

Health Forecasting at the UCLA School of Public Health

COUPLING THE BEST AVAILABLE RESEARCH EVIDENCE WITH MICROSIMULATION ANALYSIS, the Health Forecasting Project at the UCLA School of Public Health provides sound, credible forecasts to support policy decisions that improve population health and reduce health disparities.

Health Forecasting aims to provide valuable new information about the potential effects of policies and programs on the future health outcomes of specific populations, taking into account demographic trends and time-dependent effects. Especially valuable is the ability of Health Forecasting to drill below the surface of broad trends and population averages to reveal differential effects on the health of population subgroups.

At the core of this work is the *Health Forecasting Tool*, a simulation model and web-based interface that allows anyone from high-level government to local communities to access information that gauges the future health impacts of changes in programs and policies on populations. This information is customizable to suit the needs of a unique population by allowing the user to specify geographic boundaries and distributions of race, ethnicity, age and gender. Results are displayed in easy-to-read graphic charts and reports.

The Health Forecasting Project is a collaboration of the UCLA School of Public Health, the Los Angeles County Department of Public Health, and the California Department of Health Services.

Model Development

Adapted from population health models developed by Statistics Canada, the Health Forecasting model applies research evidence on various determinants of health to available population data using a continuous-time microsimulation framework. The inherent flexibility of microsimulation permits inclusion of a large number of factors and outcomes, allowing comprehensive evaluation of current and future population outcomes. This powerful analytic approach considers trends in numerous health determinants such as demographics, health behaviors, health status, and intermediate and distal health outcomes. It shows how these trends will

Health Forecasting Projects & Partnerships at the UCLA School of Public Health

- ❖ Assess and forecast Latino health disparities in relation to acculturation and compare the potential for different interventions that promote healthy behaviors to improve the health of Latinos living in California. ([NIH-R21ES019112](#))
- ❖ Expanding the capabilities of the Health Forecasting Tool by incorporating additional variables and focusing on interventions relevant to underserved individuals and communities in California. ([The California Endowment](#))
- ❖ Incorporating additional risk factors and disease outcomes into the forecasting model and applying the model to other states, beginning with Arkansas and Wisconsin. ([Robert Wood Johnson Foundation](#))
- ❖ Supporting hospitals in assessing current and future characteristics of populations they serve and identifying long-term planning needs of local communities. Providing information on future health and health disparities among subpopulations in the absence of additional effective health promotion and disease prevention efforts. ([UniHealth Foundation](#))
- ❖ Expanding the application of Health Forecasting to quantify the community health burdens related to air pollution using Placer County data and risk factors. ([Placer County Department of Health Services](#))

affect the health of the overall population and population subgroups over time under different scenarios with and without potential interventions. For example, this model has been used to forecast changes in asthma rates over a 20-year time horizon in different air basins with and without policies in place to reduce ambient levels of airborne particulates. The Health Forecasting model also provides companion forecasts of health expenditure outcomes associated with preventable or reducible levels of burden from different diseases and functional impairments.

Modeling Future Scenarios

Health Forecasting has been made possible by advances in computer technology, a growing wealth of health survey data, and an improved understanding of the effects of public health interventions and the broader “upstream” determinants of health such as education and income. The Health Forecasting microsimulation model brings these elements together to create a synthetic population with the characteristics of the actual population of interest. The lifetime health histories from birth to death of the population are modeled, from which rates of disease and mortality for the population are projected up to 20 years into the future under different sets of assumptions and policy scenarios. The Health Forecasting tool considers the composition of the overall population and population subgroups in assessing the combined impact of changes in multiple factors such as behaviors, programs, and policies.

Bringing Evidence-based Research to Community Practice

Changes in racial/ethnic distributions in the United States are projected to accelerate over the coming decades. These demographic shifts are expected to result in dramatic changes in aggregate health outcomes and will likely disproportionately affect smaller com-

munities with existing disparities in behavioral risk factors, health outcomes and access to health care. The publicly available Health Forecasting tool helps bring otherwise inaccessible evidence-based research to communities to tackle local disparities and challenges by enabling community level users to access the latest research to support local community needs and initiatives. This project intends to encourage community, municipal and state-wide engagement, along with policy change that will improve population health outcomes and reduce disparities.

Health Forecasting Web-based Tool

Web-based data sharing has been shown to increase access to data and analytic methods that were previously the exclusive domain of researchers. Evidence-based reports are available on the Health Forecasting website to facilitate access to data specific to the user’s population of interest.

Users can access the Health Forecasting web-based tool at www.health-forecasting.org where they can input the unique demographics (age, gender, and ethnicity) of a population of interest and generate reports of long-term outcomes associated with changes in risk factors, along with the effects of different interventions.

Further Information

Issue briefs on current topics are available for download on the Health Forecasting website. Please email us at info@health-forecasting.org for additional information. If you encounter trouble using the Health Forecasting tool, please consult the support pages at www.health-forecasting.org/Support. Sign up for the Health Forecasting email list to receive notifications about Health Forecasting updates and upcoming workshops.



Jonathan Fielding MD, MPH, MA, MBA
Principal Investigator

David Hayes-Bautista PhD
Co-Principal Investigator

Gerald Kominski PhD
Co-Principal Investigator

Jeroen van Meijgaard PhD
Project Manager

Lu Shi PhD
Senior Analyst

Kara MacLeod MPH, MA
Analyst

Health Forecasting
UCLA School of Public Health
61-253 CHS, Box 951772
Los Angeles, CA 90095-1772

PHONE: **310.206.1141**

FAX: **310.206.7096**

E-MAIL: info@health-forecasting.org

www.health-forecasting.org