Vicarious learning in the time of coronavirus

Christopher G. Myers

abstract

Health professionals confronting the COVID-19 pandemic need to learn vicariously—that is, learn the lessons of others' experiences—if they are to adopt and spread best practices for treatment, avoid costly repetition of prior mistakes, and not waste time "reinventing the wheel." Digital communication tools and social media could be leveraged to facilitate this vicarious learning in much the same way that they are being used to support other types of interpersonal interactions amid social distancing. Yet these tools are often not used to their full potential for learning and knowledge sharing among health professionals fighting COVID-19. Drawing on organizational and behavioral science research into how individuals and organizations learn from others' experiences, I recommend guidelines, policies, and practices that can increase both the use and the effectiveness of technological tools and social media to enhance vicarious learning among the health professionals at the front lines of pandemic care.

In the face of a pandemic, such as the current COVID-19 crisis, health professionals around the world struggle to acquire the information and skills needed to meet the challenge of providing high-quality care. These outbreaks disrupt existing routines and resources, testing the abilities of individuals and organizations to learn and be resilient as circumstances change and difficulties escalate. In many ways, responding successfully to a pandemic depends on effective vicarious learning—learning that occurs through being exposed to and making sense of others' experiences[1]—and on applying the lessons of those experiences to the situation at hand. As the disease spreads, learning from others' earlier successes and failures in addressing it can help speed the deployment of effective treatment practices while also helping to minimize the amount of time spent repeating prior mistakes.

This need to learn vicariously from others' pandemic experience to increase the effectiveness of one's own efforts is consistent with findings of a significant body of organizational and behavioral research. This research has explored the process of vicarious learning at a variety of organizational levels—among, for example, individuals, teams, units, and firms—and has documented how vicarious learning can improve performance in a wide range of industry settings, from information technology and banking to pharmaceutical research and aerospace exploration.[2–7]

Like companies in these other industries, health care organizations devote significant effort to enabling vicarious learning—for instance, by forming quality improvement collaboratives to share knowledge and learn from others' innovations.[8] Efforts to foster such learning in the face of COVID-19 have built on these existing practices, providing valuable ways to incorporate lessons from others' experiences with treating the disease. For instance, efforts to document and disseminate information on early patient testing and treatment in Asia provided an opportunity for health professionals in other countries to learn vicariously from these early experiences with COVID-19 and thereby enhance their own treatment efforts.[9–12]

Yet as the global spread of the disease continues, there is clearly room for improvement in learning from others' experiences with COVID-19. Diffusion of knowledge about effective treatments and policies for combating the disease remains slow, with different countries unfortunately "reinventing the wheel" in their approach to the disease rather than learning from the errors and successes of earlier efforts.[13] The reasons for this suboptimal vicarious learning are varied, of course, but they include a tendency to rely on formal, static mechanisms for sharing experiences with the disease; inadequate opportunities for health care providers to directly interact with peers who are treating the disease in other countries; and a lack of leadership in organizing and clearing away obstacles to engaging in those interactions. In the text that follows, I address processes identified in organizational research that can facilitate more effective vicarious learning and suggest actions that leaders can take to increase such learning by health professionals on the front lines of the COVID-19 crisis.

Processes That Facilitate Vicarious Learning

Moving Beyond Formal, One-Way Knowledge Dissemination

Part of the challenge of engaging in vicarious learning about COVID-19 is that much of the knowledge about others' experiences with the disease comes through high-level, static documentation rather than active discussion or interaction. Stories of others' experiences treating COVID-19 are often shared through outlets such as news articles or governmental reports that attempt to capture a dynamic experience and summarize it in a medium or document meant for independent consumption. During this summarization process, much of the nuance or contextualized understanding of the experience can be lost, either unintentionally or as a by-product of fitting the experience to a particular perspective, leaving readers less able to draw useful insights for applying lessons to their own situations.

