

1 Introduction

How do we decide what public health is? What are the consequences of those decisions? International, national, state, and local decisions by governments, firms, and nongovernmental actors combine to help determine the “public” part of public health. These actors come together for many purposes (e.g., assessment, monitoring, evaluation, planning). But the objectives they choose are not meaningless: public agencies are charged with delivering and insuring those population-level public health outcomes.

For instance, in 1988, the United States Institute of Medicine (IOM) 1988 report *The Future of Public Health* indicted the American public health system as a dizzyingly complex, disjointed array of governmental bodies and programs (United States Institute of Medicine, 1988). For the IOM, public health objectives should depend on scientific/technical knowledge, public values, and popular opinions. Agencies, policymakers, and the public should work together to prioritize health goals and services; once determined, agencies should assure the community that they could meet those goals.

Yet the debate continued about what was necessary to improve the American public health system. Some highlighted the need for reform and increased capacity (Baker et al., 1994), while others focused on the importance of local public health agencies (Milne, 2000). Specific topics, such as responding to bioterrorism, made their way to the public agenda (Baker & Koplan, 2002). Later IOM reports shifted attention from public agencies to the ecosystem of nongovernmental actors (United States Institute of Medicine, 2003). One broad theme was strengthening the system to make it more effective, community-based, and collaborative (Berkowitz et al., 2005), but more specific topics on the agenda included terrorism preparedness and response, America’s aging population, obesity’s health consequences, globalization and new infectious diseases, and the need to modernize the public health workforce and infrastructure. These changes in the policy agenda brought about a range of policy proposals – and these proposals spurred politicians and agencies to act.

Shaping Policy through Agency Design

In politics, one way such debates about public values are expressed is through broadscale attempts to “reform” the system through reorganization (Hanson et al., 1974; March et al., 1993; Peters, 1992). Those structural debates often center on the roles scientists play in the overall policy process. In recent years, such debates also have brought public attention to the interaction of politics and professionalism in the organizations we charge with designing and implementing policies about complex issues like climate change, agricultural research,

criminal prosecution, and national security. Throughout the years and in each of these arenas, we have seen clearly how politics and other pressures shape the relative power and position of professionals like scientists, engineers, lawyers, and economists (e.g., Bowen, 2008; Wilkinson, 1998).

Governments depend on professionals like scientists to help improve policy outcomes, but scientists are just one part of complex policy processes. Scholars of policy, agencies, and reorganization have considered the roles of scientists in the policy process and complex organizations for quite some time. Yet, few examine the intersection of these topics. Research innovations like the advocacy coalition framework have centered our attention on scientists, and our knowledge of policy processes is richer because of those innovations. For instance, we know scientists are core to understanding advocacy coalitions (Sabatier, 1988; Weible & Sabatier, 2009), and we know that the role of evidence in policy processes has changed over time (Howlett, 2009; Majone, 1989).

We know much less about how organizational pressures affect scientists in complex public organizations like national federal agencies in the US. While the literature on “managing scientists” is rich with cases from the private sector, universities, and hospitals, we know less about those processes when the organization is situated in national political settings that shape organizational missions and expectations about behavior. A broad array of literature focuses on managing professionals (like doctors) in small-scale settings (Buchanan et al., 2007; Currie et al., 2012; Davies, 2003; Forbes et al., 2004; Hunter, 1992), but few address managing scientists in large-scale national public organizations like federal agencies (Crow & Bozeman, 1998).

Researchers in both political science and public administration have argued that political actors seek to refocus the attention of or change behavior within complex public agencies to achieve broader political and policy goals. For instance, Terry Moe has focused on reorganization as a tool for shaping policy processes in institutions (Moe, 1989). Yet, while reorganization and structural changes in firms and universities are well understood, we know less empirically about reorganization dynamics in the public sector (Boyle, 1979; Christensen & Lægneid, 2007; Lee et al., 2020; Maynard-Moody et al., 1986; Peters, 1992; Pfiffner, 2007; Rainey & Thompson, 2006; Thomas, 1993; Whitford, 2020). Moreover, we know little about those dynamics when the targets of those processes are organizations populated by scientists.

