Creating a Vision for a Healthier Workforce Using a Systems-Based Approach

Laurie Walkner, MA, RN; Kathleen May, MPH, CHES; Bailey Goldman, MPH; Hannah Shultz, MA; Sonja Armbruster, MA; Brandon Grimm, PhD, MPH; Suzanne Hawley, PhD, MPH, LP; Abigail Menke, MPH, CPH; Shirley Orr, MHS, APRN; Kristin Wilson, PhD, MHA; Jeneane Moody, MPH; Tanya Uden-Holman, PhD; Kaci Ginn, BA

ABSTRACT

Context: The public health system faces unprecedented challenges due to the pandemic, racism, health inequity, and the politicization of public health. At all levels of the system, the workforce is experiencing distress, burnout, safety issues, and attrition. Public health is being challenged to demonstrate and justify its impact and value, while also leveraging opportunities for learning and system strengthening.

Program: To explore the current state and identify opportunities to strengthen the public health system, the Region 7 Midwestern Public Health Training Center (MPHTC), with support from Engaging Inquiry, embarked on a distinctive type of systems analysis, called "dynamic systems mapping."

Implementation: This approach brought together diverse sectors of public health partners in the region to develop a rich contextual narrative and system-level understanding to highlight and align existing and emergent strengths, areas for growth, and tangible goals for the immediate- and long-term sustainability of local and regional health.

Evaluation: Focus groups and workshops were conducted with diverse practitioners to identify upstream causes and downstream effects of 11 key forces driving system behavior. These focus groups resulted in the development of a visual map that MPHTC is utilizing to identify opportunities for leverage, develop strategies to maximize the potential impact of these leverage points, as well as facilitate continuous learning.

Discussion: Public health utilization of systems mapping is a valuable approach to strengthening local and national system responses to current and future public health needs. Outcomes and lessons learned from the systems mapping process are discussed.

KEY WORDS: public health workforce, systems practice, training, workforce development

Author Affiliations: *Midwestern Public Health Training Center at the University of Iowa College of Public Health, Iowa City, Iowa (Mss Walkner, May, and Ginn and Dr Uden-Holman); Engaging Inquiry, Durham, North Carolina (Ms Goldman); Feeding America, Chicago, Illinois (Ms Shultz); Wichita State University College of Health Professions, Wichita, Kansas (Ms Armbruster and Dr Hawley); University of Nebraska Medical Center College of Public Health, Omaha, Nebraska (Dr Grimm); Saint Louis University College for Public Health & Social Justice, St Louis, Missouri (Ms Menke and Dr Wilson); SOCO Consulting, Wichita, Kansas (Ms Orr); and Des Moines University, Des Moines, Iowa (Ms Moody).*

This work is supported by the Health Resources and Services Administration grant no. UB6HP31688.

The authors thank Joy Harris for socializing the systems map, Melissa Richlen for editing the figures, MPHTC Regional Steering Committee members for their guidance during the process and sharing stories from the field, focus group participants, and those interviewed for sharing their experiences.

The authors declare that they have no conflicts of interest.

Correspondence: *Laurie Walkner, MA, RN, Midwestern Public Health Training Center, University of Iowa College of Public Health, 145 N. Riverside Dr, Iowa City, IA 52242 (laurie-walkner@uiowa.edu).*

DOI: 10.1097/PHH.0000000000001523

The Midwestern Public Health Training Center (MPHTC), which serves the US Department of Health and Human Services Region 7 (Iowa, Kansas, Missouri, Nebraska), aims to build the capacity of the public health workforce (PHWF) through collaborative partnerships and workforce development expertise. MPHTC's Regional Coordinating Center (RCC) is housed at the University of Iowa College of Public Health. MPHTC's academic partners include the University of Nebraska Medical Center College of Public Health, Saint Louis University College for Public Health and Social Justice, and Wichita State University Department of Public Health Sciences. These academic partners, along with the RCC, provide expertise in training the current and emerging PHWF, as well as collaborate with a range of public health and cross-sector partners in their states.