Recent organizational research has pointed out the inadequacy of relying solely on these arm's length, one-way forms of vicarious learning,

particularly in complex, dynamic environments like those in which health professionals work.[1] Learning from others in these environments often requires more significant interaction and back-and-forth discussion between the people who are conveying their experiences and the recipients who are learning from them—a give-and-take that allows for questioning, analyzing, and refining one's understanding of the experiences in ways that enable better contextualization and adaptation.[1,14]

Engaging in Peer-to-Peer Vicarious Learning Interactions

Beyond being one-way, static communications, much of the documentation mentioned above targets a broad population of readers, which limits its value for helping frontline health professionals learn from their peers' experiences. The questions and knowledge needs of those engaged in on-the-ground patient care often differ from those of the general public or government officials. Health professionals are likely to learn more if they can communicate directly with their peers (rather than having these communications mediated through reports or media documents). Peer-to-peer interactions allow health professionals to share more nuanced, tacit knowledge, because they can rely on common terminology and norms that make it easier to draw lessons from one another's stories and experiences.

Organizational and behavioral research in health settings has repeatedly demonstrated the value of peer-to-peer vicarious learning as a way for health professionals to gain knowledge and enhance patient care. For example, surgeons practicing in a group setting or engaging in comparatively more peer interactions have been shown to perform better on recertification exams,[15] consistent with evidence that formal continuing medical education (CME) efforts are more effective in changing behavior when they involve interaction or peer discussion.[16] Other research has shown that cardiac surgeons' postoperative mortality rates are influenced not only by the surgeons' own past successes and failures but also by the experiences of their peers.[17] Likewise, emergency department clinicians have been shown to be motivated to learn from stories of other clinicians' patient care experiences and, in particular, from stories of these colleagues' exceptionally successful cases.[18]

Ways That Technology Can Support Vicarious Learning About COVID-19

These findings suggest that frontline health professionals can benefit greatly from meeting to share and discuss stories with one another about their successes and failures in treating COVID-19. Unfortunately, the global dispersion of this pandemic and those treating it, alongside the mandate to practice greater social distancing to curb the disease's spread, make it difficult to enact policies to encourage interpersonal learning interactions. Yet more technological tools exist today to address these barriers than during any prior pandemic. And although technology for treating COVID-19 patients has advanced considerably—for example, telemedicine allows health care workers to conduct some types of patient screening and treatment while maintaining social distancing[19]—these same tools have yet to be fully adopted to enable vicarious learning among the health professionals providing the treatment.

Technological tools such as videoconferencing and social media allow for greater connection and collaboration across the globe and have been increasingly playing a role in health professionals' interactions and learning in recent years.[20–22] A variety of different social media groups on platforms such as Facebook and Twitter have emerged as community forums for health professionals, often focusing on a particular specialty or area of interest. For instance, one closed-membership Facebook group of robotic surgeons from around the world (some of whom may be the only one in their geographical area performing robotic procedures) has allowed members to connect with one another and post questions, photos, or surgical videos to share their techniques or seek others' advice.[23,24] Groups such as these provide opportunities for learning and rapid dissemination of ideas and techniques and can amplify the benefits of vicarious learning, allowing for knowledge sharing by experts who

may be geographically remote while also multiplying the number of potential learners who can benefit from the information that is discussed.

Some efforts are already underway to make use of these technology-mediated, virtual vicarious learning interactions in the fight against COVID-19. News stories have documented the use of social media to rapidly spread clinical information and combat misinformation on COVID-19 and increase interaction and collaboration among physicians.[25] Other reports have noted the use of teleconferencing by health professionals in Italy and the United States to learn from their counterparts treating the disease in China.[26,27] Yet these efforts are often too sporadic or isolated to have a systematic impact on the pandemic. And there are multiple obstacles to their use, not least being that many health professionals are uncomfortable with or lack knowledge of how to apply these technologies for peer learning. Indeed, some health care professionals have been hesitant to use these tools owing to concerns about privacy (both their own and their patients'), as well as about their reputation, their potential malpractice liability, or simply the burden of trying to participate in or manage a worldwide community forum.[24,28] As a result, efforts to engage these frontline health professionals in technology-enabled vicarious learning still face significant challenges that limit its widespread adoption in combating COVID-19.

