue to reward doctors for prescribing their drugs with gifts ranging from pens and paper, to free dinners and trips.”

[Inverse Benefits Due to Drug Marketing Undermine Patient Safety and Public Health, Study Finds](#)

"Drugs that pharmaceutical companies market most aggressively to physicians and patients tend to offer less benefit and more harm to most patients -- a phenomenon described as the "inverse benefit law" in a paper from the University of Texas Medical Branch at Galveston."

[Medicine's Secret Archives](#)

"In science the phenomenon is called "publication bias," i.e. bias through selective publication. This occurs on two levels: On the first level complete studies remain unpublished. For example, an analysis of 90 drugs that had been newly approved in the US showed that they had been tested in a total of 900 trials. However, even 5 years after approval, 60% of these studies were unpublished. On the second level only selected outcomes from studies are published. Nowadays researchers have to specify in a study protocol which outcomes they want to measure and how they are going to analyze them. Comparisons of protocols and journal articles of studies showed that in 40% to 60% of studies, results had either been completely omitted or analyses changed. "In this way study results are often presented in a more positive way than is actually the case," says Beate Wieseler, Deputy Head of IQWiG's Drug Assessment Department.

This does not only affect studies sponsored by the pharmaceutical industry. In their paper, the IQWiG authors also cite an analysis in which 2000 studies on cancer topics were analyzed according to sponsorship. The proportion of published studies was extremely low: of the industry-sponsored studies, 94% were unpublished; however, even 86% of university-sponsored studies were also unpublished. "Due to legal regulations, regulatory authorities are also sometimes obliged to withhold data," says Thomas Kaiser, Head of the Drug Assessment Department."

Myth #3: The peer-review process & peer-reviewed studies in medicine & science are relatively free of bias, mistakes, misconduct or fraud

["Is Peer Review Broken?" The Scientist, Vol. 20, #2, page 26](#)

Excerpt: The literature is also full of reports highlighting reviewers' potential limitations and biases. An abstract presented at the 2005 Peer Review Congress, held in Chicago in September, suggested that reviewers were less likely to reject a paper if it cited their work, although the trend was not statistically significant. Another paper at the same meeting showed that many journals lack policies on reviewer conflicts of interest; less than half of 91 biomedical journals say they have a policy at all, and only three percent say they publish conflict disclosures from

peer reviewers. Still another study demonstrated that only 37% of reviewers agreed on the manuscripts that should be published. Peer review is a "lottery to some extent," says Smith.

Read more: [Is Peer Review Broken? - The Scientist - Magazine of the Life Sciences](http://www.the-scientist.com/article/display/23061/#ixzz1C4dC9VOW)
<http://www.the-scientist.com/article/display/23061/#ixzz1C4dC9VOW>

["The Ideological Immune System: Resistance to New Ideas in Science" \(SKEPTIC Magazine Vol 1, No4\)](#)

[Flaws in Popular Research Method Exposed](#)

"Influential studies into subjects such as the safety and effectiveness of medicines or class size in schools could be called into question by a new report into ways of identifying research bias.

The report by a leading statistician identifies the danger of relying solely on published work during systematic reviews of literature -- a common approach to research worldwide, which is often used to inform public policy."

[Retraction Watch \(Blog\) - Tracking retractions as a window into the scientific process](#)

Myth #4: The procedures, drugs & tests doctors recommend are by-and-large backed up by multiple confirmatory studies

["Reckless Medicine" by Jeanne Lenzer & Shannon Brownlee \(November 2010 issue of DISCOVER magazine\).](#)

"Research shows, if patients understand the lack of evidence for effectiveness, and the risks of treatments, they would make different decisions than their doctors."

"Less than half the surgeries, drugs, and tests that doctors recommend have been proven effective"!

"87% of drug researchers and writers receive funding from the pharmaceutical industry."

“More than 770,000 Americans are injured or die each year from drug side-effects.”

“Two drug reps were praised in a company memo for being ‘quite brilliant’ for sending their physicians sight-seeing during a presentation about low-cost safer alternatives to their product”

“Giving patients care they don’t need, and not giving them care they do need, accounts for 30% the U.S. spends annually on healthcare”

Only 1% of the National Institutes Of Health’s budget goes to research for comparing drug effectiveness, while 99% goes to pharmaceutical companies for development of new drugs!

