Note: This comment was created for journalreview.org. But, as with item D.82, a technical problem prevented posting on that site. Accordingly, I am posting it on jpscanlan.com until the journalreview.org problem is corrected.

Title: Health and healthcare disparities cannot be usefully measured without consideration of overall prevalence

Content: In setting out a methodology for measuring disparities in the incidence of sexually transmitted disease, Hoover et al. [1] note that when disparities are measured in relative terms, "both the magnitude and direction of change in a disparity monitored over time will depend on whether the outcome [examined] was adverse or favorable." This point has its origin in two articles of mine[2,3] that led the National Center for Health Statistics (NCHS) to recommend that all disparities, including health and healthcare disparities, be measured in terms of relative differences in adverse outcomes.[4,5,6]

The formulation by Hoover somewhat overstates the matter. I had described a pattern whereby, for reasons related to features of underlying risk distributions, the rarer an outcome, the greater will tend to be the relative difference in experiencing it and the smaller will tend to be the relative difference in avoiding it. Though the pattern reflected a powerful tendency, it was merely a tendency. Relative differences in experiencing an outcome and relative differences in avoiding it are also importantly functions of differences between the underlying distributions. The larger the difference between the underlying distributions, for any given prevalence level, the larger will be both the relative difference in experiencing the outcome and the relative difference in avoiding it. If the prevalence of an outcome is lower in the setting with the larger difference between distribution means, the lower prevalence may or may not be sufficient to cause the relative difference in experiencing the outcome to be larger in that setting.[2,7]

More important, however, the NCHS response to my description of these patterns was a misguided one. The point of references 2 and 3 (and varied other references made available on the Measuring Health Disparities page of jpscanlan.com, [8] including a 2006 Chance editorial) [9] is that neither the relative difference in experiencing an outcome nor the relative difference in avoiding the outcome – nor other standard measures of differences in outcome rates that tend to be affected by the overall prevalence of an outcome – can provide useful information as to the size of a disparity without in some manner taking overall prevalence into account. Ignoring this issue, and forgoing any effort to provide guidance on how one might take overall prevalence into account, NCHS simply recommended that all disparities be measured in terms of relative differences in the adverse outcome.

The measurement issue involves every kind of disparity, including disparities in morbidity and mortality. These have long been measured in terms of relative differences in adverse outcome, but without consideration of the fact that, solely for statistical reasons, decreases in the prevalence of such outcomes tend to increase relative differences if experiencing them and reduce relative difference in avoiding them. But the principal implication of the NCHS recommendation that all disparities be measured in terms of relative differences in adverse outcomes involves healthcare disparities. It used to be that disparities in receipt of beneficial

procedures like immunization and mammography were measured in terms of relative differences in favorable outcomes (receipt of the procedures). Since those procedures were increasing (and relative differences were decreasing) disparities in such procedures were regarded as declining. Under the NCHS recommendation, such disparities will tend to be regarded as increasing (allowing of course that meaningful changes may outweigh the statistical tendencies).

Reference 10 provides a succinct illustration of the implications of the NCHS recommendation. It comments on a 2008 Pediatrics study that received a Robert Wood Johnson Foundation 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. The authors, ignoring or unaware of the NCHS recommendation, relied on relative differences in vaccination rates as a measure of disparity. And they found that by dramatically increasing vaccination rates, the requirement also dramatically reduced racial and ethnic disparities in vaccination rates. But NCHS would have found dramatic increases in disparities.

As reflected in Section E.7 of MHD,[11] especially in Europe,[12-15] there is increasing scholarly recognition of the ways that overall prevalence of an outcome tend to affect standard measures of differences between health and healthcare outcome rates and the need in some manner to take overall prevalence into account in interpreting such measures. Thus, it is doubtful that NCHS and related agencies within the Department of Health and Human Services can ignore these issues forever. But the longer the delay in confronting such issues, the more resources will have been devoted to disparities research lacking a sound foundation.

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