

**Establishing a Strategic Foresight Learning and Action Network (SF-LAN) at the Centers for Disease Control and Prevention (CDC)**

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## Abstract

This article chronicles the experiences and lessons learned in establishing strategic foresight (SF) in a U.S. government organization. This has value to the field of foresight, which is seeking to establish foresight in organizations as an intentional capability to explore alternative futures and work towards preferred futures. This work also has particular value to other federal agencies establishing or considering establishing a SF practice.

## Introduction: A Model for Introducing Foresight

How does one introduce foresight into an organization? In recent years, there has been an increased emphasis on the use of foresight principles across the federal government. For example, the Office of Personnel Management (OPM) [Circular A-11](#) emphasized the need for federal agencies to incorporate strategic foresight (SF) in strategic planning and performance frameworks (OMB 2022). In addition, in 2021 OPM produced a *Federal Workforce Priorities Report* that highlighted developing agency foresight capability as one of the key promising practices, and in 2022, it produced a guidebook *on Developing & Applying Strategic Foresight for Better Human Capital Management* (OPM 2021; 2022).

Previous work suggested an iterative six-step approach. For the present work this will be referred to as the Foresight Integration Model (Hines 2012). The model is both descriptive and suggestive; that is, it describes some common patterns in introducing foresight into institutions and offers some recommendations on a best path/practices. The model assumes a champion or champions who work with a futurist(s) to promote foresight work for internal clients within the organization. Eventually, they seek a leadership sponsor in the organization to help institutionalize the foresight work.

**Table 1.** Activities in the Foresight Integration Model

Activity	Description
1. Publicizing	Raising awareness of foresight capabilities. Happens mostly at the individual futurist and foresight firm level, with some support from the foresight field, mostly in providing references. Client organizations respond to the message (or not).

2. Introducing	A persuasive process from the foresight side, primarily focusing on the benefits of foresight thinking. A champion or champions in the client organization make the initial interaction with the futurist and decide to engage and introduce the futurist to other organizational colleagues who may benefit from the conversation.
3A. Doing the work	Foresight project work is carried out for internal clients led by the futurist(s) with support from champion(s).
4A. Evaluating outcomes	Done formally or informally by futurists, champion(s), and clients. If projects are judged a success, internal clients will likely spread the word internally and expand the potential for foresight work.
5A. Positioning	The futurist and champion(s) develop a positioning strategy to further promote the internal foresight capability by identifying additional internal clients.
3B. Doing the work	Work on specific projects is now accompanied by positioning work that sets up the next project(s).
4B. Evaluating outcomes	The project and positioning work is evaluated with leadership and potential sponsor(s) of the foresight capability.
5B. Positioning	If projects continue to be successful, the futurist and champion(s) team develops and proposes institutionalizing.
6. Institutionalizing	The organization provides a formally recognized role for foresight that is reflected in formal work processes or on the organization chart.

**1. Publicizing.** The first step of the model notes the obvious point that futurists must first let the client know about the work. It is still quite common for futurists to get quizzical looks when describing this activity. Foresight is [generally] not taught in K-12, although some organizations are working to change that (Bishop 2018; Prince 2020). At some serendipitous point, an individual or organization will come across either a publication, talk, academic program, or some information about the future and thus become introduced to the concept. The Houston Foresight program calls it the “stumble upon,” as so many prospective students use the phrase to describe how they came across foresight.

**2. Introducing.** In terms of introducing foresight to an organization, the process usually begins when an individual stumbles upon foresight, then comes back to the organization and says, “we should do this.” There may be an exploratory phase or a study to assess the new capability. If the individual has the institutional authority to do so, they may initiate the foresight work themselves or recruit or persuade someone else to do it. Anecdotally, the emergence of

foresight in many disparate parts of organizations, from market research to knowledge management, data analytics, policy, human resources and so on, could be explained by foresight taking hold wherever the initial champion (or sponsor) is located.

3A. Doing the Work. The champion/sponsor initiates an activity, whether a presentation, workshop, project, or training activity.

4A. Evaluating Outcomes. This step can be done formally (e.g., follow-up survey) or informally (chat with the client). An internal sponsor may make a formal decision. The participants will also make their own decisions and spread the word either positively or negatively within the organization. If the project works well, team members will talk to their colleagues about it and build interest; if it doesn't go well, that information will also be shared.

5A. Positioning. At this point, with some work done and evaluated, the champion will typically lead an effort to develop a strategy to promote the further use of the SF capability. In some cases, the champion has developed a team and may have brought an external professional futurist on board through contractually approved mechanisms.

3B. Doing the Work. The position activity guides the next batch of work.