When reviewing the current landscape, the PHWF faces challenges at multiple levels. Nationally, the PHWF has been dwindling. The National Association of County and City Health Officials conducted the 2019 National Profile of Local Health Departments, which found that the estimated number of local health department employees has decreased by 17% since 2008.[1]

In Region 7, challenges faced by public health departments include an aging population, rurality, and the pandemic. Many of the public health agencies are small and geographically isolated with limited resources, making it more challenging for the PHWF to meet community needs.

COVID-19 also brought about complex issues for the PHWF who have been at the forefront of the response. These challenges include effectively communicating public health's role and value, building strong partnerships, implementing evidence-based interventions and policies, and advocating for public health. Coupled with the need to implement upstream strategies that support public health's mission for "assuring the conditions in which people can be healthy,"[2] this work has become more daunting.

Although there are many challenges, the PHWF remains essential to protecting and improving the public's health. As a capacity-building entity, MPHTC recognized an opportunity to support critical learning during this time of great challenge, with minimal burden to those in pandemic response. To that end, MPHTC and its partners embarked on a systems practice journey in the fall of 2020. Systems practice provides critical insights into how we might strengthen efforts to effectively address current and emerging challenges. The aim is to gain clarity about these complex challenges and how they affect the PHWF's ability to impact community health.

Approach

The essential work of public health is grounded in the recognition that there are many diverse, yet interconnected factors that influence the ability to achieve and maintain health.[3] While the value of systems thinking in public health is not new, and continues to build, it has been difficult to identify tools and methods for bringing theory to practice, let alone foster uptake across the workforce.[4] Still, there is strong agreement on the need to increase workforce capacity to better understand and engage complex challenges and bring together diverse partners for collective action.[5]

The systems practice approach applied by Engaging Inquiry (engaginginquiry.com) brings together the fields of sociology, engineering, and community development to create an actionable process, tools, and mindset shifts to understand and engage complex challenges with diverse partners. This process optimizes building relationships and shared understanding, making visible social complexity and interconnectedness of different parts of a system, and creating strategic alignment so that partners across sectors have pathways for applying high-impact shifts toward system transformation. Using participatory methodologies, narrative data, and system visualization software, maps are developed to understand and communicate essential details of context and change potential in a dynamic way.

This process takes place through 3 phases, Gain Clarity, Find Leverage, and Act Strategically, which then inform their repetition through experimentation, learning, and adaptation. MPHTC has completed the first 2 phases, which are explored through this article. While strategic action is undertaken in later stages of the process, this act of system convening and alignment fostered in the initial phases is a first intervention in the system. Participants build knowledge and capacity for applying systems strategies, seeing from other perspectives, and situating themselves as part of the larger system. This is demonstrated through the ability to narrate systemic patterns from local perspectives, use energy and "bright spots" in the system to identify opportunities for change, and apply map tools to external initiatives.

Methods

A primary factor driving this process is the involvement of key stakeholders representing the breadth and depth of the system. There are 3 levels of involvement:

- The *core team* plans and implements the process. MPHTC's academic partners from each state lead this team.
- The MPHTC Regional Steering Committee (RSC), composed of more than 30 academic and practice partners from across the region, serves as the *extended team*. It contributes contextual expertise during engagement activities and provides introductions to a wider network.
- A larger group of *participants* at the local, state, regional, and national levels, including students, provide expertise.

This journey is facilitated by Engaging Inquiry, which coaches and cocreates this experience with MPHTC to apply new ways of listening that disrupt power dynamics and honor multiple ways of knowing for deep participation across differences.

To foster the preconditions necessary for a successful effort, the core team asked the following questions: (1) "What would the system look like and produce if

it were healthy?" and (2) "What do we most need to understand about where we are now that will help us move closer to that desired state of health?" The answers were used to create the Guiding Star and Framing Question. The Guiding Star represents the collective vision and long-term goal for a healthier, more resilient system. This statement offers an inspiring, yet concrete goal that can bring together a range of perspectives. Even those who may not seem to agree on the nature of the problem, or the best approaches to resolving it, can find common ground here. It also provides guidance when prioritizing change activities by allowing participants to ask: "How will this move us closer to our goal?" The Framing Question begins the inquiry into where we are now. This question convenes the system to more deeply understand the essential forces and patterns of behavior that are leading to outcomes of interest. It also guides what perspectives must be engaged to produce a comprehensive representation of the system.

