The material below was posted on journalreview.org on October 18, 2009. It is reproduced here because that site closed.

Patterns of changes in absolute differences between rates as the prevalence of an outcome changes

Below are two follow-up points to my May 1, 2007 comment below (which was corrected with respect to its discussion of measurement approaches of the Agency for Healthcare Research and Quality by a comment of November 6, 2007).

First, in the May 1, 2007 comment, in criticizing reliance on absolute differences between outcome rates as a measure of health or healthcare disparities without regard to the way that absolute differences tend to change as the overall prevalence of an outcome changes, I explained that, solely for reasons related to the shapes of the underlying risk distributions, absolute differences tend to be small where an outcome is rare, grow larger as the outcome becomes more common, then grow small again as the outcome becomes nearly universal. With regard to the particulars of the pattern in circumstances (in terms of an increasing favorable outcome), I stated: "In situations where the distributions are perfectly normal, the maximum value for the absolute difference will coincide with the point where (1) the ratio of the advantaged group's s rate of experiencing the outcome to the disadvantaged group's rate of experiencing the outcome equals (2) the ratio of the disadvantaged group's rate of avoiding the outcome to the advantaged group's rate of avoiding the outcome." The specifics of that description hold where the difference between means of the underlying distributions is one half a standard deviation. But, even with perfectly normal distributions, the situation is somewhat more complicated with other differences between means. Thus, it would be more accurate to say that as an outcome moves toward a range defined by rates of 50 percent for either group, the absolute difference between rates tends to increase; when the outcome moves away from that range, absolute differences will tend to decline. Within the range, the patterns of changes are less predictable and affected by the size of the difference between means, though within the range changes in absolute differences tend to be small. For further explanation of these patterns, see the introductory section of the Scanlan's Rule page of jpscanlan.com.[1] This qualification, however, is of little consequence to the remainder of the May 1, 2007 comment.

Second, some months later, I developed a method for measuring the difference between outcome rates that is unaffected by the overall prevalence of an outcome – specifically, by deriving from a pair of rates the difference between means of the underlying distributions. The method, which is discussed in references 2-4, among other places, is summarized on the Solutions sub-page of the Measuring Health Disparities page (MHD) of jpscanlan.com[5]. The Solutions page also provides links to comments or presentations that applied the approach to outcome rates in various studies. A downloadable database with which to implement the approach is made available on the Solutions Database sub-page of MHD.[6] While imperfect, this approach would more usefully appraise the patterns of changes over time in the articles that

are the subject of the November 1, 2007 comment than would reliance on absolute differences without regard to the implications of changes in overall prevalence of the outcomes.

References:

1. http://jpscanlan.com/scanlansrule.html

2. Comparing the size of inequalities in dichotomous measures in light of the standard correlations between such measures and the prevalence of an outcome. Journal Review Jan. 14, 2008 (responding to Boström G, Rosén M. Measuring social inequalities in health – politics or Science? Scan J Public Health 2003;31:211-215): http://www.jpscanlan.com/images/Bostrom_and_Rosen_Comment.pdf

3. Can We Actually Measure Health Disparities?, presented at the 7th International Conference on Health Policy Statistics, Philadelphia, PA, Jan. 17-18, 2008 (invited session): http://www.jpscanlan.com/images/2008_ICHPS_Oral.pdf —

4. Evaluating The Sizes Of Differences Between Group Rates In Settings Of Different Overall Prevalence, presented at the Joint Statistical Meetings of the American Statistical Association, International Biometric Society, Institute for Mathematical Statistics, and Canadian Statistical Society, Denver, Colorado, Aug. 3-7, 2008: http://jpscanlan.com/images/jsm 2008.ppt

5. http://www.jpscanlan.com/measuringhealthdisp/solutions.html

6. http://www.jpscanlan.com/measuringhealthdisp/solutionsdatabase.html