

Crowdsourcing in a Pandemic: Pearls and Pitfalls From the Trainee Experience

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“Ping! Ping!” In rapid succession, my cell phone emitted a series of alerts from colleagues across the nation, all responding to the growing public health emergency of COVID-19. Before the pandemic, I had only a meager presence on social media, yet, as the crisis mounted, I downloaded WhatsApp. A co-fellow of mine, Dr Jonah Rubin, was building a messaging group that rapidly grew to include 240 pulmonary and critical care medicine (PCCM) fellows, representing 100 training programs in nearly all 50 states. In joining the group, members began a journey navigating the pandemic armed with instant communication to a vast network of peers. What followed was a unique nexus of social media, networking, and crowdsourcing that holds key lessons for leveraging communications technology in modern medicine.

The Intersection of Crowdsourcing and Social Media in Health Care

The use of social media among health care trainees has increased dramatically in the past decade, prompting a flurry of literature ranging from innovations in public health, education, and communication,^{1,2} to guidelines for standards of online behavior and professionalism.³ Research evaluating social media tools in health professions education has demonstrated improvement in trainee knowledge with interventions that facilitate peer-to-peer or instructor-to-student communication.¹ However, the use of peer communication via social media to crowdsource approaches to clinical problems, such as those faced by frontline trainees in the pandemic, is uncharted territory. Crowdsourcing is an emerging tool in health care with myriad applications that utilize a large virtual workforce to tackle arduous tasks.^{4,5} At least 2 studies have demonstrated feasibility of crowdsourcing applications as point-of-care diagnostic aids in medicine,^{6,7} although neither has taken the approach to a national scale.

Practical Considerations, Strengths, and Pitfalls

My co-fellow's messaging group, affectionately entitled “PCCM Fellows vs. COVID,” demonstrates the strengths and pitfalls of introducing a crowdsourcing platform into a training program (TABLE). The chat illustrates the combined potential of 3 elements:

1. A curated social network, in this case across the nation's critical care trainee workforce
2. A social media platform with the capacity for real-time communication
3. An evolving array of shared logistical and clinical challenges that stimulate trainee engagement

The strengths of this approach center upon rapid, widespread dissemination of information, often in response to a question from a peer. Group members are able to share and discuss emerging literature, creating a real-time, topical journal club. Efforts like this have the potential to close the “knowledge to practice” gap between evidence-based and practiced medicine.⁸ Beyond literature, institution-specific guidelines ranging from treatment algorithms to crisis standards of care can reach a broad audience on such a platform, allowing recipients to develop a picture of national norms against which to compare their own institutional practices. By sharing links to educational resources and videos, group members can use the collective to respond to local calls for didactics, reducing redundant parallel efforts to create new material.

In addition, practical solutions to common logistical problems can be exchanged easily. In this case, examples included placing IV poles outside of patient rooms to minimize use of personal protective equipment, using a paperclip to secure surgical masks at the occiput, thus relieving irritation of the wearer's ear lobes, and various whiteboard spreadsheets for tracking care details that might otherwise blur when all of one's patients are admitted with the same diagnosis. Practical solutions like these are unlikely to be reported elsewhere, in a peer-reviewed journal for example, yet were available at group members'

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TABLE

Crowdsourcing via Social Media Networks Among Trainees: Strengths and Pitfalls

Strengths	Pitfalls
Rapid, widespread dissemination of information:	Beware the anecdote
Medical literature	Respect HIPAA
Institutional treatment algorithms and guidelines	Avoid peers as surrogate supervisors
Links to educational content or videos	Beware misinformation, especially on open platforms
Practical innovations not reported elsewhere	
Proliferation of a community of support	

fingertips via the chat. Lastly, and perhaps most crucially, the network leveraged a unique shared experience to form camaraderie—an antidote to the stresses of facing a pandemic rife with personal health risks.

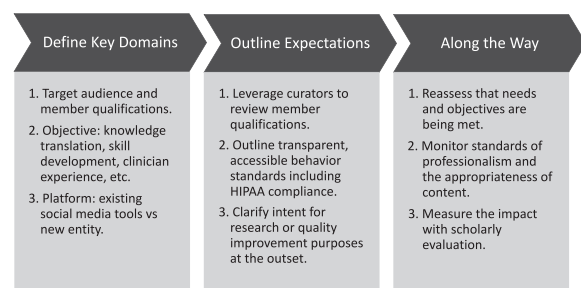
Crowdsourcing and the use of social media by health care trainees are certainly not without flaws. First, there is great temptation to share anecdotes among peers. Storytelling is central to cultural connection; however, in medicine there are well-described pitfalls of relying on anecdotal reports,⁹ which may be heightened during a novel disease pandemic. Second, sharing experiences and anecdotes leads to obvious concerns regarding patient privacy, particularly in an online medium. Messaging apps and virtual meeting platforms are increasingly offering end-to-end encryption and HIPAA-compliant authentication measures, however, social networks of colleagues outside the patient care team fail to meet the “minimum necessary” rule for sharing protected health information (PHI).¹⁰ Extra care to avoid PHI in such communications is essential. Lastly, in clinical medicine, advice from a network of trainee peers can’t become a surrogate for supervision from attending physicians. Peer communication platforms generally lack dedicated fact-checkers, relying on members to share appropriately cited and interpreted material. This last critique is particularly problematic in other social media formats, such as Facebook or Twitter, in which membership is rarely curated and the volume of communication threads makes dynamic correction of misinformation by experts challenging.

Design of Future Applications

In conjunction with the literature, these observations can be harnessed for future crowdsourcing endeavors (FIGURE). Implementation of a new crowdsourcing initiative requires definitions of 3 domains: the target audience, the objective, and the impetus for participation.¹ Answers to the questions “Who? Why? and Why now?” will clarify the motivation for members to participate and inform decisions regarding which technologies will be required. The purpose of the

effort must be defined in detail. In most published studies on social media tools in health care, interventions aim to foster communication to achieve specific goals, whether to enable knowledge translation, enhance skill development, or optimize the participant experience.¹ By elaborating on the goal of the communication, organizers can refine the platform capabilities accordingly and identify opportunities to study the project’s impact.

In addition, shared expectations for membership should be established at the outset. First, membership in the network should be curated transparently, such that all prospective members understand participant qualifications. Survey data from existing crowdsourcing tools suggest that curated networks can facilitate trustworthiness of shared content and increase member participation if contributions are non-anonymous.⁶ How curation is best operationalized is dependent on the size and nature of the project, as well as research intent. In less formal projects, like the PCCM messaging group, this may be achieved by participants themselves. Second, membership in the network should be contingent upon agreement to shared professionalism standards, including avoidance of PHI disclosure.³ In return, organizers are responsible for selecting a HIPAA-compliant technology platform to protect against accidental disclosures. Lastly, members should be advised of anticipated research or quality improvement plans at the time of entry. While scholarly analysis of a crowdsourcing endeavor is crucial for future



FIGURE

Pearls for Crowdsourcing via Social Media Networks: A Proposed Stepwise Approach

educators to better understand the impact on clinical care and the trainee experience, this need must be balanced with member protections.

Crowdsourcing has the potential to become a powerful dissemination and collaboration tool in modern medicine, particularly if the appropriate safeguards are in place to minimize misuse and misinformation. The PCCM Fellows vs. COVID chat illustrates how a curated social network with the capacity for real-time communication can impact the trainee experience in the context of a shared set of challenges. Pearls from existing crowdsourcing efforts can inform design features of future applications in health professions education. Once established, these platforms will require monitoring to ensure objectives and behavior standards are achieved, ideally with scholarly evaluation to further develop the literature.

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