POPULATION HEALTH MANAGEMENT
Volume 24, Number 2, 2021

DOI: 10.1089/pop.2020.0119

How to Respond to the COVID-19 Pandemic with More Creativity and Innovation

Alison K. Cohen, PhD, MPH,[1] and Johnathan R. Cromwell, DBA[2]

Keywords: COVID-19, creativity, innovation, pandemic, problem solving, public health, public health practice

The COVID-19 pandemic is a ''wicked problem'' that is characterized by multiple competing problems that seem to conflict with each other,[1] such as protecting lives versus preserving livelihoods. However, this problem can potentially be addressed through more creativity and innovation, which has already begun in response to the pandemic. Some innovations have helped reduce exposure to the coronavirus, such as alcohol distilleries producing hand sanitizer, and do-it-yourself makers 3D printing face shields. Other innovations have helped increase health care capacity, such as engineering firms creating new ventilator machines,[2] and pharmaceutical companies repurposing existing drugs to alleviate COVID-19 symptoms.[3] We argue that to help solve this global, wicked, and dynamically changing problem, the public health sector must continue to support, promote, and even expand on these innovative efforts by using creative problem-solving techniques.

To do so, the sector needs to broaden its norms, processes, and infrastructures by adapting its views on uncertainty. For example, in a 2017 survey of local and state governmental public health department employees, less than half reported that creativity and innovation were rewarded at work,[4] which is an essential condition for creativity in organizations.[5] Therefore, we recommend that people from all levels and domains of public health, from frontline health workers to government leaders, must not only try to reduce uncertainty during decision-making, but also embrace uncertainty as they search for new and better solutions to problems. We draw on literature from organizational creativity and innovation to propose a framework for creative problem-solving that can help people navigate this uncertainty more effectively and promote more creative and innovative responses to COVID-19.

A Framework for Creative Problem-Solving

Creativity and innovation refer to 2 different stages of the same underlying process. Creativity involves producing novel and useful ideas to solve a problem,[6] and innovation involves implementing and refining those ideas to create a tangible product, process, service, or technology that an end user can adopt.[7] In the COVID-19 context, creativity may involve any effort to produce new ideas aimed at solving a problem related to the pandemic, and these ideas become innovations after they have been fully developed into a final outcome that benefits an end user—such as hand sanitizer, ventilators, or face masks.

At its core, creativity is a problem-solving process that is fundamentally affected by the environment in which people operate.[8] Important dimensions of the environment that affect creativity include the range of problems that need to be satisfied (eg, goals, objectives, criteria) and the resources available to develop a solution (eg, knowledge, materials, finances, time).[9] Together, the scope of possible problems and resources related to a task shapes the total knowledge landscape that people must navigate as they search for novel and useful solutions to problems. The COVID-19 pandemic significantly expanded the scope of possible problems to solve while also constraining the resources available to develop solutions to those problems. The fluctuation of problems and resources over time influences how much uncertainty people experience during the process. Research shows there are 2 particularly effective problem-solving processes people can use to navigate through this uncertainty to be more creative: directed creativity, when people start with a clearly defined problem and navigate through uncertainty to search for a solution, and emergent creativity, when people start with a partially developed solution and navigate through uncertainty to search for problems.[9]

When people experience high levels of uncertainty over both the problem and solution, they can suffer from excessive stress, anxiety, and frustration because they have too many options to choose from and do not have clear guidance on where to direct their effort.[10] As a result, creativity suffers.[11] To alleviate this issue, it is essential to anchor the problem-solving process on a single dimension of the knowledge landscape (ie, the criteria of a problem, the resources for a solution), allowing people to embrace uncertainty over the other dimension and conduct a more effective search.

Departments of [1]Public and Nonprofit Administration and [2]Entrepreneurship, Innovation, and Strategy, School of Management, University of San Francisco, San Francisco, California, USA.

One effective process is called directed creativity, in which people anchor their effort on a clearly defined problem and then engage in a broad search across resources to develop viable solutions to the problem.[9] For example, once it became clear that COVID-19 affected the lower respiratory system, it provided a clear target for companies to mobilize resources toward designing new ventilator machines that could be manufactured quickly, efficiently, and at volume.[2] Directed creativity is effective because people are more likely to be creative when they generate many divergent ideas during the creative process,[12] which is facilitated by having access to more resources[12] and applying knowledge from different domains to the problem at hand.[13] Furthermore, by working on a clearly defined problem, people can more easily determine which ideas are most useful,[14] helping them avoid the negative feelings of excessive choice and reducing conflict in diverse teams.[15]

