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### **Measuring disparities in risk factors by means of absolute differences between rates**

Measuring disparities in risk factors by means of absolute differences between rates  
Kanjilat et al. [1] analyze trends in socioeconomic disparities in four major risk factors for cardiovascular disease among US adults between 1971 and 2002. They analyze the size of disparities in terms of absolute differences between outcome rates of different socioeconomic groups. To their credit, the authors make clear that they are relying on absolute differences by discussing “percentage point” changes and differences rather than “percent” changes and differences. It seems that fewer and fewer researchers exercise similar care in their terminology (as discussed in reference 2)

But the study does not discuss why the authors have relied on absolute differences between rates as a measure of disparity. And it shows no recognition of the fact that other researchers might rely on different measures, possibly to draw contrary conclusions, much less a recognition of the patterns by which absolute differences (and other measures) tend to change in certain ways as the overall prevalence of an outcome changes or of the implications of such patterns with respect to determining whether disparities are increasing or decreasing in some meaningful sense.[3-6]

The issue can be illustrated with reference to the first point Kanjilat et al. make about changes in disparities. In finding that socioeconomic disparities in hypertension rates declined, the authors state in the Results section of the abstract that “the greatest reductions [in the prevalence of high blood pressure were] among those in the lowest income quartiles and those with less than a high school education (18.0 and 15.9 percentage points respectively).” As shown in the study’s Table 2, the 18.0 percentage point reduction involved a reduction in hypertension rates from 40.6% to 22.6% for lowest income quartile, which compares with a reduction from 32.5% to 16.4% for the highest income quartile (a 16.1 percentage point reduction). The 15.9 percentage point reduction involved a reduction in hypertension rates from 39.5 percent to 23.6 percent for the lowest education group, which compares with a reduction from 30.3% to 16.9% for the highest education group (a 13.4 percentage reduction).

But the National Center for Health Statistics (NCHS), which like the employer of the authors is an arm of the Centers for Control and Prevention (CDC), takes the position that all health and healthcare disparities should be measured in terms of relative differences in adverse outcomes. That approach would have found a larger reduction in hypertension rates among the highest income group compared with the lowest income group (49.5% for the highest income group versus 44.3% for the lowest income group) and a larger reduction in hypertension rates among the highest education group compared with lowest education group (44.2% for the highest education group versus 40.3% for the lowest), correspondingly increasing the disparities between the higher and lower socioeconomic groups.

This is not to suggest that the NCHS approach is a superior one or even that it is valid at all. I have strongly criticized NCHS's approach for failure to address the way relative differences in experiencing and avoiding an outcome tend to change systematically in opposite directions as the overall prevalence of an outcome changes or to generally recognize that all standard measure of differences between outcome rates tend to change in various ways as the overall prevalence of an outcome changes.[5-6,10-13]. But the fact that one arm of CDC can interpret data on health disparities in a way diametrically opposed to the way the CDC's principal statistical arm would interpret them, without even evidencing a recognition of a measurement issue, does highlight the methodological disarray in this area.

The disarray is further highlighted by the fact that Agency for Healthcare Research and Quality, which is responsible for the National Healthcare Disparities Report, measures disparities in terms of whichever relative difference (in the favorable or the adverse outcome) is the larger. That approach tends to yield opposite conclusions as to directions of change over time from the conclusions yielded by absolute differences.[10,11]

#### References:

1. Kanjilat S, Gregg EW, Cheng YJ, et al. Socioeconomic status and trends in disparities in 4 major risk factors for cardiovascular disease among US adults, 1971-2002. *Arch Intern Med* 2006;166:2348-2355
2. Percentage Points sub-page of Vignettes page of [jpscanlan.com](http://www.jpscanlan.com):  
<http://www.jpscanlan.com/vignettes/percentgep...>
3. Scanlan JP. Divining difference. *Chance* 1994;7(4):38-9,48:  
[http://jpscanlan.com/images/Divining\\_Differen...](http://jpscanlan.com/images/Divining_Differen...)
4. Scanlan JP. Race and mortality. *Society* 2000;37(2):19-35 (reprinted in *Current* 2000 (Feb)): [http://www.jpscanlan.com/images/Race\\_and\\_Mort...](http://www.jpscanlan.com/images/Race_and_Mort...)
5. Scanlan JP. Can we actually measure health disparities? *Chance* 2006;19(2):47-51:  
[http://www.jpscanlan.com/images/Can\\_We\\_Actual...](http://www.jpscanlan.com/images/Can_We_Actual...)
6. Measuring health disparities. *J Public Health Manag Pract* 2006;12(3):293-296 (responding to Keppel KG, Pearcy JN. Measuring relative disparities in terms of adverse events. *J Public Health Manag Pract* 2005;11(6):479-483):  
<http://www.nursingcenter.com/library/JournalA...>
7. Keppel KG, Pamuk E, Lynch J, et al. Methodological issues in measuring health disparities. *Vital and health statistics. Series 2. No. 141*. Washington, D.C.: Government Printing Office, 2005. (DHHS publication no. (PHS) 2005-1341.):  
[http://www.cdc.gov/nchs/data/series/sr\\_02/sr0...](http://www.cdc.gov/nchs/data/series/sr_02/sr0...)

8. Keppel KG, Pearcy JN. Measuring relative disparities in terms of adverse events. *J Public Health Manag Pract* 2005;11(6):479–483
9. Keppel KG, Pearcy JN. Health People 2010: Measuring Disparities in Health. *Chance* 2009;22(9):6-9.
10. Scanlan JP. Measurement Problems in the National Healthcare Disparities Report, presented at American Public Health Association 135th Annual Meeting & Exposition, Washington, DC, Nov. 3-7, 2007: PowerPoint Presentation:  
[http://www.jpscanlan.com/images/APHA\\_2007\\_Pre...](http://www.jpscanlan.com/images/APHA_2007_Pre...) Presentation:  
[http://www.jpscanlan.com/images/ORAL\\_ANNOTATE...](http://www.jpscanlan.com/images/ORAL_ANNOTATE...) (March 11, 2008):  
<http://www.jpscanlan.com/images/Addendum.pdf>
11. Scanlan JP. Study illustrates ways in which the direction of a change in disparity turns on the measure chosen. *Pediatrics* Mar. 27, 2008 (responding to Morita JY, Ramirez E, Trick WE. Effect of school-entry vaccination requirements on racial and ethnic disparities in Hepatitis B immunization coverage among public high school students. *Pediatrics* 2008;121:e547-e552): <http://pediatrics.aappublications.org/cgi/ele...> 12. Sections E.4 and E.7 of Measuring Health Disparities page of jpscanlan.com:  
<http://jpscanlan.com/measuringhealthdisp.html>
13. Section A.6 of Scanlan’s Rule page of jpscanlan.com:  
<http://jpscanlan.com/scanlansrule.html>