The first phase, Gain Clarity, is focused on understanding how the system operates in its current state. In systems practice, a system is defined as "a diverse set of parts that interact with each other, and their environment, in ways that are dynamic and often hard to predict." Given MPHTC's positioning, the focus of this inquiry is the Region 7 PHWF; however, the true state of the workforce cannot be understood without recognizing the broader complexity and interconnectivity it experiences.

First, through a participatory force field analysis with a group of 25 practice partners, 11 essential forces that either enable or inhibit the PHWF's ability to demonstrate impact and value of public health for the whole of the population were identified. Next, focus groups convened around each force to analyze upstream causes and downstream impacts it has on the system. These analyses were used to identify patterns that were developed into causal feedback loops, as seen in Figure 1.

Causal feedback loops fall into 2 categories: reinforcing loops and balancing loops. Reinforcing loops represent patterns in which one time around the cycle continues to reproduce, or build, the initial force. These patterns can either be vicious (bad) or virtuous (good) depending on our valuing of what a healthy system looks like. In balancing loops, however, one time around the cycle either stops or reverses the initial force. There are 2 types of balancing loops: those that are stabilizing (when a pattern begins as a negative force in the system but is mitigated by other systemic interactions) and those that are stagnating (when an element begins as positive but is disrupted by other systemic interactions) (Figure 2).

Once all themes were analyzed and loops developed, repeating factors and relationships were brought together to create the central driving loop of the system—the Deep Structure. From there, insights and patterns across the remaining loops were interwoven to create a comprehensive map of the system.

To test and refine the map, stakeholders across Region 7 participated in small groups to engage with the map and narrative. They were asked what resonates, surprises, and needs clarification and who would be valuable to speak with to deepen understanding. Stories and examples of how key patterns from the map were showing up in their community were collected. Feedback was incorporated into the map and

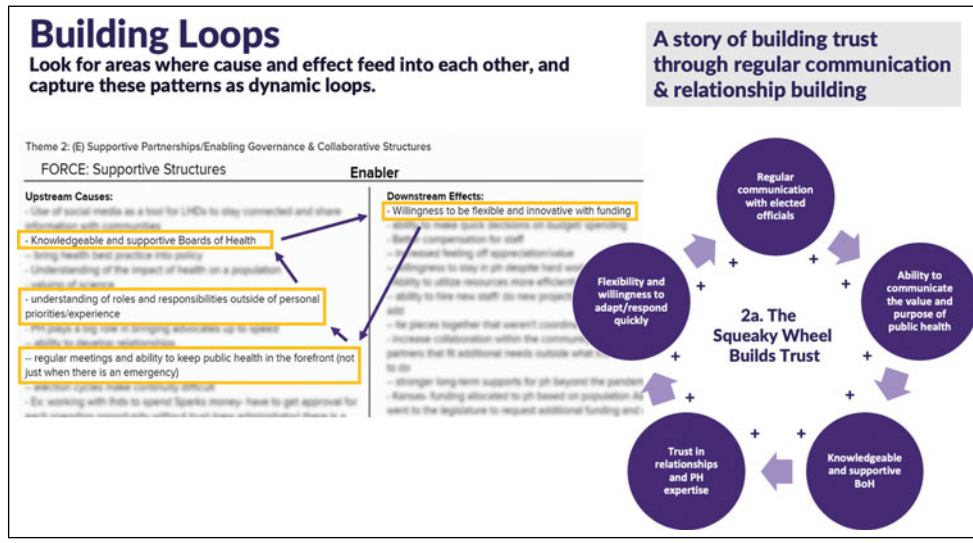

FIGURE 1 Building Loops Using Upstream Causes and Downstream Effects
This figure is available in color online (www.JPHMP.com).

