

SCIENTIFIC MANAGEMENT REVIEW BOARD
REPORT ON DELIBERATING ORGANIZATIONAL
CHANGE AND EFFECTIVENESS

NOVEMBER, 2010



NATIONAL INSTITUTES OF HEALTH
SCIENTIFIC MANAGEMENT REVIEW BOARD

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PREAMBLE

The Scientific Management Review Board (SMRB) is a Federal advisory committee charged with making recommendations to the Director of the National Institutes of Health (NIH) and others on the use of organizational authorities reaffirmed in the NIH Reform Act of 2006 (PL 109-482). Any use of these authorities—to establish or abolish institutes or to reorganize organizational units within the Office of the Director and/or within individual institutes or centers—must be preceded by a systematic, transparent process guided by sound criteria and principles and based on the analysis and consideration of multiple sources of information and opinion.

This report was originally developed by the SMRB Working Group on Deliberating Organizational Change and Effectiveness, which is one of three SMRB working groups. The Working Group was charged with (1) defining criteria for determining when organizational change should be contemplated, (2) developing guiding principles for the process of deliberation, and (3) identifying the appropriate attributes of a process for considering and, if warranted, undertaking organizational change. After a period of review and comment by the full Board, at its May 19, 2010 meeting, the SMRB accepted and approved the Working Group's report with the aim of submitting it to the Director of the NIH.

I. INTRODUCTION

Since its establishment in 1887, the NIH has evolved into the world's largest publicly funded agency for biomedical research with an exceedingly intricate organizational structure. That structure reflects the dynamic, evolving scientific and social effort to respond to the challenges of human health and disease. Today, with an annual budget of more than \$30 billion, NIH is comprised of twenty-seven institutes and centers and nearly forty task forces, committees, and other bridging mechanisms that facilitate collaborative endeavors among them.

Over time, two persistent trends have called into question the NIH's overall organization and prompted some to ask whether this organization facilitates the optimal fulfillment of the agency's mission. The first trend has been the rapid expansion over the last half century in the number of NIH institutes and centers—an expansion presenting a significant management challenge to the NIH Director. The second trend is evident in the fact that discoveries in the life (and related) sciences increasingly depend on collaborative efforts and engage scientists across multiple disciplines. Emergent technologies such as biophotonics, nanotechnology, and informatics do not fall neatly within the purview of a single institute; moreover, genomic investments critical to advancing knowledge about many disease states are best made across institutes rather than within a single or select number of organizational components of NIH. Equally important is the fact that advances in one field (e.g., diabetes and metabolism) often have a profound impact on new discoveries in seemingly unrelated fields (e.g., cancer therapies). Thus, a strict disease focus in organizational units may not fully catalyze scientific discoveries leading to successful new treatments.

A persuasive perspective on these two trends is offered, however, by the National Research Council in its 2003 study, *Enhancing the Vitality of the National Institutes of Health: Organizational Change to Meet New Challenges*. Identifying the challenges of operating within the existing NIH structure, the National Research Council observed that:

NIH's existing structure is the result of a set of complex evolving social and political negotiations among a variety of constituencies including the Congress, the administration, the scientific community, the health advocacy community, and others interested in research, research training, and public policy related to health.

