[The comment below was posted on journalreview.org on February 10, 2010. Following the closing of that site, the comment was posted here in September 2012.]

Health disparities cannot be measured without consideration of the overall prevalence of an outcome

The study by Orsi et al.[1] of changing black-white health disparities in the United States and Chicago, like almost all similar efforts to measure changes in disparities over time, suffers from a failure to recognize the pattern whereby 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 failing to experience it.[2-7] Thus, solely for reasons related to the shapes of normal risk distributions, when health and healthcare improve, relative differences in (declining) adverse outcomes tend to increase while relative differences in (increasing) favorable outcomes tend to decrease. Thus, for example, during periods of declining infant mortality, relative differences in infant mortality have tended to increase while relative differences in infant survival have tended to decrease.[3-5] As rates of mammography, immunization, and prenatal care have increased, relative differences in receipt of those procedures have tended to decrease while relative differences in failing to receive those procedures have tended to increase. Similarly, when adverse outcomes increase, relative differences in those outcomes tend to decline, while relative differences in the opposite outcomes tend to increase.

The authors in all cases rely on relative differences in adverse outcomes, citing Keppel et al.,[8] a National Center for Health Statistics (NCHS) report. That document and various other works of the same NCHS statisticians [9,10] were specifically responding to articles where I had described the above tendency.[3,4] I had also explained that because it was the convention to measure disparities in receipt of beneficial healthcare procedures, like prenatal care, in terms of relative differences in favorable outcomes, disparities in healthcare were perceived to be declining even as disparities in the outcomes the procedures were intended to reduce, like infant mortality, were deemed to be increasing. NCHS unwisely responded merely by recommending that all disparities be measured in terms of relative differences in the adverse outcome. Following that recommendation, Orsi et al., in Table 3, find a substantial increase in first trimester prenatal care disparities in Chicago (measured in terms of relative differences in the failure to receive prenatal care). Under the standard approach ten years ago, and probably still the predominant approach notwithstanding the NCHS recommendation, the disparity (measured in terms of relative differences in receiving prenatal care) would be deemed to have decreased substantially. Compare, for example, the recent study by Morita et al.[11] that, relying on relative differences in Hepatitis B immunization rates found dramatic decreases in racial and ethnic disparities in Chicago following a school-entry vaccination requirement. NCHS would instead have found dramatic decreases in disparities in failure to receive vaccination.[12]

These and other patterns by which standard measures of differences between rates are affected by the overall prevalence of an outcome are merely tendencies. They will

influence but not necessarily dictate the direction in which the measure changes over time. But it is not possible to evaluate whether there have occurred meaningful changes in the comparative health or healthcare situation of two groups without in some manner taking the tendencies into account. When both relative differences changes in the same direction, one might cautiously infer that there occurred a meaningful change in that direction. When that is not the case, one must rely on approaches such as that described in reference 7 and on the Solutions sub-page of the Measuring Health Disparities page of jpscanlan.com.[13]

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