



REVIEW

Pandemic Reading Roundup

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For almost 12 months, we have been living through the worst pandemic in more than 100 years. During that time, much has been written about the SARS-CoV-2 virus and COVID-19, especially by journalists writing for various media; I have been particularly impressed by the work of Ed Yong (*The Atlantic*), Kai Kupferschmidt (*Science*), and Carl Zimmer (*The New York Times*). But now we are seeing books being published on COVID-19, and it is some of those that I want to look at more closely.

Raul Rabadan's *Understanding Coronavirus* (Cambridge University Press, 2020) is designed, as the title suggests, to help the reader comprehend some of the basic science involved in the coronavirus pandemic. The publisher describes the book as "a concise and accessible introduction to all the science and facts you need to understand how the virus works." That turns out to be a

good description of the book. Rabadan is a Professor of Systems Biology and Biomedical Informatics at Columbia, and he describes the book as his attempt to inform a general reader (one who has very limited knowledge of biology, virology, or epidemiology) about the basic science important to understanding the pandemic. In 94 pages, he provides an overview of the molecular biology and epidemiology of the virus, a little bit of genomics connected to SARS-CoV-2 origin and evolution, and comparisons to other respiratory viruses like influenza and the coronavirus responsible for the 2003 SARS outbreak. There is also a chapter at the end that looks at therapeutic options such as drugs or vaccines, although I found it much more dated and incomplete than other parts of the book. Readers interested in learning more about the vaccines currently being deployed will have to look elsewhere, as the

chapter's description of vaccines is restricted to general concepts applicable to any vaccine. My second criticism of the book is the small size of some of the graphics, particularly some that portrayed genomic relationships. The organization of chapters and subsections as a series of questions makes it easier for readers to find information. I'm not sure how easy it would be for the general public to understand everything in the book; to me it seemed that a background equivalent to college general biology would be needed to grasp all the ideas that Rabadan presents. But for STEM faculty, particularly those in biology or chemistry or environmental science, I see Understanding Coronavirus as a useful way to get basic background information on epidemiology and virology.

Apollo's Arrow: The Profound and Enduring Impact of Coronavirus on the Way We Live by Nicholas Christakis (Little, Brown Spark, 2020) and *COVID-19: The Pandemic that Never Should Have Happened and How to Stop the Next One* by Debora MacKenzie (Hachette Books, 2021) take very different approaches than Rabadan. Both Christakis and MacKenzie set out to contextualize the experience of the COVID-19 pandemic. Christakis is a physician and sociologist on the faculty at Yale, where his research, as described on his group's website, "focuses on how human biology and health affect, and are affected by, social interactions and social networks." Not surprisingly, he takes an expansive approach to understanding COVID-19, one that places the current pandemic in the context of how humans have responded to pandemics and disease outbreaks over the past 2500 years. *Apollo's Arrow* is wide ranging in the different aspects of the current pandemic that it examines. Medicine, public health, social interactions, network science, human psychology, economics, and policy are all explored in this book. The last two chapters look forward to how the pandemic may end and how global society was changed by the experience. But Christakis is not a dispassionate narrator simply describing the events that happened; throughout the book he incorporates sharp and appropriate criticisms of how governments and organizations responded to the COVID-19 pandemic. When I finished *Apollo's Arrow*, I felt that I had gained a much broader and nuanced understanding of how pandemics, including the current one, impact human lives and societies. I also realized that while humanity has in some ways made significant progress since the

Black Death of the Middle Ages, in other ways we seem to make the same mistakes again and again.

MacKenzie is a European science writer who has written for *The New Scientist* for many years, including articles on the subject of infectious diseases. She uses a different framework for her overview of the COVID-19 pandemic, placing it in the context of how we deal with emerging pathogens. Her narrative of how the current pandemic unfolded is connected much more to recent outbreaks such as the 2003 SARS and Ebola outbreaks than is Christakis's book (although *Apollo's Arrow* does make some reference to the first SARS outbreak). She also incorporates how governments around the world and international organizations have tried (with widely varying degrees of success) to be prepared for future pandemics. Like Christakis, MacKenzie is very critical of what she views as mistakes and oversights that contributed to the severity and global toll of COVID-19. As the title *COVID-19: The Pandemic that Never Should Have Happened and How to Stop the Next One* suggests, the book also looks at what actions need to be taken on a global scale to ensure that the world is prepared for the next pandemic. MacKenzie makes it very clear in her book that the question is not "Will there be another pandemic?" The question is when it will happen, and will the pathogen be one that we have encountered in the past or a new one that will have jumped from an animal to humans.