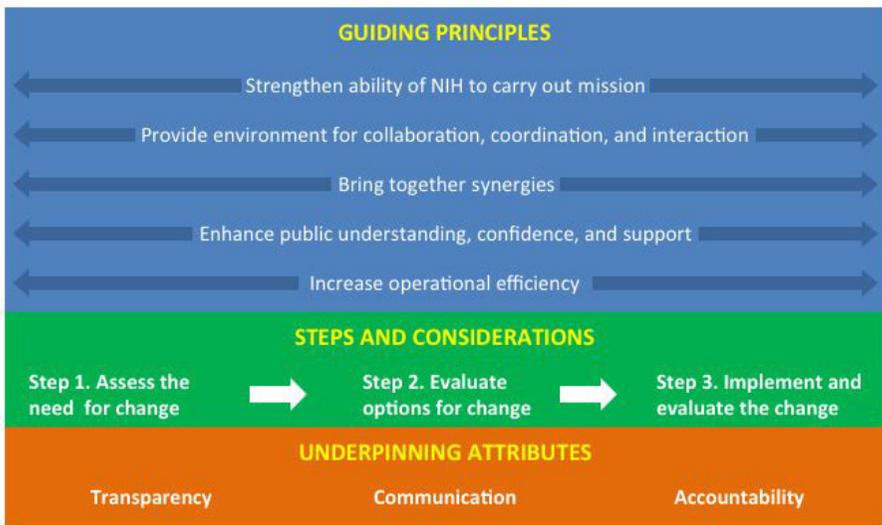
From any particular point of view or for any particular set of interests, the current situation is not only imperfect, but is certainly not one that either the Congress or the scientific

community would designate *ab initio*. Rather it has evolved as a very useful and largely productive outcome of a series of political and social negotiations that took place over time. The outcome is typical of the design of important social organizations in a pluralistic democracy.

Thus, despite the theoretical attractiveness of redesigning the NIH organizational structure *ab initio*, members of the SMRB recognized that a far-reaching overhaul of the NIH structure is neither advisable nor feasible. Although the Board acknowledged that the NIH organizational structure has some limitations, its members agreed that there is no evidence to support the conclusion that the agency is failing to achieve its mission. Indeed, the Board argues in this report that success or failure in achieving the agency's mission should be the central criterion in assessing the need for organizational change within NIH. It is, nonetheless, imperative to evaluate the agency's efficacy, periodically and systematically, along with the relationship between its organizational structure and its efficacy. And such an evaluation should not only account for how and why NIH has attained its current organizational structure but also identify ways that the agency can adapt that structure to the rapidly changing landscape for biomedical research.

This report has been developed, in part, on the basis of testimony from and discussions with individuals both inside and outside the NIH, including former NIH Directors, biomedical scientists, organizational change theorists, leaders from academic organizations, patient advocacy groups, foundations, and the private sector. These discussions have been critical ingredients for the focus of this report, the framework for deliberation and the guiding principles for considering and, if warranted, implementing and evaluating organizational change. This framework, illustrated in Figure 1, consists of five guiding principles, a three-step process for organizational change, and three attributes that should underpin the process from start to finish.

Figure 1: Proposed Framework: Principles, Process, and Underpinning Attributes



This framework will be fully explicated in Part III of this report. As a prelude to this discussion, a brief discussion of general aspects of organizational change is in order.

II. GENERAL ASPECTS OF ORGANIZATIONAL CHANGE

Much has been written about how to implement change in organizations with most of the literature derived from and focused on the business sector, which usually has clear metrics (e.g., sales, profits, return on investment, market share, and total shareholder return) that can inform discussions about whether change is necessary. Additionally, these metrics later can be used as a baseline to determine whether the change was successful. Business leaders who want to implement change typically have more flexibility in making personnel changes and their shareholders generally are aligned around easily defined financial metrics. However, despite these advantages, even corporate chief executive officers report significant difficulties when attempting to implement major organizational changes in their companies.

Executives and organizational theorists agree, however, that major change is most readily implemented in the face of a “burning platform”—a crisis that threatens the well-being and existence of the organization. For example, General Motors was highly resistant to change for decades until forced into bankruptcy. Lacking the

ability to revert to its old ways, the company was forced to reinvent itself in order to survive. Change within academic organizations has proven to be even more elusive, in part because universities do not have a “top-down” management structure, but instead are governed by multiple stakeholders with vested interests in the status quo, including faculty, students, donors, trustees, alumni, and the government. This is especially true at research universities. When change does occur in academic organizations, it is typically slow and incremental and it generally occurs through growth rather than reallocation or elimination of programs.