The main purpose of this Element is to help fill a gap in our understanding of complex policy processes – our lack of attention to the tension between scientists and managerial control in the policy process, both conceptually and empirically. The Element offers a unique perspective on this understudied aspect of the policy process – the ways in which politicians and agency leaders

attempt to “herd” or direct scientists through the reshaping of public agencies. At a conceptual level, this discussion is part of broader movements to understand the impact of the professions in policy processes. This is because professions both enable policy improvements and limit the ability of political overseers to reshape organizations.

At a more practical level, this Element centers on a failed reorganization attempt. Unlike in the private sector, where bankruptcy proceedings of Chapter 11 of the United States Bankruptcy Code create ample opportunities to study the “dog that didn’t bark” (the company that did not successfully reorganize), most reform attempts in the public sector are cast as “successes” by those who attempt them – regardless of their impacts. Indeed, it is difficult to discover the consequences of even “successful” reorganizations (March & Olson, 1983); as Salamon at one time argued, “serious empirical work on the real effects of reorganization is not only deficient, it is non-existent” (Salamon, 1981, 60). This is a practical concern if only in that each future reform attempt is in some ways a response to a past failure to reform the organization – what happens next depends on what did not happen in the past (Sinclair & Whitford, 2013; Sydow et al., 2009; Whetten, 1987).

Reorganizing Public Health Science

Broadly speaking, numerous countries have sought to answer the previously posed questions. Specifically, the US used a deliberative goal-setting process to set national public health goals, and that process fed attempts to reform the primary agency charged with administering public health science. In a nutshell, as new public problems like anthrax (Decker, 2018), severe acute respiratory syndrome (SARS), and other infectious diseases emerged in the 2000s, the US and other countries all moved to reorganize public health scientific capacity. To examine how such deliberations play out in one agency, I offer a narrative drawn from the most important attempt to reorganize the US Centers for Disease Control and Prevention (CDC) since World War II (Etheridge, 1992).

CDC’s leaders, staff, and partners sought to answer the question “what is public health?” through strategic visioning; leaders then chose an organizational model drawn from business consulting that had largely been abandoned in the private sector. The changes this model dictated – and the way in which leaders tried to implement the change process – created turmoil and led to the departures of key scientists and managers.

On April 21, 2005, Dr. Julie Gerberding, Director of the CDC, announced that the CDC had “taken a landmark step in its readiness to confront the challenges of 21st-century health threats” (US Centers for Disease Control

and Prevention, 2005, 1). The process of reorganization began in 2003 and involved two years of detailed collaboration inside the agency with line and staff and outside the agency with a broad array of stakeholders, culminating in the 2005 unveiling of the full plan.

The mission of “the new CDC” was “to promote health and quality of life by preventing and controlling disease, injury, and disability” by working with a variety of partners, located in the United States and throughout the world, to accomplish specific goals. This included monitoring health and health problems, conducting research and developing policies, implementing strategies that help people select healthy behaviors, developing future generations of leadership, and training health professionals for solving emerging problems.

To accomplish these goals, the “Futures Initiative” called for reducing the number of Gerberding’s direct reports from twenty-three to thirteen by creating six overarching “Coordinating Centers.” The Coordinating Centers represented a switch in tactics to make the CDC more flexible and responsive. Common themes in the Futures Initiative were greater coordination across the key components of the CDC, improving the impact of CDC activities in terms of American health, increasing accountability (especially in terms of business services), and building on a well-developed network of relationships to expand partnerships in the areas of science, services, and administration.

The CDC has long been considered an agency of “virus hunters” (McCormick et al., 1999); we know less about its organizational life as a public health science agency. The vignette of the CDC offered here represents important grounding for theories of change in agencies populated by scientists. It helps us better understand how science agencies like the CDC try to harness the input and support of stakeholders and partners. This is notable because the broader context shows that this reorganization attempt to reenvision public health had much in common with that of other countries in terms of purposes, processes, and timing regarding responses to key public health challenges. Moreover, that process sought to change the agency from a traditional hierarchy long marked by organizational “silos” to a new matrix structure, enhancing organizational flexibility and information sharing. Extensive deliberation among stakeholders over the organization’s goals precipitated the choice of a novel matrix structure for increased effectiveness. However, those choices carried costs associated with this form of organizational goal setting and changes to top leadership, line staff, and the broader public health community, as reflected in operations and human capital effects.

