

INEQUALITIES IN ENVIRONMENTAL BURDENS ACROSS THREE MAJOR METROPOLITAN AREAS IN CALIFORNIA

Jason G. Su, *Environmental Health Sciences, School of Public Health, University of California, Berkeley, California 94720-7360.*

Michael Jerrett, *Environmental Health Sciences, School of Public Health, University of California, Berkeley, California 94720-7360.*

Rachel Morello-Frosch, *Department of Environmental Science, Policy and Management and School of Public Health, University of California, Berkeley, California 94720.*

Bill M. Jesdale, *Department of Environmental Science, Policy and Management, University of California, Berkeley, California 94720.*

Amy D. Kyle, *Environmental Health Sciences, School of Public Health, University of California, Berkeley, California 94720-7360.*

Background and Aims: Communities of color and low income are affected by multiple environmental hazards that can magnify risks to human health. In earlier research we developed an index of inequalities in environmental hazards to assess the cumulative impacts from air pollution. Here we extended this index to compare inequalities to air pollution and heat stress for groups of different socioeconomic composition and racial-ethnic status among three large metropolitan areas in California: Alameda County (San Francisco East Bay Area), San Diego and Los Angeles.

Methods: The index used the cumulative proportion of the population — ranked by area-based racial-ethnic composition or socioeconomic strata, starting from the most disadvantaged — against metrics that represented cumulative environmental hazards.

Two main cumulative inequality indices were investigated: one with the cumulative impacts from nitrogen dioxide (NO₂), fine particulate (PM_{2.5}) and diesel PM, and another with the cumulative impacts from air pollution and heat stress.

Results: Results indicate that, for the three air pollutants, the inequality was greatest for diesel particulate matter, followed by NO₂ and PM_{2.5}. Inequalities for the cumulative burden of these three air pollutants were greater than those for single pollutants. Though inequalities differed significantly for exposure to most of the three environmental hazards within and between regions, their cumulative inequalities did not differ between any two regions. Inequalities in heat stress showed that communities with greater proportions of whites had greater impact from heat for Alameda and San Diego, but the relationship was reversed for Los Angeles with minority population having higher impact. Adding heat stress worsened the cumulative impacts from air pollution for Los Angeles, but decreased the inequalities for Alameda and San Diego.

Conclusions: The results provide a useful policy tool to address inequalities between regions and within a region between various environmental factors.