4B. Evaluating Outcomes. The next batch of work is evaluated formally or informally.

5B. Positioning. The team decides at some point that enough work has been successfully done and develops a proposal for a more permanent institutional role.

6. Institutionalizing. This activity is when the organization provides a formally recognized role, e.g., integration in formal work processes or on the organization chart.

### *Organizational form*

The Houston Foresight program teaches a module on “Organizational Futures” that suggests there are five major models (Hines 2022) for how foresight is being operationalized inside organizations. Some organizations may choose to follow a blended approach where specific aspects of the models are applied to fulfill the goals. The list below is arranged from least to most integrated:

- Ad hoc projects
- Communities of practice
- Specific functional focus
- Small group with a general focus
- Fully institutionalized

*The Ad hoc projects* model is simply that an organization carries out a foresight project when there is a perceived need and then returns to normal operating mode. While there may be

follow-up on the project, nothing is institutionalized, and when the project is completed, no additional foresight work is done ... until another project is launched.

*The community of practice (CoP) model*, which is the approach expanded upon in this article, is centered on group meetings and collaborative projects. In this model, no one is “in charge” per se, but the discussions and projects are largely led by volunteers, and an individual or an office may take the “sponsoring” role. Volunteers contribute time and effort depending on their availability and interest in a particular topic/project, often with awareness or approval from the supervisory chain. Individuals involved in organizing the CoP may have 10-25% of their time dedicated to it. A challenge this model has consistently faced is that it relies heavily on volunteers willing to participate, and eventually, either the energy fades or the pull of the “day job” leads to a waning of interest.

*The specific functional focus model* is when foresight is brought in to do just one thing. It can be any organizational function, from risk management to market research to new business development. Initially, at least, the foresight work is confined to just one thing.

*The small group with a general focus model* is when 1-5 people are appointed or hired specifically for a foresight unit intended to serve the entire organization. The names vary, from Trends to Innovation to Strategy, and typically are accompanied by an “And Foresight.” The key point is that the specific focus is on doing foresight work, and the applications can be fairly wide-ranging.

*The fully institutionalized model* represents a pinnacle, with foresight integrated into key activities and operations of the organization. Foresight becomes part of the cultural fabric of the organization. It is an essential and integral part of what the organization does. The Shell oil company is widely considered the poster child for this model in the private sector and the Government of Singapore in the public sector, (with acknowledgement to Finland and the United Arab Emirates (UAE), who are coming on strong. (Schwartz 1996; Kuosa 2011; Dreyer and Stand 2013; Wilkinson and Kuipers 2013; Smith 2017).

## **The CDC Foresight Journey**

The initial purpose for establishing SF was to enhance CDC’s capabilities in anticipating public health threats. It is important that SF is an evidence-informed approach with extensive application in the real world. Indeed, the University of Houston Framework Foresight approach that CDC adopted requires extensive research throughout its steps.

The SF journey across CDC is captured in the following sections and involves the adoption of several components of the Foresight Integration Model:

- The origin story: A retrospective horizon scan

- Introduction by champion
- Training: skill building
- The Learning & Action Network (LAN): supporting peer collaboration
- Practice: Tools and projects: applying the learning on the job
- Evaluation: training feedback and design team observation

### The origin story: A retrospective horizon scan

A real-world horizon scanning example was used as an early proof of concept for the CDC. In 2018 and 2019, a pilot was launched as a joint effort by the CDC, led by OADPS (Office of the Associate Director for Policy and Strategy), now the Office of Policy, Performance, and Evaluation (OPPE), with the Association of State and Territorial Health Officials (ASTHO) to explore the increase in head injuries and deaths caused by the use of electric scooters. The e-scooters were beginning to pop up everywhere. While cities and towns did have policies and guidelines on the operational aspects, the consequences to public safety and public health were not anticipated and prepared until accidents, hospital admissions, and even some deaths began to occur (Badeau et al. 2019; Bhavin et al. 2019). The project utilized a retrospective horizon scanning technique to see if an earlier warning could have been developed. Indeed, the process retrospectively identified the early signals of the growing use of e-scooters for wider transportation. While using e-scooters as an easy and convenient alternative to automobiles was appealing, the public health implications, road and pedestrian safety, and other city/local regulations had not been sufficiently explored before the market expansion of e-scooters.

The retrospective scan on e-scooters looked for scan hits between 2014 – 2017. Indeed, weak signals of e-scooters were observed in 2015, at least 3 years before the rapid emergence of e-scooters and unintended public safety and health concerns were realized. There clearly had been an opportunity to get proactively ahead of the problem. This realization prompted members of the OPPE to consider what value SF might add to their efforts. This example served as a proof of concept that horizon scanning approaches may help identify emerging trends and potential disrupters to public health. The authors note that this project generated significant interest from state health officers who preferred to have advance awareness about potential public health disrupters.

