

# HIGH PERFORMANCE PUBLIC HEALTH: ASSESSING AGENCIES' STRATEGIC MANAGEMENT CAPABILITIES

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## ABSTRACT

Limited knowledge about state health agencies' strategic management capabilities constrains their capacity to improve public health. The current study addresses this gap through two objectives: 1) To assess agencies' strategic management capabilities, conceptualized through a learning framework and 2) To portray both those capabilities and where the agencies have progressed along a developmental pathway of strategic management ability. Forty-one state health agencies' documents from 1995-2000 were content analyzed. Latent Trait Analysis (LTA) was used to depict both the progressive levels of strategic management capabilities and states' relative mastery along the continuum. Findings indicate that strategic management capabilities have path dependent characteristics and a distinct learning paradigm exists. Therefore, policy-makers wishing to improve agency performance can utilize this framework to assess and target capabilities that need improvement.

## INTRODUCTION

Measuring public health system performance is an area of research that is becoming increasingly important (Handler, Issel, and Turnock, 2001) and contentious (Coyne and Hilsenrath, 2002; Navarro, 2002). In particular, the role of structural and strategic planning capacities has been posited to affect population health outcomes. Noting that informational, organizational, physical, human, and fiscal resources

underlay public health's ability to provide the field's ten essential services, Handler, Issel, and Turnock (2001) suggested that common measures of structural and process capacities would facilitate work to strengthen public health efforts. This article offers such a model, combining elements of structural and process capacities of state public health agencies in a learning framework.

The effectiveness of public health organizations has ebbed and flowed over the centuries. As governments are replaced or evolve over time, the organizations charged with the public's health under their control often have their management capabilities destroyed or atrophy due to a lack of interest. Diseases, particularly epidemics, have then changed relationships among social classes, scientific and religious communities, professionals, and political states (Porter, 1999).

In the past two decades, the relationship between public health agencies and other stakeholders has become increasingly complex (Reid *et al.*, 2000). The public and private health care sectors have become increasingly interdependent. In order for these two sectors to come together effectively, government agencies need to develop networks and serve as the main link among organizations (Zanetich, 2000). In particular, the rise of managed care and the trend in contracting out public health insurance to private organizations has been challenging in this respect (Halverson *et al.*, 1997; Reid *et al.*, 2000).

Recognizing these challenges, the Robert Wood Johnson and W.K. Kellogg Foundations launched their Turning Point initiative in 1997 to help states strategically assess and improve public health functions to meet these demands (*RWJF Media Release*, 1997). Many state agencies engaged in extensive strategic planning and began to

reinvent themselves to more effectively engage in assessment, assurance, and policy development activities related to the health needs of their populations.

On September 11<sup>th</sup>, 2001, a previously latent threat became real and public health became more unpredictable. Biological, chemical, and nuclear threats have created the possibility of instant epidemics and an environment of constant uncertainty. Public health agencies have always sought to monitor and assess epidemiological data for threats to the health of the public but the magnitude of these demands and the range of information that must now be considered are far greater. Now all states must have assurance capabilities that can ensure rapid, coordinated responses to a previously theoretical category of major events. Finally, the role of state agencies in policy development now requires both a new set of internal management competencies and the ability to ally themselves even more effectively with other organizations.

The dynamic environments faced by state health agencies demand a significant capacity to assess their surroundings, learn new skills, and change strategies in order to assure the health and safety of the public. The purpose of this article is to present a model for evaluating the strategic capacities of state public health agencies using an organizational learning framework. First, a set of strategic management capabilities is outlined using Miller's (1996) typology. Next, this model is extended by the proposition that these strategic management capabilities develop in a manner analogous to human learning. Third, the model is tested empirically and state health agencies are arrayed according to their respective strategy management capacities. Finally, the results are given, implications for public health leadership discussed, and areas of future research identified.

## IMPROVING PUBLIC HEALTH

Since the seminal report, *The Future of Public Health*, of the Institute of Medicine (1988), attention has focused on how to enhance the capabilities of public health agencies. In the U.S., the legal mandate of public health rests largely at the state level. Therefore, it is critical that state health agencies build their strategic management capacity through learning (Duncan *et al.*, 1998; Senge, 1990). Learning is defined as the structures and processes through which organizations acquire, assimilate, transform, and exploit knowledge (Zahra and George, 2002).

