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Exploring the Foundations of a Syndemic Orientation in Public Health

Definition

A "syndemic" is two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population. Related concepts include linked epidemics, interacting epidemics, connected epidemics, co-occurring epidemics, comorbidities, and clusters of health-related crises (see http://www.cdc.gov/syndemics).

Background

Although the science of epidemiology has yielded remarkable achievements, even further advances can be made by incorporating into epidemiology a syndemic orientation.

Public health leaders today must maintain past achievements while confronting entrenched problems such as health disparities and quality of life impairment. Striving to promote health in its widest sense, many stakeholders increasingly object to categorical strategies that focus on preventing some diseases while allowing others to go unchecked, especially when the most burdensome problems are known to have common causes. As an alternative, health professionals and whole communities are now forming partnerships aimed at reducing excess and inequitable burdens of disease. Such comprehensive undertakings elevate prevention practice to new heights of size and complexity. Intervening at this systemwide scale requires new approaches for organizing resources along with greater understanding of the feedback effects among all the conditions that threaten health and well-being.

Unfortunately, comprehensive health improvement initiatives generally encounter barriers and receive limited institutional support compared to more narrowly circumscribed prevention strategies. Such ventures threaten to disrupt the status quo in communities and run counter to the prevailing problem-solving frameworks that undergird prevention science. A profound tension now exists between the desire to improve health comprehensively and the need to present scientific evidence of effects based on categorical models of disease. A syndemic orientation offers the possibility to cut through this bind. It could, in fact, open the way to establishing new theories of change, new alliances among interest groups, new funding policies, and new levels of achievement in protecting the public's health. At present, however, we are only beginning to comprehend what it means to operate from a syndemic perspective.

A strong consensus has formed around the need for an ecological and transdisciplinary approach to protect the public's health, but none of the frameworks put forward to date have been able to transcend persistent tensions between science and practice at the community level. The Syndemics Prevention Network will address precisely that challenge.

Research Questions

Since the early 1990s, when the concept of syndemics was first articulated, there has been no coordinated scholarship focusing on the subject. Many practical questions remain to be answered.

- What is a syndemic?
- Under what conditions do syndemics develop in communities?
- What principles characterize a syndemic orientation in public health?
- Under what conditions is it appropriate and inappropriate to use a syndemic orientation?
- What advantages and limitations are associated with a syndemic orientation?
- What procedures are available for planning and evaluating initiatives to prevent syndemics?
- How can we prepare the public and the public health workforce to adopt a syndemic orientation?

Efforts to address these *practical* questions depend on answering deeper *philosophical* questions about where the notion of a syndemic comes from and what it implies for prevention science and action. To use a syndemic orientation effectively, we must situate it within a broader history of ideas and place it within the context of social change more generally. The following questions open those historical and philosophical lines of inquiry.

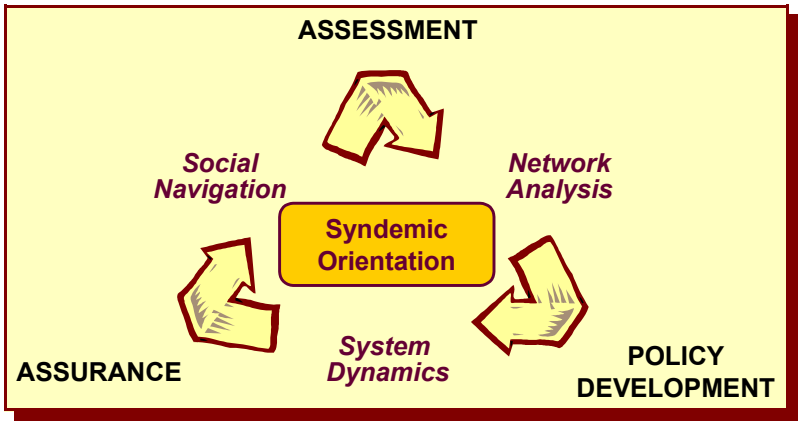
- How have concepts of "prevention science" changed through time and across cultures?
- How has the mission of public health changed through time and across cultures?
- What differences are there between the mission of public health and its routine practice?
- What concepts and methods have been used to characterize the conditions that affect health, their change, and the forces that influence their change?
- What strategies have been used to transform risky conditions into ones that are safer?
- What is the interface between the public health sector's role in assuring the conditions for health vis a vis other areas of directed social change?