This project suggested to the team that horizon scanning and SF indeed had the potential to provide decision-makers with early warnings about potential public health predicaments that would, in turn, enable more timely and appropriate responses.

### Introduction by champion

The successful pilot with ASTHO paved the way to introduce SF across the CDC. The champion for the introduction was OPPE, an organizational entity within the CDC Immediate Office of the Director. Interestingly, it was around the same time that a parallel effort was underway at the National Institute for Occupational Safety and Health (NIOSH), an institute within the CDC.

NIOSH had just begun to introduce SF by working with the University of Houston to conduct training with two dozen employees in October 2020 (Streit et al. 2020).

OPPE organized an SF Forum in September 2019 to kick off and introduce SF to the organization. Dr. Andy Hines, an Associate Professor and Program Coordinator of the Graduate Program in Foresight at the University of Houston, was invited to deliver a keynote presentation on SF and its implications for public health policy. Hines focused on the potential applications of horizon scanning, with the key benefit being that if the organization chooses to do horizon scanning, it “future-proofs” itself against being surprised. Hines then visited with several internal groups and leaders to further discuss the benefits of foresight.

### Training: Skill building

The kickoff event generated interest such that the foresight champion, OPPE, decided the timing was right to introduce SF to a wider audience by conducting a training session open to the full range of organizational members. They enlisted Hines and the University of Houston to design the training. The training goal was to raise awareness of the benefits of SF and to begin the process of skill- and capacity-building.

The training was delayed due to the onset and rapid spread of COVID-19. The training was initially designed to be face-to-face but had to be re-crafted to a virtual platform due to the pandemic. The initial plan was to offer the training to a small cohort. Demand was so great that a second cohort was also trained, thus training eighty participants in total.

The participants were broken into two cohorts of approximately forty each. A key focus of the training was working on a sample foresight project based on the participants' regular work or interest in the spirit of learning by doing. Teams were formed around ten different topics of relevance to public health. The topics were all on “The Future of:

- (1) chronic disease prevention
- (2) climate change
- (3) data collection for intellectual disability
- (4) emergency preparedness
- (5) evidence
- (6) federal grant-making
- (7) infectious disease
- (8) injury prevention
- (9) public health workforce
- (10) social media

The design of the virtual training was to deliver the content in half-day modules and then ask the teams to spend roughly a half-day completing homework assignments. The teams self-organized using meeting tools such as Zoom. Each team submitted group assignments bi-

weekly. The Houston team provided feedback, and the CDC teams updated their project deliverables.

### Strategic Foresight Design Team

The success of the training inspired the champions at OPPE to begin coordinating and planning the rollout of SF more systematically. This new group was dubbed the “Design Team.” Membership was expanded beyond OPPE to include CDC colleagues who had prior exposure to SF principles or expressed passion for foresight principles. An important contribution was coming to an understanding of what strategic foresight means for the CDC. The operational definition of SF that was adopted at the organization is as follows:

*Strategic Foresight is the study of change that uses a systematic methodology to explore the future in order to make better decisions today by helping us move us toward the futures we want and avoid those we don't, and to ultimately build confidence in the future by building our capacity to avoid surprise!*

With a definition in hand, the first order of business, described below, was to establish a CoP (Danemiller and Jacobs 1992; Hines 2003).

### Creation of the Strategic Foresight-Learning & Action Network (SF-LAN)

The next leg in the journey was the Design Team’s creation of a version of the community of practice, dubbed the SF-LAN, which explicitly focused on the concepts of learning together by taking action. It was created as an active network and place for CDC staff to practice and support the understanding and application of SF. The creation of an SF-LAN was based on the following:

- To **solve problems** quickly – they have peers to ask for help who can quickly understand the issue and focus on the heart of the problem
- To help **drive strategy** – inform how to improve what is already underway
- To start **new lines of inquiry** or investment by identifying new perspectives about unmet needs in the field
- To **transfer** promising practices

Specific objectives for the SF-LAN included enhancing scanning and sense-making and sharing best practices. From the beginning, there was an emphasis on bringing in external experts to share their tools, methods, and experiences. It also provided a platform to continue to build on the previous training, including a regular “fishbowl” session in which the UH team would focus on various aspects of CDC SF projects and walk the group through “how they do it” and answer questions. This proved to be valuable in keeping the learning from the training sessions alive and useful.