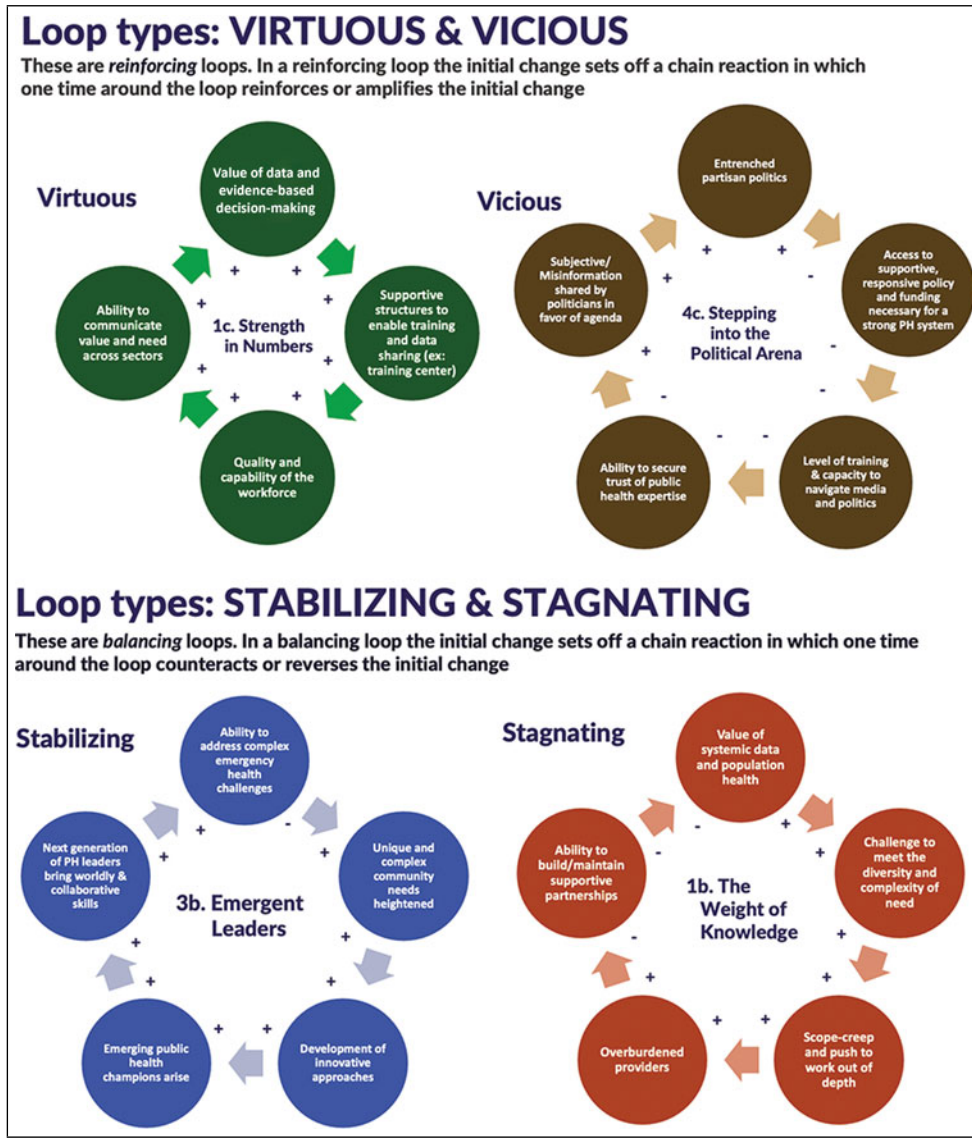

FIGURE 2 Virtuous, Vicious, Stabilizing, and Stagnating Loops
This figure is available in color online (www.JPHMP.com).

narrative, as well as used as specific descriptive data to reinforce the causal loops, as the example in Figure 3 shows.

Following socialization and map updates, the team moved to the leverage phase. In virtual workshops with stakeholders, factors of the map were labeled with the types of energy they held: frozen, showing energy for change, a bright spot, mixed bag, or areas with ripple potential. Using the energy and assets present in the system, participants identified areas with leverage potential (where a relatively small input could have an outsized impact) and created systemic change hypotheses. By facilitating participants through an empirical process of assessing systemic data, they were able to move away from preferred solutions and "unlock" the deeper change the system was calling for. These data were synthesized by Engaging Inquiry, highlighting mutually reinforcing areas for high-leverage engagement, how dynamics would be affected, and key insights for successful action.

