

Using Complexity Science to Improve the Effectiveness of Public Health Coalitions

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A new model of complex adaptive planning and evaluation (CAPE) methods is proposed to improve the efficiency and effectiveness of public health coalitions and other collaborative partnerships. The model is tested on a statewide public health coalition in Minnesota with significant results, impacting the state's healthcare industry and public health insurance system.

1 Introduction

Over the last ten years, there has been increasing recognition of the importance of approaching public health from a population health perspective based on a social-ecological model that acknowledges the biological, behavioral, social and environmental determinants of health (IOM 2003). This has led to a redefinition of 'public health' not as a formal structure of government agencies (IOM 1988), but as an intersectoral health system - "a complex network of individuals and organizations that have the potential to play a critical role in creating the conditions for health" (IOM 2003). Consequently, there has been increased use of intersectoral coalitions, networks, task forces, partnerships and collaboratives to address population health issues (Kreuter, Lezin, and Young 2000). The "mobilization of community partnerships to identify and solve health problems" is considered one of public health's 'ten essential services' (APHA 1994).

Most public health coalitions use formal community health planning models that follow a multi-phased sequence of coalition formation, implementation, maintenance, and accomplishment of goals (Butterfoss, Goodman, and Wandersman 1993). Three

examples are the *Planned Approach to Community Health* (PATCH), *Community Tool Box*, and *Mobilizing for Action Through Planning and Partnerships* (MAPP). Developed in 1983, PATCH is a nine-phase model of community mobilization and assessment, followed by implementation, and evaluation (CDC 2004). On average, it takes a year and a half for a PATCH project to move through community mobilization and assessment to implementation (Green and Kreuter 1999). Created in 1995, the Community Tool Box has a six-phase cycle of assessing community needs and assets, collaborative planning, developing leadership, community action and intervention, evaluating community initiatives, and promoting and sustaining the initiative (University of Kansas 2007). Released in 2001, MAPP has two start-up phases (organizing for success followed by a visioning process) then four phases of assessment, followed by a final phase of planning, implementing and evaluating the plan's activities (NACCHO 2004).

Unfortunately, collaborative health coalitions have had a mixed record of success (Butterfoss 2007). A review of 68 published descriptions of health coalitions with evaluation protocols found only six examples of coalitions with documented health status or systems change (Kreuter, Lezin, and Young 2000). The authors attributed these failures, in part, to problems with the collaborative planning process. Many coalitions failed early, breaking down before completing the needs assessment phase. For others, planning tasks (conducting needs assessments, writing objectives, and developing logic models) proved too difficult, and the coalitions failed to produce rigorous plans. Conflicts between public health staff and community members also contributed to coalition failures. Faced with this evidence, Butterfoss argues, "The question is not, do coalitions work, but, what do we still have to learn about to how to make them work better?" (Butterfoss 2007).

1.1 Applying Complexity Science to Health Systems

Standard public health planning models share several attributes: an objective epistemology, an assumption that planning and implementation are two separate linear sequential activities, and an assumption that social systems change can be predicted and controlled (Sanderson 2000). These assumptions stem from a mechanistic worldview that originated in the 17th century, when philosophers perceived the world as a "grand clockwork machine" (Wheatley 2005). This Newtonian paradigm continues in science, health, and management practices that are based on prediction and control, using tools, techniques, and 'best practices' designed to 're-engineer' processes and 'drive' change (Snowden and Standbridge 2004). In contrast, a new research paradigm has emerged over the past 60 years called complexity science, investigating concepts of holism, pattern development, mutual causation, emergence, self-organization, co-evolution, and networked relationships. The study of complexity cuts across all disciplines of science, including mathematics, physics, biology, psychology, social sciences, engineering, management, and medicine (Bar-Yam 2005). Complexity science studies "how relationships between

parts give rise to the collective behaviors of a system and how the system interacts and forms relationships with its environment” (Ibid.).

Complexity science is the study of complex adaptive systems, “the patterns of relationships within them, how they are sustained, how they self-organize, and how outcomes emerge” (Zimmerman et. al. 2001). Complex adaptive systems are densely connected webs of interacting agents who adapt by changing their rules, and hence their behavior, as they gain experience (Ibid.). Examples of complex adaptive systems include social systems, human immune systems, hospitals, corporations, economies, cultures, political systems, forest ecologies, and weather systems (Dooley 1997). In its 2001 report, *Crossing the Quality Chasm*, the Institute of Medicine (IOM) redefined health care as a complex adaptive system, offering ten new complexity-based rules for transforming the U.S. health system (IOM 2001).