Policy Actions to Advance Vicarious Learning in the Time of Coronavirus

These challenges are nontrivial but not insurmountable. As detailed in Table 1, leaders and policymakers—both within particular health institutions and outside of them (nationally and internationally)—can take a variety of actions to enhance and extend technology-mediated vicarious learning among health professionals.

Increase the Use & Value of Existing Vicarious Learning Technologies
In the short term, hospital and practice leaders can more extensively engage with technological conduits for vicarious learning already being used by those fighting COVID-19. Existing social media groups for health professionals represent a valuable resource for sharing knowledge— many have memberships numbering in the tens of thousands,[25] often with a core of highly active users who engage meaningfully with posted questions or information.[23] Although concerns about misinformation on these platforms are not unfounded,[25,28] developing policies and providing resources to allow individuals to better engage with these existing platforms (as opposed to avoiding or ignoring them) can help to address the worries about misinformation.

For instance, hospital leaders could identify individuals in their organizations who already engage frequently with these kinds of groups and tap them to form a social-learning initiative or committee. This committee could then serve as the designated outlet for sharing accurate, real-time data from the hospital (such as up-to-date patient counts, documented outcomes, revised protocols, or other approved information) on these social media platforms; the committee could also be tasked with interpreting and incorporating the knowledge that people from other institutions post to these groups. Creating this central contact point for knowledge flowing out of and into the hospital via social media would enable the information being shared to be better filtered for quality, allow for more systematic dissemination among care teams within the hospital, and provide a critical knowledge resource to COVID-19 decisionmakers.

At the same time, leaders and policymakers at the national level—for instance, leaders of professional associations or advocacy groups— could work in the short term to remove some of the barriers to engaging in virtual vicarious learning among health professionals. One key action would be advocating for legal protections for technology-mediated peer learning, including working to incorporate this kind of learning into existing frameworks that protect other peer-learning and quality-improvement tools (such as informal conversations or morbidity and mortality conference discussions)

Table 1. Strategies & actions for enhancing virtual vicarious learning among health professionals

Strategic goal (time frame)	Action steps for leaders and policymakers
Increasing the use and value of existing vicarious learning technologies (in the short term)	Organizational and institutional leaders can: • identify employees who are active members of online health professional groups or social media platforms and provide resources and support (such as time and recognition) for bringing in outside knowledge via these platforms to improve the organization's practices. • set up a working group or committee to organize knowledge shared and received via these online learning communities and provide them with more frequent access to pertinent data to share with others for learning and feedback (such as hospital-level case data, equipment status, or clinical-protocol revisions, in consultation with hospital legal personnel as needed to ensure compliance with regulations and privacy guidelines). • cultivate within-organization standards and norms for learning and sharing knowledge with others (not only outside the organization but also across different internal care sites or units) and for incorporating this knowledge into decisionmaking. Professional associations and national policymakers can: • use existing platforms and clout to advocate for appropriate legal protections for online vicarious-learning activities among health professionals, conferring these virtual tools with protections similar to in-person peer-learning activities (such as morbidity and mortality conferences and quality-improvement efforts). • develop a database of reputable health professional social media groups (including associations' own forums or discussion groups) and encourage engagement in online vicarious learning among association members or other constituents to help further reduce reputational barriers to engaging in peer-learning interactions.
Creating new vicarious learning opportunities and technology platforms (in the long term)	Organizational and institutional leaders can: • strengthen partnerships with neighboring organizations (such as regional associations of hospitals or partner members of health system networks) by creating shared practices and expectations for how vicarious learning (both in-person and virtual) will be carried out to help connect health professionals at each organization. • expand formal organizational connections (for example, institutional partnerships, professional-exchange programs, or information-sharing collaboratives) with a broad set of organizations around the globe to establish a network of learning relationships that can be drawn on in a future crisis or pandemic. Professional associations and national policymakers can: • engage health technology companies to establish secure, privacy-compliant platforms for online discussion and interaction to provide association members and other constituents with a reliable tool for engaging in peer-to-peer vicarious learning. • encourage the integration and cross-compatibility of online peer-learning platforms with other systems and technologies, such as electronic medical record software, to enable or potentially automate knowledge sharing (such as using analysis of de-identified, privacy-compliant data to connect health professionals experiencing similar patient challenges). • incorporate in-person or online vicarious learning or both into standard expectations and practices within professional communities (such as by including vicarious learning in continuing education expectations and credentialing processes) to embed these practices into professionals' usual workflow before they are urgently needed in a crisis or pandemic.