Answering these questions could proceed from several academic perspectives. Logical options include public health, social ecology, system dynamics, or philosophy of science. Part of the intent of introducing a syndemic orientation, however, is to transcend the general fragmentation that has evolved through disciplinary scholarship. Because of the complex nature of syndemics, research strategies must combine all relevant scholarly traditions in a way that allows health professionals and community leaders to relate their unique perspectives. The aim is not to create a single, rigid framework but to define a systems-oriented frame of reference that multiple stakeholders can use for working effectively together.

Core Public Health Functions

A syndemic orientation is one among many perspectives that can be used to carry out the core functions of public health: assessment, policy development, and assurance (Figure 1) (Institute of Medicine, 1988). The focus on syndemics is primarily distinguished from other perspectives by its explicit emphasis on examining connections between health-related problems. This concern elevates public health practice to a level above conventional epidemiology and implies the need for selecting theories and methods that match that shift in scale. Three methodologies are especially well-suited for working at the syndemic level: network analysis, system dynamics, and social navigation. Each has a firm foundation in other branches of applied science, but as yet has not reached the mainstream of applied public health. Together, these and other techniques designed for understanding relational systems may form the foundations for a syndemic orientation in public health. The sections that follow provide a brief description for each area of inquiry.

Figure 1: Core Functions Under a Syndemic Orientation



Network Analysis

Assessment is the first function of public health. It involves monitoring the health of communities and populations at risk to identify health problems and priorities. Under a syndemic orientation, assessment proceeds according to a different logic than it does when focused on health problems singly. The intent is not only to characterize disease burden and distribution, but also to understand whether and how health problems are connected. By employing network methodology, health assessments would reveal the overall structure of disease in a community. Combined with information about the problems themselves, network analyses provide a rich context for both categorical and comprehensive prevention planning. In addition, knowing that disease burden is almost always unevenly distributed, network models can be readily expanded to encompass the patterns of social ecology that influence who becomes sick and who enjoys health. Previous applications of network analysis in public health have focused primarily on informational, interpersonal, and interorganizational ties (e.g., who talks to whom? who relies on whom for social support? which organizations work well together? etc.). Many observers have pointed out relationships between health problems, but surprisingly few have used the formal methodologies of network analysis to document epidemic connections. Nevertheless, the opportunity to employ those methodologies clearly exists (Scott, 2000; Wasserman and Faust, 1994). The proposed study will explore the foundations of network analysis and describe how these procedures can strengthen a syndemic orientation for public health.

System Dynamics

Policy development, which involves collaboratively formulating public policies designed to solve health problems, takes on a different character when working at the level of syndemics. Society looks to public health leaders for guidance about how to avoid risky conditions that threaten health. Those conditions exist along a vast continuum from the most immediate biological

"causes" of illness to the most systemic forces, or "causes of causes." Great strides in health promotion have been made by thinking ecologically, refusing to accept single-cause explanations for illness in a world filled with interdependency and layers of complex social organization. Nevertheless even ecological models have, for the most part, developed in parallel along categorical lines (i.e., separate ecological models for heart disease, asthma, HIV, injury, and other afflictions). These divisions persist despite the fact that health problems themselves exist and interact in a shared social ecology.

Under a syndemic orientation, clusters of connected problems are examined together as a network in an effort to have greater impact on all. At this scale, the task of identifying policies capable of transforming risky conditions into safer ones is beset by an array of obstacles (Sterman, 2000). Chief among these is the phenomenon *policy resistance*–the tendency for interventions to be delayed, diluted, or defeated by the response of the system to the intervention itself (Meadows, Richardson and Bruckmann, 1982). This concept does not refer to the resistance of individuals to health messages, but to the systemwide backlash that can occur when policies are not strong enough or not properly crafted to change how the system behaves. Policy resistance threatens more than a failed intervention; it can and often does make the problem worse. Feedback dynamics inherent in all complex systems make policy resistance an unavoidable fact of life (Richardson, 1991).

To avoid the trap of resistance requires more than high-stakes trial and error experimentation. A more ethical and more efficient approach involves testing policies by simulating their effects in the system. For example, airline regulators today would never consider altering policies that affect pilot behavior without first observing how the proposed policy functions in a flight simulator. In the past 30 years, simulation technology has moved from science fiction to the streets. Today, dynamic models and flight simulators have been developed and validated for a wide range of social and organizational systems. Leaders seeking evidence-based policy options use these techniques to identify the most effective leverage points for intervention (Meadows, 1999). Decision makers in public health have the same needs, yet prevention planners rarely simulate the effects of proposed interventions before launching experiments in communities. Why is that? The technology certainly exists and is commonly used in other branches of applied science including, industrial management, ecology management, and urban development (Forrester, 1961, 1969, 1971; Meadows, Meadows and Randers, 1992; Roberts, 1999; Sterman, 2000). Our study of foundations will explore how system modeling can be used to identify high-leverage policies for preventing syndemics.

