Commentary

Designing a Learning Health Organization for Collective Impact

Tomás J. Aragón, MD, DrPH; Barbara A. Garcia, MPA; and the Population Health Division Leadership Team

● Introduction

In May 2014, the Public Health Leadership Forum published "The High Achieving Governmental Health Department in 2020 as the Community Chief Health Strategist."[1] This groundbreaking paper started with the following statement:

> Local and state health departments need to adapt and evolve if governmental public health is to address emerging health demands, minimize current as well as looming pitfalls, and take advantage of new and promising opportunities. To succeed requires a view into the future.

In November 2011, the San Francisco Department of Public Health (SFDPH), Population Health Division embarked on this journey to reorganize the public health division into a high-achieving governmental health department for the future. We used public health accreditation as the catalyst to reorganize, and the new organization structure launched on July 1, 2013.

For the staff in the SFDPH, public health accreditation is about the humble and passionate pursuit of results, equity, and accountability for improving community health. This inspired us to call our framework for public health accreditation and improvement **REACH** (**R**esults, **E**quity and **A**ccountability for **C**ommunity **H**ealth). Staff are focused on achieving results (impacts, goals, and outcomes); integrating equity into quality improvement efforts; designing accountability into our activities, including community-based evidence (local voice, wisdom, and knowledge) with science- and practice-based evidence; and protecting and promoting population health.

REACH was developed after the SFDPH leadership embraced the idea that public health accreditation could be used as a vehicle to protect and promote the health of all San Franciscans. The San Francisco Health Commission—the governing health body—passed a resolution declaring public health accreditation a top strategic health priority for San Francisco. With this support, the SFDPH embarked on an extensive reorganization of its public health services into a new Population Health Division.

The overarching goal was to design a community-centered, responsive, and agile health organization that could adapt quickly to current and emerging public health challenges and opportunities. Strategic objectives included the following:

- provide leadership in health protection, health promotion, disease and injury prevention, and disaster preparedness;
- expand our focus to community wellness, beyond disease events;
- promote healthy and sustainable environments;
- integrate health equity into quality improvement efforts;
- strengthen service excellence to communities, clients, and providers;
- ensure a culture of trust and innovation;

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- strengthen our culture of finding, translating, and implementing science-based solutions to problems; and
- achieve and maintain public health accreditation.

An organization design team consisting of leaders, managers, and staff was convened. Because there is limited collective knowledge and funding for developing organizational structures in local health departments, a new structure was designed using existing local experience and published resources. The design team members reviewed public health accreditation domains and standards, population health models,[2,3] the Baldrige Criteria for Performance Excellence (CPE),[4] key public health texts,[5,6] and modern organization design books.[7,8] The design team actively engaged the staff, the affected community, and other stakeholders to bring in and build connections of trust and understanding. By pulling together all those sources of input, the design team developed a strategic map and then created an organization design framework and staffing chart. With that foundation, the REACH framework evolved after reviewing and testing several quality improvement models.[9-16] Finally, the SFDPH was able to leverage funding and technical assistance from the Centers for Disease Control and Prevention and the National Association of County & City Health Officials, which supported preparation for public health accreditation and funding for program collaboration and service integration.[17]

The purpose of this commentary is to review how the SFDPH used organization design concepts and continuous improvement frameworks to reorganize from autonomous, categorical silos of public health services to an integrated, community-centered Population Health Division. We believe that these concepts and methods can be adapted to many health organizations.

● Challenges and Opportunities

For many years the SFDPH public health services consisted of autonomous, mostly categorical (disease-focused) sections that reported separately to the county health officer. This structure promoted siloed, highly specialized activities. Although the SFDPH has had notable successes within this categorical structure (eg, HIV prevention and research publications), the organization had limited capability to adapt and respond easily to a rapidly changing and increasingly complex external environment. Table 1 lists several of the challenges and opportunities that motivated the organizational change.

The design team started by reviewing population health definitions and frameworks. The Institute of Medicine defines public health as "fulfilling society's

TABLE 1 ● Selected Current and Emerging Public Health Challenges and Opportunities

Public Health "Triple Aim"	Challenges and Opportunities
Population health and well-being	Climate change
	Health inequities
	Childhood obesity and adult chronic diseases
Public health practice	Public health accreditation
	"Health in all policies" approaches
	Community-based participatory research
	Collective impact and health impact assessment
Health financing	Patient Protection and Affordable Care Act
	Prevention and Public Health Fund
	Hospital community benefits

interest in assuring conditions in which people can be healthy."[18(p7)] The design team adapted a version of the Institute for Healthcare Improvement's composite model[2] of population health (Figure 1) and defined population health as "a systems framework for studying and improving the distribution and determinants of health and quality of life states through collective action and learning." In this definition, "systems" means complex adaptive systems (defined later). The definition of outcomes includes not just disease and injury but also health and function and well-being. Because community health involves complex social systems, this view of population health requires solutions that are more than evidence-based: solutions must reflect unique local circumstances to be impactful and sustainable. What worked in an intervention trial may not work in a different neighborhood or social network, indicating that local stakeholders must be engaged in designing, implementing, and improving health interventions. Finally, the generation of inequities starts at the highest levels and leads to disparities in determinants and health outcomes.