Figure 1 summarizes the various aspects of the SF-LAN. As the practice of foresight began to spread, the SF-LAN evolved to include discussion of ongoing scanning and full foresight projects.

**INSERT Figure 1. Aspects of the SF- LAN**

Since its inception, a two-hour meeting has been held on the third Thursday of every month. The time is typically evenly split between an external guest speaker presenting on a foresight topic, and the other segment most often features the fishbowl activity.

The external presenters have graciously donated their time to help spread foresight at the CDC. They have come from multiple domains: federal government, non-profit, and academic institutions. Some have been professional futurists, and others have been involved with foresight efforts inside their organizations. The idea is to allow CDC SF-LAN practitioners to learn different approaches and methods from external experts.

The fishbowl involves some aspect of CDC foresight work being reviewed “live” by the UH futurist team to enable the community to get a peek inside the mind of the futurists as they do their work. Members went beyond asking questions addressing “what was decided” to get at the underlying understanding by asking the futurists ‘how and why something was decided’. This led to rapid and practical learning in the participants in building their SF capacity.

Table 1 lists the external speakers and the accompanying LAN topic. They were not designed to be related, although that happened occasionally.

**Table 1. SF-LAN Topics**

<b>Date</b>	<b>Guest Speaker</b>	<b>Fishbowl</b>
December 2020	CDC SF-LAN launch	Introducing Strategic Foresight and Its Benefit to CDC; HORIZON Tool Showcase: A CDC-developed tool for horizon scanning introduction; and Understanding Approaches for Conducting Strategic Foresight.
January 2021	No guest	Scanning and the Diigo* Library  *Diigo is an online resource where scanning hits can be collected, annotated, organized, and shared.
February 2021	Dr. Tom Savel, CDC, Horizon Scanning Tool (Live Demo)	TIPPS (trends, inputs, plans, projections) & Drivers

March 2021	Dr. Dave Bengston, US Forest Service, "Futures Research in the USDA Forest Service"	Scenarios, Pathway Headlines & Vignettes
April 2021	Robin Champ/US Secret Service, Sharaelle /GAO and Eric Popiel/OPM), "A conversation with the Federal Foresight Community of Interest (FFCoI) Co-Chairs"	Implications & Options
May 2021	Glenda Eoyang, Human Systems Dynamics "Pattern Recognition in Uncertain Times"	Organizational Futures
June 2021	Dr. Andy Hines and Laura Schlehuber; "Integrated Strategic Approach," a session focused on informing CDC Leaders of CDC foresight projects	Future of Grantmaking: Getting Started with Scanning
July 2021	Lori Melichar, Robert Wood Johnson Foundation, "Pioneering Ideas for an Equitable Future: A Future-Focused Program at the Robert Wood Johnson Foundation"	Future of Grantmaking: Domain Map Review
August 2021	Eric Popiel, OPM, Applying Foresight and Building Capacity in the Federal Government: the Chief Financial Officers Council Project	Future of Grantmaking Diigo Library
September 2021	CDC Strategic Foresight Project Teams (CDC) "Future of Evidence" and "Future of Laboratory Preparedness"	Future of Grantmaking: Emerging Issues
October 2021	Jonathan Moyer, Pardee Center for International Futures, "International Futures Model"	Future of Grantmaking: Evaluating Scan Hits
November 2021	Jim Lee, Stratfi, "Artificial Intelligence (AI): An introduction using stock market investing as an example."	Future of Grantmaking: Stretching your Scanning
December 2021	Year in Review	Future of Grantmaking: Taking Action
January 2022	Katie King, Knowledge Works, and Joe Waters, Capita, "Using Strategic Foresight to Create Flourishing Futures for Young Children and Families"	Future of CDC Grant Making: Exploring Innovative Approaches Using Strategic Foresight Principles