Organizational learning has been an area of growing interest in the management literature (Popper and Lipshitz, 2000) but no particular model has been widely accepted (Bell, Whitewell, and Lukas, 2002). Further, as Cohen and Sproull (1991:i) assert, “[T]he research in organizational learning has suffered from conceptions that were excessively broad.” Therefore, it is necessary to identify a model that is thoroughly specified, builds on work that has been accepted, and focuses on a specified aspect of organizational learning.

Miller’s (1996) article provides a framework that meets the three aforementioned criteria. In particular, it focuses on strategic management capabilities. His previous research on organizational configurations provides a set of constructs and measures that have been demonstrated to be reliable and valid. Further, his configuration work has been considered by some to be among the most important in management science (Bettis, 1996). Therefore, Miller’s typology of organizational learning was used to assess the management capabilities of public health agencies.

Miller (1996) posited that organizational learning could be divided into two major categories: methodical and

emergent. Methodical learning employs rational data analysis to optimize performance relative to existing expectations. Formal models of strategic planning, Total/Continuous Quality Improvement, and best practices are all examples of methodical learning.

The second major category of learning is emergent and is more intuitive, unstructured, and global in nature. This category has been described as "learning how to learn" because it entails questioning the assumptions that underlie performance expectations. Under these conditions, organizational strategies may "emerge" (Mintzberg, 1999) in more spontaneous and even unexpected ways.

Building on his previous organizational configuration research, Miller and Friesen, 1984) and other frameworks from the management literature, Miller (1996) further argued that there were two basic types of learning: methodical and emergent. Within each type of learning there were three basic "modes" or ways of learning.

### **METHODICAL LEARNING MODES**

The first mode of methodical learning Miller identifies is "structural" which he describes as routinized and standardized. Routines codify processes, enabling organizations to repeat sequences with a minimum of errors or effort as well as convey values that guide how organizations learn (Miller, 1996; Nelson and Winter, 1982). The second mode of methodical thought and action is described by Miller as "experimental," portrayed as learning through problem-driven searches for better solutions. Experimentation is central to Total Quality Improvement which assumes that organizations increase their efficiencies through a continuous cycle of incremental, data-driven trials.

The third and final mode is "analytic," the deliberate,

systematic assessment of causes and effects (Miller and Frieson, 1984). Analysis builds on experimentation to make inferences about how systems are currently operating and how they might be improved.

### **EMERGENT LEARNING MODES**

The first mode of emergent thinking, "institutional," carries the conservative connotation of the analytic mode of methodical thought. Institutional learning refers to the influence of organizational ideologies and customs on response to events. The second mode, "interaction," occurs when organizations discover new opportunities from the conflicting objectives of their members. The final mode, "synthesis," is the intuitive, holistic incorporation of elements into new models for action.

### **OPERATIONALIZING THE MODES**

The first extension of the work of Miller (1996) in this study is the operationalization of his six learning modes in terms of measurable constructs. This in turn makes it possible to test a learning model of public health agency learning. Each mode is considered in turn.

The two dimensions from previous work that best exemplify structural learning are control and communication. Control refers to the number and scope of systems employed to specify process standards and target performance goals (Mintzberg, 1984). These are the monitoring mechanisms through which organizations learn how well their existing routines are working and, thus, when modifications may be needed. Communication refers to the ease and fidelity with which information flows through the agency.

The two dimensions that best illustrate experimental learning are adaptive behavior, defined as the extent to which the organization responds to external events and futurity, or how far in advance the organization projects in its strategic management capabilities (*Ibid.*). In order to learn through experiments, organizations must first recognize the need for change and plan ahead proactively. Although Miller portrays experimental learning as incremental and local, the concepts posited here incorporate broader efforts as well.

In order to analyze information effectively, organizations must both scan their environment and devote time and effort to evaluating and interpreting problems and opportunities. Inadequate scanning can cause omissions of relevant trends; incomplete interpretation can lead to logical gaps in the plans developed to address these challenges and opportunities.

One indicator of institutional learning is the technocratization or the proportion of staff with professional degrees (Miller and Friesen, 1984). Technocratization is expected to increase the influence of professional norms on organizational thinking as members draw guidance from their disciplinary training to react to new information.

Two factors contribute to interactive thinking. The first is the presence of differentiation in goals, behaviors, operations, and/or management styles between and among units of the organization. The second is integration across complementary units. Together, these factors make it possible for organizations to learn from new perspectives even when they conflict with existing norms and patterns of behavior.