By 2009, new leaders had already started to roll back all the changes of the Futures Initiative. In a short time, nothing of consequence remained of those changes, and the CDC was already on a new reform path. The buildings

remained, and the agency's structure was closer to its old one, but many senior scientists were gone. The Futures Initiative was a failed reform. It unraveled so quickly that we cannot assess its effects on the agency – except by assessing the change process itself. There is no “post” experiment to compare to the “pre.” Long on design, it fell short on implementation.

This Element examines this narrative about the CDC to help us better understand how political motives, organizational theories, public problems, and scientific professionalism become entwined in public health. Most of the gains in longevity and health quality have resulted from the work of organizations like the CDC, making public health scientists and practitioners the front-line producers of health.

Yet herding scientists is fraught with risk, and governing scientific organizations is a less-understood aspect of traditional policy implementation. To help improve this understanding, I focus on four messages. First, the Element draws the “big picture” within which this story proceeds: new public problems emerge, politicians and their proxies demand change, and professionals like scientists seek and advocate for solutions. “Herding scientists” is a core part of the policy process. Second, political appointees attempt to “steer the boat” of public scientific organizations through tools like reorganization, but reorganization is not a singular event; it is a policy process involving constituencies, stakeholders, and sellers of advice. Third, reorganization and reform have consequences for how agencies do their daily work in deciding what to do and how to do it. In this way, the reorganization attempt may be the big policy battle, but the process is really a multitude of smaller skirmishes – none of which occurs in a vacuum and without its own history. Fourth, scientists live inside agencies, but few joined to implement organizational change. Consequently, in the CDC, morale suffered greatly, and many valuable public health scientists left the organization.

This Element centers on a dilemma: the outcomes of many policy processes depend on the knowledge and technical expertise of scientists, but most of the agencies they reside in are managed by generalists appointed by politicians. One of the most potent methods for “shuffling the deck” and changing those outcomes is reorganizing the agency's groups of scientists – most of whom are disinterested in organizational change. How does that dynamic play out? In several ways, the Element builds a grounded theory about these and related dynamics.

My main point remains on the dynamics that define the reform of complex agencies like the CDC – on how herding scientists is itself a policy process. After building a theory, this Element reviews the broader public health context before offering a deep discussion of reorganization attempts at the CDC, the

motives behind them, the methods and participation models used, the role of leaders and their motives, the reorganization models selected and their origins in business, and the consequences of these factors in the context of the CDC as a science-based organization. I pay special attention to the presentation of empirical evidence drawn from surveys about these consequences.

After this deep discussion, I draw several broad conclusions about the roles of politics, leadership, and ideas in the context of the main dilemma: How do organizations like the CDC balance science and managerial control in complex policymaking environments? Finally, in the conclusion, I offer a short discussion of this exercise for our improved understanding of complex policy processes. As noted, there are any number of ways in which similar dynamics are playing out or soon will play out – with attendant consequences for policy selection and implementation.

The Value of This Story

The world's recent experiences in the coronavirus pandemic will lead to calls to reform our global public health systems. In the conclusion, I describe why this is probably inevitable, but recent books like Andy Slavitt's *Preventable: The Inside Story of How Leadership Failures, Politics, and Selfishness Doomed the U.S. Coronavirus Response* (Slavitt, 2021), Scott Gottlieb's *Uncontrolled Spread: Why COVID-19 Defeated Us and How We Can Beat the Next Pandemic* (Gottlieb, 2021), and Michael Lewis' *The Premonition: A Pandemic Story* (Lewis, 2021) all signal that there is money to be made in calls for reform and change. The point of the story I document here is that we have been down this road before. After the anthrax events and the 9/11 attack, we tried to reorganize our way to policy change at the CDC – and it failed. There are rarely “silver bullet” solutions to changing agencies, but perhaps this story helps us better understand the complex world of herding scientists.

2 Scientists, Managerial Control, and Reform

Professionals act as a fulcrum in this political game of shaping public organizations. As new problems emerge and the public and the politicians who represent them come to demand change, professionals (often scientists) are asked to determine what is needed and how to achieve improvement in social conditions. While political appointees are the mechanism through which politicians seek to shape those public scientific organizations, appointees wield tools (like reorganization) that are only coarse mechanisms for redirecting how scientists go about doing the public's business. This is partly because reorganization is itself a policy process involving constituencies, stakeholders, and sellers of advice.