February 2022	Brian David Johnson and Melissa Smallwood, Arizona State University “Threatcasting Lab”	Future of Grantmaking: Prioritization
March 2022	Robin Champ, US Secret Service, “Foresight at the US Secret Service”	Climate Change and Human Health: Overview and CDC Actions and Priorities and Horizon Scanning Introduction
April 2022	John Sweeney, University of Houston, “Participatory Futures in Practice: Concepts, Cases, and Considerations for Impacting Engagement, Preparedness, and Decision-Making”	Horizon Scanning on Compound Hazards and Climate Change: Public Health Implications
May 2022	Connie Reimers-Hild, Wild Innovation, “Strategic Foresight: A Core Leadership Competency”	Horizon Scanning on Compound Hazards and Climate Change: Public Health Implications
June 2022	Steve Gale, Henry Kotanjyan, and Mary Carenbauer, USAID, “Strategic Foresight: Building USAID Mission Capacity to Tackle Uncertainty”	CDC Team presentations: update/next (Future of Preparedness, Future of Evidence, Future of Grantmaking, and Climate and Human Health
July 2022	Lauren Keller, School for the Future of Innovation in Society, Arizona State University, “A case study of the Future of Aging in Smart Environments”	Climate and Human Health: Compound Hazards
August 2022	Sarah Felknor & Jessica Streit, NIOSH, “Preparing the OSH workforce for sudden disruptions that impact work and working people.”	Climate and Human Health: Compound Hazards
September 2022	Sharaelle Grzesiak, GAO, “Foresight in Government and the Utility”	Horizon Scanning on Compound Hazards and Climate Change: Public Health Implications
October 2022	Directed CDC colleagues to attend the FFCoI session “Foresight is 20/20: Challenges and Opportunities in Congress’ Future.”	No CDC fishbowl
November 2022	Brian Coppersmith, Serco Inc, “Beyond the Basics: Advancing Strategic Foresight Concepts and Methods”	Sense-Making: The Future of Grantmaking

December 2022	Dr. Amir AghaKouchak, University of California, Irvine “Compound and Cascading Hazards in a Changing Climate: Typology, Risk Assessment, and Impacts”	Climate Health and Compound Hazards: Making sense of horizon scanning hits
February 2023	Peter Bishop, Teach the Future, “A Foresight Culture for 21st Century Excellence.	Fireside chat “On Being a Futurist” with Peter Bishop & Andy Hines.
March 2023	Andy Hines, University of Houston	2-hour Activation workshop
April 2023	Andy Hines, University of Houston	3-hour Strategic Foresight Refresher course
May 2023	Wendy Schultz and Victoria Ward, Jigsaw Foresight, “Getting to Where the Rubber Hits the ...Sky. Effective Futures Research and Applied Foresight	Setting up an Agency-wide Scanning System
June 2023	Andy Hines, University of Houston	Scanning for Planning: Kickoff
July 2023	Andy Hines, University of Houston	Scanning for Planning: Building a Scanning Library
August 2023	Rebecca Ryan, “Discernment: How to Make Sense of Trends and Signals”	Scanning for Planning: Building a Scanning Library
September 2023	The NNPHI Experience: Foresight on the Front Lines (National Network of Public Health Institutes)	Scanning for Planning: Building a Scanning Library
October 2023	Andy Hines, University of Houston	Scanning for Planning: Building a Scanning Library/Preliminary Sense Making

There is an SF-LAN listserv for staying in touch between the monthly meetings and alerting staff to relevant presentations and resources. A SharePoint site has also been established to facilitate learning and collaboration among the staff hosting previous recorded sessions and presentations.

Practice: Tools and Projects

*Tools*

A Horizon Scanning tool, aptly called the Horizon tool (beta 1.0 for internal use only), was prototyped and piloted for internal use by colleagues from the Office of the Chief Information Officer (OCIO) for helping to identify emerging public health events via Reddit posts. The tool applies natural language processing and machine learning technologies to rapidly sift through thousands of Reddit posts and comments daily and clusters health-related words and phrases that may contain signals for the future relevant to public health. The Horizon Tool has the potential to automate and accelerate scanning and help identify emerging public health trends.

*Learning by working on high-impact and time-relevant projects*

A key part of the foresight learning journey was a collaboration between CDC colleagues and the University of Houston team to carry out full-scale SF projects (going through all the stages of strategic foresight and leading to a detailed report) – selecting some of the preliminary projects conducted during the certificate course and expanding them into full-scale projects. The goal was to gain hands-on experience in the full life cycle of SF steps and develop a final report with a set of considerations and actions. The project work was shared in the monthly SF-LAN to spread the lessons more widely across the organization.

The projects went through the full UH Framework Foresight process and could draw on the work already completed during the training. Since it was a volunteer effort, the selection was based on which teams demonstrated the most enthusiasm, did the most work, and had the time and will to keep going. In addition, the immediate relevance of the proposed projects to the present public health context was also considered. Accordingly, three teams were selected, and two were combined into one project – evidence and social media.

The two topics were (1) “The Future of Evidence” and (2) “Future of Emergency Laboratory Preparedness.” The “Future of Evidence” explored changes in how evidence is generated and communicated in the future, likely characterized by ongoing uncertainty and frequent crises. The “Future of Emergency Laboratory Preparedness” examined trends in focus areas (e.g., partnerships, regulatory environment, workforce, testing) with the potential to impact national public health laboratory preparedness and response activities.

