

How a Deadly Pandemic Cleared the Air: Narratives and Practices Linking COVID-19 with Air Pollution and Climate Change

Space and Culture
2020, Vol. 23(3) 293–300
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1206331220938641
journals.sagepub.com/home/sac



Eva Angelyna (Evalyna) Bogdan¹ 

Abstract

The recent COVID-19 pandemic revealed the intricate connections between human and planetary health. Air pollution cleared over the countries ordering lockdowns of nonessential businesses to flatten the curve of the pandemic. The links between pandemics and pollution are not obvious at first, yet the two phenomena have several characteristics in common. Both pandemics and pollution originate from specific locations but then spread globally, and both are human-induced rather than natural-hazard disasters. I examine narratives and practices linking COVID-19 with air pollution and climate change as the pandemic unfolds. I compare these findings with research on the Black Death plague in Europe and the air pollution in China's Haze City. Applying the analytical frameworks from these two studies, I analyze media articles and reports on COVID-19 to explore risk experience, stress behaviours, and resistant discourse during the adaptive cycles of the pandemic to gain insights into current and future changes to sustainability.

Keywords

COVID-19, air pollution and climate change, discourses and practices, adaptive cycle

The air began to clear over Wuhan, China, towards the end of the Chinese Lunar New Year in late January and early February 2020. Air pollution levels tend to temporarily decrease during these celebrations. However, this time, the pollution levels dropped faster and have lasted longer than in past years (Liu, as cited in *BBC News*, 2020). This change is attributed partly to the economic slowdown due to the lockdown imposed on January 23 in Wuhan to curb the spread of COVID-19. By mid-February, China's emissions were 25% lower, and significant improvements in air quality were observed in other countries that were prohibiting nonessential businesses and services (see Ambrosio, 2020). This decrease in air pollution has exposed the intricate connections between human activities and toxic emissions, such as transportation-related traffic and industrial processes. The drop in air pollutants has led to calls for not returning to 'normal' but rather shifting to more environmentally and socially sustainable practices.

¹Department of Political Science, University of Waterloo, Waterloo, ON, Canada

Corresponding Author:

Eva Angelyna (Evalyna) Bogdan, Department of Political Science, University of Waterloo, HH 350, 200 University Avenue West, Waterloo, ON N2L 3G1, Canada.
Email: ebogdan@uwaterloo.ca

Humans are constantly making sense of the world around them by creating narratives through meanings, discourses, or stories about events. Out of the many narratives created at the individual and social levels, a few will eventually dominate and inform policy, which then directs programs and practices. This situation is also the case for pandemics and pollution. Geobey and McGowan (2019) asked: “Can we understand how people make sense of complex systemic change from inside that system in real time?” (p. 23). In this article, I examine narratives and practices linking COVID-19 and air pollution as the pandemic unfolds, and their implications for future sustainability. I analyze media articles and reports on COVID-19, loosely drawing on analytical frameworks and findings from the narratives and practices during the Black Death plague in Europe and the recent research on air pollution in China’s Haze City.

The links between pandemics and air pollution are not obvious at first, yet the two phenomena have several characteristics in common. Both pandemics and pollution have spatial and geographical dimensions as they originate from specific locations but then spread globally. Both air pollution and the COVID-19 pandemic are human-induced rather than natural-hazard disasters because they are contemporary risks arising from “hazards and insecurities induced and introduced by modernization itself” (Beck, 1992, p. 21). Mbembe (2020) contended that “modernity has been an interminable war on life” (para. 12). The negative consequences arising from such contemporary risks can trigger questioning of the established institutions and ways of thinking and being that made such risks possible, and thus lead to reflexive modernization (Beck et al., 2003) and recognition that “humankind and biosphere are one” (Mbembe, 2020, para. 21).

Drawing on Past Pandemics and Current Pollution

Since the opening of China in 1978 and the subsequent reforms, the country has witnessed unprecedented growth and has become the world’s second largest economy. One of the negative impacts of this increased industrialization and urbanization is pollution. The lowest air quality recorded was in the Bohai economic belt region, where most Chinese industries are located (see Zhou, 2019). In cities such as Shijiazhuang and Beijing, the air quality is 52% and 69%, respectively, meaning that air quality is good only during half or one-third of the year. The air pollution combines with the weather and moisture in the air to create smog or haze, hence the name “Haze City” (Zhou, 2019). Inspired by the social theorist Lefebvre and his conceptualization of spatialization as consisting of the interrelated dimensions of the physical, the mental, and the social, Zhou (2019) explored the space of Haze City through residential and tourist risk experiences, stress behaviors, and resistant discourses. Although COVID-19 has reversed the effects of smog by helping to clear the air, some of Zhou’s insights about how the smog has influenced risk experiences, stress behaviors, and resistant discourses are relevant to the current pandemic.