In creating new organizational structures for public health, it is critical to recognize that health organizations are also complex adaptive systems with events that can be surprising, unpredictable, deceptive, and ambiguous.[8] Health departments have unique institutional histories, structures, politics, and cultures that have evolved under hierarchical, bureaucratic, political, and categorically funded environments. Some health organizations may have evolved into institutions that are not sufficiently agile, adaptive, and responsive for addressing emerging problems or exploiting new opportunities.

The imperative, then, is to design new organizational structures that can adapt and address the

FIGURE 1 ● **Population Health Systems Model**
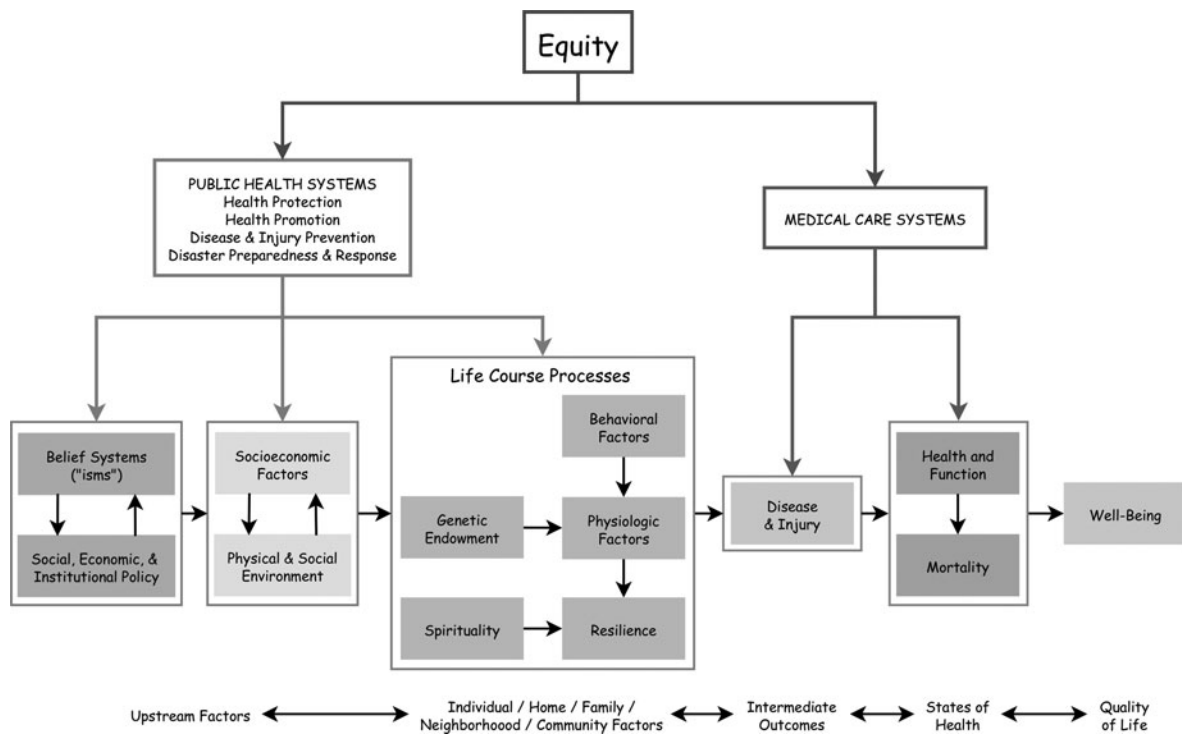
Adapted from Stoto.[2]

increasing complexity of our society and its organizations. New organizations must have structures and systems in place to assess readiness for change and the ability to adapt to the external environment. New organizations must be able to view all failures as learning opportunities. New organizations must promote simple frameworks that can spread and empower staff to be creative, innovative, and adaptive. New organizations must promote a culture of inquiry and humility[19] to balance the strengths in advocacy.

● Organization Design Concepts

A complexity science approach to organizational design is more than applying systems thinking to redesign.[20] Complexity occurs when we have a population of diverse agents, all of which are connected, with behaviors and actions that are interdependent, and that exhibit adaptation and learning.[21] Organizations, like communities, are complex adaptive systems that evolve by adapting to internal and external pressures.

