

FORUM

COVID-19 pandemic perspectives: A scientific silver lining?

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Funding information

ASW is supported by funding from the National Institutes of Health (R01HL141291).

Handling Editor: Mary Cushman

Abstract

Accounts of the numerous negative effects caused by COVID-19 are pervasive, but few perspectives have identified any positive impacts of this massive societal shift. This forum examines potentially positive changes that have occurred within the scientific community amid the chaotic pandemic. Among these positives are the formation of virtual supergroups and an interdisciplinary brain trust. In forcing scientists away from their lab benches, COVID-19 has created time and space for more conversations about science and experimental design. Being away from the lab in this time of social unrest has also given scientists time to directly address institutional racism and its suppression of diversity in science. Although COVID-19 has been an unforeseen disaster of epic proportions, some of the resulting changes in our scientific community should remain in place after the pandemic is over. By leveraging these small wins, we will undoubtedly return to our laboratories stronger, smarter, and more efficient.

KEYWORDS

COVID-19, interdisciplinary research, mentors, motivation, pandemic, thrombosis

Essentials

- COVID-19 has been one of the largest culture-shifting phenomena of this generation.
- Amid many negative impacts of COVID-19 on science, certain positives have emerged.
- Positives include enhanced global interactions, time for reflection, and diversity initiatives.
- We should preserve positive outcomes when returning to a post-COVID-19 world.

Undoubtedly, COVID-19 has been one of the largest culture-shifting phenomena of this generation. Many countries, including Canada, Israel, Ireland, and the United States, have seen double-digit increases in the percentage of their workforce filing unemployment insurance claims, with over 40 million people unemployed in the United States alone, due to the pandemic.^{1,2} Many who are still employed are facing significant hurdles and career setbacks as they attempt to navigate budget cuts, promotion freezes, and the demands of child care (without the help of schools and daycare services). Socioeconomic disparities have been exacerbated by differential access to high-speed Internet, computers, health care, and

child care. Some, though not all, reports document fewer COVID-19-related scientific publications by women compared to men, suggesting the pandemic has had a disproportionate impact on the productivity of this segment of the academic workforce.³⁻⁶ Rapid restructuring in funding mechanisms to support scientific studies in COVID-19 may have shifted funding away from other established areas, with potentially negative repercussions for research on other diseases. COVID-19 has seamlessly brought the global economy to its knees, and simultaneously dismantled the crux of every social interaction. It has been, in essence, an endless newsreel of catastrophic proportions.

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However, some positives have surfaced amid the chaos. More time spent with families⁷ and reduction in harmful environmental emissions⁸ are two silver linings. Amid the many negative impacts COVID-19 has had on science and the scientific community, are there positives that have been overlooked? Here, we aim to examine possible benefits that have resulted from the impact of COVID-19 in hopes that our “new normal” can incorporate some of these hard-earned lessons and rewards. Our perspective stems largely from our shared experience as academic basic/translational scientists in the United States. However, positives outlined in this manuscript may inspire others to identify additional silver linings particularly relevant to their own situations.

1 | VIRTUAL SUPERGROUPS

The increased use of videoconferencing software has had a significant impact on science communication. Downloads of meeting apps like Skype, Zoom, and Houseparty have increased over 100%.⁹ Although there was a technological learning curve for many, these programs have enabled scientists to give presentations, defend dissertations, collaborate, and mentor students with greater global reach than we have ever had. Notably, videoconferencing has also shown key advantages over traditional teleconferencing. Functions like screen sharing and an in-software whiteboard facilitate a transfer of information and ideas that were previously impossible with traditional teleconferences. Scientists can now see each other, facilitating networking and introductions of people who may not have met before, and increasing the sense of community. Use of this technology has allowed scientists to gather in large groups for lab meetings and talks that would normally be geographically isolated. Grassroots seminars organized around these technologies (eg, the Blood and Bone series) have brought together scientists across the world and made science more inclusive by removing transportation and financial barriers. The virtual Blood and Bone series has seen attendance topping 600,¹⁰ and the ISTH had record-breaking participation in the virtual form of its annual meeting in July 2020 (12 149 attendants vs 9515 attendants at the previously best-attended annual meeting in Berlin in 2017). Although also enhanced by the lack of registration charges for these events, trends like these suggest videoconferencing and virtual programming should continue even after face-to-face interactions have resumed. One could easily argue that the current crash course in these communication models that enable us to put more heads together will make better science happen.