Redirecting scientists means using reorganization to change how agencies decide what to do and how to do it. Reorganization involves changing low-level activities within organizations that professionals engage with daily – the organization’s rules, routines, and procedures. Yet, scientists as professionals are relatively unique in that few join those organizations because of natural inclinations toward management or organizational “tending” (the hard work of healing and redirecting fractured organizations; Powley & Piderit, 2008). As in other organizations, such discordances naturally lead to “exit, voice, and loyalty” problems (Hirschman, 1970; Lee & Whitford, 2007; Whitford & Lee, 2015).

This section first turns to scientists as professionals and their lives in organizations that depend on their expertise, for it is the scientists who play the central role in the CDC narrative offered in Section 3. I then offer a broad view of reorganization and what often changes in terms of day-to-day operations. After that, given the nature of the changes discussed in the CDC as a public health science organization, I then discuss the origin of those changes in the business literature. Finally, given this viewpoint, I offer a brief overview of the reorganization literature with a focus on politicians shaping agency design.

Administrative Rituals and Science Professionals

Debates over the true nature of administrative reorganization in public agencies should start with a synthetic discussion of the bureaucrats themselves – for it is their production and activities that are the ultimate focus of all reorganization attempts. In this section, my focus is on professionals, scientists as professionals, and scientists operating in a world of administrative rituals (March & Olson, 1983).

First, scholars largely agree about what constitutes a profession and what those aspects bring to our understanding of the day-to-day operations of professionals in organizations (Freidson, 2001; Hall, 1968; Miller & Whitford, 2016; Wilensky, 1964). Professions are centered on bodies of knowledge that create wells of expertise for their operators. Professionals have surprisingly long-term career perspectives and often self-identify with their profession for longer than they serve in a specific organization. Professionals operate themselves in relative insulation and exercise relative oversight of their members and the bodies of knowledge they curate. Finally, professionals have had long-standing relative independence from sources of authority centered in hierarchies – that in fact part of professionalism is the maintenance of “elaborate social arrangements, formal and information, [to] sustain this autonomy” (Wilensky, 1964, 146).

These aspects stand in contrast to the relative position of managers and the administrative rituals they curate because managerialism “denies authority to expertise by claiming a form of general knowledge that is superior to specialization and because it can organize it rationally and efficiently” (Freidson, 2001, 117). For political scientists, these functions of professionalism create opportunities for political credible commitment to specific policy paths (Miller & Whitford, 2016). As Moe (1987) notes: “Professionals are difficult to control, but their behavior is fairly easy to predict. And that, of course, is at the heart of all this. A professional, if given total autonomy and insulated from external pressures, can be counted upon to behave in a manner characteristic of his type. That is what true professionalism is all about. (259)”

But political scientists also recognize that these attributes make professionals inherently undependable (in political terms) because they are difficult to recruit and retain (Gailmard & Patty, 2007). In sum, professionals are important components in a theory of political reshaping of agencies, and proceeding without their consideration is a futile exercise.

Second, scientists are a unique brand of professionals that warrant special consideration and treatment – indeed, scientists can be considered the “profession par excellence according to [Talcott] Parsons” (Brante, 1988, 119; Parsons, 1939). Since the beginning of modern science, academics have struggled to characterize scientists’ mental models, purposes, organization, and utility within broader society and its institutions (Meier, 1951; Merton, 1957; Tarkowski & Turnbull, 1959). Indeed, much of our understanding of the professions as a social construct relies on our understanding of the unique role of scientists in society (Carr-Saunders & Wilson, 1933). The attributes of professions laid out here are even more important in considering the special role of scientists – if only because we have long recognized that “the most important goal for the ‘typical’ scientist is that of advancing the knowledge of his field by some form of basic research” (Glaser, 1964, 1). While our understanding of scientists’ mental models, purposes, and other aspects has certainly evolved over time, it is impossible to discuss scientists within agencies without that starting assumption: that they develop, curate, and maintain bodies of knowledge that exist outside the bounds of public agencies.

Within the policy process literature, though, we have come to understand similarly important roles in the evolution of policy debates, adjudication of policy knowledge, and even the advocacy of specific policy positions (Sabatier, 1988; Smith, 1992; Weible & Sabatier, 2009). We also know the complexity of the process by which scientific knowledge and evidence is translated into policy

(Howlett, 2009; Majone, 1989), but such understandings do not tell us that scientists are just like other actors in the policy process – indeed, they are a reminder of the long recognition that scientists are different, that they see themselves as different, and perhaps even that they should be different. There are benefits in the predictability of being a special type.