The complexity of effecting major organizational change in governmental entities is even more daunting. Highly diffused authority, the lack of well defined and universally agreed upon metrics for performance, and pressure from a diverse group of powerful stakeholders and constituencies make even the contemplation of change within the government a difficult task. As a government agency with an academic mission, the NIH embodies the most challenging aspects of both.

When contemplating organizational change, among the many considerations are two that are “generic” to the process. First, incremental change is not always effective. Slow processes of change often prolong the chaotic transition process, during which it can seem easier to return to the status quo than to continue forging a new path forward. Additionally, the amount of time and political capital required to implement *any* controversial change can make it cost-prohibitive to implement small changes. Therefore, if one is considering a change, the benefits must be substantial enough to justify the investment.

Second, organizations respond to resource allocation. Regardless of the nature of the change, whether it is significant and sweeping or incremental and limited, it is critical that sufficient resources and support be provided to the new or reorganized entity.

One additional consideration, applicable to all organizations but worthy of emphasis in this report, is that successful change relies heavily on the support and attention of organizational leaders. In the case of the NIH, the NIH Director must champion any proposed change within the organization.

¹ One notable counterexample is Tulane University, which faced possible closure following Hurricane Katrina. Amidst incredibly challenging financial and environmental problems, the president of Tulane, Scott Cowan, led the University through a process of reorganization, including school and program closures, which has not only removed the threat of bankruptcy, but, in President Cowan’s view, greatly strengthened the University going forward.

III. PROPOSED FRAMEWORK FOR DELIBERATING ORGANIZATIONAL CHANGE AND EFFECTIVENESS AT NIH

What is organizational change? Within the context of the current organization of NIH, the SMRB has defined organizational change as follows:

Organizational change is any modification of an organization's existing structure or of its ways of arranging and coordinating its component parts in order to achieve its mission. Organizational change may be driven by internal and/or external forces.

Moreover, organizational change may be *structural* and/or *functional* in nature. *Structural* organizational change entails the creation of new organizational components and/or the merger or elimination of existing components. The basic components of the NIH are its 27 institutes and centers. (See Figure 2, lower half) Establishing a new institute, merging two or more existing institutes or centers, and eliminating one or more institutes are all examples of structural change. *Functional* organizational change consists in the design and implementation of new mechanisms for coordinating the work of existing components, usually with the aim of realizing some as yet unrealized goal. Such mechanisms may take the form of committees, task forces, or consortia that bring together structural components around shared foci, activities, and goals. As such, they are flexible and have the potential to create and sustain new synergies. At NIH, there are nearly 40 working examples of functional strategies for organizational change. (See Figure 2, upper half)

The importance of defining and elaborating on organizational change *within this concrete context* should become clearer with the presentation of the proposed framework.

Figure 2. Current Organization of the NIH



FRAMEWORK AT A GLANCE

As previously noted, the Board’s proposed framework for deliberating organizational change and effectiveness has three principal elements: 1) a set of five principles to guide the process of considering and, if warranted, implementing organizational change; 2) a three-step process for change, along with considerations relevant to each step; and 3) the attributes that must underpin any deliberative process by a publicly funded and accountable body. The Board anticipates that this provisional framework will be revised and refined, especially in light of the ongoing efforts of the SMRB Working Groups on Substance Use, Abuse, and Addiction and on the NIH Intramural Program, which are already grappling with the substance of this report. The Board hopes that this framework will not only benefit from input from the other Working Groups of the SMRB, but will also inform and enhance their deliberative efforts.

FUNDAMENTAL PREMISE AND GUIDING PRINCIPLES

Although this framework has been informed by consultations with experts in the theory and practice of organizational change and strategic development, the Board has tailored it to the unique nature of NIH as a public agency and to its core mission. Indeed, the framework’s fundamental premise is this:

Any rationale for organizational change at NIH must be to improve the agency's ability to fulfill its mission.