A review of the narratives from the European Black Death plague during the fourteenth century found that those experiencing the pandemic developed personal understandings or meanings of the societal changes, which then progressed to collective understandings of how to respond to the crisis (Geobey & McGowan, 2019). The authors overlaid the narratives and measures of system resilience by mapping the Plague over the four phases of the adaptive cycle found in socioecological systems: collapse, reorganization, exploitation, and conservation (Holling & Gunderson, 2002, as cited in Geobey & McGowan, 2019). Similarly, I describe the narratives and practices linking the current pandemic and pollution throughout these adaptive cycle phases to understand current and future changes from COVID-19.

The Current State of COVID-19 and Carbon Emissions

COVID-19 emerged as a novel coronavirus disease in 2019. Coronaviruses are a large family of viruses that cause upper-respiratory tract illnesses, including the common cold. The specific

strains of coronavirus that cause severe acute respiratory syndrome (SARS) are zoonotic. There have been several global SARS outbreaks. The first SARS (SARS-CoV or SARS1) emerged in the early 2000s, possibly originating from civets and bats sold live in wet markets in China, but then spreading across the globe. The cause of COVID-19 (or SARS-CoV-2) is believed to have originated from either bats or pangolins (anteaters) sold in Wuhan, China (Andersen et al., 2020).

SARS-type illnesses attack the lungs and are thus exacerbated by air pollution. Air pollution is produced by cars and industries generating carbon dioxide, nitrous oxide, methane, and other airborne chemicals. In 2019, global carbon emissions hit a record high (Jordan, 2019), despite almost every country agreeing to reduce greenhouse gas emissions by signing the Kyoto Protocol in 1997 and Paris Agreement in 2016.

Air pollution is linked to 4.2 million deaths per year by causing or exacerbating conditions such as respiratory illnesses, heart disease, and stroke (World Health Organization, as cited in Koren, 2020). A recent study estimated that air pollution could be causing 8.8 million extra deaths per year in Europe, which is twice the number previously estimated (Lelieveld et al., 2019). Burke (2020) estimated that the reduction in air pollution in China over a two-month period, as a result of the economic disruption caused by COVID-19, saved the lives of 51,700–73,000 elderly adults and 1,400–4,000 young children. Conversely, several studies found significant relationships between high air pollution levels and COVID-19 infections and deaths (Ma et al., 2020; Yongjian et al., 2020).¹

Narratives and Practices Linking Pandemics and Pollution Through the Adaptive Cycle

Collapse

In the first phase of a pandemic, collapse (lasting around 6 months), connections sustaining seemingly stable and large social systems break. In Medieval Europe, despite the social systems breaking down during the Plague, status quo system indicators continued to be used for understanding and measuring the event phenomena—for example, mass deaths (Geobey & McGowan, 2019). Also, traditional worldviews remained intact and were used to frame solutions.

The world is still in the early stages of the COVID-19 outbreak, but already signs of collapse are apparent. As of May 31, 2020, there are over six million confirmed COVID-19 cases and about 370,000 deaths (Johns Hopkins University, 2020). Many more cases are predicted as the virus spreads, although much less than the predicted 40 million deaths if global action to flatten the curve of the pandemic had not been concerted. The elderly and those with respiratory issues and compromised immune systems are considered at especially high risk of complications and death from COVID-19. The behaviors and actions mandated by governments during COVID-19 are similar to those for addressing air pollution in China, such as social isolation, wearing masks, and lockdowns or shutdowns of public and private systems, which have resulted in reduced traffic and industrial production. The spread of the virus has been slowed by such measures, yet social isolation can increase social and health problems, including mental health and domestic abuse.

