A comparative analysis of measurement approaches for physiological dysregulation in an older population

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Abstract:

The theory of allostatic load [McEwen, B.S., Stellar, E., 1993. Stress and the individual: mechanisms leading to disease. Arch. Intern. Med. 153, 2093–2101] describes how the cumulative experience of emotional challenges and stressful events over the life course may take a significant physiological toll on multiple interrelated systems of the body. Various summary measures of these effects have been proposed in the literature, but few studies focus on systematically evaluating them. We use data from a population-based sample of older Taiwanese to compare the explanatory power and cross-sectional predictive performance of several measures of allostatic load for diverse health outcomes. We find that choices regarding which biomarkers to include in a summary measure and how the measure is formed have modest effects across the basic prediction models we evaluate. Our findings suggest that count-based summary measures incorporating risk at both high and low tails and measures that preserve the continuous properties of the biological variables are strategies that may yield stronger predictions of a wider array of health outcomes than other measures. These fundamental insights are useful for researchers in search of empirical formulations of allostatic load and for those who are focused on the development of improved measurement strategies.