

Deciphering Outcomes: Thirty Percent More of Nothing Is Still Nothing

written by Robert McNutt, M.D. | June 21, 2018



Trying to pass a Bill through a legislature demands a hardy disposition. I have been involved in three attempts on different issues—one bill passed, one is still in limbo, and a third, the most salient for me, failed. In the latter case, I was the sole proposer of the Bill. My idea captured the imagination of a state representative who said she would sponsor it, but, first, she wanted to get some other views. Eleven lobbyist conversations later, my Bill was dead. Something about the legislator being worried that my Bill would be taking on the First Amendment, which allows us to say nearly anything we want, even if it is a lie.

My Bill, indeed, was about a form of lying: using relative numbers in medical advertisements. Maybe lying is too strong a characterization, but relative numbers do not fully communicate the tangible consequences of a medical choice, so, if you are making a choice for your health care, relative numbers could fool you—and [fooling you is not what medical care should be about](#). My Bill proposed that only absolute, actual differences in outcomes should be presented for public consumption. Simple idea, failed execution.

Understand the Difference Between Relative and Absolute Numbers

A relative number is one that defines the proportion of change. For example, if my coffee costs 1 dollar and yours, 50 cents, you saved 50 percent (difference, or change, in cost—50 cents—divided by the greater cost—100 cents—is a 50 percent reduction in cost). But, the actual savings depend on the starting cost. If my coffee cost 50 cents and you saved 50 percent, your actual savings would only be 25 cents, not 50 cents. The relative number stays the same, but the tangible benefit to you has changed.

This seems a simple notion, but every ad about medical care I observe presents the *relative* decline for one treatment versus another, not the *actual* decline. For example, one ad claimed that a treatment lowered heart attacks by 30 percent. Did that mean 30 percent of a 100 percent chance of having a heart attack, or 30 percent chance of a 2 percent chance of having a heart attack? The 30 percent decline from a 100 percent chance would be an absolute decline of 30 percent, but in the second situation, only a 0.6 percent decline (30 percent times 2 percent). These absolute differences matter to you; the relative value does not.

Six Numbers You Must Know to Decipher Disease and Treatment Outcomes

How do we know the actual, absolute differences? In all [randomized treatment trials](#) (the only ones that matter for you), patients get either treatment A or B. The study question is always the same: Is A better than B in terms of producing better outcomes of disease? This experiment sets up six numbers you must know.

First, there are two numbers for the percentage of people in the trial having a specified study outcome related to the disease the patients have. For example, in many cancer treatment trials, the outcome may be “live” or “die” over a given time period. There will be a percent of people who die when given treatment A and another percent of people who die when given treatment B. These are the first two numbers you must know; the percents of people having disease-related outcomes for compared treatments.

The third number is the simple subtraction of those two outcome measures. For example, if 10 percent die with treatment A and 20 percent with treatment B, the difference, absolutely, is 10 percent. The difference number is the foremost number; that number tells you how much better one treatment is than another. It is an actual number, not a relative number.

The other three numbers are for the percent of people being harmed by the treatments.

Unfortunately, treatments that improve disease-related outcomes invariably produce greater percent chances of side effects, or complications. Again, there will be two percents of people being harmed for both treatments, and, following, a simple subtraction of those percents.

In summary, you must know the absolute differences in disease- and treatment-caused outcomes to compare options for your care.

Relative Numbers Are Biased and Can Be Misleading

Why did I try to pass a Bill to eliminate relative numbers for medical care communication? Because relative numbers are biased. Relative numbers are always larger than actual numbers, and, for some people, the size of a number matters. Researchers have found that patients will more likely take a treatment if the benefits are communicated as relative differences rather than absolute differences. I attended a lecture from an industry-sponsored speaker who presented benefits of the sponsored treatment in relative numbers (positive bias for treatment), but harm numbers were presented in absolute differences (also positive bias for treatment).

The use of relative numbers in reports to consumers is ubiquitous. Even government agencies responsible for our health use relative numbers rather than absolute numbers. The Centers for Disease Control (CDC) recommends shingles vaccine, for example. The CDC site states the vaccine is “over 90 percent effective” (a relative number). A Google search also finds numerous reports documenting the [relative decline in shingles, but not absolute differences](#).

The 90 percent relative decline in shingles, however, is an absolute difference of less than 1 percent per year (0.3 per 1000 person-years with vaccine; 9 per 1000 person-years without; the absolute difference is 8.7 per 1000 person-years, or 0.87 per 100 person-years—hence, less than 1 percent). A 90 percent relative difference sounds remarkable; the 1 percent absolute difference per year, less so.

This sort of relative number obfuscation is common, and patients recount to me that conversations with their physicians rarely include discussions of absolute differences. I don't think my Bill failed for fear of denting the First Amendment. My Bill failed because there is a bias inherent in the communication of today's medical care; if a relative number spurs taking treatments, it is likely preferred by those who want the treatment plans followed.

Unfortunately, there is no “Bill of Rights to See Only Absolute Numbers” in the legislative pipeline, so you must be resolute to know the absolutes. Even if accurate, relative numbers limit your understanding of the medical care offered to you. If not outright lies, they are

obfuscations that cloud already difficult choices. Don't be deceived.

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