The first dimension of synthesis is a willingness to rethink both ends and means; that is, to engage in "double-loop" learning (Argyris, 1976), necessary to make the leap from the new configuration of information attainable

through integration to new organizational paradigms and strategies. Thus, “rethinking” is the first posited dimension of synthesis. Although Miller (1996) asserts that rethinking normally is the product of one creative mind, in fact the complexity of the internal and external contexts of public health agencies is too great for a few people to manage effectively. Instead, agencies must find ways to incorporate epidemiological, social, political, and organizational information across units in order to optimize their impact on population health. Thus, “decentralization” is necessary to allow synthesis to emerge. Popper and Lipshitz (1998) state that organizational learning and task performance, at the highest level of strategic capacity, indistinguishable and all members of the organization are engaged continuously in learning and helping others to learn while sharing their learning with others.

### A DEVELOPMENTAL PATHWAY

The second conceptual contribution of this article is to extend Miller’s (1996) typology to a testable model of how learning evolves along a developmental pathway. He depicts learning within methodical and emergent categories. Learning organizations progress along a path of strategic capabilities where human or organizational actions are progressively less constrained by resources, political, and cognitive factors. For example, experimental learning is less constrained than structural learning and analytic thinking, with its application of experimental conclusions to future planning, has even more freedom. Likewise, within emergent modes of learning, institutional learning is the most constrained, inactive learning entailing communication across organizational boundaries, is more voluntary, and synthetic learning, which brings together seemingly



disparate ideas into new combinations, is the least constrained.

This article extends Miller's (1966) configuration by portraying all six modes of learning as progressing along a single path-dependent continuum of difficulty. Analogous to individual learning, organizations must master one mode of learning before progressing to the next (Kusunoki, Nonaka, and Nagata, 1998). Thus, learning is a combinative achievement (Kogul and Zander, 1992) in which organizations apply earlier stages of capability mastery to create new capacities more complex in nature. For instance, an organization must have effective structures of coordination before it can learn from its experiments and must have learned how to experiment before it can effectively analyze the options those experiments imply.

## **METHODS**

There were three phases to the research process. The first step was to identify the agency in each state that had primary responsibility for public health functions. Second, the data sources relevant to the sample were identified and the information gathered. Finally, a special set of latent trait analysis algorithms called Rasch analysis was used to array the health agencies along a developmental pathway.

## **SAMPLE**

The 50 United States were used as the sampling frame. Territories were omitted because of the varying degree of federal involvement in their programs. The District of Columbia was also omitted because it represents one city and has extensive federal oversight. The next step in the sample specification required identifying the agency within

each state with primary responsibility for assuring the health of the public. Because the IOM (1988) recommended that public health leadership should have direct access to each state's governor, the health agency with cabinet-level representation and public health responsibility was selected for this study.

### DATA SOURCES

Using organizational documents drawn from the state health agencies, expert raters (possessing an MHA, MPA or similar health-related degree) content analyzed the materials and scored the capability variables. The items specifically requested were strategic plans, budgets, annual reports, Healthy People 2000 and 2010 goals, speeches of leaders, and organizational charts. States were deemed to have provided adequate capability information if two reviewers agreed that all of the variables could be scored.

### MEASURES

The measures used in this research were based on methodical and emergent organizational learning types suggested by Miller (1996). In the interest of parsimony and statistical power, variables that failed to differentiate organizations in previous research were eliminated (see Table 1 for a description of variables). In addition, the cues to scorers were modified to reflect the public health agency context. The eleven variables were each scored on a Likert-like scale ranging from a low of one to a high of seven. Multiple raters scored each state's documents. A post hoc test of state rating agreements yielded a Kappa statistic of .865 ( $p < .001$ ), indicating a high degree of interrater reliability (Pedhazur and Schmelkin, 1991).

**TABLE 1.**  
**STRATEGIC MANAGEMENT CAPABILITY VARIABLES AND**  
**DEFINITIONS**

Strategic Management Capabilities Measures (Items)	
Variable Name	Definition
Controls	The number and scope of systems to measure performance trends.
Communication	The ease and fidelity with which information flows throughout the agency.
Adaptive Behavior	The amount of response by the agency to external environmental conditions, and the appropriateness with which and degree to which the agency attempts to shape its environment.

TABLE 1 (Cont.)