That mission² is science in the “pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burdens of illness and disability.” In addition, the NIH has enunciated four goals that further specify the outcomes by which the agency should be judged. These goals are:

First, to foster fundamental discoveries, innovative research strategies, and their applications to advance the nation's capacity to protect and improve health;

Second, to develop, maintain, and renew scientific human and physical resources to assure the Nation's capability to prevent disease;

Third, to expand the knowledge base in medical and associated sciences to enhance the Nation's economic well being and ensure high return on the public investment in research; and

Fourth, to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.

In any effort to utilize the proposed framework for deliberating organizational change, the mission and goals of NIH must be recognized and kept firmly in mind. Thus, the framework's fundamental premise is reflected in the first guiding principle of the framework:

1. Organizational change should strengthen the ability of the NIH to carry out its mission in advancing science to improve public health.

Thus, in proposing and implementing change, there should be confidence that the specified change will have this qualitative impact on the pursuit of NIH's mission.

Moreover, scientific discovery and translation are highly dynamic processes. The NIH must have the capacity to adapt, structurally and functionally, to this dynamism in order to meet unforeseen challenges and capitalize on emergent opportunities.

2. Organizational change should provide an environment that will enable more effective collaboration, coordination, and interaction across all disciplines to advance the pace of scientific discovery and improve health.

The process of scientific discovery and translation is increasingly collaborative and

² NIH Mission: <http://www.nih.gov/about/mission.htm>

requires engaging individuals and groups from a range of disciplines. It is clear that the pace and productivity of the process depend on interactions among investigators working not only in the life sciences but also in engineering as well as in the physical and computational sciences. To fulfill its role as steward of medical and behavioral research for the Nation, NIH must create and foster an environment that catalyzes and sustains collaboration among disciplines.

Of note, these collaborations should include not only interdisciplinary collaborations, but collaborations on other levels, including within NIH, across Federal Agencies, between the intramural and extramural community, and internationally.

Inherent within this principle is the need to train the next generation of scientists and foster the development of careers at this intersection of disciplines. This meets NIH's goal of developing, maintaining, and renewing "human and physical resources to assure the Nation's ability to prevent disease" and is directly relevant to the first principle.

3. Organizational change should bring together units in which there are synergies of the scientific and/or clinical foundations for discovery and translation.

In the domain of human health, the process of scientific discovery and translation is a process that continually redraws and transcends the boundaries between and among the relevant disciplines. To be a leader in that process, NIH must have the capacity to organize and direct—and if need be, reorganize and redirect—its component parts in ways that support and enable the pursuit of promising trajectories of discovery and translation.

4. Organizational change should enhance public understanding of, confidence in, and support for science and the NIH.

Public trust is the cornerstone of the NIH. NIH is duty-bound to exemplify the highest standards of integrity, accountability, and responsibility to continue to reap the benefits of the public's confidence in the agency as a steward of medical and behavioral research for the nation.

In considering changes of organizational structure or function, NIH must undertake initiatives on two interrelated fronts. First, it must ensure that the processes of considering, deciding, and implementing change are transparent and conducive to public input and scrutiny. Second, it must ensure that any changes will enhance public understanding of, confidence in, and support for science and the NIH.

5. Organizational change should increase operational efficiency and ensure a high return on public investment in biomedical research.

Again, as the “steward of medical and behavioral research for the Nation,” the NIH has an important responsibility to advance science and promote public health, while using resources responsibly to achieve these goals. The goals of enhancing economic well-being, maximizing the return on the public’s investment, and promoting scientific integrity, public accountability, and social responsibility are particularly germane to this principle.

Because opportunities for scientific advancements will likely always exceed the resources available for their discovery, organizational structures should foster the optimal use of resources, however limited or plentiful they may be. For example, if other funding bodies are devoting significant resources and attention to research in a particular area, it may warrant fewer resources from NIH. Conversely, if there are barriers to the conduct of research in a certain area, it may signal a need for NIH to focus on reducing unnecessary burdens or barriers.