However, many problems can be vague, ambiguous, and open-ended, making it difficult for people to define a problem clearly at the beginning of the process. Under these conditions, it may be more effective to use emergent creativity, in which people anchor their efforts on a particular resource or piece of the solution, and then engage in a broader search across problems that can be solved by those resources. For example, a more open-ended problem from COVID-19 has been how to maximize quality of life as people avoid unnecessary human contact. To address this issue, two friends created a new virtual dating game that emphasizes the mystery of physical distancing as people virtually get to know each other.[16] Furthermore, in emergent creativity, new problems can emerge as people explore the range of possible problems that can be solved with various resources.[17] For example, in Madrid, using nothing more than social media and their balconies, people coordinated a safe mass appreciation for essential workers at the height of the pandemic.[18]

Both directed and emergent creativity can help people navigate through uncertainty to develop creative solutions to problems. Sometimes, these efforts can even result in breakthrough solutions that solve a wicked problem. For example, COVID-19 has upended both public health and the economy, often sacrificing one for the other. The most creative solutions can resolve this tension and fully satisfy both competing demands,[19] such as when the local and state governments in California paid hotels a discounted rate to house health care workers and/or the homeless.[20] This solution not only protected vulnerable populations, but it also kept hotel workers employed. Altogether, there are many different levels of creative solutions, including less creative existing solutions to existing problems, new solutions for existing problems or existing solutions for new problems, new solutions to new problems, and maximally creative breakthrough solutions for wicked problems. All of these solutions are welcome and necessary as we collectively respond to COVID-19.

Facilitating More Innovation in the Public Health Sector

There are several ways that the public health sector can broaden its norms, processes, and infrastructures to help creative ideas become tangible innovations that have a positive benefit for our society in these unprecedented times. First, at a broad level, all members of the public health sector can adopt new norms and attitudes about the role that uncertainty plays during decision-making. Public health always grapples with uncertainty, but often treats it as a nuisance that must be reduced or eliminated in order to make better decisions. However, when adopting a more creative approach to problem-solving, uncertainty actually can be a tool to help people explore and discover more novel and useful solutions to problems. Therefore, public health leaders can learn to embrace this uncertainty and encourage others to explore the knowledge landscape in search of better outcomes. Directed creativity is already aligned with these norms, whereby leaders can set an agenda with clearly-defined problems, and then give staff more autonomy and flexibility to develop novel solutions to these problems. When a new solution emerges that outperforms existing procedures, leaders should be ready to implement it quickly and efficiently.

However, another approach that could be effective in resource-constrained settings, as is occurring with COVID-19 and with public health work more generally, is to adopt emergent creativity. To facilitate this process, rather than setting an agenda that provides clear targets for people to hit, leaders can instead encourage people to be as creative as possible within the bounds of what resources are available. To accommodate people's need for autonomy,[20] leaders can relinquish some control over the problem, allowing people to have more flexibility to identify new and emerging problems that can be solved. As with directed creativity, it is important for leaders to identify new ideas that can be implemented quickly and efficiently, but they also may want to exert final decision-making authority over ideas to maintain some degree of focus and specialization. Altogether, by broadening norms to embrace uncertainty through both directed and emergent creativity, the public health sector can increase the rate at which creativity and innovation positively impact society significantly.

Second, the public health sector can broaden its processes related to funding public health activities and public health research. Funders often set strict guidelines on the problems that funding is to be used for, which is fully compatible with directed creativity, but also may inhibit emergent creativity. To promote more emergent creativity, funders could create calls for proposals that set a particular budget cap on resources, to be applied to much more open-ended problem domains. By allowing grantees to apply constrained resources to a broader range of potential problems, they may be able to discover new and important problems (and solutions) that could not have been foreseen ahead of time. Given that the problems emerging from the COVID-19 pandemic are changing dynamically, such an approach could help facilitate more innovative responses to the current pandemic. Furthermore, an emergent approach to innovation generally increases the chances of developing breakthrough solutions,[21] meaning that funders could potentially get significantly more return on investment by adding more emergent approaches to their portfolio of philanthropic responses to COVID-19.

Finally, this is a time for everyone in public health to work together across disciplines. We must break down existing infrastructures that reinforce silos and replace them with new structures that encourage collective action for the common good. The wicked problem of COVID-19 calls for integrated solutions across infectious disease, epidemiology, health behavior education, occupational and environmental health, and others outside of public health. For example, public health agencies and housing agencies can collaboratively identify

different practices for sheltering in place when there is not capacity to meet existing social distancing recommendations. Creativity and innovation thrive when diverse experts work together to solve problems,[22] and currently there are no physical or logistical limitations to bringing diverse groups of people together. However, such collaborations also present challenges because diverse experts often have different ways of conceptualizing problems, communicating ideas, and prioritizing solutions.[15] To help overcome these challenges, public health professionals should adopt either directed and/or emergent creativity processes in response to COVID-19. This may, in the first process, help people focus on a clear and shared problem and then engage in a collective search to develop creative solutions, and in the second process, help people anchor their effort on a clear and concrete resource and then engage in a collective search to discover new and important problems to solve.[17]

Conclusion

COVID-19 is a dynamic, uncertain, and wicked problem that must be addressed with an extensive suite of creative and innovative solutions. The public health sector is composed of a diverse and dedicated workforce that is capable of rising to this challenge, and we propose different approaches for creative problem-solving that can help them be more successful as they develop more creative and innovative responses to COVID-19. Key to success is the notion of embracing uncertainty and using directed and emergent creativity toward the ultimate goal of developing breakthrough solutions to wicked problems. These capabilities will not only improve our collective response to the current pandemic, but also may better prepare us to handle even more wicked problems looming in the future.

