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Editorial

Apart, together: reflections on the COVID-19 pandemic

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December 2021 marks 2 years since the first reports of an outbreak were covered by a handful of international media outlets. Few could have envisioned what would transpire over the coming months. None can accurately predict how things will unfold in the years to come. The pandemic continues, diminished in some places, unabated in others, and periodically re-emerging throughout. Although the future remains uncertain, we have chosen to use this anniversary as an opportunity to reflect on the indelible aspects of this uniquely difficult epoch and our hopes for the future.

As part of this reflection, the *Trends* team recognizes the scientists, researchers, clinicians, and healthcare workers who lost their lives to COVID-19, whether directly or indirectly. These include individuals who succumbed to complications arising from SARS-CoV-2 infections, including those whose deaths reflect the growing mental health toll of the pandemic. Still others suffered delayed diagnosis and treatment for chronic illnesses and diseases because of overburdened, nearly broken healthcare systems. More recently, we have been shocked to learn of vaccinated healthcare workers who nonetheless died from COVID-19, as they continued to battle outbreaks.

Reflecting on loss during the pandemic, Dr Craig Wilen, Assistant Professor at the Yale School of Medicine, who has been relentlessly working in the laboratory on SARS-CoV-2 and COVID-19, remembers feeling ‘an acute sense of loss in the early days of the pandemic’. He felt particularly sad for ‘missing out on important time with my kids, who were then 1 and 4, especially during such an uncertain time’. Dr Wilen also noted feeling ‘tremendous guilt about the reality that my career was being prioritized over my wife’s during that period of time (who is also an assistant professor)’. We also wanted to understand what loss meant to someone who had very little to no laboratory time and, as such, we spoke with Dr Nathalie Grandvaux, Principal Scientist at University of Montreal. She reflected that, ‘Being isolated at home was critical for me as an immunocompromised person who had previously suffered severe symptoms from respiratory viruses. But this necessary sanitary isolation jeopardized my role as leader of my research team and in particular as a mentor’. Amid all of these concerns, Dr Grandvaux notes that what kept her going was ‘actually COVID itself. As a researcher interested in respiratory viruses, I was quickly approached by many authorities. While each of the new tasks was a challenge in itself, they also made me feel useful and serve the community’. Fueled by the feedback that she received from the community, she went on to say that ‘Establishing a pandemic research network (Quebec COVID Pandemic Network) combining basic, clinical, and social sciences was also very inspiring and motivating. What has certainly motivated me the most is the contributions in the media, both in scientific radio and TV broadcasts, and in general public information broadcasts’.

Of all the phrases that have become a part of our collective vocabulary during the pandemic, one became a global rallying cry as we faced a common threat that forced us to distance ourselves from each other: ‘All in this together’. From sequencing the SARS-CoV-2 genome and sharing it rapidly with the rest of the world, to unearthing host factors involved in viral entry, to characterizing methods of transmission and spread, the role that research scientists have played over the course

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of the COVID-19 pandemic has been truly remarkable. In the real world, epidemiologists were quick to disseminate useful information regarding the effect of masks on the spread of the virus, ventilation, and social distancing, among others. Scientists have also played an instrumental role in communication and public outreach during the pandemic. For instance, several researchers started using their Instagram accounts to discuss the effects of vaccination and the epidemiology of various variants and to dispel various antivaccination myths about the vaccines that are in circulation. They used Instagram stories to comprehensively review relevant preprints or publications and discuss the real-world ramifications of these, while advocating for the importance of vaccinating the population. The pandemic has captured the public's attention and interest and, in response, scientists have used social media to discuss COVID-19 with the public directly. These discussions cover all aspects of the COVID-19 pandemic, such as conspiracies on the origin of the virus, effects and myths of vaccination, basic immunological concepts with easy-to-follow animationsⁱ, and the science behind the effectiveness of wearing a mask, to name but a few [1]ⁱⁱ. Certain researchers have also used their voices to accelerate certain key topics such as long COVID and gender-based differences in various COVID-19-related researchⁱⁱⁱ.

These collective efforts, which have all led to an unparalleled pace of progress and discovery over the past 2 years, have continued even in the face of significant setbacks. With lockdowns in place worldwide, laboratory closures and restrictions imperiled research on a global scale. In some institutions, scientists and clinicians were required or encouraged to stop their personal research to instead help to fight COVID-19 by processing tests, formulating sanitizers, donating equipment, and/or working on the frontlines^{iv-vi}. Laboratory heads scrambled to sustain their research and keep their teams safe, with some even struggling to obtain basic supplies and keep model organisms alive. In academia, colleges and universities faced existential threats, as they grappled with plummeting student enrolment and the challenges of remote learning. Under these circumstances, some researchers have lost their jobs. Those who remain face an exceptionally fraught path for navigating even standard career milestones such as preparing grants and tenure packages. Increasingly, there is strong evidence that this path is more fraught for women researchers, researchers with children, and early-career researchers [2-6]^{vii-ix}. Undeniably, the pandemic has also taken a significant toll on the mental well-being of researchers and students alike; individuals have coped and dealt with the severe restrictions and isolation with varying levels of success that frankly depends on the day, month, and season. The wounds inflicted by the pandemic on the scientific community run deep and will certainly take time to heal.

Science continues, despite everything, because of the compassion, sacrifice, and endurance of our communities. Those with access to their laboratories worked grueling hours to advance coronavirus research, while those barred from their space embraced creative approaches to continue their own, still vital, research. Group meetings and departmental visits through virtual platforms ensured that past connections were maintained, while still providing a path forward for forging new links. Institutions and grant agencies stepped in to provide tenure extensions and funding resources to ease the crises. Where possible, COVID-19 tests were made free and available to many scientific staff members and students, allowing research to progress in some formats. Meetings and conferences organized by various sections of the scientific community turned virtual, providing access to many who would not have otherwise been able to attend.

Nations with the means to do so are investing an incredible amount of funding into COVID-19 research, helping to streamline clinical trials and expedite approvals for life-saving therapies and vaccines. The collective effort, unity, and collaboration on a global scale renders it possible to move therapies from bench to bedside and is the ultimate reminder that we are 'all in this together'. As the pandemic continues to run its uncertain course, we will prevail by remembering

what we have all experienced, witnessed, and endured over these past 2 years, whether together or apart.

Resources

- ⁱwww.youtube.com/watch?v=jeN8v5i5VNA
- ⁱⁱwww.the-scientist.com/careers/science-and-policy-collide-during-the-pandemic-67882
- ⁱⁱⁱwww.the-scientist.com/features/sex-differences-in-immune-responses-to-viral-infection-68466
- ^{iv}www.gov.uk/government/news/ukaeas-helping-hand-for-the-nhs
- ^v<https://cen.acs.org/safety/lab-safety/Getting-back-lab-during-COVID-19/98/i19>
- ^{vi}www.science.org/content/article/pandemic-pivot-how-scientists-answered-call-diagnostic-tests
- ^{vii}www.bordertelegraph.com/news/national/18826659.pandemic-threatens-research-early-career-scientists-look-leave/
- ^{viii}<https://edition.cnn.com/2020/06/18/health/coronavirus-research-gender-bias-scn/index.html>
- ^{ix}www.forbes.com/sites/ashleystahl/2021/04/02/struggles-for-working-parents-are-likely-to-remain-post-pandemic/?sh=437133ed6856

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