from undue legal challenges.[24] National associations could also take advantage of their existing networks and social platforms to increase access to virtual vicarious learning, either by providing their own forums for peer interaction (such as a member discussion hub) or by curating and promoting lists of reputable social media groups for health professionals.

Create New Vicarious Learning Opportunities & Technology Platforms

In the longer term, leaders and policymakers across all levels of the health industry can work to build a more robust infrastructure for peer-to-peer vicarious learning, helping to routinize this method of sharing knowledge before the next global pandemic or crisis arises. At the

local level, hospital leaders can work to build stronger relationships with other organizations to better position their staffs to engage in vicarious learning with these partners in the future, including by setting up in-person knowledge-sharing conferences or personnel rotation programs as well as virtual-learning opportunities. Having these relationships already established can be useful for rapid vicarious learning in times of crisis, as vicarious learning is often easier when parties share a preexisting commonality or relationship. Indeed, organizational research has shown that having more deeply embedded ties or a common identity with a partner can help reduce the perceived risks of sharing private information and facilitate knowledge transfer.[29,30]

This benefit of closer ties can help explain why the vicarious learning that has occurred so far in the fight against COVID-19 has often been driven by preexisting social relationships. For instance, infectious disease specialists at Johns Hopkins University held a videoconference to learn from Chinese physicians treating COVID-19, an opportunity realized primarily because an office mate of one of the specialists personally contacted several former medical school classmates in China.[26] Yet even among these personal contacts, some were hesitant to share their specific experience in the absence of national treatment guidelines in China (out of worry over potentially spreading incorrect information), with one hospital's leaders ultimately agreeing to participate at least partially because its physicians had already successfully held similar meetings with hospitals in Europe (see note A). This experience points to the value of hospitals forging more global partnerships and ties, so these kinds of exchanges become more routine (rather than tied to idiosyncratic personal connections) and thus can serve as reliable tools for future vicarious learning.

Finally, leaders and policymakers can encourage health technology companies to develop more secure and easy-to-use peer-learning and knowledge-sharing platforms for health professionals. Given that existing technologies already allow for virtual patient–physician engagement and telemedicine,[19] development of a similar platform for virtual knowledge sharing, advice seeking, and interactive peer-to-peer discussion among health professionals does not seem out of reach. Professional associations can take charge of these platforms, providing them as tools for their members to connect with and learn from one another and incorporating the platforms into broader learning practices. For instance, although CME programs are increasingly making use of technology platforms, they are often used to replicate formal, noninteractive continuing education modalities such as slides, readings, or recorded presentations,[31] despite evidence of the value of interactivity for both in-person and online CME.[16,32] Professional associations and accrediting bodies can also expand the use of new technological tools to include more informal peer-to-peer learning interactions—and not only by providing the platforms for doing so. They can also find ways to incorporate these interactions into professional learning requirements (such as by including in-person or online peer learning interactions in annual CME standards) and can advocate for integration of these platforms with other frequently used health technologies (such as electronic medical record systems). Doing so would help to further embed vicarious learning into the habits and routines of health professionals, allowing these interactions to become a common learning practice, both for regular times and in a pandemic.