Results

Gain clarity

MPHTC began by defining a vision for the healthy system, our Guiding Star:

> A valued and capable Public Health system that is seamlessly interwoven within communities and across institutions to provide adaptive, respectful,

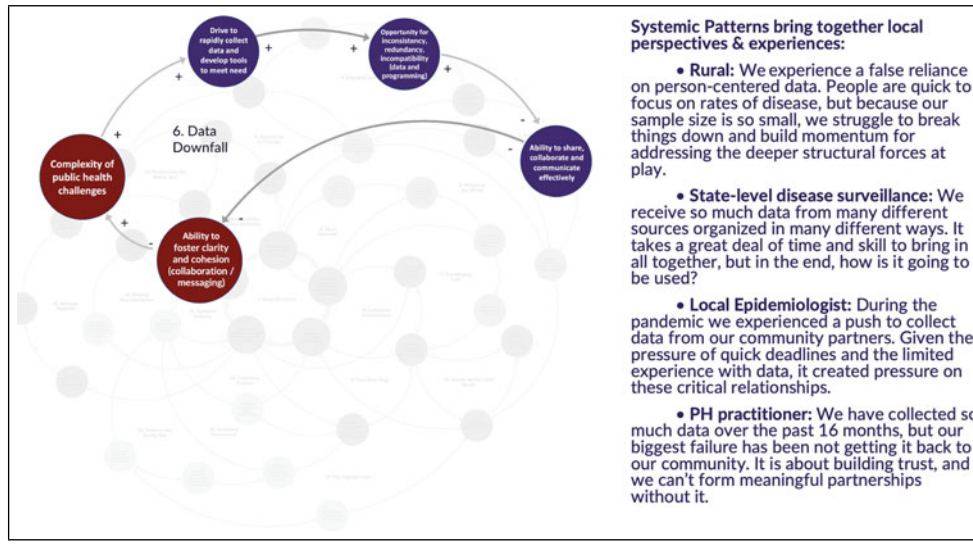

FIGURE 3 Systemic Patterns in Data Downfall
Abbreviation: PH, public health. This figure is available in color online (www.JPHMP.com).

and informed leadership that enables health and dignity for the full, beautiful diversity of our population.

A Framing Question was created to gain a deeper understanding of the system:

What forces account for the current ability of the public health workforce to demonstrate impact and value of public health for the whole of the population?

The MPHTC RSC met to uncover what forces are enabling or inhibiting us from demonstrating impact and value for the whole population. As a result, 11 forces that drive system behavior were identified (Table).

The cause-and-effect analysis, produced through small focus groups, formed cross-perspective and multileveled data to explain the forces. Forty-three causal feedback loops were developed from these analyses, providing the building blocks of the systems map.

Systems map

The dynamic systems map provides an engaging and informative visual of the system's complexity and interconnectivity (Figure 4). Beginning with the Deep Structure, the map's 19 loops offer a cohesive narrative of system behavior and their implications. The loops fall into 5 areas amplifying lived experiences.

TABLE
Enablers and Inhibitors[a]

Center	Inhibitors
Workforce adaptability and systemic lens	Politics and authority conflicts
Supportive partnerships/enabling governance and collaborative structures	Lack of value and understanding of public health
Committed and skilled workforce/shared vision	Lack of understanding of equity and systemic racism
	Competition and silos
	Challenges to effective communication/mistrust
	Challenges to health and mental health of the PHWF
	Barriers to data access
	Lack of representation in the workforce

Abbreviation: PHWF, public health workforce.

