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New Tool Evaluates Health and Equity Impacts of Sacramento's Regional Transportation Plans

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Issue

There is growing value in developing regional transportation plans that foster safer, healthier, and more environmentally sustainable communities. Greater rates of active travel (walking and biking) can lead to improved health outcomes due to increases in physical activity and air quality improvements, although they also increase risks of traffic injury. Analytical tools that evaluate the distribution of outcomes and the tradeoffs between transportation plan alternatives are needed to inform public debate and ensure that gains in some health outcomes are not being undermined by losses elsewhere. Additionally, there is a need to evaluate the impacts of transportation plans on different demographic groups to work toward more equitable outcomes.

This project creates a tool to investigate the distribution of public health impacts resulting from the implementation of a regional transportation plan in the six-county Sacramento Area Council of Governments (SACOG) region.

Key Research Findings

The Integrated Transportation Health Impacts Model (ITHIM) has been applied worldwide. It is based on relationships between behavior and health that are transparent and well-established. There are several other tools that can be used to assess the public health impacts of a region's transportation plan, each with different characteristics (including different methodological approaches, spatial

scales, exposure pathways, user inputs, built-in data, and outcomes considered.) The choice of which tool to use depends on the particular analytical needs in a region.

The ITHIM-Sacramento Equity Analysis Tool, built for this project, can be used to support health equity analysis of modeled regional transportation planning scenarios. The tool combines data that describes regional demographics, transportation behavior, physical activity, traffic injury, and health to predict future physical activity and traffic injury outcomes of different transportation plan scenarios. Results can be disaggregated by county, race/ethnicity, and income. Results can also be viewed as total numbers (indicating community-wide impacts) or standardized by age and population (indicating the risks faced by the average resident in a community).

The ITHIM-Sacramento Equity Analysis Tool indicates that physical activity and traffic injury outcomes that are expected to result from the adopted regional transportation plan vary widely for different counties. Some counties are expected to see health improvements among their residents while others are expected to see increased health risks. The reduction in total community-wide health burdens under the adopted regional plan is greatest for Sacramento County as a whole, mainly because of its larger population. Physical activity underlies most of the health benefits in Sacramento County. Standardized estimates (which reflect individual-level risk) show that the reduction in health risk for individual

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residents is greatest in Yolo County. Here, physical activity plays the most significant role in the decrease in health risks, and reduced traffic injury is also an important outcome.

Health impacts of the adopted regional transportation plan also vary by race/ethnicity and income. Looking at both total (community-wide) and standardized (individual-level risk) health outcomes, the magnitude of the outcomes varies greatly between race/ethnicity and income groups.

Detailed ITHIM-Sacramento Equity Analysis Tool results can be accessed via an interactive web tool. Graphical model results can be easily tailored by geographic area, plan scenario, units, demographic categories, and health outcome.

Analyzing and representing the public health and equity impacts of transportation plans in a user-friendly way can be useful for planners, policy makers, and advocates. By allowing users to evaluate and visualize the health impacts of different planning scenarios, the ITHIM-Sacramento Equity Analysis Tool can be used by transportation policy makers, planners, and community advocates

to develop a shared information base to inform crucial decisions about the region’s future. The ITHIM-Sacramento equity analysis tool can elevate the quality of the civic dialogue about how to build healthy communities and regions and the specific strategies needed to achieve this.

Further Reading

This policy brief is drawn from the “Development and Application of an Integrated Health Impacts Assessment Tool for the Sacramento Region” research report prepared for the California Department of Transportation by Alex Karner (the University of Texas at Austin); Dana Rowangould (Sustainable Systems Research); Yizheng Wu, Ofurhe Igbinedion, and Jonathan London (University of California, Davis). The project report can be found here: <https://ncst.ucdavis.edu/project/development-and-application-of-an-integrated-health-impacts-assessment-tool-for-transportation-plans-in-sacramento-county/>.

The interactive web tool can be viewed at https://aakarner.shinyapps.io/06_equity_analysis. All source code and model documentation are available at <https://github.com/aakarner/ITHIM-Sacramento>.

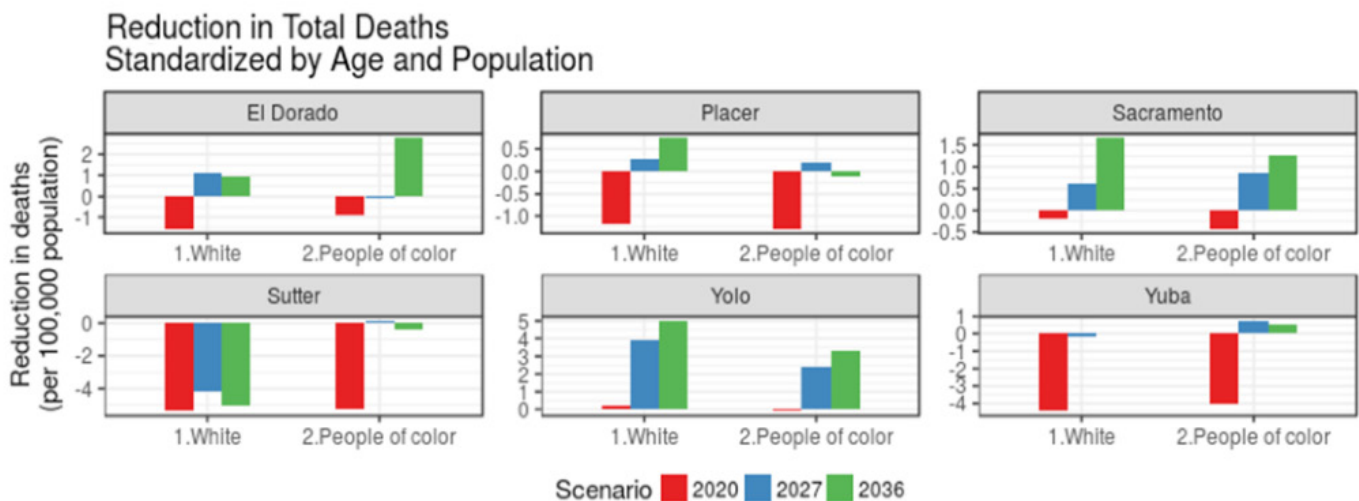


Figure 1: Example ITHIM-Sacramento Equity Analysis Tool output. This figure shows the modeled health impacts of the SACOG regional transportation and land use plan projected out to 2036, disaggregated by race/ethnicity and standardized by age and population (reflecting differences in individual-level risk).

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