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June 1, 2010

Karen Davis, Ph.D.  
President  
The Commonwealth Fund  
1 East 75<sup>th</sup> Street  
New York, NY 10021

Dear Dr. Davis:

The Commonwealth Fund is a leading institution in promoting efforts to understand and address health and healthcare disparities and provides substantial support for research concerning those disparities. But there exist certain methodological issues that have been largely overlooked in disparities research supported by the Commonwealth Fund, just as such issues have been largely overlooked in disparities research supported by other private and public institutions. And there exist serious questions as to the value of research that fails to consider those issues.

Disparities in health and healthcare are generally evaluated in terms of some standard measure of differences between outcome rates – mainly, relative differences in experiencing an adverse or favorable outcome, absolute differences between rates, and odds ratios, as well as certain more complex measures that are in some way functions of the measures just mentioned. Virtually all health disparities research, however, has failed to consider certain patterns whereby, solely for reasons related to features of the underlying risk distributions, each standard measure of difference between outcome rates is affected by the overall prevalence of an outcome. The most notable of these patterns is that 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. Thus, as mortality declines, relative differences in mortality rates tend to increase while relative differences in survival rates tend to decrease. As beneficial procedures like mammography and immunization become more widely available, relative differences in receiving them tend to decrease while relative differences in failing to receive them tend to increase. Absolute differences between rates and odds ratios tend also to change systematically as the overall prevalence of an outcome changes, though in more complicated ways. Roughly, as uncommon outcomes (those with rates of less than 50% for both groups) become more common, absolute differences between rates tend to increase; as common outcomes (those with rates of more than 50% for both groups) become even more common absolute differences tend to decrease. Differences measured by odds ratios tend to change in the opposite direction of absolute differences between rates.

The point is not simply that one may draw different conclusions depending on choice of measure. Rather, the point is that to draw meaningful conclusions about the size of health or healthcare disparities, including whether such disparities are increasing or decreasing over time, one needs to distinguish between patterns that are functions of differences in the overall prevalence of an outcome and those that reflect something more significant.

Over a hundred references explaining the above-described patterns as they bear on the interpretation of group differences in the law and the social and medical sciences may be found on the [Measuring Health Disparities](#)<sup>1</sup> (MHD) page of [jpscanlan.com](#), and the nuances of the patterns are discussed on the [Scanlan's Rule](#) page of the same site. The extent of scholarly consensus with the views on those pages and the references they make available is summarized in [Section E.7](#) of MHD. The [Solutions](#) sub-page of MHD addresses an approach to measuring differences between outcome rates that is not affected by the overall prevalence of an outcome and the [Solutions Database](#) sub-page of MHD provides a downloadable database with which to implement that approach. A number of key references are found after the signature.

Reference 6 provides a particularly useful illustration of the issues. It comments on a 2008 *Pediatrics* study for which the Robert Wood Johnson Foundation presented the principal author (Dr. July Morita of the Chicago Department of Public Health) an award for addressing health disparities. The study examined the effects of a school-entry Hepatitis B vaccination requirement on racial and ethnic disparities in vaccination rates among Chicago school children. Dr. Morita and her colleagues, relying on relative differences in vaccination rates as a measure of disparity, found that the requirement dramatically reduced racial and ethnic disparities in vaccination rates. But the National Center for Health Statistics (NCHS), which invariably relies on relative differences in adverse outcomes to measure disparities, would have found dramatic increases in disparities. The Agency for Healthcare Research and Quality (AHRQ), which measures healthcare disparities in terms of whichever relative difference is larger (*i.e.*, in the favorable or the adverse outcome) would have reached different conclusions as to directions of change for different time periods. Researchers who rely on absolute differences between rates would also have reached different conclusions as to the direction of change for different time periods, which conclusions would be the opposite of those reached by AHRQ.

A number of these issues can be illustrated with reference to the Commonwealth Fund's March 2008 publication *Racial and Ethnic Disparities in U.S. Health Care: A Chartbook*. The *Chartbook* does not discuss measurement issues. In Chapter 3, however, it evidently relies on relative differences and, while not discussing the matter, does so with regard to adverse outcomes. With respect to Chart 3-3, the *Chartbook* notes that the racial disparity in chronic outcomes is larger at higher income levels. But, as discussed in references 1 and 2, one commonly finds large relative differences in adverse outcomes in comparatively advantaged subpopulations simply because those outcomes are rarer in such subpopulations. On the other

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<sup>1</sup> The underlining of various references in this letter reflects the fact that, in order to facilitate review of those references, links to the references are provided in an electronic copy of this letter posted on the Institutional Correspondence sub-page of the Measuring Health Disparities page of [jpscanlan.com](#).

hand, relative differences in the opposite (favorable) outcome tend to be smaller in such subpopulations. And in fact Chart 3-3 also reveals that relative differences between black and white rates of avoiding chronic conditions are smaller at higher income levels than at lower income levels.

