



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.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



The art of medicine

COVID-19, comics, and the visual culture of contagion

The COVID-19 pandemic is inescapable. From curtailing our daily social and professional interactions, locking down or physically distancing our communities, and drawing our anxious attention to daily updates of international case and death statistics, the lived experience of the pandemic is at once personal, local, and global. It is also a shared experience that emphasises, through the pandemic's pervasive disruption, the social interactions and behaviours that define our shared world. One cultural response to the disruption and uncertainty during an infectious disease outbreak is the construction of what Priscilla Wald terms the "outbreak narrative", a formulaic plot that serves to shape our collective understanding of a pandemic. This narrative traces the emergence and spread of a novel pathogen and the scientific, social, and political responses to the outbreak. In doing so, the outbreak narrative emphasises the breakdown of boundaries, the sites of infection, the social interactions that are disrupted and enacted, and the efforts of science to contain the spread and find a cure. In our increasingly visual society, images are a vital component of the outbreak narrative and more broadly contribute to the visual culture of contagion.

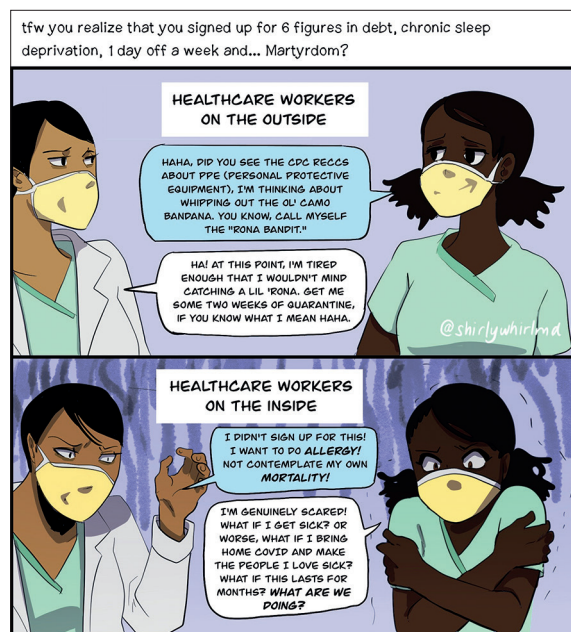
We routinely engage with images of the pandemic, whether through epidemiological maps or infographics, photographs of masking and physical distancing—or the lack thereof—and the ubiquitous medical illustration of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). These images serve to inform, provide meaning, and illustrate the outbreak narrative in ways that help us process, reflect on, and understand our experiences. The dynamic nature of our engagement with these images allows us to generate collective knowledge about the pandemic in a cultural space where images are created, contested, embraced, and at times transformed into icons. Comics, as both a visual medium and cultural product, are important contributions to the visual culture of the COVID-19 pandemic.

Comics have long been part of the visual culture of medicine. From some of the earliest sequential cartoons that depicted morality tales of public health concerns in 18th-century England, to heroic medical comic books of the 1950s in the USA, through international activist comics from the HIV/AIDS pandemic, to present day graphic illness narratives, comics are a unique contribution to our understanding of illness and health. The visual and textual properties of comics can portray the nuances of the illness experience with the immediacy of visual engagement. Graphic medicine is an interdisciplinary field within the health humanities that encompasses the creation, use, and study of comics in medicine and health, and the field has

taken up the task of illustrating the COVID-19 pandemic and curating related comics.

Beyond the immediacy of engagement with their visual, textual, and aesthetic properties, comics capture key aspects of the pandemic narrative. The pandemic has transformed bodily and communal spaces and transformed our social interactions and daily routines. These disruptions occur concomitantly across a multitude of perspectives (scientific, political, social, cultural) and levels of seeing (microscopic, personal, national, global) that encapsulate the full scope and impact of the pandemic. Comics can depict and articulate spatial, temporal, and relational aspects of the pandemic in ways that may be more challenging for other media to portray. Harnessing the visual power of maps, diagrams, and symbols, while simultaneously depicting multiple perspectives, comics can delineate the social, bodily, and geographical boundaries that have been impacted by the virus, the reconfiguring of social interactions, and emotional responses to such things as physical distancing, isolation, and the risk of becoming infected.