“Risk space” (Zhou, 2019, p. 117) is created by air pollution and is especially dangerous when combined with respiratory diseases. Individual risk is experienced unequally depending on baseline health conditions as well as socioeconomic stratification factors (e.g., living conditions and access to medical resources). Zhou (2019) described how smog in China has had multiplier effects, such as low visibility of landmark sites, damaging the tourism industry; reduced citizen desire to live in popular but polluted cities; and a diminished experience of space by altering depth perception and causing disorientation. The opposite to Haze City has occurred during COVID-19: The air has cleared and visibility improved; even the birds seem louder because the

world became quieter (Koren, 2020). Similar to Zhou's findings on air pollution, the pandemic lockdown has also hurt the tourism industry, but whether people start to move out of the larger cities where COVID-19 cases are concentrated remains to be seen. COVID-19 has also led to concerns about environmental and health issues, and even "a sense of crisis about self-survival" (Zhou, 2019, p. 114).

The International Monetary Fund (IMF) predicts that the pandemic will push the world economy into the worst recession since the Great Depression in the 1930s, and it is expected to be worse than the 2009 Global Financial Crisis (Gopinath, 2020). Due to the "The Great Lockdown," many businesses are struggling to stay afloat. In April, global oil demand dropped by 19.9 million barrels per day (approximately 20% of the daily global demand) compared to the previous year, and will continue to decline in May (International Energy Agency, 2020). In addition to the drop in oil demand, prices are lower than they have been for 18 years, strongly hitting the oil industry (Dunn, 2020). Although some are calling this "Black April" for the energy market, it is "Green April" for the environment.

Reorganization

During the next phase of a pandemic, reorganization (3 months to 10 years), the system is in chaos, but new features start to emerge. The previous status quo indicators are questioned by a growing number of people, but powerful, established institutions may try to reinforce the status quo ante (Geobey & McGowan, 2019).

Most people are eager to "return to normal" after COVID-19, and some have opened borders and businesses earlier than advised by health experts. But many who are concerned about the environment are directly and openly criticizing social actors such as leaders (e.g., U.S. President Trump) and corporations (e.g., fossil fuel industries funding climate science denial) about their policies and practices. These discourses of resistance are muted in China, where there are strict regulations and censorships. Thus, criticism is veiled by subtle language and ironic tone, such as through "the folk humor culture of haze" (Zhou, 2019, p. 120) and through symbolism, such as placing masks on statues and animals.

Western scientists such as Cobb have been urging world leaders to "bend the curve of planet-warming emissions" (Sengupta, 2020, para. 4) and to lead a shift towards sustainability that is within the Earth's capacity. Some have argued that "there is no returning to normal after COVID-19 but that there is a path forward" (Albani, 2020, para. 1). This path includes "changing our production and consumption habits towards cleaner and greener" (Andersen, 2020, para. 6). These voices of resistance from subpolitical groups are necessary for reflexive modernization (Beck et al., 1994).

Exploitation

The exploitation phase (10+ years) follows, in which it is still not clear what form the new system(s) will take. Personal narratives along with shared and pluralist narratives emerge. It is during this phase of the Plague that economic relationships changed: for example, decreased agricultural productivity, reduced prices of goods, and drops in labor wages, which led to the bloody 1381 Peasants' Revolt in England (Geobey & McGowan, 2019).

If the exploitation phase takes over a decade to manifest, then the COVID-19 pandemic clearly has not yet reached this phase. However, after four months, personal, shared, and pluralist narratives have already emerged, and so have changes in economic relationships and cases of exploitation. For example, some people bought large amounts of toilet paper and hand sanitizer to resell at exorbitant prices. Many have lost their jobs, and even though some governments are offering emergency income, not everyone is eligible. Agricultural productivity may significantly decline in the upcoming growing and harvesting seasons as temporary foreign workers are denied entry.

The large-scale outbreaks of COVID-19 in high-volume slaughterhouse and meat-packing facilities—for example, in Canada and the United States—have resulted in shutdowns and reduced meat production as well as their domino effects down the supply-chain, forcing farmers to depopulate by killing millions of livestock (Kevany, 2020). China's air pollution has also had economic impacts, as noted earlier.

Protests and riots, some violent, have erupted around the globe over various pandemic-related issues. The gathering of large masses has produced the opposite intended effect of social distancing to reduce viral transmission. In contrast, protests in China are silent visual statements that are not repressed by the official culture but are rather praised and normalized, forming a unique rhetoric in which the intended message is lost in translation between citizens and officials, creating an “incisive ironic effect” (Zhou, 2019, p. 124).