These aspects of science as a profession create special concerns when it comes to their management. Long recognized in the literature on professions, scientists and administrators rarely share a mutual understanding of what are the organizational problems and how they should be solved. Even sixty years ago, the clash between scientists and managers was seen as being fundamental to the organization's operations: that “it is well known that professional scientists and professional administrators often lack sympathy for each other's point of view,” so “the results may vary from lack of co-operation, due to absence of interest or understanding, to occasional open clashes” (Tarkowski & Turnbull, 1959, 213–214). From that point, researchers have sought to better understand those problems and their possible solutions.

Yet, little of that research literature speaks to the problem of managing scientists working in public organizations, even though we have long recognized that the problems may be greatest in those settings (Tarkowski & Turnbull, 1959, 214). This is especially interesting given the role of science in large government institutions throughout World War II and during the Cold War (Carpenter, 2001, 2010). Most of what has been written comes from the point of view of how to manage scientists and engineers in generic firms and similar organizations (Badawy, 1995; Glaser, 1964; Kerr et al., 1977; Raelin, 1991; Sapienza, 2004; Sayles & Chandler, 1971). Most of that literature simply argues for applying lessons from traditional management theory to the domain of scientists.

In contrast, in their seminal study of the US federal research and development (R&D) laboratories, Crow and Bozeman (1998) lay out a synthetic, developmental understanding of the way such organizations evolve and perform in a public sector setting. While their broader focus is on an empirical understanding of their operations (for instance, helping continue their understanding of “red tape” in knowledge organizations), they also help us understand a major point about those organizations: that “public policies affecting R&D laboratories seem to pay little heed to the laboratories themselves . . . that politics pay so little heed to the character and quality of their instrument [for solving public problems]” (p. xx).

This Element adds to this lineage by turning the question of the management of scientists in government on its side: rather than focusing on the political redesign of public organizations populated by bland bureaucrats, in the

narrative that follows, the public organization is populated by scientists. Instead of concentrating on the general management of scientists, this narrative centers on a public agency that politicians seek to reshape and redesign. In the words of Crow and Bozeman (1998), the “character and quality” of the CDC is a core part of processes that seek to shape its policy outputs through reorganization. While reorganization often takes the form of “administrative ritual,” its practical impact as a mechanism for “herding scientists” for public purposes is worth greater attention in the policy and administrative literatures.

What Reorganization Changes

Reorganization is one of the basic facts of organizational life (Gortner et al., 1997, 91). For Emmerich, reorganization is any change in executive functions that measurably affects how executive branch leaders supervise and direct how functions are exercised (Emmerich 1971, 8). In theory, the principal goals of reorganization are divided among (1) those having to do with changing policy and program; (2) those intended to improve administrative effectiveness in carrying out existing responsibilities; (3) those directed specifically to problems of personnel, individuals, or groups; and (4) those intended to counter or respond to pressures and threats from outside the organization (Mosher, 1967, 497). Peters (1992) classifies these motives as “purposive” (the intentional seeking of attaining goals), “environmental dependency” (reactions to outside changes, such as technological change), and “institutional” (maintenance of internal systems with the organization’s history and values).

In practice, reorganizing the executive branch is a popular exercise, mainly because of structural fragmentation and the political independence of many bureaucracies (Meier, 1980), so reorganization is often intended to consolidate agencies to enhance control and coordination (Goodsell, 2004). Reorganization is often a tool for responding to changing priorities that assumes that centralization improves operational efficiency and effectiveness (Radin, 2007). Most modern presidents have supported some kind of organizational shuffling to reduce perceived conflict and enhance coordination (Kettl, 2021).

Yet, it is difficult to assess whether reorganization achieves its goals; some argue that perhaps “reorganization cannot attain its manifest goal” (Meier, 1980, 399). While reorganizations intend to change what agencies do (Wilson, 1989), the empirical evidence of effects is mixed at best (Lee et al., 2020; Thomas, 1993). For example, while the “semi-merger” of the Federal Bureau of Investigation and Drug Enforcement Administration in 1968 and 1973 offered new resources and redefined core tasks (Wilson, 1989, 267), “assembling a variety of agencies together into a Department of