[a] *Participants were guided to designate these "forces" based on how they were most significantly experienced in relation to the Framing Question. This does not mean they are not also experienced in the alternative. These "bright spots" or "downsides" are noted and explored in more depth within the map tool and leverage analysis.*

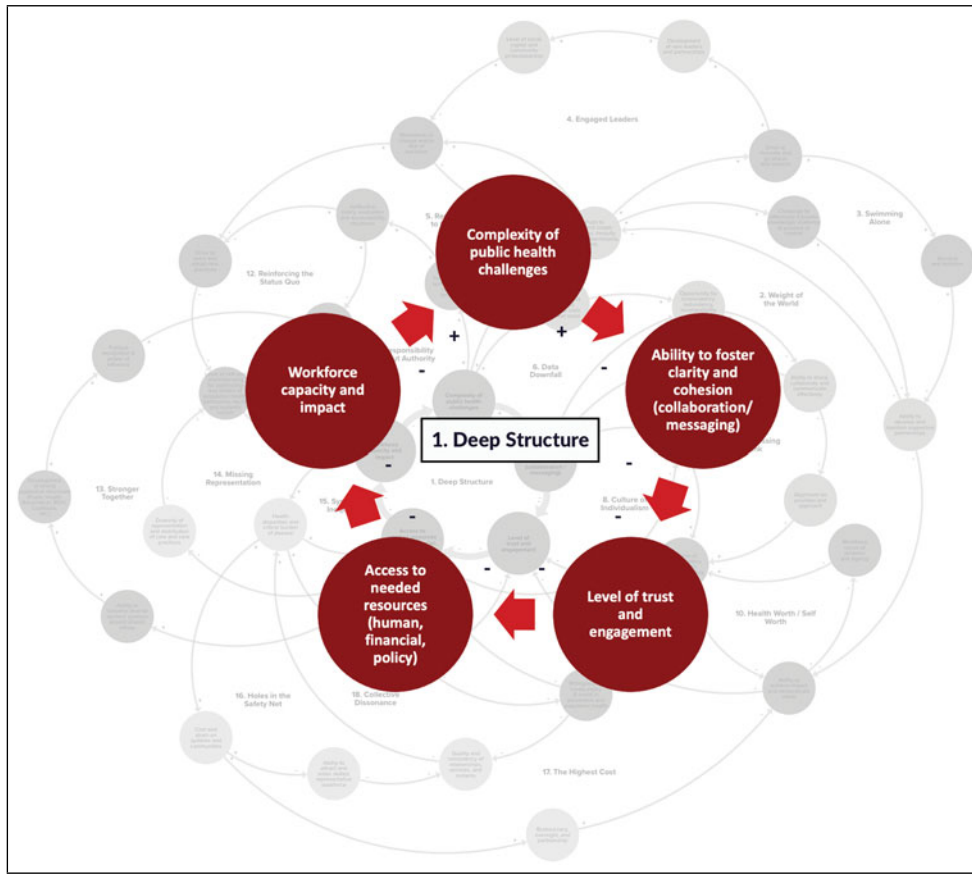

FIGURE 4 Deep Structure of Systems Map
This figure is available in color online (www.JPHMP.com).

Deep structure

The complexity of public health practice, and challenges it seeks to address, ignites passion and innovation within the workforce but creates challenges to building clarity and alignment both internally and externally. Within public health, lack of clarity in role can lead to weakened internal cohesion and limited collaboration across programs and levels of service (local/state/regional). Similarly, with external stakeholders, this creates a risk of inconsistent or ineffective messaging and barriers to fostering the value of public health necessary for supportive partnerships.

With poor alignment across the multiple spheres of practice, levels of trust and engagement with the PHWF diminish. Without the trust and engagement of essential stakeholders (community members, political leaders, etc), the ability to secure needed resources is reduced. These resources include adequate workforce, funding, infrastructure, and policy/authority—all of which are essential for bringing the expertise of public health into practice. As a result, public health challenges, such as COVID-19, are impossible to control, inequities persist and worsen, and strain on the system increases.

As capacity of the PHWF is reduced, passionate and driven practitioners experience burnout and lack of appreciation. Overwhelmed, it becomes challenging to pursue new knowledge and practices. With little incentive to join, develop, or stay, the skill and representation of the PHWF do not match the intersectionality of the public's identity and distribution is unequal across settings.

With workforce capacity compromised, the ability to translate research and values into practice, both in times of health and in times of urgency, becomes difficult. Thus, the challenge of effectively understanding, communicating, and improving the public health challenges of our time becomes more complex.

Communication and partnerships

The loops in this section demonstrate patterns of developing and maintaining critical partnerships and pathways for collecting and sharing data both within and beyond public health. In the face of great need and complexity, the pathways that we take, whether it is shouldering the burden alone or seeking to connect and build partnerships, influence the impact and trust we foster.

