

Climate Change, Environmental Justice, and Public Policy: Measurement and Evaluation of Stressors on Multiple Dimensions of Well Being

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Background/Objectives. Climate change will make waves of elevated temperatures more severe and frequent, elevating the potential for heat-related health effects that are adverse in areas that are already warm. Temperature effects may interact with and be mediated by other stressors such as obesity and other correlates of socio-economic status, as well as physical dimensions of urban settlements such as density and permeability. In such a setting, evaluation of the effects of policies on outcomes across persons in different circumstances is complex. This presentation will review existing environmental justice (EJ) tools, and illustrate with an example potential economic approaches for measuring multi-dimensional inequality. The approach in many federal and state EJ screening tools is to evaluate inequality on each dimension of interest, and then (perhaps) aggregate across them to achieve an inequality index that could be used in evaluating policy changes. An alternative approach first integrates across dimensions for each individual into a personal measure of well-being, and then aggregates across persons in a way that accounts for principles of justice. This allows for evaluation of trade-offs when examining policies that affect individual well being.

Approach/Activities. Recent developments in medicine have shifted the paradigm of heatstroke (Lim, 2018). Evidence points to an empirical relationship between chronic exposure to high heat and the risk of death due to heat sepsis. This risk may compound with other factors that differentially affect individuals at different locations in a distribution of exposure to stressors. We construct an economic model that integrates heat exposure, access to park/urban green space, and income.

We draw on recent economic research in welfare economics and public policy analysis that considers inequality across persons (Chakravarty, 2018). We examine how the economic benefits of providing additional access to parks differs between traditional methods, and methods that consider the benefits of heat reduction and health improvements and their interactions. We then examine the sensitivity of these benefit measures to parameters that govern individual and social aversion to inequality.

Results/Lessons Learned. Initial exploration across other dimensions of environmental disadvantage suggest that failure to scale for inequality can substantially underestimate the benefits of locating green spaces in under-served communities.