I found both *Apollo's Arrow: The Profound and Enduring Impact of Coronavirus on the Way We Live* and *COVID-19: The Pandemic that Never Should Have Happened and How to Stop the Next One* well worth reading. For STEM faculty teaching courses with a focus on microbiology and emerging infectious diseases, MacKenzie's book may be slightly preferable. On the other hand, faculty teaching courses with a broader focus (courses for nonscience majors, first-year seminar courses) may find Christakis's book more useful. Personally, I'm happy that I have both of them on my bookshelf.

While Christakis and MacKenzie set out to describe what happened and contextualize the events of the COVID-19 pandemic, two other books are more focused on just the analysis. Richard Horton is the longtime editor of *The Lancet*, a British weekly medical journal that is one of the oldest in the world. In June, he published *The COVID-19 Catastrophe: What's Gone Wrong and How to*

Stop It Happening Again (Polity Press, 2020), which may be best described as a combination of analysis and polemic. The dictionary definition of polemic is "an aggressive attack on or refutation of the opinions or principles of another"; as a longtime advocate for the importance of global public health, Horton is well prepared to present an aggressive refutation of how the world responded to COVID-19. He uses as examples how different countries responded to the pandemic, although he provides more details about actions/inactions in the US, UK, and China. Consequently, reading Horton's book may help US readers develop a better sense of how similar or dissimilar government reactions to COVID-19 were in different countries. *The COVID-19 Catastrophe* doesn't go into as much detail about global responses to other pandemics as MacKenzie's book does. When Horton does make comparisons between COVID-19 and other pandemics, it is typically to the SARS outbreak of 2003 and what was learned from that. The book was published in June 2020 and presents Horton's scathing critique of government responses to COVID-19 in the first six months of the pandemic. In the last two chapters of the book, Horton looks at the implications of COVID-19 for society in general, particularly in regard to the problem of inequality. I found the argument and analysis in this section significantly less compelling than the earlier sections of the book. A major difficulty is that Horton's argument comes across as much more abstract, theoretical, and unevenly supported. Faculty may find the *The COVID-19 Catastrophe* worth reading as one person's analysis of the mistakes that were made and how countries should respond differently in a future pandemic, but I think there is significant overlap between this book and the one by MacKenzie.

In *The Pandemic Information Gap: The Brutal Economics of COVID-19* (MIT Press, 2020), Joshua Gans approaches the pandemic from the perspective of economics. A recurring theme in his analysis is that responding to COVID-19 is, in many ways, an information problem. How do we know who has been exposed, who is infected, and who is capable of infecting others? Another recurring theme is the challenge of balancing human health and economic activity. Separate chapters look at a number of different topics: viral transmission and human behavioral responses, communicating public health information,

distributing resources that are limited in quantity, restricting physical movement, testing, re-emerging safely from periods of mandated lockdowns, and the role of innovation. The final chapter asks what we should learn from the COVID-19 pandemic and how that knowledge can inform future actions. As an economist, Gans's perspective on these topics is markedly different from, although not opposed to, what I routinely encounter in the scientific literature. As I read the book, I found myself thinking in new ways about aspects of the COVID-19 pandemic that students and I had talked about during 2020.

There are, however, two chapters where I felt Gans's analysis fell far short: the question of wearing masks and the role of innovation. In his discussion of the changing recommendations on wearing masks, Gans writes that "[w]e, the public, were played. And we were played by those whom we were supposed to trust implicitly because of their expertise." Harsh words, which Gans tries to justify in a footnote, where he writes:

I use the word "played" to refer to the fact that experts gave advice to prevent mask adoption by claiming that there were no public health benefits from using face masks when there was ample evidence that masks would prevent the spread of infections prior to COVID-19.