The work process was unique from the perspective of the University of Houston. The projects were “applied”, in the sense that the teams were encouraged to use the results in their own work, but at the same time, an equally important objective was to teach and to provide hands-on training. The process design thus had to incorporate both objectives. The University of Houston team was led by a Principal Investigator, Research Director, and alumnus, assisted by two teams of five graduate students. Each UH student team was assigned to assist a CDC project team. The typical workflow was that a joint meeting of all the teams and participants would plan work in monthly cycles to coincide with the SF-LAN meetings to share the work with the larger community. The steps were:

**Table 2/ University of Houston Framework Foresight Process and Deliverables**

<b>Activity</b>	<b>Description</b>	<b>Deliverable</b>
<b>Framing</b>	Scoping the project, defining the focal question, and mapping the domain	Domain Description & Map
<b>Scanning</b>	Identifying the current state of play and finding, collecting, and analyzing signals of change	Current Assessment & Scanning TIPPS & Drivers

<b>Futuring</b>	Identifying a baseline and alternative futures using archetypes (continuation, collapse, new equilibrium, and transformation)	Baseline & Alternative Futures
<b>Visioning</b>	Identifying important and provocative implications of scenarios	Implications
<b>Designing</b>	Synthesizing strategic issues (or innovation or policy concepts), developing strategic options for responding, and tying it together into an integrated strategic approach across the futures landscape	Options & Integrated Approach
<b>Adapting</b>	Communicating response, implementing actions, monitoring indicators along the pathway to each scenario	Actions Indicators

The CDC team did the initial work on each step with the guidance of the University of Houston faculty. University of Houston graduate student teams further refined CDC teams' work, and subsequent versions were shared monthly on the SF-LAN. While this approach required a lot of careful scheduling, in the end, it proved workable. These efforts culminated in the development of two reports, and the findings from those reports are in various stages of consideration or implementation within the respective offices.

The University of Houston Framework Foresight process, horizon scanning, and the two projects noted above have been key aspects of internal communications about foresight within the organization. At the beginning of each SF-LAN meeting, the graphic shown in Figure 2 is used to orient participants about the past and ongoing foresight work.

**[Insert Figure 2. Applications]**

The University of Houston Framework Foresight involved initial steps “mapping the future,” followed by sense-making of signals of change to inform action, which we refer to as “shaping the future” (labelled as A). We have initiated a broad horizon scanning process to identify and monitor emerging trends/issues in public health (labelled as B). Conducting projects based on SF complete life cycle and conducting broader or specific-topic-related scanning are two approaches we utilize in the strategic foresight efforts.

Scanning projects

After the two “full” projects were completed, it was decided that a useful next step would be to develop an ongoing scanning capability. One option was to scan broadly for changes impacting

the entire organization. The other was to focus on a particular aspect of the organization. The more focused approach was a smaller-scale option and was decided upon. The Design team went back to the ten teams (minus the three who had just completed the full project) and asked if they had an interest in doing a horizon scanning pilot. Again, the goal was to use shared results with the SF-LAN. In fact, the team's work organized itself around presenting work to colleagues at the SF-LAN.

One team immediately expressed interest in exploring the Future of Federal Grant-making as the topic. CDC is one of the largest grant funders to the states, tribes, territories, and local governments to promote public health. For example, in FY 2021, the Office of Grants Services (OGS) supported 5,648 grant awards to 2,424 recipients. These awards generated 16,433 actions that placed more than \$49.2 billion into public health programs and research around the world. OGS also published 152 new Notice of Funding Opportunities (NOFOs). Overall, there has been increasing interest in the future of federal grantmaking. The enormous increase in funding in recent years made the project timely and relevant (The Pew Charitable Trusts 2022).

While that project was ongoing, the CDC's Climate and Health program was interested in exploring developments in Compound Climate Hazards and their implications for human health. The SF-LAN put out a call for volunteers for this horizon scanning effort and ended up enlisting 40 colleagues from across the organization. A mini training on Horizon Scanning was provided, and the project was launched.

### **Where next: The Way Forward (Evaluation/Impact)**

The SF journey began with enhancing the CDC's capabilities in anticipating public health threats. Over time, as more was learned about SF, additional practical applications were explored, as evidenced by the ongoing projects (Future of Grantmaking and Climate and Human Health: Compound Hazards).

After completing the initial certificate course, the eighty participants were surveyed about their experience.

Several representative questions and responses are presented below.