PROCESS STEPS

In light of the potential benefits and potential risks of organizational change, the process of deliberation demands careful planning; the collection, analysis, and judicious consideration of information and data; continual assessment; and transparency. The process must be both systematic and publicly accountable.

Within the proposed framework, the process moves forward in three sequential steps, each of which entails considerations to help identify relevant information and data for analysis and evaluation.

1. Assessing the need for change

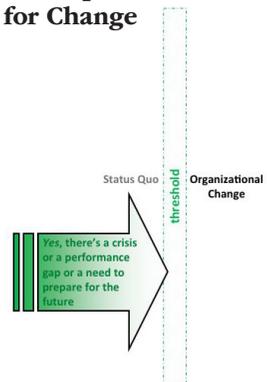
Some of the most complex processes begin with posing and answering a seemingly simple question. In organizational change, that question is this: *Is there a need for change?* (See Figure 3.) It is no easy task to pose and answer that question in a rigorous fashion. It requires clarity about the nature of the alleged need and about the evidence required for establishing such a need. With respect to the NIH, one might begin by asking if there is a health problem or an important area of scientific inquiry that is being neglected or inadequately addressed because of limitations imposed by the current organization

Figure 3. Threshold Concept and Assessing the Need for Change

Is there a crisis? Is there a demonstrable gap in organizational performance? Is there a compelling need to prepare for the future?

These (and other) questions are posed in the process of assessing the need for organizational change.

An affirmative response to any such question offers a potential warrant for movement across the threshold between the status quo and organizational change—to one degree or another.



of the agency. Or, one could ask, as well, if there is a need and a way to improve the agency's ability to fulfill its mission?

It logically follows that any assessment of the need for change will entail a careful analysis of certain mission-related indices and factors such as:

Fostering innovation and scientific advancement: It is imperative that the NIH be responsive to, as well as catalyze and lead progress in, biomedical science. Scientific discoveries often disrupt the landscape of existing knowledge, thereby creating new opportunities for innovation and advancement. It is critical that NIH be able to take advantage of these opportunities when they occur.

Protecting and improving public health: Emergent or evolving problems in public health create both challenge and opportunity. In the face of such problems, NIH may need to adapt its organization in order to contribute to effective solutions to these problems.

Stewarding human and physical resources to prevent disease: Biomedical research and public health are large-scale enterprises dependent upon the successful marshalling of complex—and usually expensive—human and physical resources. Changes in the supply and demand of these resources, as well as the dynamics of the forces (e.g., availability of education and training and other forces relevant to specifically human resources) that impinge on the effective deployment of these resources, may necessitate a review of the agency's organizational structure.

Promoting scientific integrity, public accountability, and social responsibility: The NIH strives to operate in a transparent and socially responsible manner. The challenges of conflict of interest, scientific integrity, ethical conduct of research, and many other issues may require organizational changes within the agency.

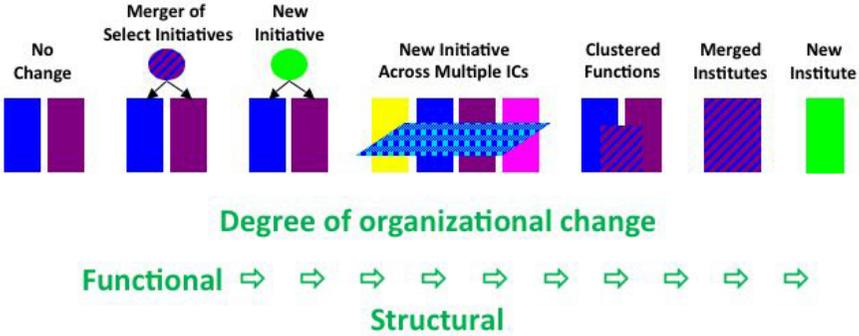
2. Evaluating the options for change

If a sufficient need for change can be demonstrated, the next step is to carefully evaluate the options for change. This step, in itself, has several additional procedural components:

- a) Identify viable options for change;
- b) Conduct a risk-benefit analysis of each viable option;
- c) Solicit and analyze key stakeholder perspectives on each option; and
- d) Identify and analyze the broader implications of each option.