Futurity	The time frame used by the agency in strategic planning.
Scanning	The amount of tracking and the number of agency members scanning the environment in terms of consumer issues and administrative developments.
Analysis	The amount of time and thought devoted to real or perceived problems and ways to deal with the problems.
Strategic reappraisal	The degree to which the agency rethinks its strategies and the way in which it will attain its strategies.

TABLE 1 (Concluded)

Strategic Management Capabilities Measures (Items)	
Variable Name	Definition
Technocratization	The percent of staff with professional qualifications.
Differentiation	The degree of differences in goals, administration, behavior, operations, management style between units or departments in the agency.
Integration of Decisions	The degree to which actions in one unit of the agency complement or support those in other units.
Centralization of strategy-making power	The distribution of power to make long-term, strategic decisions. Is power is distributed throughout the agency and decentralized or centralized in top management?

## ANALYTIC APPROACHES

Rasch analysis is a form of Latent Trait Analysis (LTA) that arrays items along a continuum of difficulty and also tests for the degree to which each item lies along a common (latent) dimension. In addition, Rasch analysis can be used to depict subjects in terms of their relative mastery along the common dimension. In this case, the items were the learning modes, the common (latent) dimension was the strategic learning capability, and the subjects were the state public health agencies.

LTA, including Rasch models, is a family of procedures used to estimate a measure's dimensionability and the interval of ordinal-scaled items along a single dimension. First developed in the early 1960s for use in education and psychology, Rasch analysis models have been used to infer an individual's position along a series of hierarchical items. Rasch analysis can also identify items such as strategic capabilities that are redundant and those that do not fit in the dimension specified by the other variables. In order to create the intervals scale, Rasch analysis estimates both abilities (an organization's level of successful performance on a variable) and item difficulty (level of resistance to successful performance) for a set of variables. The basic assumption is that the probability of an individual's or organization's success or failure on a particular item depends both on ability and the difficulty of the item.

The Rasch analysis algorithm estimates item difficulty on a logistic scale in "logits" (the log odds transformation of the probability of a correct response) and creates an interval scale. This technique can also identify strategic learning capabilities that are redundant or that do not fit the presumed organizational learning pathway. The standardized infit (a weighted fit statistic) and outfit (an outlier

sensitive fit statistic) statistics identify redundant items, noise, and outliers. Rasch users "routinely pay more attention to infit scores than outfit scores" (Bond and Fox, 2001: 45). Items with very low infit scores may be redundant. Items with unusually high infit scores indicate an unusual response pattern across items. For example, very able organizations may lack an easy capability. Such items can either be removed, if they are captured by another measure, or be retained if they are deemed theoretically essential. The Rasch analysis provided a standardized learning capability measure for every organization.

Using expert raters to score the variables on a Likert-like scale and employing Latent Trait Analysis (LTA) to array strategic capabilities hierarchically achieved theoretical and statistical correspondence in two ways. First, a single Likert-like rating scale encompasses a variety of concepts that may not have scalar qualities. Second, LTA empirically assesses the posited progression of strategic capabilities along a learning pathway.

## RESULTS

The results are based on 41 states (82 percent) that provided information to be scores on all of the strategic management capabilities. Demographic data showed the non-respondents to be similar to respondents in age, distribution, median household income, percent of children below poverty, and population density. Non-respondent states had significantly larger white populations not of Hispanic origin ( $p < .05$ ; 82 percent) than the sample (74.3 percent) (U.S. Census Bureau, 2000). Because only one of five demographic measures differed significantly between respondent and non-respondent states, no systematic response bias is inferred.

Table 2  
 Characteristics of Survey Respondents

	African-American Respondents # / (%)	Caucasian Respondent # / (%)	Total Respondents # / (%)
Total N*	502 / (49.9)	504 / (50.1)	1,006
Respondents			
Female	308 / (61.4)	304 / (60.3)	612 / (60.8)
Age			
65-74	288 / (57.4)	286 / (56.7)	574 / (57.1)
75-84	156 / (31.1)	168 / (33.3)	324 / (32.2)
85+	58 / (11.6)	50 / ( 9.9)	108 / (10.7)
Urban	340 / (67.7)	342 / (67.9)	682 / (68.0)

\* Percentages in this row are of total respondents.



