



11

The Darkened Horizon: Two Modes of Organizing Pandemics

Matthias Leanza

Introduction

The horizon has darkened. The future no longer seems like an open space full of opportunities and risks. Rather, what is in store appears to be deeply threatening. Whether one thinks of global warming, terrorism or the continuing instability of the banking and finance sector, our expectations for the future in many areas of public life exemplify what Craig Calhoun (2004, p. 376) calls an ‘emergency imaginary’: ‘A discourse of emergencies is now’, as he wrote more than 10 years ago in a diagnosis that is even more applicable today, ‘central to international affairs. It shapes not only humanitarian assistance, but also military intervention and the pursuit of public health.’ Due to this emergency imaginary, we feel that our social institutions, our health and well-being, and even, as in the case of global warming, the future of mankind as such are deeply endangered.

M. Leanza (✉)

Sociology Department, University of Basel, Basel, Switzerland

© The Author(s) 2018

H. Krämer, M. Wenzel (eds.), *How Organizations Manage the Future*,
https://doi.org/10.1007/978-3-319-74506-0_11

This chapter deals with the recent darkening of the future horizon in the global fight against pandemics. Around the year 2000, the World Health Organization (WHO) started collaborating with a large number of local actors and made a concentrated effort to protect the world's population against emerging infectious diseases such as severe acute respiratory syndrome (SARS), swine flu, Ebola and Zika. Although efforts have been made so that the spread of future infectious diseases will be contained through early intervention, the actors in charge expect the extant measures to fail to some degree. They believe it is simply impossible to prevent all pandemics from happening. But steps can and should be taken through emergency preparation to lessen an unavoidable pandemic's impact. As Andrew Lakoff (2007, pp. 253–254) summarizes:

Preparedness assumes the disruptive, potentially catastrophic nature of certain events. Since the probability and severity of such events cannot be calculated, the only way to avert catastrophes is to have plans to address them already in place and to have exercised for their eventuality—in other words, to maintain an ongoing capability to respond appropriately.

In recent years, scholars of security studies, cultural studies and other research areas have paid much attention to these developments in emergency preparedness, which, it is worth noting, are not limited to the domain of public health. This issue has primarily been addressed at two levels: first, by changing global security policies after the 9/11 attacks, and, second, by scrutinizing the narratives and rhetorical strategies through which the emergency imaginary is constructed and gains plausibility (e.g. Massumi 2005; Aradau and van Munster 2011; Horn 2014). In this chapter, I will focus on *organizations* as key actors in these processes of emergency planning. Without the capacity of organizations to produce binding decisions for their members, which allows them to plan for an uncertain future, pandemic preparedness would not be feasible—especially not on a global scale.

I will unfold my argument in four steps. With regard to the WHO, which was established in 1948, I will discuss the question of how supra-national coordination and planning for the future is rendered possible by

building formal organizations and organizational networks at a global level. I will then highlight some aspects of the attempts undertaken by the WHO and its partners after the year 2000 to fight pandemics on a global scale. My analysis of relevant policy papers, legal norms and manuals shows that two different though complementary strategies are applied: early intervention and emergency planning.¹ These are, as I will discuss more explicitly in the final section, two different kinds of organizing (for) the future or, to put it differently, two modes of how organizations manage pandemics. The overall aim of the empirical analysis offered in this chapter is to reconstruct organizational programmes and rationales rather than to give an account of the actual operations of these systems. The focus lies on public discourses and normative texts and not so much on the ‘inside’ of these organizations, meaning their day-to-day routines and practices.

Organizing Global Public Health

Contagious diseases do not stop at state borders. Pathogens circulate without regard for political and administrative spheres of influence. What Gilles Deleuze and Félix Guattari (2005, introduction) establish for rhizomes in general also applies to infection chains in particular: by growing rampantly, they produce a ‘deterritorializing effect’. Pathogens connect distant regions and different kinds of people; zoonoses even trespass the boundary between animals and humans. By doing so, communicable diseases create spaces and communalities that did not exist before. This is also the reason why every epidemic requires new maps (e.g. Koch 2015).

Even though pathogens do not stop at state borders, sovereignty ends there, and the difficult terrain of diplomacy begins. The International Sanitary Conferences, which took place between 1851 and 1938, made a first step towards creating a global field of public health (Howard-Jones 1975; Bynum 1993). While the first couple of these conferences—there were 14 in all—dealt primarily, though not exclusively, with cholera, further diseases and topics were discussed and negotiated beginning in the 1880s. Laborious agreements regarding quarantine, inspection and surveillance measures were worked out and in some cases ratified.

But the field of global health diplomacy did not receive a coordination and control unit until 1948 with the establishment of the WHO as a specialized agency of the United Nations (Zimmer 2017). In passing the International Health Regulations (IHR) of 1969, which superseded the International Sanitation Regulations of 1951, the WHO established standards and norms with a legally binding character for its signatory states. The primary goal of these regulations was to provide ‘maximum security against the international spread of disease with the minimum interference with world traffic’ (WHO 1962, p. 5). To this end, epidemiological surveillance and alarm systems were installed in signatory states, or already existing structures were expanded. In addition, the WHO made more specific efforts to combat infectious diseases. One of the first large projects was the Global Malaria Eradication Program (1955–1969). In order to defeat the dangerous tropical disease, the insecticide DDT (dichloro-diphenyl-trichloroethane) was used liberally and repeatedly in over 60 countries. Even though certain regions profited from this measure, the actors in charge had to accept in the end that this goal was, on the whole, too ambitious (Zimmer 2017, pp. 198–362). More successful, however, was the vaccination programme against smallpox, which was enacted in 1959 and intensified in 1966 (Fenner et al. 1988, pp. 365–592, 1103–48). After roughly 20 years, it finally reached its goal. In 1980, the WHO announced: ‘smallpox is dead!’ (ibid., p. 1106).

