



# VIRTUAL POPULATION OBESITY PREVENTION (VPOP) LABORATORIES

## VISION

To develop suites of simulation models of communities, cities, and regions that allow decision makers and stakeholders (e.g., policymakers, funders, public health officials, school officials, and business professionals) to design and test various obesity prevention measures, policies, and interventions with the safety of a computer before trying in real life.

## POTENTIAL USERS

Our VPOP Labs can help a wide variety of decision makers and stakeholders such as:

- **Policy makers:** To design, plan, evaluate or advocate for policies or interventions
- **Funders:** To determine the impact (e.g., return-on-investment) of supporting a particular policy, program, or intervention
- **Businesses and Community Members:** To understand how a new policy or intervention may affect them
- **Researchers:** To explore the causes of obesity and potential solutions

## IMPACT

Simulation modeling has *transformed many professions and industries* such as transportation, air traffic control, meteorology, and manufacturing. For example, the ‘live’ weather maps frequently shown on television are simulation models that combine and synthesize information from many different types of data from sources such as air, land, and water temperature, barometric pressure, wind speed and direction, and cloud patterns.

For obesity prevention and control, simulation models can serve as “Virtual Population Laboratories” (VPOP Labs) for decision makers in a community, city, or region to:

- Determine the factors and relationships that may be leading to obesity
- Forecast future scenarios and impact
- Design and plan obesity-related policies and interventions
- Assess the potential impact of policies or interventions, including their potential secondary and tertiary effects and unintended consequences
- Guide and prioritize data collection by identifying data gaps and demonstrating the effects of having better information

Obesity results from and involves a complex system of policy, economic, environmental, social, cultural, behavioral, and biological factors and relationships. More traditional studies alone may not fully capture and characterize the complex factors and interactions in a community, city, or region. Virtual laboratories can save considerable time, effort, and resources by allowing decision makers and researchers to first test hypothetical interventions and policies in the safety of a computer.

## CURRENT WORK

To date, the GOPC has developed VPOP simulation models of the following cities: Baltimore, Mexico, New Orleans, Philadelphia, San Francisco and Washington D.C. Each model includes geospatially explicit virtual representations of the children, homes, school, food sources, and physical activity locations of the designated city. Each virtual agent—like a real person, has an age, gender, and race/ethnicity. Each simulated day, the virtual people move from their homes to various locations to eat and exercise. Each person has an embedded metabolic model that then processes the calories ingested and the calories expended. Over time each virtual person will gain or lose weight, depending on his/her caloric intake.

### Examples of questions the VPOP models have helped answer include:

- What is the economic, epidemiologic and clinical impact of increasing the physical activity of children?
- What is the impact of crime on African American women's physical activity and obesity?
- How can increasing the number of trained coaches impact youth participation rates in physical activity?
- How can the implementation of sugar-sweetened beverage (SSB) warning labels impact obesity prevalence?

## ABOUT US

Bruce Lee is the Executive Director of the Global Obesity Prevention Center (GOPC) at Johns Hopkins University.