Enhanced coordination and support for using social media as a learning tool; appropriate legal protections for virtual knowledge sharing; increased partnerships and learning relationships across organizations; and access to secure, privacy-compliant platforms for peer-to-peer learning are challenging goals for health leaders and policymakers to achieve, but they are attainable. Adopting these interventions would go a long way toward achieving more effective vicarious learning by the worldwide community of health professionals, thereby enabling more rapid dissemination of best practices and lessons learned in the fight against COVID-19 and future epidemics.

author affiliation

Myers: Johns Hopkins University. Author's e-mail: cmyers@jhu.edu.

references

1. Myers, C. G. (2018). Coactive vicarious learning: Toward a relational theory of vicarious learning in organizations. *Academy of Management Review, 43,* 610–634. https://doi.org/10.5465/amr.2016.0202

2. Argote, L., & Fahrenkopf, E. (2016). Knowledge transfer in organizations: The roles of members, tasks, tools, and networks. *Organizational Behavior and Human Decision Processes, 136,* 146–159. https://doi.org/10.1016/j.obhdp.2016.08.003

3. Bingham, C., & Davis, J. P. (2012). Learning sequences: Their existence, effect, and evolution. *Academy of Management Journal, 55,* 611–641. https://doi.org/10.5465/amj.2009.0331

4. Bresman, H. (2010). External learning activities and team performance: A multimethod field study. *Organization Science, 21,* 81–96. https://doi.org/10.1287/orsc.1080.0413

5. Kim, J.-Y., & Miner, A. S. (2007). Vicarious learning from the failures and near-failures of others: Evidence from the U.S. commercial banking industry. *Academy of Management Journal, 50,* 687–714. https://doi.org/10.5465/amj.2007.25529755

6. Madsen, P. M., & Desai, V. (2010). Failing to learn? The effects of failure and success on organizational learning in the global orbital launch vehicle industry. *Academy of Management Journal, 53,* 451–476. https://doi.org/10.5465/amj.2010.51467631

7. Myers, C. G. (in press). Performance benefits of reciprocal vicarious learning in teams. *Academy of Management Journal.* https://doi.org/10.5465/amj.2018.0875

8. Wells, S., Tamir, O., Gray, J., Naidoo, D., Bekhit, M., & Goldmann, D. (2018). Are quality improvement collaboratives effective? A systematic review. *BMJ Quality and Safety, 27,* 226–240. https://doi.org/10.1136/bmjqs-2017-006926

9. Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72,314 cases from the Chinese Center for Disease Control and Prevention. *JAMA, 323,* 1239–1242. https://doi.org/10.1001/jama.2020.2648

10. World Health Organization. (2020). *Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19).* Retrieved from https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

11. Wang, C. J., Ng, C. Y., & Brook, R. H. (2020). Response to COVID-19 in Taiwan: Big data analytics, new technology, and proactive testing. *JAMA, 323,* 1341–1342. https://doi.org/10.1001/jama.2020.3151

12. Gawande, A. (2020, March 21). Keeping the coronavirus from infecting health-care workers. *The New Yorker.* Retrieved from https://www.newyorker.com/news/news-desk/keeping-the-coronavirus-from-infecting-health-care-workers

13. Pisano, G. P., Sadun, R., & Zanini, M. (2020, March 27). Lessons from Italy's response to coronavirus. *Harvard Business Review.* Retrieved from https://hbr.org/2020/03/lessons-from-italys-response-to-coronavirus

14. Bresman, H. (2013). Changing routines: A process model of vicarious group learning in pharmaceutical R&D. *Academy of Management Journal, 56,* 35–61. https://doi.org/10.5465/amj.2010.0725

15. Valentine, M. A., Barsade, S., Edmondson, A. C., Gal, A., & Rhodes, R. (2014). Informal peer interaction and practice type as predictors of physician performance on maintenance of certification examinations. *JAMA Surgery, 149,* 597–603. https://doi.org/10.1001/jamasurg.2014.183

16. Davis, D., O'Brien, M. A. T., Freemantle, N., Wolf, F. M., Mazmanian, P., & Taylor-Vaisey, A. (1999). Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA, 282,* 867–874. https://doi.org/10.1001/jama.282.9.867