Videoconferencing has also shifted the social infrastructure between scientists. While the physical table has been removed, seats at the proverbial table have increased. Videoconferencing has helped create equality within the synthetic hierarchy of research. There is no podium on videoconferences and no “back of the room.” On the computer screen, everyone sees everyone else through same-sized windows arranged without regard to seniority. These technologies also allow people to interact directly (eg, verbally asking) and

indirectly (eg, submitting a question via a chat function), potentially increasing participant involvement. These observations suggest that even after this pandemic is over, prioritizing videoconferencing over teleconferencing for scientific communications will enhance involvement and interaction across our field.

Videoconferencing has also changed the way we interact in less formal settings. Although everyone has felt the loss of coffee with coworkers and grabbing drinks at conferences, even casual social interactions, like happy hours, meet and greets, lab reunions, and game nights have been made more accessible, regardless of status or location. Colleagues who normally gather to relax and chat only once or twice a year are meeting regularly and getting to know each other from the comfort of their own homes. An increased sense of community built from this shared experience may have lasting positive consequences for future endeavors.

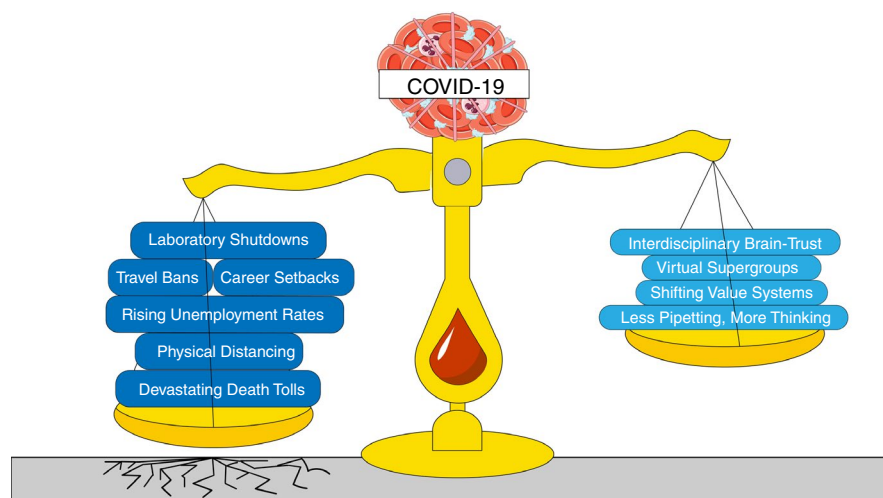
2 | INTERDISCIPLINARY BRAIN TRUST

The fast-paced research focused on COVID-19 pathophysiology has necessitated an increase in interdisciplinary research, leading to new collaborations.¹¹ COVID-19 infection has presented with such a range of symptoms and pathological mechanisms that scientists have had to act quickly to assess COVID-19 problems and contribute to what will hopefully be a host of effective treatment and prevention options in the near future. Progress seen in the past 6 months has demonstrated how rapidly science is capable of moving when necessary. The unexpected coagulation abnormalities and thrombosis documented in patients with COVID-19¹²⁻¹⁴ have brought together scientists specializing in blood science with pulmonologists, virologists, and infectious disease specialists. Many of these collaborations have been possible in part by the expedited sharing of resources and completion of paperwork (eg, rapid approval of studies and protocols) due to the urgency of the pandemic. These collaborations will produce innovative discoveries on the intersection of infection and coagulation, even after COVID-19 has been addressed. Funding mechanisms to support this increase in interdisciplinary scientific problem solving will ultimately advance our understanding of these intricate pathways immeasurably.

