

## EDITOR'S CHOICE



# A SYSTEMS APPROACH TO A COMPLEX PROBLEM

This issue of the *Journal* focuses on systems modeling in tobacco control, a combination of terms that juxtaposes a promising current trend in approaching complex public health problems next to one of the most serious health risks we face today.

We have known for many years that tobacco smoking is the leading cause of preventable deaths in the United States. In response, the public health community has waged a war against tobacco that has resulted in a nearly steady decline in per capita consumption and prevalence for almost 50 years, cutting both measures by more than half from their peak values in the mid 1960s and saving millions of lives in the process. However, despite the extraordinary success in tobacco control achieved in this country, progress toward further reducing tobacco use appears to be slowing. While tobacco still kills nearly 450 000 Americans annually, one in five adults smokes regularly, and the same proportion of young adults become regular smokers every year.

We know that the tobacco problem is a very complex one, affected by multiple factors that range from socioeconomic to purely biological. Nicotine addiction, social networks and norms, education, price, and the tobacco industry's relentless promotion of its products are just a few of the different factors that interplay to sustain the epidemic. To continue our progress toward eradicating tobacco we will have to develop solution approaches that further take into account this complexity, recognizing the interaction of different aspects of the problem and potential synergies among proposed solutions, as well as unexpected, unwanted outcomes stemming from poorly planned interventions. In this context, systems modeling can help.

Modeling is just a formal expression of our thoughts about the mechanisms that drive a real phenomenon. Systems modeling allows us to represent, simultaneously, multiple facets of a problem and define their interconnections. Models can provide a common framework to exchange ideas, crystallize our thoughts, highlight what we know and what we still need to find out, and experiment with

potential solutions before actually implementing them.

Systems modeling has been gaining increasing acceptance among the public health community, which is recognizing its value in addressing the complex nature of problems that affect the health of the population. As evidence of this trend, in March 2006, the *Journal* published a theme issue on "Systems Thinking" to demonstrate the application of systems techniques to public health problems.

Systems modeling is not new to tobacco control, either, as other articles in this issue will show. In May 2008, with sponsorship from the National Cancer Institute, the University of Michigan Tobacco Research Network and the University of Michigan Center for the Study of Complex Systems, a group of tobacco modelers convened at the University of Michigan School of Public Health to discuss the state of the science of systems modeling in tobacco control. The meeting highlighted different modeling efforts that have been developed to illuminate key elements of the smoking epidemic and derive and inform policies aimed at ending the tobacco problem.

A key conclusion of the meeting was that there needs to be more coordination and collaboration in our modeling efforts to fully realize the potential of this approach. This theme issue of the *Journal* is one of the avenues we are employing to reach out to a larger community of public health scientists and practitioners to seek their support and collaboration. We hope to show that systems models can provide a rich platform on which different types of expertise can converge to devise novel and effective strategies to combat, and ultimately abolish, the tobacco epidemic. ■

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