Figure 1.  
Map of State Health Agencies and Strategic Management Capabilities on a  
Logit Scale

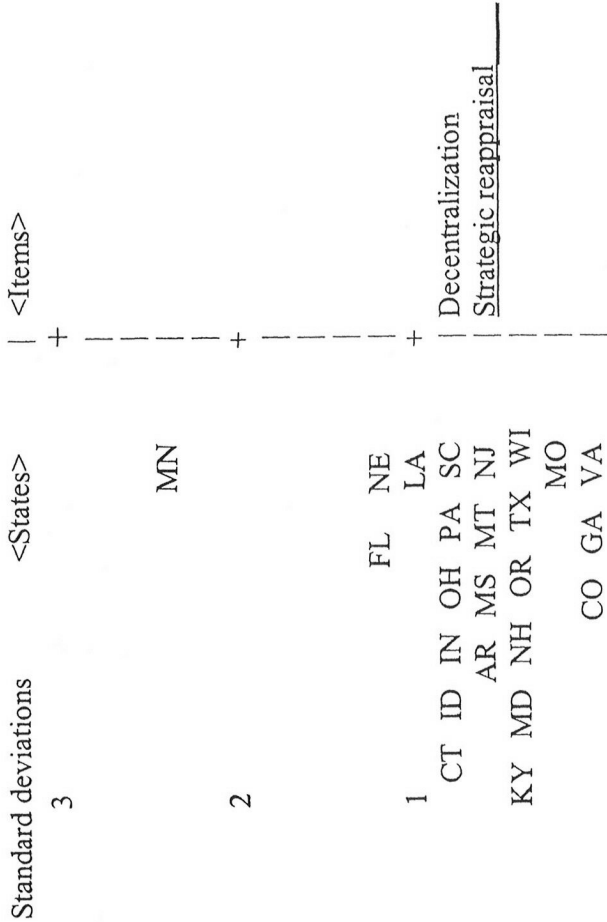
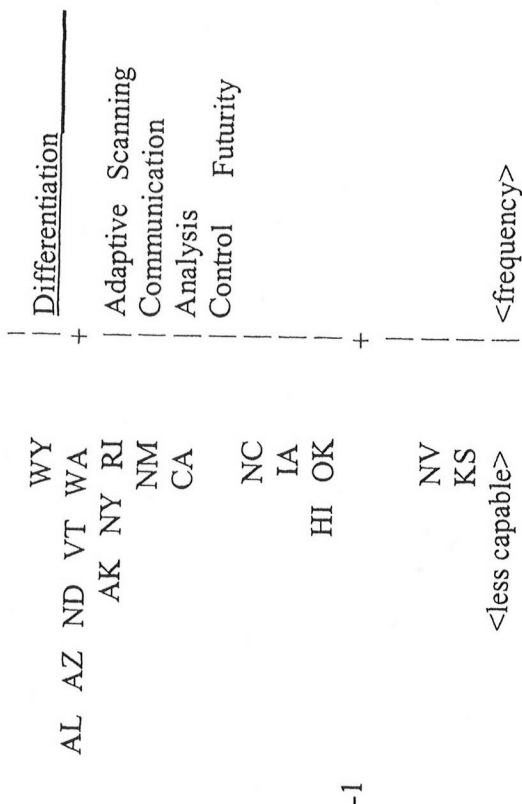


FIGURE 1 (Cont.)



Results of the Rasch procedure are presented in Table 2 and Figure 1. Rasch uses two  $X^2$  fit statistics to determine how well all the items fit a common latent dimension, *outfit* or unexplained variance and *infit* or explained variance. The  $X^2$  statistics are divided by their degrees of freedom to create a ratio scale with an expected value of positive one. Both measures are also reported as standardized scores,

Technocratization and Integration of Decision-making did not fit the model and were removed. One other item, Differentiation, had an *outfit* test statistic with a significant score but the test statistic is not weighted and Rasch users pay more attention routinely to *infit* scores rather than *outfit* one (Bond and Fox, 2002), therefore the item was released.

The final nine-item model had overall *infit* and *outfit* scores of 1.0 ( $p < -0.1$ ) and 1.01 ( $p < -0.1$ ) respectively. These measures indicate a nearly ideal Rasch model with an item reliability of 0.89 (Cronbach *alpha*) supporting this article's extension of Miller's (1996) typology as a developmental pathway of successively more difficult learning capabilities.

Several significant discontinuities emerged along the developmental pathway of variables. There was a gap between methodical and emergent capabilities; in addition, all the emergent variables were above all of the methodical measures in difficulty. One discontinuity occurred between the Differentiation and Scanning variables. Another was also detected between Differentiation and Strategic Reappraisal in the emergent section of the pathway. Overall, the results strongly supported the proposition that learning capabilities can be depicted as occurring along a developmental pathway.