Values and investment

These loops tell the stories of political forces influencing public health autonomy and authority. This contributes to perception and bias that drive behavior at the local, state, and national levels ranging from community engagement to resource distribution.

Structural inequity

These loops reveal how various communities have differing historical relationships to public health and how these perspectives and collective memories contribute to opportunities and challenges of building quality relationships within the PHWF and between the PHWF and community. The loops speak to racial and regional inequities.

Barriers to change

These loops share stories from the system that speak to the complexity of public health, placing unmatched weight and expectations on the PHWF to address and heal physical, social, and emotional needs from the community. This forges pathways for champions, as well as toward burnout.

Focus groups and interviews were conducted with a broader group of participants to collect additional stories and experiences to validate and refine the system. Through these conversations, we gained deeper clarity on the forces, patterns, and behavior of the current system.

An interactive systems map provides the narrative description accompanying community stories for each loop (https://kumu.io/engaging-inquiry/midwestern-public-health-training-center#theory-of-context).

Find leverage

The next phase of the journey is to find leverage, areas where a relatively small input could achieve outsized impact on system behavior. Through participatory methods, a group of multisectoral stakeholders identified 5 areas with potential to shift system dynamics: (1) burnout and isolation, and supportive partnerships; (2) data collection, and clarity and cohesion; (3) level of trust and engagement; (4) workforce capacity and impact, and skills for complex challenges; and (5) ability to attract and retain a skilled and representative workforce. They conducted iterative, systemic analysis in each area, which was then synthesized into 4 leverage hypothesis:

Hypothesis 1. Culture shift: Caring collaborations

If we work to foster a culture shift to value our own health, then we will unlock new potential for sustainable partnerships that increase our ability to achieve impact and demonstrate value, all the while reinforcing health and purpose in the workforce.

Hypothesis 2. Value shift: Data as communication

If we support new capacity and thinking around data as a tool for communication, then we will increase the ease and effectiveness with which we engage with key stakeholders. This will allow for greater cohesion and collaboration across the system with public health as a valued and trusted partner.

Hypothesis 3. Opportunity shift: Expanding the pathway

If we expand the PHWF pathway to begin earlier, include more diverse pathways, and have less limiting human resource policies, then we will be able to attract and retain a workforce with greater representation and skill. This will increase the quality of services and community embeddedness necessary for making a real impact on health disparities.

Hypothesis 4. Positional shift: Training for the future

If we develop a regional training plan that centers the needs of a 3.0 workforce (Justice, Equity, Diversity, Inclusion) and releases what is no longer serving us, then we will build a workforce that can apply requisite knowledge and skills to address the most critical health needs of our time. This will increase impact, as well as build trust and bring new resources to the field.

While unique, these hypotheses are interconnected and mutually reinforcing. In addition, themes around building trust and engagement, cohesive partnerships, demonstrating value, and strong communication are woven throughout. The next phase of the journey, "Act Strategically," will support strategies that test these hypotheses and measure their impact.

Discussion

With codesigned regional strategies for high-impact systemic action in place, the next step is to identify opportunities to pivot current practice and policies toward greater alignment with these guidelines, engage additional stakeholders and partners, and utilize these tools and learnings to attract necessary resources to the system. By designing at the systems level, insights into opportunities for change, as well as barriers to avoid, are applicable across sectors and levels of influence. For example, a local health department can

ask itself (in response to Find Leverage Hypothesis 2), "How might we shift our data collection process so that it is a learning experience for our community?" Even small pivots, when they are aligned and happening at scale, can be transformative.

As these pivots begin to take shape across the region, a supportive structure for bringing learning together, working to address challenges, and expanding what is going well is essential for sustainability of this effort. Systems are stronger and more resilient when they are highly connected. Creating pathways for support and accountability, as well as collective advocacy, will maximize potential impact. The second phase of Engaging Inquiry's work with MPHTC's coalition of systems partners will support the development of this structure, as well as intervention design and assessment.