The narratives on sustainability and sustainable practices have continued to multiply as the pandemic unfolds. The social and natural world are intricately interconnected, which becomes especially visible with zoonotic diseases. Goodall has argued that the root cause of both pandemics and climate change is the attitude that nature is dispensable. Goodall (2020) has advised people to rethink their relationship with the natural world and has recommended “treating climate change. . . as if it was a pandemic” (Diprose & Neal, 2020, para. 29). Others have gone further and have argued that the common root of COVID-19 and climate change is the current predominant economic model of infinite growth at the expense of the environment and vulnerable populations, and they are calling for planned degrowth and just climate transitions (Framasoft, 2020; Kolinjivadi, 2020; Mookerjea & Mounsef, forthcoming). Similarly, Mbembe (2020) stated:

If war there must be, it cannot so much be against a specific virus as against everything that condemns the majority of humankind to a premature cessation of breathing, everything that fundamentally attacks the respiratory tract, everything that, in the long reign of capitalism, has constrained entire segments of the world population, entire races, to a difficult, panting breath and life of oppression. (para. 16)

Mbembe (2020) pleaded for people to conceive of breathing not just as a physiological act but also as a universal right to breathe and a fundamental right to existence.

These subpolitical narratives of sustainability, however, have not yet become dominant. The destruction of natural habitat and the continued demand for meat (wildlife trade and industrial farms) is expected to increase the number of new and existing diseases transmitted from animals to humans, foreshadowing future pandemics. Additionally, although the air has temporarily cleared in some places, there is no sign that air pollution will not return to pre-COVID-19 levels or increase. Countries such as the United States and South Africa have even relaxed air pollution standards during the pandemic, despite the links between COVID-19 health issues and air pollution (Kumar et al., 2020). Even after the 2009 financial crash, carbon emissions initially declined but then increased four-fold afterwards (see Dunn, 2020).

Conservation

In the final phase, conservation (lasting a generation or longer), new systems organize and stabilize, and dominant frames and measures emerge describing these systems. Examples from the Plague include the increased availability of land and a shift in access to capital. It is during the conservation phase that the differences in various regions' responses and changes become clear (Geobey & McGowan, 2019). A new value system emerged from the Plague of hope and hubris, which is believed to have fueled the drive for fame and glory, and hence the exploration, innovation, and invention that characterized the new Renaissance era (Cohn, 2003, as cited in Geobey & McGowan, 2019).

The emphasis on public health response to COVID-19 and fears of deep economic recession have pushed climate issues to the backburner (Ambrosio, 2020). But while attention and resources

tend to be focused on more immediate issues such as making masks and dispensing emergency income, it is important to assess long-term priorities and allocate some energy and resources towards them (Albani, 2020). Trillions of dollars will be invested into economic stimulus, including to industries with large emissions such as airline companies, steel producers, and cement manufacturers, thereby increasing emissions. However, potential exists for long-term changes in behavior in reducing travel and continuing with remote work and telecommuting (Ambrosio, 2020). The pandemic could be a “golden opportunity to channel significant portions of those funds to fast forward to a renewable energy economy. . .to seriously reduce air pollution, greenhouse gas emissions and. . .future pandemics” (Kumar et al., 2020, para. 10). Economic recovery packages promoting a low-carbon economy (already underway in Germany and France) and systemic shifts in energy use will be needed (in English, 2020).

On the one hand, the pandemic has had visible positive impacts by improving air quality and reducing greenhouse gas emissions. On the other hand, the drastic and unexpected economic slowdown has and will continue to have damaging social consequences. Therefore, the head of the UN Environment Programme (UNEP), Inger Andersen, cautioned against viewing the pandemic as a silver lining for the environment (Andersen, 2020).

Some characteristics of the conservation phase apply to Haze City that may have implications for the unfolding pandemic. In China, there is growing appreciation, including by officials, of a healthy environment, and measures are being introduced to reduce environmental degradation (Zhou, 2019). China is considered a world leader in renewable energy but, paradoxically, uses half the coal burned globally and is the top emitter of greenhouse gases (Larson, 2019). Such contradictions may multiply during the pandemic.