Researchers have been developing complexity-based public health and health care management tools, and techniques (Miller et. al. 1998, Anderson and McDaniel 2000, McDaniel, Jordan, and Fleeman 2003, Farmer 2004, and Bar-Yam 2006), drawing on a larger literature of complexity-based organizational management theory. These methods include: seeing a system through a ‘lens of complexity’; aligning system structures and processes to match the system’s level of complexity; building a good-enough vision as an attractor to support change; creating conditions within the system to support the emergence of new innovative patterns of behavior by using simple rules to set the system’s direction, boundaries, resources, and permissions; maintaining the system’s diversity, and using reflective practices to track and learn from system changes (Axelrod and Cohen 2000, Olson and Eoyang 2001, Plsek and Wilson 2001, Zimmerman et. al 2001, Wheatley 2005, and Westley et. al. 2006). The next section describes how these complexity-based methods were applied to a statewide public health coalition in Minnesota.

2 Minnesota Health Care Disparities Task Force

2.1 Task Force Overview

In early 2004, the Governor of the State of Minnesota authorized the creation of the Minnesota Health Care Disparities Task Force and charged the statewide task force with the work of ensuring that “culturally and linguistically appropriate health care services (CLAS) are provided to all Minnesotans” (Hargreaves 2006). The Governor charged the task force with five responsibilities, to: (1) review relevant national recommendations and tools, (2) share ways in which these tools were being used or could be used in health care organizations, (3) create and oversee a coordinated implementation plan, (4) design accountability measures, and (5) share resources, successes, and lessons learned, where appropriate.

The task force was co-chaired by two physicians, the president of the state's medical association and the chief clinical officer of a large health services system, with staff support provided by the state's public health (Minnesota Department of Health - MDH) and human service (Minnesota Department of Human Services - DHS) departments. Participating in the task force were about 30 member organizations representing a broad spectrum of the state's health care industry, including: urban and rural clinics and hospitals, integrated health care delivery systems, provider associations, health plans, and hospital and health plan associations. To facilitate its work, the task force organized three work groups, focusing on: (a) patient access and language interpretation, (b) patient demographic data, and (c) clinician practice and education. An executive committee of state agency managers and work group chairs provided overall direction to the task force. Between March 2004 and May 2005, the full task force met six times (March, April, June, and September 2004, and February and May 2005), with work group meetings interspersed (Ibid.).

In late June 2004, the two state agencies hired the author as a consultant to provide planning and evaluation services to the task force for a year, on the understanding that this would not be a standard public health task force responsible only for developing recommendations for future action. Instead, the charge of this task force was to create and oversee the implementation of a statewide action plan. It was also clear that this task force would not be tightly controlled by the two state agencies; leadership would be provided by the member organizations with support from the two agencies (Ibid.). To respond to this challenge, the author developed and tested a new set of complex adaptive planning and evaluation (CAPE) methods for the public health task force. Below is a summary of the task force's methods and results.

2.2 CAPE Methods and Results

In contrast with standard public health planning methods that impose a tightly directed sequence of planning activities, a new approach was used to support more generative relationships and innovative action among the task force members.

1: Use a Complexity Lens to Match the Solution to the Complexity of the Problem:

The unique nature of the task force and the issues it addressed allowed for a non-traditional approach. *Method:* using a complexity-based perspective, the state's health care system was viewed as a complex adaptive system, with the task force members as agents who were developing a range of CLAS practices to adapt to the state's increasingly diverse patient population. The work of the task force was framed as a co-evolutionary process, in which task force members and organizations were interacting and learning from each other, in both cooperative and competitive ways, to improve their services. The task force was not seen as a simple mechanism for enforcing federal CLAS standards, but as an opportunity to create conditions in which improved CLAS practices would emerge from the interaction and co-evolution of task force members. *Result:* the task force's executive committee reviewed and approved a plan testing the new complexity-based framework and methods.

2. Develop a Common Vision to Attract Change, not Overcome Resistance:

Attending the June 3, 2004 task force meeting as an observer, the author noted there was not yet consensus regarding the task force's responsibilities, the scope of its work, or the resources available. Should the task force address the deeper causes of health care disparities and therefore consider issues of health insurance access, or should it only be concerned with improving health care service delivery for those with insurance? Was the task force expected to study the problem of health care disparities for a year and then make recommendations for change, or should it 'roll up its sleeves,' develop action plans and start implementation before then? Was the task force being used to mandate statewide compliance with federal CLAS standards, or to develop and disseminate more effective practices statewide?

Method: rather than using a top-down, command and control approach to define the task force's responsibilities for the members, time was set aside on the agenda of the September 2004 meeting, for members to reach consensus on their own interpretation of their charge and responsibility. *Result:* at the meeting, the members determined that their mission encompassed addressing disparities in health insurance access, which expanded responsibility for addressing the issue beyond the providers themselves to include funders of public health insurance, such as state government.

3. Increase System Diversity to Amplify Differences and Generate Change:

Although the task force included representatives from all the major stakeholder organizations in the state's health care system, some task force members complained that its membership was not diverse enough, as almost all members were White. Also, some noted clinicians with expertise in providing CLAS services had not yet been invited to join the initiative. *Method:* time was set aside in the February 2005 meeting for members to nominate individuals who could contribute substantively to the work of the task force, including physicians and other practitioners of color. *Result:* at the May 2005 meeting, the task force approved several new members.