“Most doctors are trained to memorize data, not analyze scientific data...or to think critically”
— Dean of University of California at Davis Medical School

Myth #5: Medical regulatory boards do not “railroad” doctors

Here are two examples of how recent misconduct on the part of medical boards in two separate states, Texas and Alabama, became the focus of activism on the part of the Association of American Physicians and Surgeons, Inc:

<http://www.aapsonline.org/press/122107.php>

12/21/2007

DOCTORS SUE TEXAS MEDICAL BOARD FOR MISCONDUCT

Cites institutional culture of retaliation & intimidation

The entire Texas Medical Board (TMB) and its officials have been named in a lawsuit filed by the Association of American Physicians and Surgeons (AAPS). The complaint, filed this week in District Court in Texarkana, accuses the board of misconduct while performing its official duties, specifically:

1. Manipulation of anonymous complaints;
2. Conflicts of interest;

3. Violation of due process;
4. Breach of privacy; and
5. Retaliation against those who speak out.

<http://www.aapsonline.org/judicial/herrera-amicus.pdf>

Hall of Shame - Alabama Board of Medical Examiners

- [Politically motivated license revocation on the pretext of sloppy handwriting](#)

The AAPS's filing (link above) in the case of a physician named Pascual Herrera, Jr. who had his license to practice medicine revoked by the Alabama Board of Medical Examiners, is very telling because this decision was based in part on Dr. Herrera's alleged sloppy handwritten medical notes with respect to a case involving "three young adults from prominent families died from an overdose of OxyContin in Gadsden, Alabama" (The AAPS goes on to state in its suit that "Dr. Herrera had no connection or culpability with that tragedy, but as a foreign-born physician he was a convenient scapegoat.")

Continuing from the AAPS "*AMICUS CURIAE* BRIEF OF THE ASSOCIATION OF AMERICAN PHYSICIANS & SURGEONS (AAPS) IN FAVOR OF PETITIONER" filing:

"The Commission's asserted reasons for revoking Dr. Herrera's license are woefully inadequate. The Commission based its revocation in part on the alleged sloppiness of Dr. Herrera's handwriting. **That rationale, if affirmed, would support the revocation of the licenses of hundreds of thousands of physicians, and quite a few attorneys as well.** If that were truly the Commission's concern, then it could simply require training and monitoring to address the issue. In fact, the handwriting of the Board's own expert was no more legible than Dr. Herrera's. The other cited bases for revocation are even less legitimate and self contradictory. The Commission found that Dr. Herrera failed to perform an adequate history and physical on three patients, but that he also performed unnecessary diagnostic tests on them and prescribed excessive medication. **Thus, he supposedly tested too little and also tested too much.**"

Concluding Remarks

The scientific and medical enterprise is indisputably riddled with weaknesses, flaws, biases, and even corruption. Abundant evidence exists attesting to the fact that some scientists, physicians,

regulatory agencies, denizens of the pharmaceutical industry, medical (consumer) advocates and medical boards are not above (among other things) being influenced and even corrupted by monetary incentives and influences, their own greed and ego, and the seduction of power; given to taking positions based more so on political expediency or self-serving agendas than fairness or objective truth; and are even (at times) disposed to advocate policies and endorse drugs, medical procedures and tests that are not only lacking in genuine scientific validation or support but which actually enjoy none of this.

This is not to argue for scraping it all or (to put it in the vernacular) “to toss the baby out with the dirty diaper.” The fact is that there is no better, more reliable way to arrive at what is true or reliable in the physical (testable) realm than the methods and tools of science. However, we have to temper this realization with (1) an awareness of the things many scientists, regulators, pharmaceutical kingpins, medical board members and others have done (and will do) which impede and even undermine the very “engine of progress” they are part of and play a large role in steering; and (2) a willingness to act on this awareness so as to help facilitate “course corrections.” Of course, non-scientists cannot tell scientists how to do science any more than non-physicians can tell physicians how to practice medicine. However, an informed citizenry can help keep the scientific enterprise fair and honest using the very time-tested tools that have kept our democracy from veering too far into the sort of extremism that tends to breed intolerance, injustice and tyranny: Resisting what is untrue, skewed and just plain wrong coupled with grassroots advocacy and activism aimed at minimizing and ultimately eliminating this.

At the very least make a conscious point of questioning “official findings” or pronouncements – be it issued or quoted by an august scientific body, a government agency, a consumer advocate or journalist or your trusted family doctor. The peg they are hanging their hat on could be cracked or even broken.

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