Complex organizations can exhibit path dependence: today's strategic decisions can launch a trajectory that can limit future organizational options and capabilities.[22] For example, the development of categorical silos in public health is an adaptation to categorical funding, local optimization of operations

and practice, and professional peer recognition for specialized knowledge and achievements (eg, scientific publications). Over time, organizations evolve into structures, systems, and cultures that may make it very difficult to change course (path dependence), especially in government bureaucracies that are accustomed to hierarchy and stability.

Complex organizations can be unpredictable, with actions resulting in unexpected and unintended consequences. The nature of complexity and the requirement for change, when put together, yield the imperative to expect and prepare for failures. Every failure is an opportunity to learn and improve and not necessarily a flaw in people or performance. In this context, public health quality improvement training prepares us to deal with this uncertainty of building new organizational structures in public health systems. Such professionals have experience in problem-solving, energy to inspire creativity and innovation, and the training necessary to engender trust by requiring high standards of ethical behavior in themselves and others.

Using concepts and information in a selection of books on public health[5,6] and organization design,[7,8] an Open Systems Model of organization design (Figure 2) was developed by integrating the Nadler-Tushman Congruence Model[23] and the Baldrige CPE.[4] The pillars of the CPE are leadership and results, and the CPE are supported by knowledge integration and decision support, and by values (respect, continuous improvement,

FIGURE 2 ● **Open Systems Model for Organization Design**
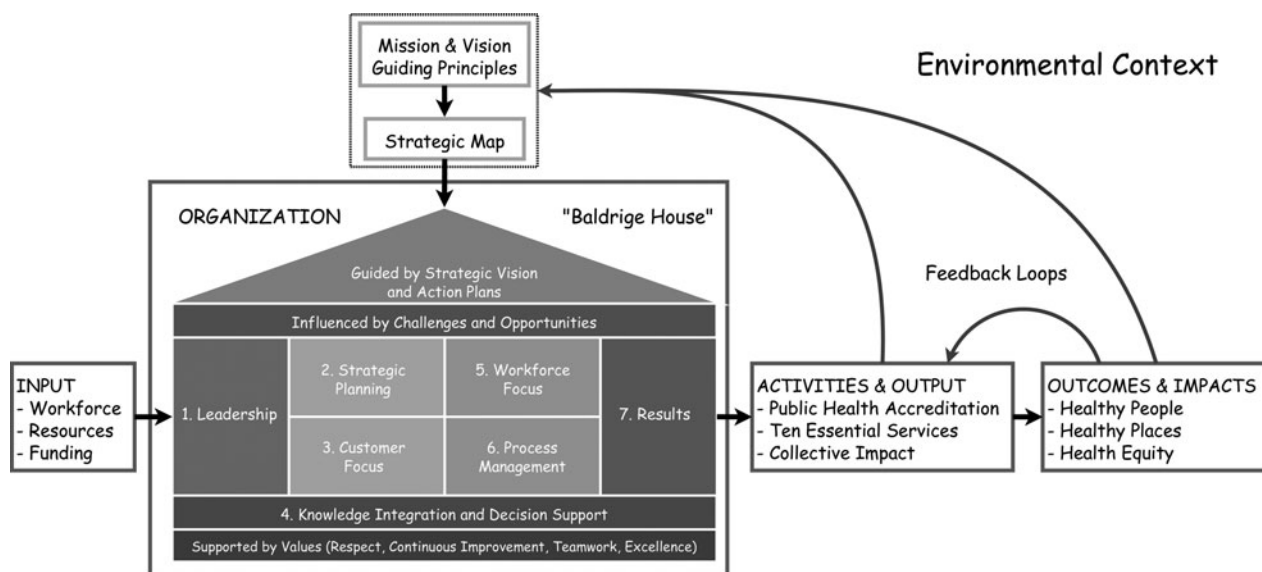
Adapted from Nadler and Baldrige criteria.[4,23]

teamwork, and excellence). The Open Systems Model led to significant improvements to the Strategic Map.

The Population Health Division Organization Design Framework was developed (Figure 3) from the Open Systems Model, the Population Health Systems Model (Figure 1), and the public health accreditation domains. This Organization Design Framework ("physiology") guided the design of the organization chart ("anatomy"), going from categorical silos to functional branches. selected branches, offices, and centers. Specialized units (eg, tuberculosis control) continue to exist but are now united with similar units (eg, general communicable disease control). Horizontal integration (numbered light gray bars) represents multidisciplinary, cross-sectoral teams; work groups; task forces; or initiatives that are convened for high-priority (eg, HIV prevention) or emerging public health areas (eg, childhood obesity). The design phase was iterative, lasted more than 15 months, and included extensive input from members of the community, staff, and other stakeholders. Within-branch integration continues; however, this phase is slower because it requires comprehensive business process redesigning.

