

Disparities in Measuring Disparities in Health Care: A Statistical Conceptual Framework

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The IOM (Institute of Medicine, United States) defines disparity in health care as "racial or ethnic differences in the quality of healthcare (Q) that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention." This implies that when we contrast two populations for the purposes of measuring disparities, we need to adjust for some variables such as health status (H), but not others, such as social-economical status (S). Depending the causal relationship between H and S, the needed adjustment will take several rather different forms. If H has a causal impact on S, then we should adjust for the marginal distribution of H, while keeping the conditional distribution of S give H intact, then examine the disparity as measured by the difference in the adjusted Q across groups – we label this *conditional disparity*. (We assume throughout that both H and S have causal impacts on Q.) If S has a causal impact on H, then we need to adjust for the conditional distribution of H given S, while keeping the marginal distribution of S unchanged. We label this as *marginal disparity*. If H and S have a reciprocal causal relationship, then we need to adjust the joint distribution for H and S – we label this *joint disparity*. The key emphasis of this framework is that meaningful estimation of disparity is inherently a very challenging one because it depends heavily on causal assumptions that are impossible to verify with observational studies. (This is a joint work with Naihua Duan of Columbia University, Margarita Alegria of Harvard Medical School and Chih-nan Chen and Julia Lin of Cambridge Health Alliance.)