Author Disclosure Statement

The authors declare that there are no conflicts of interest.

Funding Information

No funding was received for this article.

References

1. Rittel H, Webber M. Dilemmas in a general theory of planning. Policy Sci 1973;4:155–169.
2. Bashir N. James Dyson designed a new ventilator in 10 days. He's making 15,000 for the pandemic fight. CNN Business. 2020. https://www.cnn.com/2020/03/26/tech/dyson-ventilators-coronavirus/index.html Accessed March 28, 2020.
3. Simonite T. AI uncovers a potential treatment for Covid-19 patients. Wired. 2020. https://www.wired.com/story/ai-uncovers-potential-treatment-covid-19-patients/ Accessed April 22, 2020.
4. Locke R, Castrucci BC, Gambatese M, Sellers K, Fraser M. Unleashing the creativity and innovation of our greatest resource—the governmental public health workforce. J Public Health Manag Pract 2019;25 suppl 2:S96–S102.
5. Amabile TM, Conti R, Coon H, Lazenby J, Herron M. Assessing the work environment for creativity. Acad Manage J 1996;39:1154–1184.
6. Amabile TM, Pratt MG. The dynamic componential model of creativity and innovation in organizations: making progress, making meaning. Res Organ Behav 2016;36:157–183.
7. Perry-Smith JE, Mannucci PV. From creativity to innovation: the social network drivers of the four phases of the idea journey. Acad Manage Rev 2017;42:53–79.
8. Amabile TM. The social psychology of creativity: a componential conceptualization. J Pers Soc Psychol 1983;45:357–376.
9. Cromwell JR, Amabile TM, Harvey J-F. An integrated model of dynamic problem solving within organizational constraints. In: Reiter-Palmon R, Kennel VL, Kaufman JC. Individual creativity in the workplace. London: Academic Press, 2018:53–81.
10. Schwartz B. The paradox of choice: Why more is less. New York: Harper Perennial, 2004.
11. Chua RY-J, Iyengar SS. Creativity as a matter of choice: prior experience and task instruction as boundary conditions for the positive effect of choice on creativity. J Creat Behav 2008;42:164–180.
12. Simonton DK. Creativity as blind variation and selective retention: is the creative process Darwinian? Psychol Inq 1999;10:309–328.
13. Uzzi B, Mukherjee S, Stringer M, Jones B. Atypical combinations and scientific impact. Science 2013;342:468–472.
14. Byron K, Khazanchi S. Rewards and creative performance: a meta-analytic test of theoretically derived hypotheses. Psychol Bull 2012;138:809–830.
15. Cronin MA, Weingart LR. Representational gaps, information processing, and conflict in functionally diverse teams. Acad Manage Rev 2007;32:761–773.
16. Lorenz T. Love is quarantine, and your apartment is the pod. 2020. https://www.nytimes.com/2020/03/18/style/coronavirus-love-is-quarantine.html Accessed March 28, 2020.
17. Sonenshein S. How organizations foster the creative use of resources. Acad Manage J 2014;57:814–848.
18. Moran L. Quarantined Spaniards are thanking medical workers each night in the most moving way. HuffPost. 2020. https://www.huffpost.com/entry/spain-medical-workers-coronavirus_n_5e720084c5b6eab7793f6ac5 Accessed March 28, 2020.
19. Miron-Spektor E, Gino F, Argote L. Paradoxical frames and creative sparks: enhancing individual creativity through conflict and integration. Organ Behav Hum Decis Process 2011;116:229–240.
20. Nieves A, White JB. California finds 140,000 subsidized hotel rooms for health care workers. Politico PRO. Published April 9, 2020. Accessed May 27, 2020. https://www.politico.com/states/california/story/2020/04/09/california-finds-140-000-subsidized-hotel-rooms-for-health-care-workers-1274516.
21. Andriani P, Ali A, Mastrogiorgio M. Measuring exaptation and its impact on innovation, search, and problem solving. Organ Sci 2017;28:320–338.
22. Hülsheger UR, Anderson N, Salgado JF. Team-level predictors of innovation at work: a comprehensive meta-analysis spanning three decades of research. J Appl Psychol 2009;94:1128–1145.

Address correspondence to:
Alison K. Cohen, PhD, MPH
University of San Francisco, School of Management
2130 Fulton Street
San Francisco, CA 94117
USA

E-mail: akcohen@berkeley.edu