Invisibility is an important aspect of contagion. Both the viral pathogen and the routes of transmission cannot be seen by the naked eye, lending a mix of fear and doubt about the pandemic experience that can play out in our personal behaviours, politics, and dissemination of disinformation and misinformation. The now iconic medical illustration of SARS-CoV-2 is depicted,



Shirlene Obuobi's comic about health-care workers on the COVID-19 front line



Monica Lalanda's comic about the health workforce and COVID-19 in Spain

reinterpreted, and anthropomorphised in comics. In depicting the coronavirus within our social spaces and placing it in direct conflict with us, comics articulate and legitimise the fears and anxieties of our uneasy relationship with the virus. Similarly, comics can depict epidemiological routes of transmission, at multiple scales, as the virus crosses global, communal, and bodily boundaries to inform and educate about how to prevent spread and protect yourself and others. Although other types of images, like infographics, are able to provide similar information, a strength of comics is that they present this information through engaging visual storytelling that can place the reader into the experience and contextualise the impact of contagion. In making visible the invisible paths of contagion, comics visually articulate the pandemic as an outbreak narrative.

Comics are also able to portray COVID-19 in the often unseen clinical spaces where the physical and emotional toll of the pandemic weighs heavily: the hospital rooms and intensive care units where health-care workers tend to the sick and dying and where patients with COVID-19, often intubated, may die without family and loved ones at their bedside. For the lay public, these spaces, and the technology and the medical practices and experiences within them, are unfamiliar. In these settings, the death narratives of the pandemic occur. Some comics have recreated the clinical space and explored the emotional and physical burden of caregiving in the pandemic. Comics serve to illustrate and validate the deeply personal experiences of a pandemic that have been abstractly defined by case numbers and death statistics or, worse, downplayed or denied by disinformation campaigns. The perspectives of health professionals articulated through comics also illuminate

medicine's unrelenting efforts to contain the pandemic, care for the afflicted, and comfort the dying.

At present, comics about the COVID-19 pandemic by health-care workers are greatly outnumbered by the work of non-medical cartoonists. Diary comics about the daily travails of life under COVID-19 control measures and the anxiety of global uncertainty abound on social media and webcomic sites. Health professionals who create comics and work on the front line of the pandemic are a fairly small group, but they exist. Not surprisingly, for some their creative output has been stifled by high clinical workloads during the COVID-19 pandemic. Muna Al-Jawad, a geriatrician in the UK who makes comics under the name Old Person Whisperer, encapsulates these feelings well, stating: "I couldn't draw comics during the peak of the COVID-19 outbreak. I was working in the emergency department and acute medical unit mostly. It was a difficult time as it felt like a threat to my personal health and that of my family, plus my colleagues were getting ill and there was a lot of emotion around older people potentially dying from COVID-19, and fighting against the 'just leave them all to die' arguments that came to me from some quarters. I think it takes a while for me to work out what I'm feeling and I need distance and time to understand it. Another thing was that comics are stories and the story of COVID-19 kept changing really fast so what might have been reasonable one week, seemed ridiculous the next and vice versa."

Those health-care workers who have created comics tend to focus on the fears, anxieties, and exhaustion of being on the front line of the COVID-19 response; they contemplate the uneasy label of hero or essential worker and articulate concerns about being a vector of contagion to loved ones and the community. Playing to comics' ability to depict multiple perspectives simultaneously, these graphic narratives often express the conflicting attitudes and emotions inherent in caring for the sick during this pandemic. Taken together, these comics provide insights into the medical community's response to the pandemic, the challenges of rapidly adapting to a new and often riskier work environment, and the emotional and physical toll of their clinical work.

One of us, Shirlene Obuobi, a resident physician at the University of Chicago Medical Center who shares her comics on Instagram as Shirywhirlmd, has been rendering into comics her experiences of caring for patients with COVID-19. Her comics explore a phenomenon well known among health professionals, in which so-called gallows humour is frequently used as a way to deal with more distressing emotions and provide levity in challenging situations. The juxtaposition of internal and external dialogues can be visualised directly in comics, and Obuobi's comics about COVID-19 take advantage of that flexibility to depict conflicting perspectives. Unlike the images of stoic, heroic health-care workers that predominate in the general

For Shirywhirlmd see
<https://www.instagram.com/shirywhirlmd/>

media, her more frantic, emotional characters are meant to be relatable and depict the reality of being a health-care provider on the front line. Additionally, as a resident physician, her comics detail both the angst and pride of working during a pandemic that has disrupted her training programme and at times thrown into question her calling to medicine.