Social Navigation

The third public health function, assurance, requires that all populations have access to effective care including health promotion and disease prevention services. Within this function is the commitment to providing a safety net, a minimal set of conditions designed to protect the health of all. By acknowledging this as a core function, public health organizations accept the paradoxical responsibility for assuring the conditions for health, without having direct control over those conditions. Quite the contrary. Decisions made in all sectors of society are what shape the climate for health protection. In a world of accelerating globalization and interdependency, few if any decisions have benign effects on human health. It is our collective choices that either enrich or erode the prospects for healthier communities. Because of this

arrangement, public health officials and their partners must advocate for health in the broader process of directed social change.

The discipline of social navigation provides both an ethical and a mathematical structure for guiding transformations between unhealthy and healthier conditions. The ethical dimension involves clarifying the precise direction and destination for change (Thompson, 2000). For example, before his death Jonathan Mann was a persuasive spokesperson for the idea of fusing public health and human rights (Mann, 1999). He argued that promoting and protecting human rights is inextricably linked to the goal of promoting and protecting health. Similarly, the Precede-Proceed model for health promotion (Green and Kreuter, 1999) positions health as an instrumental value that is distinct from and often seen as a means to the ultimate value–quality of life. These two examples illustrate how public health advocates can align their efforts in support of other human values that are consistent with health, while actively resisting influences that might pull society off course from a healthful destination. Only by developing and following an explicit moral compass, grounded in cultural values and endorsed by a large public and private constituency, will health policies gain enough momentum to overcome inertia and propel communities toward a healthier state of being.

The image of a navigational voyage has great rhetorical value, which is why it is the most common metaphor used to describe public health ventures. However the metaphor loses much of its potency if not translated into specific procedures for charting progress and understanding change. Explicit mathematical models for navigation are used in other branches of science, such as seamanship, geography, oceanography, zoology, and geology. But until recently, the navigational properties of public health have not been incorporated formally into the ways we collect and analyze data. For instance, evaluations of most health interventions are concerned with relative change from baseline. In a navigational experiment, by contrast, distance from one's point of origin provides good information, but it is not nearly as important as knowing one's position relative to the destination. Navigational analyses are inherently forward-looking and provide a more useful guide for maintaining direction amidst constantly changing conditions.

Scientists who study navigation use circular statistics based on polar coordinates instead of the Cartesian grid (Batschelet, 1981; Fisher, 1993; Jammalamadaka and Sengupta, 2001). These are the only valid approaches for analyzing directional data. Although directional data usually refer to movement through physical space, with a suitable theory they may also be used to model transitions through social space, such as the movement from one set of community conditions to another. In the context of a syndemic prevention initiative, navigational statistics might well provide the elusive quantitative tools necessary to demonstrate whether communities are on course to achieve their health-related goals. The proposed research will explore the technical feasibility of applying navigational methods to public health problems, as well as their utility within a broader system of social navigation that is grounded in the core values, ethics, and moral obligations of each community as well as the public health profession at large.

Learning Aims and Activities

There are three major aims for the proposed exploration: (1) better understand the phenomenon of syndemics as well as what it means to adopt a syndemic orientation; (2) define the competencies necessary for applying a syndemic orientation to specific community health initiatives; and (3) develop and test procedures that make it feasible to adopt a syndemic orientation in routine practice.

To achieve these aims, we will engage in both academic and practice-based learning activities. The academic studies will be transdisciplinary, drawing upon the expertise of epidemiologists, philosophers, network analysts, system dynamicists, community organizers, mathematicians, political scientists, and others. Complementing this conceptual and methodological work will be ongoing collaborations with selected community health initiatives. Of particular interest are comprehensive initiatives funded by tobacco settlements (e.g., Hawaii Health Initiative); community-based efforts undertaken to eliminate health disparities (e.g., REACH 2010 Demonstration Projects); and public health systems reforms (e.g., Partnership for the Public's Health, Turning Points). Compared to other public health endeavors, projects of these types have a higher probability of investing in changing community conditions or addressing the social inequalities that give rise to multiple health problems. Such fieldwork experiences will ensure that syndemics prevention concepts remain relevant for high-stakes projects seeking to improve overall community health.

The learning process will involve efforts to identify and consolidate relevant existing knowledge about community health improvement as well as parallel efforts to identify and fill gaps in knowledge particular to a syndemic orientation. The result will be a scientifically sound and practical strategy for overall community health improvement based on a syndemic orientation.

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