- In response to a question to rank the overall quality of this training, 40% considered it as excellent, and 47% considered it good.
- In response to a question to rank the level of learning about Strategic Foresight from this training, 34% strongly agreed, and 52% agreed.
- In response to a question on how likely the individual or organizational unit is to incorporate Strategic Foresight into their work at the CDC, 20% responded very likely and 48% likely.

These results showed a broader interest in strategic foresight among initial training participants. In addition, OPPE leadership received informal feedback from interested colleagues and incorporated the suggestions in subsequent planning efforts.

A science leader within the National Center for Environmental Health (NCEH) and a key player in the Compound Hazard horizon scanning project observed that: “Strategic foresight helped us identify new, previously untapped resources and topics of research. While we traditionally look into peer-reviewed literature and request information on science gaps from subject matter experts, we often cannot get perspectives from outside those areas – such as the public, communities, and groups with interest and work in the topic but not scientific or research background. Yet, they are often those most impacted by our work and drivers of change. We were able to expand the Division research agenda as well as the climate health one, thanks to this new methodology.” This statement gives some indication that CDC leaders who have experienced strategic foresight are beginning to apply horizon scanning approaches and to think differently about the research agenda.

### **Lessons: Barriers and responses**

The introduction of any new capability into an organization will confront barriers. Time, budget, and staff are among the major barriers encountered to date, and the approach has relied on the Design Team, SF-LAN volunteers, and external consulting with subject matter experts to guide the effort. Volunteer energy can eventually fade or be overwhelmed by one’s day job. It is helpful to have a professional futurist on staff, but that confronts the typical budget and staffing barriers.

Below are four barriers typical to a foresight introduction and how they have been addressed at the CDC (Hines and Gold 2015)

1. Foresight competes for attention with other priorities. Busy colleagues don’t have time for new initiatives. The notion that “good ideas” would find their way to the agenda is often quickly abused. In this case, the external consultant observed with some amazement that this capability was introduced during the pandemic, and people participated despite an unprecedented and often overwhelming workload. Perhaps that was because SF aligned so well with the need to keep looking forward.
2. Foresight is perceived as threatening. The champions are often overly optimistic in assuming a receptive response from respective institutions and colleagues. In reality, not everyone is comfortable introducing ideas like strategic foresight. At the CDC, this was addressed during the work on the two full projects. There is also concern that in some instances, particular scenarios are not fully developed, and the emerging nature of it may not be ready for full release because of the potential to be misunderstood.
3. Foresight is viewed as intangible. It can be perceived by some colleagues as more of an intellectual activity than about getting things done. This has probably been the most challenging barrier at the CDC, as with most organizations. However, we wish to state



that several positive changes have been observed in recent months. For example, the Future of Emergency Laboratory Preparedness project team has socialized the findings and recommendations with external partners and is beginning to operationalize some critical action items. The Future of Grantmaking project is likely to introduce a few considerations to the upcoming Notice of Funding Opportunities (NOFOs) and encourage the use of foresight principles in strategic planning. Lastly, the Compound Hazards project has led the Division leadership to consider trends observed through non-peer-reviewed sources also to be considered to inform the research agenda. These developments indicate a small but significant cultural shift and positive momentum in applying foresight principles to improve program quality and effectiveness.

4. Foresight capacity requires continuous application in respective offices and needs leadership support and nurturing. What might be called entry-level recognition of future thinking often exists to a degree in many organizations – i.e., the level of trend lists. But to go deeper requires consistent and ongoing work to spread across a large organization. The CDC is slowly and steadily building that capacity via training, and the SF-LAN is taking the next step to re-introduce it to state, territorial, and local public health authorities.

The table below synthesizes the key points about how the CDC experience tracks with the Foresight Integration Model.

**Table 3.** Foresight Integration Model and the CDC Experience

Activity	CDC Experience
Publicizing	An internal seed for strategic foresight was planted in 2016 when the Office of Policy, Performance, and Evaluation (OPPE) conducted listening sessions on trends to inform internal thinking.
Introducing	OPPE invited futurist Dr. Andy Hines to visit the CDC in 2019, which involved a combination of talks and small group discussions with OPPE Leaders and interested members over the course of a day. The conversation initially focused on the benefits of horizon scanning but expanded to cover “how might foresight benefit CDC?”
Doing the work (1)	The introductory activity and subsequent conversations generated interest in conducting a training course. A week-long training activity was set up for 80 participants, along with approximately 30 horizon scanners.
Defining and measuring success (1)	A post-workshop survey yielded positive results that inspired the champion(s) to continue. This step is crucial, as an initial activity judged as a failure can be devastating, if not fatal, to the foresight effort. On the other hand, a successful sentiment can generate internal buzz that expands the potential for more foresight work.