However, I think Gans is ignoring two important things. The first is how our understanding of COVID-19 infection was rapidly changing in the spring. Aerosol transmission, now viewed as a significant mechanism for infection, wasn't initially understood as well as it is now. The extent to which transmission involved people who were asymptomatic was also becoming clearer. Gans also makes no mention of the mixed and often contradictory messaging coming from public health and government officials and the politicization of wearing a mask. I'm not suggesting that there isn't room to criticize how public health messages related to masks were conveyed to the general public. There is. But I found Gans's analysis of this topic flawed and incomplete. In a later chapter focused on the role of innovation in combatting the pandemic, Gans's analysis completely ignores how scientific research on SARS-CoV-2 and COVID-19 built on a combination of prior research on other viral diseases

(AIDS, Ebola, SARS) as well as the development of new technologies long before the COVID-19 pandemic. For example, RNA-based vaccines have been an area of active research for at least a decade and were being actively discussed before Gans's book was published in November 2020. But even with these flaws, I would recommend *The Pandemic Information Gap: The Brutal Economics of COVID-19* to faculty interested in seeing how another discipline approaches the challenge of a pandemic.

All of the books that I've described up to this point are works of nonfiction, most of them in the category of science writing. I want to finish this reflection on pandemic reading by encouraging faculty to spend some time also looking for works that are more creative in nature. In *The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education: Branches from the Same Tree*¹, the National Academies of Science, Engineering, and Medicine encouraged faculty to continue efforts to integrate the arts and humanities with STEM in higher education. Such integration offers potential for increased student engagement and learning. Living through a pandemic certainly provides unique opportunities for such integrations. There are, of course, the obvious "classics": Daniel Defoe's *A Journal of the Plague Year* and Albert Camus' *The Plague*. But more recent works may also be of interest to faculty and students. Emily St. John Mandel's luminous *Station Eleven* is a novel set in a post-pandemic world that explores the idea embodied in the phrase "because survival is insufficient" (from a *Star Trek: Voyager* episode). Mandel's novel is wonderful exploration of the human spirit and ways we can bring meaning into our lives. *There Is No Outside: COVID-19 Dispatches* (published in June 2020) is a collection of essays that look at the experience of COVID-19 in a variety of contexts: prisons, emergency rooms, homeless encampments, migrant camps, and even in our homes. I will finish with two poems written in response to COVID-19. Paul Muldoon's "Plaguey Hill"² is set in a small village in central New York state but connects back to memories of the Plaguey Hill burial mound in Belfast, Ireland that contains the bodies of people who died in

the cholera epidemic of the 1830s. Simon Armitage's "Lockdown"³ connects an outbreak of bubonic plague in the English village of Eyam in the 17th century and the resulting quarantine to the experience of living in the UK during the COVID-19 lockdown.

List of Books Reviewed

- Christakis, Nicholas A. (2020). *Apollo's arrow: The profound and enduring impact of coronavirus on the way we live*. Pp. 384. New York: Little, Brown Spark. ISBN 978-0316628211.
- Gans, Joshua. (2020). *The pandemic information gap: The brutal economics of COVID-19*. Pp. 160. Cambridge, MA: MIT Press. ISBN 978-0262539128.
- Horton, Richard. (2020). *The COVID-19 catastrophe: What's gone wrong and how to stop it happening again*. Pp. 140. Cambridge: Polity Press. ISBN 978-1509546466.
- MacKenzie, Debora. (2021). *COVID-19: The pandemic that never should have happened and how to stop the next one*. Pp. 304. New York: Hachette Books. ISBN 978-0306924248.
- Rabadan, Raul. (2020). *Understanding Coronavirus*. Pp. 120. Cambridge: Cambridge University Press. ISBN 978-1108826716.

About the Author



Matthew A. Fisher is a professor of chemistry at Saint Vincent College, where he has taught since 1995. He teaches undergraduate biochemistry, general chemistry, and organic chemistry lecture. Active in the American Chemical Society, he has been involved in ACS's public policy work for over 15 years and was recognized as an ACS Fellow in 2015. His research interests are in the scholarship of teaching and learning, particularly related to integrative learning in the context of undergraduate chemistry.

¹ Summer 2018 issue of this journal (Vol 10 issue 2, pp 11-15)

² Paul Muldoon's poem "Plaguey Hill" was published in the July 10, 2020 issue of the *Times Literary Supplement*.

³ Simon Armitage's poem "Lockdown" can be found at <https://www.simonarmitage.com/wp-content/uploads/Lockdown-by-Simon-Armitage.pdf>