We came to appreciate that the foundation of a learning health organization is continuous quality improvement. Therefore, to develop the REACH framework, several quality improvement models were explored to enable bottom-up and top-down approaches to organizational learning and transformation and to tackle complex community health problems.[9-16]

● **The REACH Framework**

REACH is our comprehensive, integrated framework for population health improvement, organizational performance management, and continuous quality improvement. REACH leverages established frameworks used nationally and internationally, and moves from simple, everyday objectives to complex organizational and community challenges. REACH has 4 components affecting different types of staff:

1. CPE: senior managers, leaders
2. Four strategic questions (4SQ): all division staff
3. Results-based management (RBM): program and senior managers, leaders
4. Health Equity X (HEX) model: program and senior managers, leaders

REACH 1: Criteria for performance excellence

The Baldrige CPE[4] is a comprehensive framework for assessing and improving organizational performance (see "Baldrige House" in Figure 2). Organizational complexity is recognized in the CPE; however, attempts to fully implement the CPE can overextend a health organization.[24] Instead, in adapting the CPE to public health, we focused on the pillars of the CPE: leadership and results. Results had 5 subcriteria: health outcomes and processes; community-focused (our primary customer); workforce-focused; leadership and governance; and financial and market. An RBM approach was used, and other criteria were drawn upon as needed.

FIGURE 3 ● **The Population Health Division Organization Design Framework**
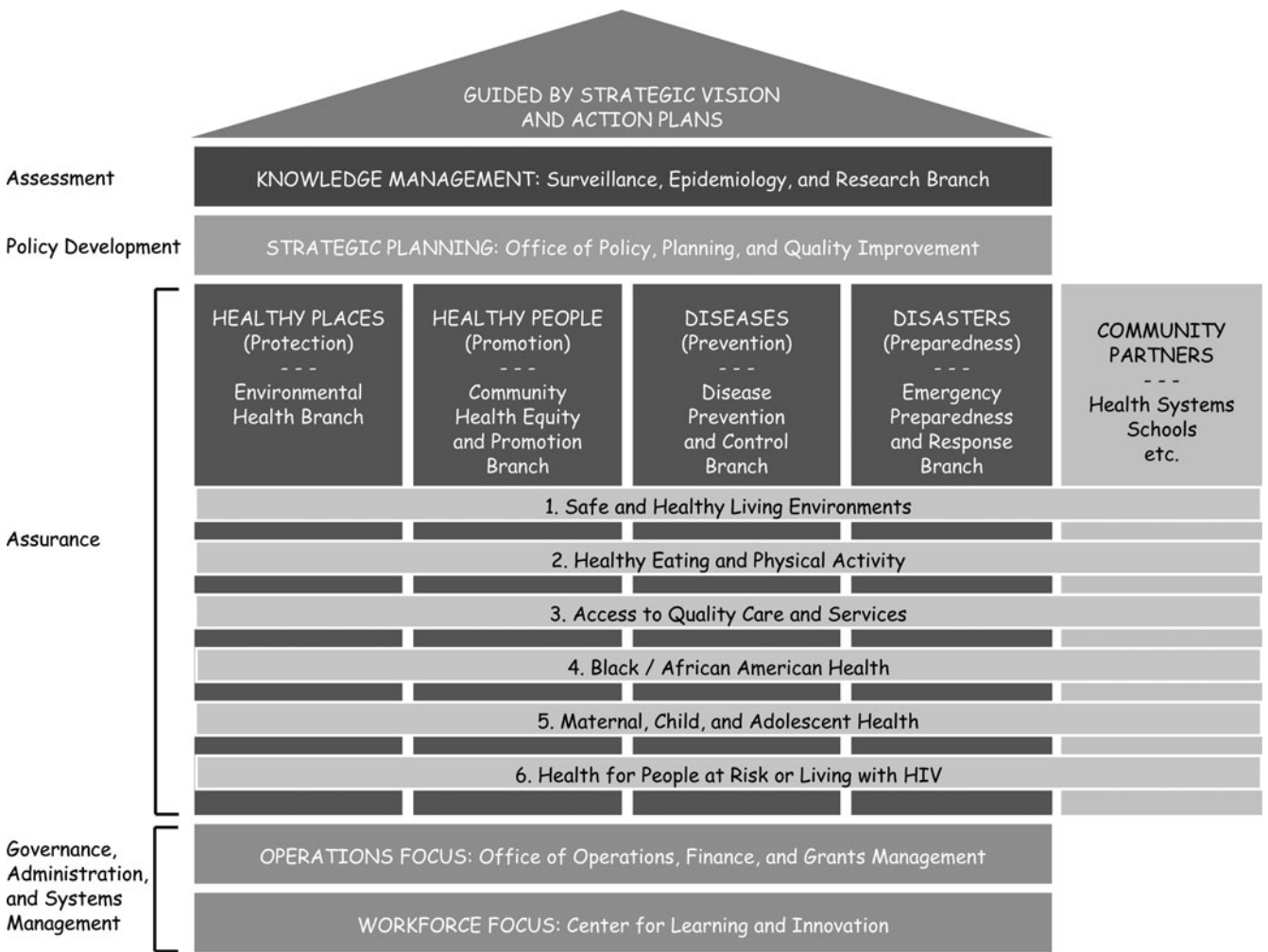
The Baldrige CPE provided a high-level framework to ensure that, during the reorganization, the design team did not lose sight of key components that are characteristics of high-performing, learning organizations (Table 2). In general, the public health accreditation domains guided mission and strategy, the organization design concepts[7,8] guided structure, and the CPE guided organizational functions. Table 2 summarizes the influences that CPE had on the new organization structure and functions.