Chapter 7 of the *Chartbook* contains a good deal of discussion about the way various things that generally improve healthcare will tend to affect healthcare disparities. But that discussion fails to recognize the implications of choice of measure. Chart 7-1, which shows vaccination rates by race/ethnic group over time, is intended to show that increasing immunization will tend to reduce immunization disparities (presumably in terms of the relative differences in vaccination rates as in the case of the Morita study). As it happens, the information in Chart 7-1 suggests that there occurred a narrowing of disparities regardless of how disparities are measured. But, as reflected by the discussion of the Morita study, measures that increase overall vaccination rates, while commonly reducing relative difference in vaccination rates, often will increase relative differences in failure to receive vaccination (which is the way NCHS always, and AHRQ frequently, will measure disparities).

Chart 7-2, which shows rates of control of blood pressure for black and white men in VA and non-VA hospitals, notes that the disparity is smaller in the former setting. These data, too, would seem to show a smaller disparity in VA hospitals than in non-VA hospitals regardless of how the disparity is measured (though the appraisal of the size of disparities among subpopulations defined by presence of a condition is an especially complicated matter, as discussed in reference 7, a comment on the study cited in the chart, and in the [Truncation Issues](#) sub-page of the Scanlan's Rule page of [jpscanlan.com](#)). But whatever this particular study shows, it should be recognized that improvements in control of blood pressure will tend to reduce relative differences in control rates while increasing relative difference in lack of control (which, again, is the way NCHS always, and AHRQ frequently, will measure such disparities).

Chart 7-3 mentions smaller screening disparities for Hispanics among persons with a regular doctor than persons without a regular doctor. But data in the chart reveal that in the case of blood pressure monitoring, where Hispanics are disadvantaged compared with whites and blacks, both NCHS and AHRQ, which would measure the disparity in terms of relative differences in failure to be screened, would find the Hispanic-white disparity slightly larger, and the Hispanic-black disparity substantially larger, among those with a regular doctor than those without a regular doctor.

Chart 7-8, which examines rates of the forgoing needed care, states that the ethnic disparity for Hispanics is substantially lower among the insured. The measure underlying the statement would seem to be the absolute difference between rates (though one would also find a slightly smaller relative difference in the favorable outcome – never forgoing needed care – among the insured). But both NCHS and AHRQ, relying on relative differences in forgoing needed care, would find the Hispanic-white (or Hispanic-black) disparity to be greater among the insured (RR = 1.71) than among the uninsured (RR = 1.59).

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Chart 7-9 relies on a 2003 *Journal of the American Medical Association* study by Sehgal, which had relied on absolute differences between rates, for showing that quality improvements tend to reduce healthcare disparities. This is a study I have used many times for illustrative purposes (as in references 4 and 5), because NCHS would find the disparities to have increased. This is situation where it is difficult to know what AHRQ would find, since, at the outset, it would rely on relative differences in the favorable outcome, and, in the end, would rely on relative difference in the adverse outcome. See Addendum to reference 5. But, say, for the period between 1997 and 2000, AHRQ would have relied on relative differences in inadequate dialysis and would have found the disparity to more than double.<sup>2</sup>

Finally, I note that both pay-for-performance generally and the impact of pay-for-performance on health and healthcare disparities have been issues of particular interest to the Commonwealth Fund. But because of the concrete steps that may be taken based on perceptions about the way disparities may be affected by pay-for-performance, the pay-for-performance area is one where the failure to recognize the measurement issues may have the most serious implications. This subject is discussed at some length on the [Pay for Performance](#) sub-page of Measuring Health Disparities page of [jpscanlan.com](#). That page, among other things, addresses the fact that the failure to recognize the way absolute differences between outcome rates are affected by the overall prevalence of an outcome has led to a perception in the United States that pay-for-performance will tend to increase disparities at the same time that said failure has led to a perception in the United Kingdom that pay-for-performance will tend to decrease healthcare disparities.

I hope you find the references of interest and give the points they raise some thought in the Commonwealth Fund's future work in this area.

Sincerely,

/s/ **James P. Scanlan**

James P. Scanlan

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[http://www.jpscanlan.com/images/Can\\_We\\_Actually\\_Measure\\_Health\\_Disparities.pdf](http://www.jpscanlan.com/images/Can_We_Actually_Measure_Health_Disparities.pdf)

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<sup>2</sup> [Section D](#) of the Measuring Health Disparities page provides links to more than 80 comments on medical and health policy journal articles involving the measurement issues discussed here. But there are few articles on health and healthcare disparities where the reasoning is not in some manner undermined by the failure to recognize the patterns by which measures of differences between outcome rates are affected by the overall prevalence of an outcome. Simply because it is was only recently posted, I am aware that item D.74 involves a study funded by the Commonwealth Fund. I assume, however, that some number of the other items made available in the section also involve studies supported by the Commonwealth Fund.

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4. Scanlan JP. Can We Actually Measure Health Disparities?, presented at the 7th International  
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