Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Trends in Biotechnology

CellPress

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 what 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 this uniquely difficult epoch and our hopes for the future.

After learning of the passing of community members, including authors who have contributed to the *Trends* journals, my colleagues and I were moved to create this reflection, in part to remember all those whose scientific achievements endure beyond their time with us.

As the COVID-19 outbreak rapidly evolved into a global pandemic, phrases based on scientific principles such as 'flatten the curve', 'herd immunity', '6 feet apart', and 'hotspots' assumed unprecedented importance in everyday life. The phrase 'follow the science' soon transformed into a trending tagline, with the status of scientists seemingly elevated to that of celebrities. Some medics and frontline workers were even featured on covers of fashion magazines[i], an unusual but rightful recognition of their vital contributions to the community at large. Yet, despite the esteem and accomplishments, scientists and clinicians are human and vulnerable to the deadly virus they have led the fight against. 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 healthcare systems. We are saddened to learn of vaccinated healthcare workers who nonetheless died from COVID-19 as they continued to battle outbreaks. These are sobering reminders of the sacrifices that have been made by so many, and the magnitude of the loss endured by our community, and countless others.

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'. The scientific community has embraced this call for collective action, sustaining an unparalleled pace of progress and discovery over the past 2 years, 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 working on the frontlines [ii–iv]. Laboratory heads scrambled to sustain their research and keep their teams safe, with some struggling to obtain basic supplies and keep model organisms alive. In academia, colleges and universities faced existential threats, as they grappled with plummeting student enrollment and the challenges of remote learning. Under these circumstances, some researchers have lost their

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jobs. Those who remain face an exceptionally fraught path for navigating standard career milestones such as preparing grants and tenure packages. Increasingly, there is strong evidence that this path is even more difficult for women researchers, researchers with children, and early-career researchers [1–5][iv–vii]. 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 fluctuating with 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 form. Meetings and conferences organized by various sections of the scientific community, along with college and university classes, turned virtual, providing access to many who would not have otherwise been able to attend [6].

And as scientific editors, we managed unprecedented volumes of manuscripts, accelerating scientific publishing [viii] to meet the demands of our communities while maintaining scientific integrity. *Trends in Biotechnology* alone received more than 620 article proposals from March 2020 to February 2021. While we could not come close to publishing each of these proposed articles, I am sincerely grateful for the community's ongoing support and interest in the journal. I hope that reading about the many useful applications of biology, some directly related to the pandemic [7,8], but many not, has continued to inspire you.

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 every aspect 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 animations, and the science behind the effectiveness of wearing a mask, just to name a few [9][ix]. Some non-scientists were dismayed to learn what scientists have known all along: that 'the science' is a complicated and nonlinear process that can yield seemingly contradictory results when viewed from different perspectives; that starkly different public policies can nevertheless follow reasonably from the same set of scientific data; and that it is a sign of the process working when assumptions that seemed reasonable early in the pandemic were scrutinized and then overturned in the following months. Informing non-experts about these ambiguities has added to the communications challenge that scientists have faced, yet a greater understanding of the scientific process and a deeper respect for its uncertainties among the public is not a bad outcome. It is our hope that the community continues these public outreach efforts, even after we emerge from this pandemic.

Together, these efforts have led, and continue to lead, to astounding achievements. From sequencing the SARS-CoV-2 genome and sharing it with the world, to unearthing host factors involved in viral entry, characterizing methods of transmission and spread of the virus, and continued genomic surveillance of new viral variants, the scientific community is working tirelessly and collaboratively to develop and deploy tools to combat the pandemic. Nations with the means

to do so are investing an incredible amount of funding into COVID-19 research, helping 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

[i]www.vogue.co.uk/news/article/keyworkers-july-2020-issue-british-vogue

[ii]www.gov.uk/government/news/ukaeas-helping-hand-for-the-nhs

[iii]https://cen.acs.org/safety/lab-safety/Getting-back-lab-during-COVID-19/98/i19

[iv]www.science.org/features/2021/01/pandemic-pivot-how-scientists-answered-call-diagnostic-tests

[v]www.bordertelegraph.com/news/national/18826659.pandemic-threatens-research-early-career-scientists-look-leave/

[vi]https://edition.cnn.com/2020/06/18/health/coronavirus-research-gender-bias-scn/index.html

[vii]www.forbes.com/sites/ashleystahl/2021/04/02/struggles-for-working-parents-are-likely-to-remain-post-pandemic/?sh=437133ed6856

[viii]www.cell.com/COVID-19

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