In Spain, Monica Lalanda, an emergency medicine physician who previously worked in the UK, has been creating comics about her pandemic experience. In her comics, she says she critically reflects on “how health-care workers were not only perceived but used (and abused) by the health service”. Lalanda also sought to fill a void in patient information, creating patient-oriented comics in response to the “social distress” she saw on social media. She also converted important medical information into comic form and shared it through social media to reach patients. Lalanda has been collecting Spanish comics about the pandemic and reports recurring themes of anthropomorphised viruses, the effects of living in isolation, and the “heroic behaviour of health workers and their own suffering”. But she has also noticed that “surprisingly I have missed seeing more about the suffering of patients and their relatives and the illness and death in solitude”.

Another of us, Ian Williams, a general practitioner in the UK and founder of the Graphic Medicine website, has turned a critical eye to the challenges of caring for patients during the pandemic and of adapting to a rapidly changing work environment, including a shift to telemedicine. For him, life in the health centre changed overnight when the lockdown in response to COVID-19 was announced. Suddenly, all the routine work was cancelled and the doctors at his practice were only doing emergency telemedicine. Over the intervening months, they have begun to restart routine family medicine, seeing some patients face-to-face, but only if they needed a physical examination. Williams thinks the change has been very strange for doctors and patients alike, but gradually both have navigated the new system, aware of the strengths and weaknesses of this way of working. His comics illustrate this fraught transition to telemedicine and the tensions and humour engendered in the reconfigured patient-provider relationship.

Comics of the COVID-19 pandemic are valuable contributions to the outbreak narrative and to the evolving visual culture of contagion. They can help us collectively process and understand this moment. The visual documentation of the pandemic in comics helps demystify the invisibility of contagion, creates personal narratives about the pandemic, provides public health education, and can create a sense of solidarity around shared emotions and experiences resulting from the disruptions to social interactions, bodily integrity, and communal boundaries. The comics created by health-care workers bring fresh insights by exploring the fraught reality of their work during



Comic by Ian Williams on the shift to telemedicine in the pandemic

the pandemic and their responses to it. Their comics connect them to the communities they serve and validate the personal and professional toll of the pandemic. Comics are well known for their humorous, irreverent, and subversive intent, and health-care professionals have leveraged these aspects of the medium to make comics that add levity to distressing circumstances. In doing so, these comics make disconcerting and emotional topics more approachable and amenable to discussion. One can argue that while we remain physically distanced, comics are a means by which we strive to stay connected through collective memory-making. Importantly, just as we look to past pandemics to inform our current situation, the contemporary contributions of comics to the outbreak narrative and the visual culture of contagion are an important historical visual documentation that can inform our understanding of both the spread of pathogens and ideas.

**Brian Callender, Shirlene Obuobi, M K Czerwiec, Ian Williams*
 Department of Medicine (BC, SO) and Stevanovich Institute on the Formation of Knowledge (BC, MKC), University of Chicago, Chicago, IL 60637, USA; Graphic Medicine, Lakeside, MI, USA (MKC); and Trinity Medical Centre, Hove, UK (IW)
 bcallend@medicine.bsd.uchicago.edu

We thank Muna Al-Jawad and Monica Lalanda for their insights and for providing quotes to us for inclusion in this essay.

For Monica Lalanda's website see <https://monicalalanda.com/>

For Graphic Medicine see <https://www.graphicmedicine.org/>

Further reading

Boileau K, Johnson R, eds. COVID chronicles: a comics anthology. University Park: Graphic Mundi (in press)

Brown D. Fever year: the killer flu of 1918. New York: Houghton Mifflin Harcourt, 2019

Chute H. Why illness and disability. In: Why comics?: from underground to everywhere. New York: Harper, 2017: 239-74

Czerwiec MK, Williams I, Squier SM, et al. Graphic medicine manifesto. University Park, PA: Penn State University Press, 2015

Wald P. Contagious: cultures, carriers, and the outbreak narrative. Durham, NC: Duke University Press, 2008

Williams I. Graphic medicine: comics as medical narrative. *Med Humanit* 2012; **38**: 21-27

Graphic Medicine. Graphic Medicine COVID collection. 2020. <https://www.graphicmedicine.org/covid-19-comics/> (accessed Sept 29, 2020)

Czerwiec MK. Comic Nurse. 2020. <https://comicnurse.com/> (accessed Sept 29, 2020)