

Foreword

As we have come to see time and time again, complexity is the hobgoblin of health policy. This is of course no surprise to biologists. During a time in the mid-twentieth century when penicillin was driving pneumonia and wound infection into retreat, and when vaccine was beginning to stop the polio epidemic in its tracks, the biologist Ludwig von Bertalanffy was proposing what came to be called “systems theory.” In some respects a direct reaction to the reductionist single organ system or “silver bullet” notions of disease and its control, systems theory emphasizes that the behavior of any entity—be it an organization, an individual, a human body—can only be truly understood not by focusing on the properties of its component parts, but by examining and characterizing the collective nature of the positions and relationships among the parts.

Tobacco—and the control of its use and impact—offers a splendid model for using a systems perspective to advantage and gleaning insights about potentially broader applications in health. We have for some time known that health status is the product of the dynamics at play within several domains of influence: our genetic predispositions, our social circumstances, the physical environments within which we live, the behavior patterns we choose, and the medical care we receive. We are also learning that often more important than what happens *within* any given domain is what happens *between* and *among* domains. How does the interplay of our genetic predispositions with our physical environments or behavior choices influence our risk for disease? How do social circumstances affect the medical care we receive and our responses to it? How are our behavioral choices influenced by our social and physical environments?

In tobacco, some of the answers to these questions are coming into closer focus—certainly that is the case for a stronger appreciation of the complexity. We are long past the time that tobacco use is purely a matter of “individual choice” and its control dependent on a strategy of “one-person-at-a-time.” Tax policy, school interventions, clean indoor air regulations, agricultural initiatives, advertising campaigns, medical care initiatives, community mobilization, and political action are all among the elements at work to reduce the use of tobacco among Americans. The results have been impressive, deriving from the loosely coordinated contributions of often disparate players. The challenge now is to better understand how these efforts work best in concert under different circumstances. If, through accurate characterization of the nature of the relationships at work, we can develop testable hypotheses about the circumstances in which elements of tobacco control are more, or less, effective, we can accelerate the push to the next level of tobacco control.

The Initiative on the Study and Implementation of Systems (ISIS), a four-year project sponsored by the National Cancer Institute (NCI), represents an innovative and potentially important contribution in that respect. Through ISIS, NCI has supported a careful exploration of four elements of systems approaches to improving tobacco control: systems organizing, system dynamics, system networks, and systems knowledge. This monograph reflects the first two years of the project. Beginning with the identification of key stakeholder groups—practitioners, leaders, advocates, and researchers—ISIS has carefully worked to

identify characteristics, apparent and subtle, that shape, and are shaped by, the characteristics of the interactions and networks both within and among stakeholder groups; the structure of the feedback loops involved in fostering synergy; and the role of learning as an integral feature of the systems at play. The lessons of that exploration are presented in this monograph as potential insights for the ways organization, management, adaptation, and learning might be enhanced for tobacco control and, by reflection, for work in other areas.

The possibilities for application to a broad range of public health challenges are clear. Complexity is simply the central feature to be addressed in the terms of effective engagement for any public health initiative. What we used to think of as the products of personal behavior—diet, physical activity, obesity, substance abuse, teen pregnancy, violence—we now know to be the dynamic results of complex physiologic, social, and environmental influences. Whereas we formerly thought of social circumstances as simply shaping exposures to health risks and complicating the ability to defend against them, we are now beginning to understand that they may in fact be integral components in the etiology of disease and disability. And rapidly occurring climate changes that interact with urbanization and population growth to accelerate altered ecological equilibrium, with potentially dramatic and irreversible implications for human health, underscore the necessity to better understand not only the system dynamics, but also the urgency of the mandate.

As important as are the issues presented in this monograph, equally compelling is the need to keep the concepts accessible and to guard against the creation of a new guild of systems theorists. The ISIS project has performed an important service by giving emphasis and structure to the reality, embodied in both physics and philosophy, that entities and actions interrelate, and that true understanding derives from understanding the nature of the relationships. This is a notion so fundamental that it must be a central feature of problem analysis, strategy formulation, program development, and research design in every social endeavor—not cordoned off as the province of those who have access to the credentials and the thesaurus.

The times are different now from when elements of systems theory were initially advanced. Now we have the tools from epidemiology, statistics, large-scale databases, and computational science that allow more structured exploration of the dynamics. But an impedance to progress when various academic disciplines were beginning to explore systems theory in the 1960s may have been the inclination—typical of many academic pursuits of the time—to construct structures and terms that defined its separateness and limited its accessibility. The irony is obvious for a concept rooted in commonality.

Laudably, the ISIS project and this monograph give emphasis to the importance of translation, linkages, synergies, and common perspectives, as work proceeds. We should be grateful to NCI and the ISIS leadership for this insightful contribution.

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