3 | LESS PIPETTING BUT MORE THINKING

The COVID-19 pandemic has led to changes in the way front-line bench scientists approach their projects. Conducting experiments everyday seldom lends itself to thinking about the “big picture” in one’s research. Often, it is only after all the data have been generated that pipetting stops and one has the opportunity to stop and ask, “So what does it all mean?” With mandated time out of the lab, many of our lab members have found new time to review data and related literature, enabling much-needed reflection and interpretation. Alternative approaches and methodologies can be explored

FIGURE 1 Amid many negative impacts of COVID-19 on science (left), certain positives have emerged (right). We should preserve these positive outcomes when we return to a post-COVID-19 world



without the pressure to generate dots via methods we usually turn to out of habit. Even laboratory notebook and record keeping has been revamped and reorganized to make it more accessible to fellow laboratory members. The opportunity for trainees to stop, read, and contemplate existing data before resuming experiments may result in more well-planned experiments and a more streamlined and efficient scientific method. Instating a formal weekly reading/planning day may help us retain this benefit even after returning to the lab bench in a post-COVID-19 normal.

4 | SHIFTING VALUE SYSTEMS

Science does not happen in a vacuum (unless that is your particular experiment). It is swayed by political and social constructs often thought to be beyond our control. However, the COVID-19 era has allowed time and resources to be spent examining how we can better limit the nonscientific influences on science. For too long, diversity within science has not reflected the inherent diversity within our populations. This is an increasingly complex issue and one that rarely gets the attention it needs when everyone is focused on their primary scientific goals. That is a shame, since the data on this subject are clear; more diversity in science means more perspectives are considered and more problems solved.¹⁵ Motivated by pivotal events, including the recent, wrongful death of George Floyd¹⁶ and the Black Lives Matter movement,¹⁷ the COVID-19-mandated time off the bench has given us more flexibility to focus on these issues. There has been a surge in meetings, panels, and editorials dedicated to exposing institutional racism and increasing diversity in science.^{18,19} For example, at our institution, the Office of Graduate Education created a “Dismantling Racism in Academia: Journal Club & Discussion Group” to facilitate conversations and address institutional racism in the “ivory tower.” Governing organizations in the hemostasis and thrombosis field, including both the ISTH and the American Society of Hematology, issued statements committing to diversity, equity, and inclusion within science. Of course, transforming the scientific community

into an inclusive, equitable, problem-solving task force requires that we carry this commitment beyond the COVID-19 pandemic. Taking this COVID-19-mandated break to address race and diversity barriers could yield programs and initiatives that will fuel future progress. Following through on these conversations with decisive action and policy changes will yield a better scientific community for all of us.

5 | FINAL THOUGHTS

Taken together, the COVID-19 pandemic is still a tragedy of apocalyptic measure. But as with anything, there is good and bad (Figure 1). As we move forward, recognizing positives that have come from this experience may help us emerge stronger and better than before. Staying connected over distances, collaborating with scientists outside of our disciplines, valuing time for planning and reviewing data, and affirming our commitment to diversity within our ranks should not end when the COVID-19 pandemic is over. At the very least, we will value each other's company that much more when we can return to our in-person social gatherings and conferences to talk about all we have learned.

ACKNOWLEDGMENTS

The authors thank Dr Kellie R. Machlus for her thoughtful comments on the manuscript.

RELATIONSHIP DISCLOSURE

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

DAD wrote the manuscript; DAD and ASW edited the manuscript and approved the final version.

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How to cite this article: Dobson DA, Wolberg AS. COVID-19 pandemic perspectives: A scientific silver lining?. *Res Pract Thromb Haemost* 2020;4:1083–1086. <https://doi.org/10.1002/rth2.12432>