

[The comment below was posted on journalreview.org on August 6, 2010. Following the closing of that site, the comment was posted here in September 2012.]

Resolving measurement issues should be the pressing health disparities research concern

The technical report by Flores and the Committee on Pediatrics Research [1] systematically reviews the literature on racial and ethnic health and healthcare disparities among children and calls for rigorous evaluations of interventions to address those disparities. But, while it touches upon certain methodological issues, the report overlooks a fundamental methodological problem that, while likely present in all the studies the report reviews, is of particular relevance to the evaluation of interventions.

By and large, the studies examined in the report rely on some standard of measure of differences between outcome rates without recognizing the way that, for reasons related to the shapes of the two groups' underlying distributions, each such measure tends to be affected by the overall prevalence of an outcome. Most notably, the rarer an outcome, the greater tends to be the relative difference in experiencing it and the smaller tends to be the relative difference in avoiding it. Thus, for example, as infant mortality declines, relative differences in infant mortality tend to increase while relative differences in infant survival tend to decrease; as prenatal care and immunization become more widespread, relative differences in receiving them tend to decrease while relative differences in failing to receive them tend to increase.[2-4] Absolute differences between rates and odds ratios tend also to be systematically affected by the overall prevalence of an outcome, though in a more complicated way. Roughly, when for any outcome the rate of experiencing it is less than 50% for both groups, general decreases in the outcome tend to reduce absolute differences between rates and general increases in the outcome tend to increase absolute differences. Differences measured by odds ratios tend to changes in the opposite direction of absolute differences. Apart from references 2-4, over a hundred references addressing these patterns in particular contexts may be found on the Measuring Health Disparities page (MHD) of jpscanlan.com,[5] and the nuances of these patterns are described on the Scanlan's Rule page of the same site.[6]

A study by Morita et al.[7] that appeared here in 2008, and which won a Robert Wood Johnson award for addressing health disparities, nicely illustrates the issues. The study examined the effects of a school-entry Hepatitis B vaccination requirement on racial and ethnic disparities in vaccination rates. Measuring the disparities in terms of relative differences in vaccination rates, the authors concluded that the requirement, which dramatically increased vaccination rates, dramatically reduced racial and ethnic disparities. As I showed in a comment on the study,[8] the National Center for Health Statistics, which would have measured the disparities in terms of relative differences in rates of failing to be vaccinated, would have found dramatic increases in disparities. Researchers who measure disparities in terms of absolute differences between rates would have reached different conclusions regarding the directions of changes as to different points in time, as would the Agency for Healthcare Research and Quality (AHRQ), which measures disparities in terms of whichever relative difference (in the favorable or the adverse outcome) is larger. But the AHRQ interpretation would have been the opposite of that reached by researchers who rely on absolute differences.

The point is not simply that different measures may yield different conclusions about the comparative size of health disparities at different points in times or in settings differentiated other than temporally. Rather, the point is that none of the standard measures of differences between outcome rates can alone provide useful information about the size of a disparity even in an abstract sense. To meaningfully appraise the size of a disparity in rates of experiencing some outcome (or its opposite) one needs a measure that is not in some manner affected by the overall prevalence of the outcome.

The Solutions sub-page of MHD [9] discusses a method for measuring health and healthcare disparities that theoretically is not affected by the overall prevalence of an outcome, and the referenced comment applies that approach to data in the Morita study. Section A.7 of the Scanlan's Rule page applies the approach to historical data on racial differences in infant mortality. As discussed in those places, the approach may have certain weaknesses. But it is nevertheless much superior to the reliance on standard measures of differences between rates without consideration of the way those measures are affected by overall the prevalence of an outcome. At any rate, resolving the measurement issue is crucial to conducting useful health disparities research especially research that endeavors to evaluate the efficacy of intervention to address disparities.

References:

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