## DISCUSSION

This study demonstrated the likely existence of a developmental pathway of strategic capabilities among state public health departments. Starting with the strategic capabilities that are the easiest to master and advancing to more complex strategic capabilities, it is possible to suggest a progression parallel to that of the core public health functions.

The first steps in the methodical portion of the pathway can be viewed as related to assessment functions and more advanced methodical capabilities can be associated with the assurance function. Significantly more challenging are the emergent capabilities such as strategic reappraisal that is necessary to engage in effective policy development in rapidly changing environments. Based on the results of this study, several state public health agencies may have already made this leap; others still need substantial development of their strategic capabilities before they will be able to successfully engage in emergent modes of thought and action.

There are several potentially useful points that state health agency leaders can consider from these findings. First, establishing effective methodical strategic management processes are likely necessary preconditions to other strategic capacities. In particular, a control system to monitor and measure performance is essential to enabling agencies to learn from experience. The need to monitor and assess public health performance at the state and local levels is well known. For several years, the Centers for Disease Control and Prevention has had an ongoing research program to establish national public health performance standards and to develop and validate tools to assess performance at the state and local levels.

Second, building on the concept of futurity, agencies could develop a series of possible scenarios describing how the agency's future environment might evolve (Venable *et al.*, 1993). Such scenarios should include both national trends and factors unique to that state. Also, assessment will require careful attention to establishing and maintaining open channels of communication among organizational members if the information generated is to be effectively acted upon to assure the health of the public. Many of the "front line" workers in public health systems are professionals who bring both disciplinary expertise and a deep awareness of program functioning. Given the traditional hierarchical nature of state government organizations, there may sometimes be numerous layers of management between these front line professionals and organizational leaders. Only purposeful and ongoing activities to maintain open channels of communication are likely to bring continuous interchange of information.

The public health assurance function might be seen as beginning with scanning which entails searching for issues and development that affect the way an organization executes its activities—assurance functions. Based on scanning, agencies can effect adaptations in the way they do business either to compensate for or exploit changes in their task environment. However, the wide range of activities public health agencies perform means that no one strategy will enable every unit to meet their goals and objectives. Finally, the highest level of learning capacity may be decentralizing strategy-making power to the front lines—not just including their voices in centralized strategic decisions but allowing them to develop strategies that fit their local contexts.

Empowering all members of the organization workforce from every level of the organization so that they can affect

strategy is perhaps the hardest capability to achieve since this requires leadership to consider a wide range of perspectives with greatly varying implications. However, given the range and unpredictability of threats to public health emergencies now faced, every public health professional needs to have both the mandate to assess the environment and the empowerment to raise concerns and seek appropriate actions. By greatly broadening the views and information incorporated into strategic management activities, such inclusiveness will have the greatest impact on the core function of policy-making.

Similar to results of previous research on public health agencies (Scutchfield *et al.*, 1997), about half of the state agencies surveyed were proficient in the more difficult emergent capabilities suggesting capacity in the policy development function. One explanation for the lower than expected number of agencies engaged in policy development activities is related to a capability that did not appear to fit the model well.

Technocratization or the proportion of staff with formal public health training did not fall within the strategic management pathway. Dr. Koplan (2001), Director of the Centers for Disease Control and Prevention, identified an "inadequately trained public health staff" as being a deficiency that needs to be addressed. Perhaps as state agency members gain the skills they need and the credentials that accompany them, the measure will fall in line with the other capabilities. Alternatively, human resources may be a separate but related construct that needs further exploration.

One final implication of the empirical results presented here is that the scale of strategic management capabilities does not fully measure the capabilities of every agency. Minnesota, in particular, and Florida, Nebraska, and

Louisiana to a lesser degree, all exceeded the scale's ability to measure their capabilities. These agencies may possess other strategic capabilities such as intra-organizational partnering, entrepreneurial skills or highly developed strategic thinking throughout the workforce that this study did not capture.

In the immediate aftermath of the September 11, 2002 terrorist attacks, Dr. Jeffrey Koplan (2001), Director of the Centers for Disease Control and Prevention, observed of the public health environment that either we are all protected or all at risk. Given this new standard and facing complex, unpredictable environments, state health agencies face a tremendous strategic learning challenge. The contribution of the current study has been to outline and empirically validate a model for how the requisite structural capacities may evolve.

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