17. KC, D., Staats, B. R., & Gino, F. (2013). Learning from my success and from others' failure: Evidence from minimally invasive cardiac surgery. *Management Science, 59,* 2435–2449. https://doi.org/10.1287/mnsc.2013.1720

18. Quinn, R. W., Myers, C., Kopelman, S., & Simmons, S. A. (in press). How did you do that? Exploring the motivation to learn from others' exceptional success. *Academy of Management Discoveries.* https://doi.org/10.5465/amd.2018.0217

19. Hollander, J. E., & Carr, B. G. (2020). Virtually perfect? Telemedicine for covid-19. *New England Journal of Medicine, 382,* 1679–1681. https://doi.org/10.1056/NEJMp2003539

20. Vohra, R. S., & Hallissey, M. T. (2015). Social networks, social media, and innovating surgical education. *JAMA Surgery, 150,* 192–193. https://doi.org/10.1001/jamasurg.2014.1324

21. Jain, S. H. (2009). Practicing medicine in the age of Facebook. *New England Journal of Medicine, 361,* 649–651.

22. Allen, M., Sargeant, J., MacDougall, E., & Proctor-Simms, M. (2002). Videoconferencing for continuing medical education: From pilot project to sustained programme. *Journal of Telemedicine and Telecare, 8,* 131–137. https://doi.org/10.1177/1357633X0200800302

23. Myers, C. G., Kudsi, O. Y., & Ghaferi, A. A. (2018). Social media as a platform for surgical learning: Use and engagement patterns among robotic surgeons. *Annals of Surgery, 267,* 233–235. https://doi.org/10.1097/SLA.0000000000002479

24. Myers, C. G., Kudsi, Y., & Ghaferi, A. A. (2017, October 30). Surgeons are using social media to share and learn new skills. *Harvard Business Review.* Retrieved from https://hbr.org/2017/10/surgeons-are-using-social-media-to-share-and-learn-new-skills

25. Smith, M., Cortez, M. F., & Bloomberg. (2020, March 24). How doctors are using social media to develop coronavirus treatments in real time. *Fortune.* Retrieved from https://fortune.com/2020/03/24/doctors-social-media-develop-coronavirus-treatments/

26. Begley, S. (2020, March 24). Desperate for covid-19 answers, U.S. doctors turn to colleagues in China. Retrieved from https://www.statnews.com/2020/03/24/covid-19-answers-doctors-turn-to-china/

27. China, Italy doctors share experiences of COVID-19 control via teleconference. (2020, March 7). Retrieved from https://news.cgtn.com/news/2020-03-07/China-Italy-doctors-share-experiences-of-COVID-19-control-online-OFi0gryDVS/index.html

28. Yurieff, K. (2020). Doctors turn to Twitter and TikTok to share coronavirus news. Retrieved from https://www.cnn.com/2020/03/31/tech/social-media-doctors-coronavirus/index.html

29. Uzzi, B., & Lancaster, R. (2003). Relational embeddedness and learning: The case of bank loan managers and their clients. *Management Science, 49,* 383–399. https://doi.org/10.1287/mnsc.49.4.383.14427

30. Kane, A. A. (2010). Unlocking knowledge transfer potential: Knowledge demonstrability and superordinate social identity. *Organization Science, 21,* 643–660. https://doi.org/10.1287/orsc.1090.0469

31. Harris, J. M., Jr., Sklar, B. M., Amend, R. W., & Novalis-Marine, C. (2010). The growth, characteristics, and future of online CME. *Journal of Continuing Education in the Health Professions, 30,* 3–10. https://doi.org/10.1002/chp.20050

32. Sargeant, J., Curran, V., Jarvis-Selinger, S, Ferrier, S., Allen, M., Kirby, F., & Ho, K. (2004). Interactive on-line continuing medical education: Physicians' perceptions and experiences. *Journal of Continuing Education in the Health Professions, 24,* 227–236. https://doi.org/10.1002/chp.1340240406