The fourth CPE (measurement, analysis, and knowledge management) was changed to "knowledge integration and decision support." "Knowledge integration is the process of combining information from many sources (and disciplines) to accelerate the translation of scientific discoveries into health benefits for both individuals and populations."[25] In practice, it is the management, synthesis, and translation of knowledge into decision support systems to guide, influence, and inform public health policy and practice. Our epidemi-

ologists and surveillance units are now in the same branch, to improve knowledge integration and decision support to the division. Selected staff (integrators) are embedded in other branches to improve integration across branches.

REACH 2: 4 strategic questions

The 4SQ is the daily practice of asking 4 strategic questions with all important activities from defining daily objectives, to planning effective meetings, to tracking progress on projects. All key activities should be fulfilling a strategic intent. The idea is to promote a culture in which staff are aware of how their daily planning and decisions drive strategy. Staff should feel accountable for results, but in a supportive environment that empowers staff and values creativity. The 4SQ are:

1. What are we trying to accomplish and why? (strategic intent)
2. How do we measure success? (scorecard)

TABLE 2 ● Influence of the Baldrige Criteria on Organization Design

Baldrige Criteria	Examples of Organization Design Achievements
1. Leadership	Executive team leadership academy
	Staff leadership academies (under development)
2. Strategic planning	Office of operations, finance, and grants management
	Result-based strategic planning for accreditation
3. Customer focus	Community health equity and promotion branch
	Disease prevention and control branch
4. Knowledge integration and decision support	Integrated surveillance and epidemiology unit
	Integrating all disease surveillance systems
	Continuous decision improvement (CDI) training
5. Workforce focus	Center for learning and innovation
6. Process management	Office of policy, planning, and quality improvement
7. Results	Collective impact using results-based management

3. What other conditions must exist? (assumptions and risks)
4. How do we get there? (action planning)

The 4SQ are part of the logical framework approach that is used worldwide for project planning and management.[9] By itself, 4SQ is powerful—it is easy to teach, learn, and use, and makes activities become more focused, productive, and strategic. One can use 4SQ to hold team members accountable (eg, "What are we trying to accomplish?" is a great question at a nonproductive meeting). The 4SQ are an example of "simple rules" that can take hold and spread in a complex organization and can be used to improve performance and add practical value to staff. Ultimately, the goal is to promote a culture of strategy awareness and results-based accountability in a highly accessible way.

REACH 3: Results-based management

Building upon 4SQ, RBM is a comprehensive framework used by the United Nations for strategic planning and implementation, collective impact, and continuous improvement.[16] As a variant of the logical framework approach,[9] the RBM results chain looks like the familiar logic model:

Inputs → Processes → Outputs → Outcomes → Impacts and Goal

Results are changes in a state or condition that come from a cause-effect relationship. There are 3 types of results: outputs, outcomes, and impacts. A goal is a desired strategic objective. Impacts are changes in people's lives, including changes in knowledge, skill, behavior, health, or living conditions. Changes can be intended or unintended, positive or negative, longer-term effects. Outcomes are changes that occur between the completion of outputs and the achievement of goals. Outputs are changes in knowledge, skills, or abilities of individuals, changes in organizational capabilities, or the delivery of services or products that result from processes within the control of the organization. The results chain ensures causal logic: teams manage processes that produce outputs that achieve outcomes that contribute to impacts and a goal.
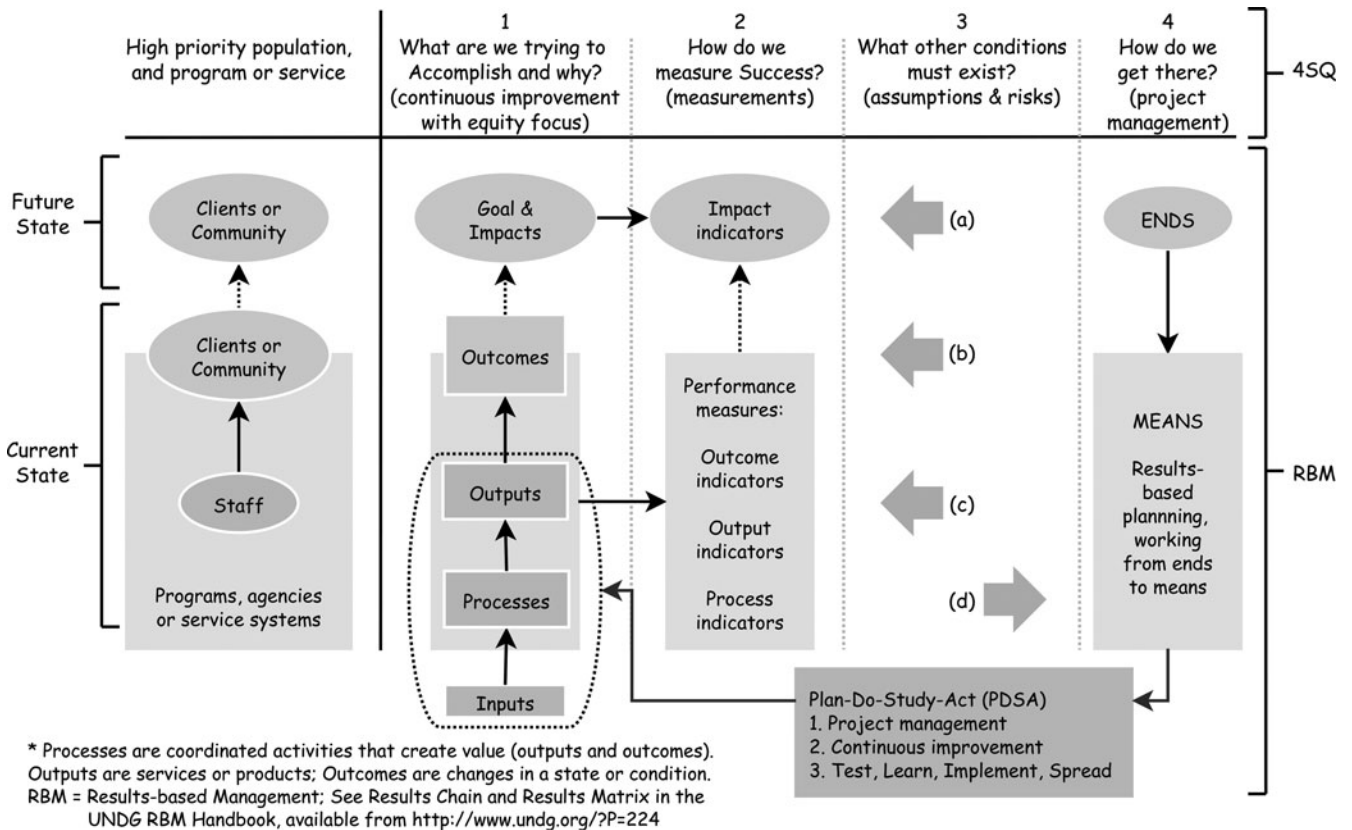
For RBM planning the results matrix is a 4 × 4 planning matrix derived from the results chain and the 4SQ (Figure 4). Combined with Plan-Do-Study-Act (PDSA) cycles for testing, learning, implementing, and spreading change, we have a quality improvement framework that aligns with the Model for Improvement—a quality improvement framework adopted by the Institute for Healthcare Improvement.[10,26] Higher importance is given to monitoring and acting on lead indicators (processes, outputs, and early outcomes) because they are under our control and causally predictive of lag indicators (late outcomes, impacts, goal).[27] Put another way, quality improvement is about acting on lead indicators to improve lag indicators (performance management).

"Collective impact is the commitment of a group of actors from different sectors to a common agenda for solving a complex social problem."[28-31] It is a partnership collaborative with a common agenda (goal), shared measurements (process and result indicators), and mutually reinforcing activities (Figure 5). In short, collective impact is a quality improvement framework applied to complex social problems (Table 3). Results-based management is a comprehensive, rigorous, and tested framework for implementing collective impact, as summarized by the United Nations Development Group [16]:

> RBM is a management strategy by which all actors, contributing directly or indirectly to achieving a set of results, ensure that their processes, products and services contribute to the achievement of desired results (outputs, outcomes, and higher level goals or impact). The actors in turn use information and evidence on actual results to inform decision making on the design, resourcing, and delivery of programs and activities as well as for accountability and reporting.

To support collective impact planning, the 4SQ was expanded into 7 planning questions to design, implement, monitor, and improve collective impact projects (Table 4). The questions were designed to engage diverse stakeholders with nontechnical backgrounds. Collectively, the 7 questions (A-G), along with RBM, enforce an established systems

FIGURE 4 ● **Results-Based Management (RBM) Is an Extension of the 4SQ (4 Strategic Questions)ᵃ**

* Processes are coordinated activities that create value (outputs and outcomes). Outputs are services or products; Outcomes are changes in a state or condition. RBM = Results-based Management; See Results Chain and Results Matrix in the UNDG RBM Handbook, available from http://www.undg.org/?P=224

approach to problem definition, solution design, decision making, and solution implementation, known as the systems decision process.[32] Using collective impact, the Population Health Division and the San Francisco Health Network (managed-care system) have launched the Black/African American Health Initiative to improve cardiovascular health using the Million Heart Initiative.