Conducting a comparison of the consequences of different national and regional policies for COVID-19 and air pollution is out of scope for this position statement but would be interesting for future research. Will new value systems emerge and stick? It is also not yet clear whether narratives on environmental sustainability and economic security will shift from the usual arguments juxtaposing them as incompatible to new ones echoing subpolitical voices on their interdependence. Globally, there needs to be a “rediscovering. . .that we have an indivisible bond with all life” (Mbembe, 2020, para. 21), which is reflected in a “profound, systemic shift to a more sustainable economy that works for both people and the planet” (Andersen, 2020, para. 1).

Conclusion

In this article, I examined the narratives and practices linking COVID-19 with air pollution and climate change in media articles and reports. I compared and contrasted these findings with those of scholarly works on the Black Death Plague in Europe and the air pollution in China’s Haze City. Although there are similarities between the Plague and Haze City during the collapse, reorganization, and exploitation phases of the adaptive cycle, it is yet to be seen which transformations will occur during the upcoming conservation phase. A greener and more socially equitable future is possible but only if quick and decisive action to address the underlying unsustainable systemic problems are addressed.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The Social Science and Humanities Research Council (SSHRC) Postdoctoral Fellowship and the Marine Environmental Observation, Prediction and Response Network (MEOPAR) Postdoctoral Fellowship.

ORCID iD

Eva Angelyna (Evalyna) Bogdan  <https://orcid.org/0000-0002-5157-2215>

Note

1. Other studies are also underway examining the links between pollution levels and COVID-19 cases, but some are yet to be peer-reviewed.

References

- Albani, M. (2020, April 15). There is no returning to normal after COVID-19: But there is a path forward. *World Economic Forum*. <https://www.weforum.org/agenda/2020/04/covid-19-three-horizons-framework/>
- Ambrosio, N. (2020, March 18). COVID-19 and climate: Multifaceted impacts. *Prevention Web*. <https://www.preventionweb.net/news/view/70921>
- Andersen, I. (2020, April 5). First person: COVID-19 is not a silver lining for the climate, says UN Environment chief. *UN News*. <https://news.un.org/en/story/2020/04/1061082>
- Andersen, K. G., Rambaut, A., Lipkin, W. I., Holmes, E. C., & Garry, R. F. (2020). The proximal origin of SARS-CoV-2. *Nature Medicine*, 26, 450–452. <https://doi.org/10.1038/s41591-020-0820-9>
- Beck, U. (1992). *Risk society: Towards a new modernity*. Sage Publications.
- Beck, U., Bonss, W., & Lau, C. (2003). The theory of reflexive modernization: Problematic, hypotheses and research programme. *Theory, Culture & Society*, 20(2), 1–33. <https://doi.org/10.1177/0263276403020002001>
- Beck, U., Giddens, A., & Lash, S. (1994). *Reflexive modernization: Politics, tradition, and aesthetics in the modern social order*. Polity Press.
- Burke, M. (2020, March 8). COVID-19 reduces economic activity, which reduces pollution, which saves lives. *Global Food, Environment and Economic Dynamics [G-FEED]*. <http://www.g-feed.com/2020/03/covid-19-reduces-economic-activity.html?m=1>
- Diprose, K., & Neal, M. (2020, April 12). Jane Goodall says global disregard for nature brought on coronavirus pandemic. *MSN News*. <https://www.msn.com/en-au/news/coronavirus/jane-goodall-says-global-disregard-for-nature-brought-on-coronavirus-pandemic/ar-BB12t90E>
- Dunn, K. (2020, April 15). ‘Black April:’ IEA warns of ‘staggering’ demand drop in global oil markets. *Fortune*. <https://fortune.com/2020/04/15/black-april-oil-production-iea/>
- English, J. (2020, May 23). Why your reduced carbon footprint from lockdown won’t slow climate change. *CBC News*. <https://www.cbc.ca/news/technology/pandemic-climate-change-covid-emissions-1.5579232>
- Framasoft. (2020). Degrowth: New roots for the economy. <https://framaforms.org/degrowth-open-letter-1587824775>
- Geobey, S., & McGowan, K. (2019). Panarchy, ontological and epistemological phenomena, and the Plague. *Ecology and Society*, 24(4), Article 23. <https://www.ecologyandsociety.org/vol24/iss4/art23/>
- Goodall, J. (2020, April 6). COVID-19 should make us rethink our destructive relationship with the natural world. *Slate*. <https://slate.com/technology/2020/04/jane-goodall-coronavirus-species.html>
- Gopinath, G. (2020, April 14). The Great Lockdown: Worst economic downturn since the Great Depression [blog post]. *International Monetary Fund*. <https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>
- Johns Hopkins University. (2020). COVID-19 dashboard by the Center for Systems Science and Engineering (CSSE). <https://coronavirus.jhu.edu/map.html>
- Jordan, R. (2019). Global carbon emissions growth slows, but hits record high. *Stanford University*. <https://earth.stanford.edu/news/global-carbon-emissions-growth-slows-hits-record-high#gs.3i9vn9>
- Kevany, S. (2020, April 29). Millions of farm animals culled as US food supply chain chokes up. *The Guardian*. <https://www.theguardian.com/environment/2020/apr/29/millions-of-farm-animals-culled-as-us-food-supply-chain-chokes-up-coronavirus>
- Kolinjivadi, V. (2020, March 30). The coronavirus outbreak is part of the climate change crisis. *Al Jazeera*. <https://www.aljazeera.com/indepth/opinion/coronavirus-outbreak-part-climate-change-emergency-200325135058077.html>