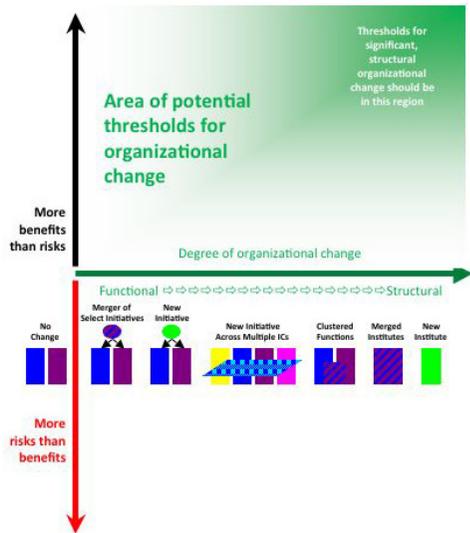
At NIH, the options for change can be viewed along a spectrum (see Figure 4), which includes maintaining the *status quo*, clustering existing organizations into a functional unit, merging institutes, or creating a new institute.

Figure 4. Spectrum of Options for Organizational Change



The construction of a continuum begs the next question of what degree of organizational change is required to address the need. Here, too, the concept of a threshold is useful as a schema for judgment and decision-making. Each option has anticipated (as well as unintended) benefits and risks (i.e., a benefit/risk ratio), and these should be evaluated carefully. An option that yields significant benefits with low risks is, of course, the ideal solution. The threshold is that point at which a particular form of change is justified and perhaps necessitated—by a positive ratio of anticipated benefits to anticipated risks. In general, a higher benefit-to-risk ratio is needed to justify a greater degree of organizational change (see Figure 5).

Figure 5. Threshold Concept and Evaluating Options for Change



3. Implementing and evaluating change

Once the need for change has been established and the appropriate solution has been identified, the third and “final” step is to implement and evaluate the change. The constituent tasks of step 3 are to develop and implement a plan for:

- a) Operationalizing change including timeframes, clearly delineated tasks, and the key responsibilities and accountabilities;
- b) Addressing unforeseen consequences, in both the short- and the long-term; and

c) Evaluating change at specified intervals, including identifying/analyzing relevant data and information, communication with key stakeholders, etc.

To be effective, the operational plans to accomplish change will require the full support of the NIH Director and must be developed in close consultation with the Director and his/her staff.

UNDERPINNING ATTRIBUTES

The legal mandate of the SMRB, as well as the nature, integrity, and ultimate success of the deliberative process itself, dictate that the process of deliberating organizational change and effectiveness at NIH be distinguished by three attributes:

- a) **Transparency:** Organizational change at NIH must be considered through fully transparent processes of deliberation, conducted in a manner that invites and is sufficient to withstand scrutiny by all interested parties and the public at large. If organizational change is undertaken, it should continue to uphold the strongest commitment to transparency.
- b) **Communication:** SMRB members and NIH staff should undertake ongoing efforts to communicate the results of the Board's deliberations about organizational change at NIH—to all interested parties and to the public at large.
- c) **Accountability:** NIH's viability and vitality as an organization depend ultimately on the trust of the public, to whom the DOCE process and those to whom it is entrusted are accountable. Every contributor to the process should be conscious of the public to which he or she is ultimately accountable.

IV. CONCLUSION

As noted in the introduction, the Board submits this report as a “work in progress” to the NIH Director. Every dimension—particularly the proposed framework—is open to the critical review of the members of the SMRB contemplating specific instances of organizational change. The Board is currently interested in the experiences of the Working Groups on Substance Use, Abuse, and Addiction and on the NIH Intramural Program and in the extent to which those experiences relate to the current framework. In summary, the Board welcomes and seeks any additional ideas to enhance the ability of the SMRB to deliberate on the challenges of organizational change within NIH.