4. Use Simple Rules to Create Conditions for Self-Organization:

Task force structures and processes influenced three conditions of self-organization: (1) the kinds of exchanges and relationships experienced between members, (2) the management of members' differences, and (3) the physical and procedural limits or boundaries (meeting spaces, simple rules) within which the task force operated. *Methods:* several strategies were used to change these conditions. First, to facilitate formal and informal sharing of information among task force members, contact information was updated and distributed. Second, full task force meetings were suspended between October and January to transfer planning activities from the executive committee to the work groups. This was done to change the direction and flow of the planning process (from top-down to bottom-up), and to intensify interactions in smaller groups, increasing member trust and reciprocity. Third, work groups were given simple rules to develop action plans and budgets that fit within their missions and that could feasibly be implemented by members and their organizations. Fourth, to support system-wide diffusion of innovative and adaptive CLAS practices, member presentations replaced research study reports on meeting

agendas. Finally, to increase opportunities for emergent action by the full task force, time was set aside after work group presentations on meeting agendas to encourage full task force discussion and reaction.

Results: working under these changed conditions, task force members were able to complete and present work group plans and budgets to the full task force in less than five months (at the February 2005 meeting), a fraction of the time used by standard public health planning processes. More important, the task force took immediate action on several work group proposals. The most dramatic example was the task force's decision to accept a work group proposal to protest the Governor's budget proposal to cut the state's public health insurance programs. The task force members decided to send letters to the Governor and key legislators protesting the cuts. Signed by all but one member organization, the letters were sent out on February 23, 2005. This decision was unprecedented; the state's health care providers had never before acted collectively on a political level to maintain and protect the state's Health Care Access Fund for the state's public health insurance programs. Bolstered by these and other letters of protest, Senate Democrats resisted the Governor's proposal until the end of the state's legislative session, forcing the state government's first-ever shut-down of all but essential services (exempting state parks) over the July 4th holiday, until the Governor backed down and the proposed cuts were restored (Ibid.).

5. Initiate Reflective Practice through Developmental Evaluation:

Developmental evaluation is more useful than formative or summative evaluation approaches when a system or entity is in a reorganization phase, when the evaluator can ask evaluative questions and facilitate data-based assessments of where things stand, how things are unfolding, and which directions hold most promise (Patton 2005). *Methods:* although the executive committee originally considered doing a baseline assessment of member organizations' level of compliance with federal CLAS standards, this was changed to a developmental evaluation study after considerable debate. The baseline member practices study was redesigned to showcase adaptive variations in member organizations' CLAS practices. During in-depth qualitative interviews regarding their CLAS practices, task force members were also asked to give feedback on the task force's new processes, progress to date, and to provide recommendations for how to improve the task force.

Results: At the May 5, 2005 meeting, the member practices study was presented and approved for distribution by the full task force. Several member suggestions, such as increasing the diversity of the task force's membership, were approved by the group. Feedback on the task force's process was positive; a number remarked on the progress and breadth of task force activities in contrast with a comparable statewide Immigrant Health Task Force on which several had previously served. Members were also interested in the CLAS practices of their colleagues; a number planned to take innovative practices back to their own organizations (Hargreaves 2006).

3 Discussion

The development and testing of the CAPE model on the Minnesota Health Care Disparities Task Force showed that complexity-based public health planning and evaluation methods can improve the efficiency and effectiveness of public health coalitions. Should CAPE replace standard public health planning models? The answer depends on the purpose of such activities. In many situations, the answer may be a 'both-and' scenario, in which some formal planning elements are paired with increased opportunities for less scripted, more adaptive and emergent action. A key insight is that the alternative to tightly controlled public health planning is neither chaos nor inaction – the right path to intersectoral change may be found in the complex middle ground of negotiation, collaboration, competition, and co-evolution.

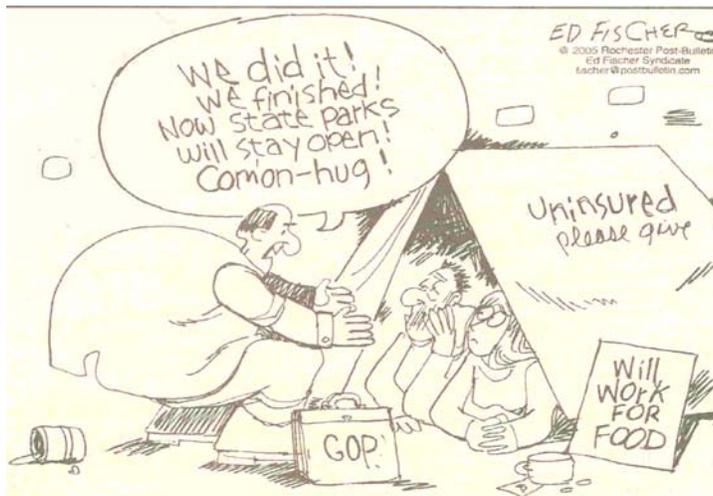


Figure. 1: A political cartoon of the state government shut-down during the public health insurance debate in July 2005.

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