REACH 4: Health Equity X model

The HEX model (Figure 6) is used for designing and managing efforts to achieve results in complex environments, including for health inequity, quality improvement, and collective impact. The following domains can be targeted for process and/or results change: people (mental models, belief systems, cultural norms, "isms"); policy (social, organizational); place (neighborhoods, schools, work place, open spaces); program (programs, agencies, service systems); provider (clinicians, teachers, employers); and patient (clients, students, workers). The patient-provider dyad represents relationships with a power imbalance (eg, student-teacher, tenant-landlord, employee-employer).

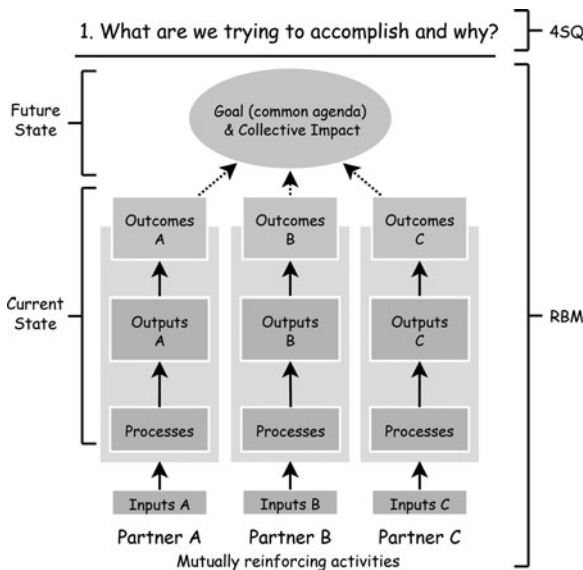The HEX model evolved from the observation that some collaborative groups were struggling with how to implement collective impact. Collaboratives were balancing competing goals, priorities, and proposed activities. This challenge is not surprising given the complexity of the problems and solutions. The HEX model was developed to simplify, clarify, and organize collective thinking. The HEX model was inspired by the Bay Area Health Regional Inequities Initiative public health framework for reducing health inequities,[3] a presentation given by Dr Anthony Iton,[33] and "performance accountability" (involving program, staff, customer) as described by Friedman.[11]

The HEX model is a visual reminder that these population health system components are diverse, connected, interdependent, and adapting (ie, complex). A goal to change one component (eg, organization cultural norms) may require action, measurement, and improvement of the other components. Actions in one area can lead to feedback loops and to unexpected and unintended consequences in components across the system.

● Lessons Learned

On July 1, 2015, the Population Health Division will be celebrating the second anniversary of the

FIGURE 5 ● Collective Impact Using Results-Based Management[a]

> 1. What are we trying to accomplish and why? ─ 4SQ

Future State

Goal (common agenda) & Collective Impact

Current State

Outcomes A	Outcomes B	Outcomes C
Outputs A	Outputs B	Outputs C
Processes	Processes	Processes
Inputs A	Inputs B	Inputs C
Partner A	Partner B	Partner C

Mutually reinforcing activities

─ RBM

[a]Only first column of results-based management (RBM) results matrix is shown.

reorganization. We have only just begun—there is tremendous integration work ahead. While there are many lessons learned, 4 stand out because they are important and underappreciated, and they require institutional commitment and support:

- building and restoring *trust* is a core competency that requires ongoing team training and practice;

- cultural *humility* is a core competency that requires ongoing training and practice;
- improving team decision-making for complex environments requires ongoing training and practice; and
- embracing collective impact enables us to apply quality improvement methods to complex community health problems.

TABLE 3 ● Collective Impact Components Adapted for Quality Improvement[a]

Component	Description
Common agenda	All participants have a shared vision for change including a common understanding of the problem and a joint approach to solving it through agreed-upon actions
Shared measurement	Collecting data and measuring results consistently across all participants ensure that efforts remain aligned and participants hold each other accountable
Mutually reinforcing activities	Participant activities must be differentiated while still being coordinated through a mutually reinforcing plan of action
Continuous improvement	Continuous quality improvement methods applied to mutually reinforcing activities
Backbone support	Dedicated staff to serve as the backbone for the entire initiative and coordinate participating partners and organizations.

[a]Adapted from www.fsg.org.