Taking a systems approach to strengthening the PHWF in Region 7 is critical to the mission of MPHTC. A participant summed up the overall perspective from stakeholders: "We're training PH 3.0 students for 2.0 jobs, funded by 1.0 elected officials." At the regional level, systems practice has given us the opportunity to discuss how to better prepare the emerging workforce. We need to ask and answer the following questions: "How do we recruit and retain a diverse workforce into the current environment?" "How do we create a culture of lifelong learning?" "What does a learning organization that fosters innovation and creativity look like?" and "How do we build support for public health investment?"

At the state level, Iowa is establishing a statewide PHWF development coalition that will benefit from this systems analysis. Discussions with partners have focused on embedding health equity and mental health training within organizational culture and expanding into the community. Other evolving conversations have centered on making training more engaging, accessible, and transferable by taking a community of practice approach. Kansas's longstanding PHWF development coordinating council was included in the systems work and plans to consider its implications in future planning efforts. Recently, Kansas presented how this process can support building a culture of resilience in the region.[6] It is anticipated that the results of this mapping process will be shared at a variety of statewide conferences to foster dialogue and critical thinking among public health practitioners. Missouri is examining public health from a systems perspective. These results will help inform strategies around health equity and the implementation of the Foundations in Public Health Service model developed through #HealthierMO, a collaboration of public health partners across the state. Nebraska is currently accessing the strengths, gaps, and opportunities for the governmental public health system. The process has included a visioning retreat with state, local, and tribal health leaders. The systems map provided leverage points for concerns with data, policy, training, and equity that impact the health of communities.

Implications for Policy & Practice

- Greater alignment across the system/region maximizes political voice and capital.
- Recognition that the challenges we see "out there" in the system are also happening within public health. We must turn our lens of prevention and health promotion inward so that we might have the greatest chance of impact on the larger population.
- Dynamic tools and participatory methods are necessary for effectively understanding and engaging the complex social/political factors influencing the most critical health challenges of our time.
- Strong, engaged coalitions of cross-sectoral actors are key for systemic learning and engagement—sustainability, expanded impact, and stronger partnerships in the future.
- Greater movement toward health equity is essential in building workforce capacity.

Limitations

This journey was faced with its own challenges and limitations. Most significantly, public health professionals were overwhelmed responding to a pandemic, limiting time for participating in workshops and focus groups. However, those involved with the process were very generous and highly engaged. In addition, using virtual engagement may not have been as robust as in person, given potential challenges with using digital technology for some. On the contrary, we were able to achieve greater access and participation from stakeholders across the region for whom travel may have been a barrier.

Conclusion

A valued and capable public health system is dependent on having a skilled and adaptive workforce to address complex challenges. The public health training centers are equipping the current and emerging workforce with the knowledge, skills, and tools needed to address these challenges. MPHTC and partners found the systems practice approach highly beneficial for gaining understanding and alignment

around high-leverage opportunities for shifting the PHWF to a greater state of health.

References

1. National Association of County and City Health Officials. 2019 National Profile of Local Health Departments. https://www.naccho.org/uploads/downloadable-resources/Programs/Public-Health-Infrastructure/NACCHO_2019_Profile_final.pdf. Published 2019. Accessed November 1, 2021.
2. DeSalvo K, Hughes B, Bassett M, et al. Public health COVID-19 impact assessment: lesson learned and compelling needs [discussion paper]. *NAM Perspect*. 2021;2021:10.31478/202104c.
3. Singh GK, Daus GP, Allender M, et al. Social determinants of health in the United States: addressing major health inequality trends for the nation, 1935-2016. *Int J MCH AIDS*. 2017;6(2):139-164.
4. Chughtai S, Blanchet K. Systems thinking in public health: a bibliographic contribution to a meta-narrative review. *Health Policy Plan*. 2017;32(4):585-594.
5. Office of the Assistant Secretary for Health, US Department of Health and Human Services. Public Health 3.0: a call to action to create a 21st century public health infrastructure. https://www.healthypeople.gov/sites/default/files/Public-Health-3.0-White-Paper.pdf. Published 2016. Accessed November 1, 2021.
6. Hawley SR. Mental health and resiliency for public health practitioners and their community. Online paper presented at: Region VII Academic Health Department Conference; October 14, 2021.