C-DIAS
Center for Dissemination & Implementation At Stanford

Can Predictive Modeling Bridge the Gap Between Public Health Data and Strategic Resource Allocation?

The Public Health Problem

Decision makers face challenges in using abundant data to guide resource allocation toward effective combinations of evidence-based practices (EBPs).

As a result, billions of dollars are often misallocated — either spent on ineffective services or poorly implemented EBPs. This inefficiency reduces the overall impact of public health efforts and wastes scarce resources.

Background

While data dashboards are becoming more common, decision support tools remain underused in public health. Decision makers express frustration about how to use dashboards and translate lists of EBPs into specific allocations of an array of services that will be effective.

What This Article Addresses

This paper examines how a Model-Driven Decision Support (MDDS) approach—combining community engagement, local data, and predictive modeling—can help public health decision makers move beyond standard tools to confidently allocate resources toward strategies that improve upon the status quo.

What They Did *(Methods)*

The paper draws on examples from HIV prevention and overdose death reduction, illustrating how agent-based modeling (ABM) can simulate intervention strategies and predict population impact to support better decision making and resource allocation.

What They Discovered *(Findings)*

Community engagement is crucial: Even strong interest in modeling tools is undermined by barriers like difficulty accessing timely local data and unclear responsibility for acting on results.

Predictive models show potential: MDDS can identify optimal combinations of interventions that improve health outcomes at the community level.

Barriers persist: Too many decision-makers and not enough trust in the tools make it hard to use predictive models effectively.

Opportunities for Action

The study findings highlight opportunities for:

Health care leaders and providers

- Encourage the use of predictive decision support tools when planning public health strategies.
- Ask what community leaders are doing to improve service systems and advocate for model-driven approaches.

Policymakers and payors

- Expand beyond data dashboards: integrate predictive modeling tools to explore "what if" scenarios and guide better resource allocation.
- Support the development of trustworthy, transparent modeling systems and training for local leaders.

Researchers

- Study how to integrate predictive models into real-world decision-making processes.
- Evaluate the effectiveness of predictive modeling in improving public health planning and outcomes.

Patients and families seeking recovery

- Advocate for local leaders to adopt tools that improve decision-making for health services, especially when resources are limited.
- Ask community officials how they are using data to drive improvements in health systems.

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