TABLE 4 ● Results-Based Management (RBM) Collective Impact Planning Questions Derived From the 4 Strategic Questions (4SQ)

4 Strategic Questions (4SQ)	RBM Collective Impact Planning Questions	Comments
1. What are we trying to accomplish and why?	A. What is the goal?	Describe desired future state (see HEX model). Specify population, policy, place, or program? Population can be community, client, patient, or staff.
2. How will we measure success?	B. How are we doing?	Review indicator curves and data for current state. See HEX model for ideas.
	C. What are the drivers?	Root cause analysis of current state (eg, 5 whys, force field analysis, fishbone diagram, research)
	D. What strategies work?	(*a*) Comparative effectiveness analysis and (*b*) Prioritization and selection
	E. What partners can help?	For collective impact we have common agenda (Q-A), shared measurement (Q-B), mutually reinforcing activities (Q-D), and continuous improvement (Q-G)
3. What other conditions must exist?	F. What other conditions must exist?	Assumptions are conditions, not under our control, that can affect (positively or negatively) our project. Risk is the chance that a valid assumption (eg, sufficient funding) becomes invalid (eg, loss of funding) and has consequences. Answering this question improves risk and consequence management planning.
4. How do we get there?	G. How do we get there?	Project management and continuous improvement: (*a*) focus on Goal, (*b*) act on lead indicators, (*c*) keep a compelling scorecard (lead and lag indicators), and (*d*) create a cadence of accountability (meet weekly);[38] and Plan-Do-Study-Act cycles to test, learn, implement, or spread improvement

FIGURE 6 ● The Health Equity X (HEX) Model
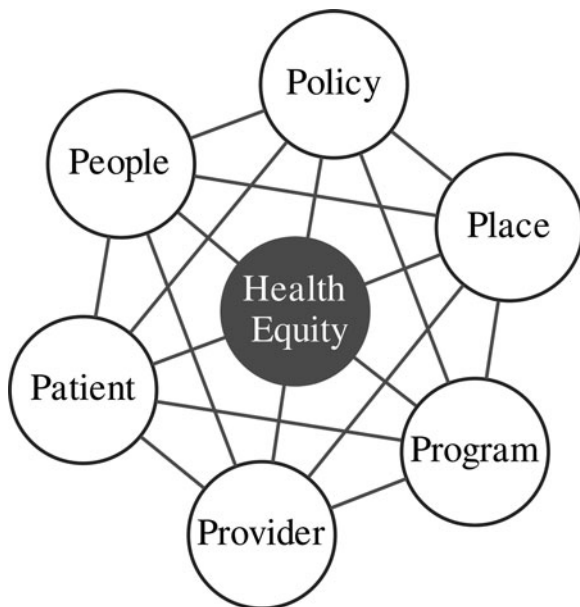
Inspired by Iton[33] and Friedman.[11]

Everyone knows that trust is important. However, building trust was so important to us that a formal training program was launched. Through the new Center for Learning and Innovation, certified trainers work with teams to understand trust-building and trust-restoring behaviors[34] as a way to help staff adapt to newly forged collaborations, and in some cases, merging of different work cultures. A culture of trust supports positive relationships as well as a positive climate that improves team and organizational performance.[35,36]

Cultural humility is committing to a lifelong process of self-reflection and self-critique, recognizing and setting aside biases, learning from and accepting differences, and redressing power imbalances in our work with communities, clients, and coworkers.[37] The focus on self-awareness and humility empowers staff to accept criticism and to learn from and grow with every human interaction. In a diverse organization that serves diverse communities, cultural humility synergizes with trust-building to accelerate change and improve performance. The SFDPH has embraced cultural humility and has launched a workforce initiative.

The new organization structure requires horizontal integration with more work in project-based, multidisciplinary teams. Therefore, our training focus has shifted to improving team-based skills.[38] Teams must be able to make good decisions under time constraints and in complex environments. Team decision making requires cooperation, and genuine cooperation requires trust and humility. To make good decisions, teams must be able to engage in constructive conflict, build consensus (commitment and shared understanding), evaluate and improve the quality of their decisions, and monitor implementation effectiveness.[39] Collaborators at the University of California, Berkeley School of Public Health are developing a team-based decision-making training curriculum. The approach—continuous decision improvement—uses quality improvement tools to improve the quality of public health team decisions.[32,40]

Collective impact is a cross-sectoral quality improvement framework applied to complex community health problems.[41] Collective impact leverages complexity science concepts in implementation[31] and evaluation.[42] For quality improvement, RBM is used for designing and implementing collective impact. In public health practice, collective impact complements other community-engagement approaches, namely health impact assessment[43] and community-based participatory research.[44] Collective impact holds great promise for public health practice because it converts partners' passionate commitment to a common health agenda into a systematic quality improvement framework for the mutually reinforcing activities.

In summary, public health is practiced in an increasingly complex world. Health organizations must adapt and respond more effectively to emerging challenges and opportunities. To be effective, teams must improve trust building, cultural humility, and decision making. REACH provides a comprehensive continuous improvement framework to test, learn, implement, and spread adaptive changes that will promote truly learning health organizations. We believe that these concepts and methods can be adapted to many health organizations.

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