- Koren, M. (2020, April 2). The pandemic is turning the natural world upside down. *The Atlantic*. <https://www.theatlantic.com/science/archive/2020/04/coronavirus-pandemic-earth-pollution-noise/609316/>
- Kumar, A., Burston, J., & Karliner, J. (2020, April 15). The deadly link between COVID-19 and air pollution. *World Economic Forum*. <https://www.weforum.org/agenda/2020/04/the-deadly-link-between-covid-19-and-air-pollution/>
- Larson, C. (2019, December 2). China leads the world in coal and clean energy, baffling experts. *Global News*. <https://globalnews.ca/news/6245974/china-climate-paradox-energy/>
- Lelieveld, J., Klingmüller, K., Pozzer, A., Pöschl, U., Fnais, M., Daiber, A., & Münzel, T. (2019). Cardiovascular disease burden from ambient air pollution in Europe reassessed using novel hazard ratio functions. *European Heart Journal*, 40(20), 1590–1596. <https://doi.org/10.1093/eurheartj/ehz135>
- Ma, Y., Zhao, Y., Liu, J., He, X., Wang, B., Fu, S., . . . Luo, B. (2020). Effects of temperature variation and humidity on the death of COVID-19 in Wuhan, China. *Science of the Total Environment*, 724, Article 138226. <https://doi.org/10.1016/j.scitotenv.2020.138226>
- Mbembe, A. (2020, April 13). The universal right to breathe (C. Shread, Trans.). *Critical Inquiry*. <https://critinq.wordpress.com/2020/04/13/the-universal-right-to-breathe/>
- Mookerjea, S., & Mounsef, D. (Eds.). (Forthcoming). *Toxic media ecologies: Critical responses to the cultural politics of planetary crisis*. University of Athabasca Press.
- Sengupta, S. (2020, March 12). Climate change has lessons for fighting the coronavirus. *The New York Times*. <https://www.nytimes.com/2020/03/12/climate/climate-change-coronavirus-lessons.html>
- Yongjian, Z., Jingu, X., Fengming, H., & Liqing, C. (2020). Association between short-term exposure to air pollution and COVID-19 infection: Evidence from China. *Science of the Total Environment*, 727, Article 138704. <https://doi.org/10.1016/j.scitotenv.2020.138704>
- Zhou, X. (2019). Spatial practices in the space of Haze City. *Space and Culture*, 22(2), 111–125. <https://doi.org/10.1177/1206331218775329>

Key (Non-commercial) Online Resources

1. Just Powers Energy Transition: <https://www.justpowers.ca/>
2. Protests over responses to the COVID-19 pandemic: https://en.wikipedia.org/wiki/Protests_over_responses_to_the_COVID-19_pandemic

Author Biography

Eva Angelyna (Evalyna) Bogdan is a SSHRC and MEOPAR postdoctoral research fellow in the Department of Political Science, University of Waterloo. Her interdisciplinary research focuses on how diverse stakeholders with varied perceptions and interests shape decisions, policies, and practices in risk governance, with a focus on flooding. She has published in the following: *Canadian Review of Sociology*; *International Journal of River Basin Management*; *Journal of Agriculture, Food Systems and Community Development*; and edited books. Dr. Bogdan is a research associate at the Centre for Community Disaster Research (Mount Royal University).