Positioning	<p>A Design Team was formed to guide the ongoing introduction of SF to the organization. The team engaged with key organizational stakeholders and provided strategic guidance.</p> <p>A key element of that strategy, and the key focus of this paper, was the intention to create an internal community of practice that continuously learns and practices. It was christened the SF-LAN (Strategic Foresight Learning and Action Network).</p> <p>A follow-up from the training was to select two of the preliminary projects from the training and effectively convert them into comprehensive SF projects.</p>
Doing the work (2)	<p>In addition to the LAN, the next major work was two comprehensive Foresight projects: The Future of Evidence and The Future of Emergency Laboratory Preparedness. Both projects got their starts as preliminary projects from the Foresight training. The University of Houston brought a full team of faculty, alumni, and students to assist with these projects.</p>
Defining and measuring success (2)	<p>This second evaluation was done informally. After several months of project work, the results were shared with leadership at one of the monthly SF-LAN meetings. They were well received, and further work, this time involving horizon scanning, was launched.</p>
Positioning (2)	<p>This work is underway.</p>
Institutionalizing	<p>The CDC is in the process of integrating foresight into strategic opportunities. An effort to build capacity at the state, territorial, local, and tribal health departments is underway through a cooperative agreement with the National Network of Public Health Institutes (NNPHI). Threatcasting, tabletop exercises, and sense-making are a few examples of the training considered. In addition, strategic foresight principles are being utilized in CDC's DMI efforts in scanning emerging policy and legal developments and how they impact data interoperability and modernization efforts.</p>

CDC colleagues who have gone through the University of Houston certificate course, contributed to foresight projects and are part of the CDC SF-LAN community can scan for emerging trends that can have a harmful, and potentially disruptive impact on public health. Participation and contribution to SF efforts are completely voluntary. CDC strategic foresight efforts have received visibility and attention among CDC colleagues, as evidenced by a gradual increase in projects and CDC efforts recognized by external foresight scholars and federal agencies. For example, an independent report on strategic foresight across the US federal government mentioned CDC SF-LAN as an example of "Green Shoots of Strategic Foresight" (Scoblic 2021). The US OPM 2022 Federal Workforce Priorities Report highlighted the CDC

Strategic Foresight Learning & Action Network (SF-LAN) as an example of “promising agency practices.”

### Lessons for foresight

Spreading the word about foresight and getting more people and organizations interested and involved is a key priority (Scoblic 2021). But we have relatively few models and cases for how to do it. This case illustrates one pathway and provides some valuable insights and lessons. It is particularly noteworthy that the CDC has been extremely eager and open to learning from how others did it. In the case, the Federal Foresight Community of Interest (FFCOI) community of practice has provided valuable lessons in sharing their experiences. Clearly, there are opportunities for the field to ease the journey. It was interesting to see the CDC first “test” the idea of foresight with an association representing state, tribal, local, and territorial health officials. Might this suggest to futurists that associations could be equally valuable partners in providing test beds for their members to try out foresight?

The integration of foresight proceeds at varying degrees of speed depending upon the external circumstances. The community of practice-driven approach that relies largely on volunteers is likely to take longer than an approach with staff, budget, and a fixed position on the organization chart. This approach has to convince people that it is worth volunteering their time amongst many competing priorities, including an unprecedented global pandemic directly drawing tremendously on agency resources. Foresight can be vexing in that it deals with ideas about the future that resist conventional vetting efforts comforting to a science- and evidence-based organization. Despite these challenges, the Design Team is busy planning for the next stage in the foresight journey. SF-LAN community continues to be the hub of the foresight activity.

In addition, the initial SF efforts coincided with the emergence of the COVID-19 pandemic, followed by CDC emergency responses for COVID-19 and other re-emerging disease outbreaks (Ebola in Africa, Polio in the US, and Monkey/Mpox around the world). These multiple emergency response activities might have made the agency more focused on outbreak responses than on a newly introduced concept like strategic foresight.

In spite of the process and progress described here, challenges remain before foresight is fully integrated and institutionalized. CDC employees consider themselves part of a scientific or evidence-driven organization/culture, and strategic foresight is inherently about the future. At this time, there is no evidence to show an adverse event was averted or a particular condition (health or social) was improved because of the horizon scanning and strategic foresight projects. That might account for the continued need to institutionalize SF at an agency such as CDC. Void of direct causal chains illustrating SF made a difference. We expect the uptake to be slow. It could be very similar to the public perception of primary disease prevention because it may be harder for the public to realize how primary prevention may have saved lives as opposed to the mortality and morbidity caused by a disease condition.

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