Sovereign nation states use the mechanism of formal organization to cooperate in this and further policy areas of international concern. While ‘leagues of subjects’ within a state ‘savour of unlawful design’, as Thomas Hobbes (1651, p. 145) famously wrote in *Leviathan*, ‘leagues between Commonwealths, over whom there is no human power established to keep them all in awe, are not only lawful, but also profitable for the time they last’. As well as mutual agreements and legally binding contracts, inter- or supranational organizations are a specific form taken by such leagues today. Drawing on Niklas Luhmann (1964), organizations can be perceived as a type of social system that is defined by formal membership roles and processes of decision-making. As inter- or supranational organizations demonstrate, not only natural but also legal persons, such as

states, can become members of organizations. By entering an organization, sovereign nation states are, in principle, capable of producing collectively binding decisions on a global level, without losing their autonomy to a sovereign world state.

Today, a wide range of organizations constitute the global field of public health and disease control (Youde 2012, part 2). Besides the WHO, they include the World Bank, UNAIDS (which was established in 1996) and governmental and nongovernmental organizations. These organizations are the main action centres within the field of global public health. They deliver expertise, develop policies, launch programmes and mobilize the global community. To achieve their goals, they regularly ally with other organizations and build networks that can be activated when necessary. This especially holds true for the global fight against pandemics. In certain respects, in order to deal with an unfolding threat, organizational networks have to spread as rampantly as the pathogens themselves. Otherwise they will be unable to prevent further harm.

Early Intervention

In 2000, and thus very much in the shadow of the global AIDS crisis, the WHO laid the foundation for a new regime in the global fight against pandemics by setting up the Global Outbreak Alert and Response Network (GOARN). Since then it has acted in more than 130 cases (Mackenzie et al. 2014). Through ‘rapid identification, verification and communication of threats’ (WHO 2000, p. 2), GOARN seeks to contain the spread of infectious diseases, especially highly infectious ones. ‘No single institution or country’, so the main argument for this international cooperation goes, ‘has all of the capacities to respond to international public health emergencies caused by epidemics and by new and emerging infectious diseases’ (WHO n.d.). In 2002–2003, the SARS pandemic, which resulted in nearly 800 registered deaths, triggered a global health alarm due to GOARN, though the communication of this risk kindled by the predicted future *potential* of the pandemic outstripped, in certain respects, its *actual* impact (Smith 2006; Ong 2009).

The thoroughly redesigned IHR from 2005, which came into force in 2007, further developed and shaped this process. In contrast to the regulations it replaced—the International Sanitation and Health Regulations of 1951 and 1969, which, in comparison, were quite static since they only applied to a specific catalogue of communicable disease—the IHR now includes an early warning system that seeks to detect every potential ‘Public Health Emergency of International Concern’ (PHEIC) (Fidler 2005). The focus is on so-called points of entry, especially sea- and airports (WHO 2005a, pp. 11–15, 18–20). The member states of the WHO are responsible for implementing this global safety net at the local level; they must establish surveillance, contact and coordination units. In Germany, for instance, the Federal Office of Civil Protection and Disaster Assistance coordinates and oversees this implementation process in cooperation with the Robert Koch Institute.² The Robert Koch Institute, in turn, works with the European Centre for Disease Prevention and Control, which is an important partner of GOARN.³

Because many different kinds of organizations across a wide range of countries are connected in this network, it is necessary to standardize decision-making. Without the ‘structural coupling’ (Maturana and Varela 1987, pp. 75–80) of a shared decision process, cooperation and coordination between the participating organizations would not be feasible. Decisions would simply not be able to circulate within the network. Instead, they would have to be re-evaluated at every nodal point. For this reason, the IHR (WHO 2005a, pp. 43–46; see also WHO 2012) stipulates a risk-assessment matrix for signatory countries: after a local surveillance unit has detected an event ‘that may constitute a Public Health Emergency of International Concern’ (WHO 2005a, p. 43), three yes/no questions regarding its actual and potential impact must be answered. Then, it is determined whether the event should be rated as unusual or unexpected. If the answers are all positive, the WHO must be notified within 24 hours. If they are not all positive, there are two further levels of such yes/no questions, which address the risk of international spread and, in a final step, the possibility that countries or other entities would impose international travel or trade restrictions in response to the outbreak. The answers to these questions then determine whether notifying the WHO is required or not.

This decision-making tool can be understood as an ‘attention filter’. Since there are now many globally connected surveillance units, mechanisms have to be installed that not only allow and trigger but also suppress communication between them. Otherwise, the network would be flooded with more information than it can process. In other words, the elements within this structure would be too closely connected. Nonetheless, the goal is to set the attention thresholds as low as possible. Even if notifying the WHO is not required at one point, the event in question has to be kept under surveillance. This, of course, does not prevent the situation from being evaluated incorrectly. The 2014–2015 Ebola outbreak, for instance, was declared a PHEIC relatively late because the actors in charge initially viewed it as only a local problem of a poor region in West Africa (Lakoff et al. 2015).

Together with the attention thresholds, the reaction times of the relevant public health organizations are also to be lowered. While the decentralized structure of networks improves the alarm function, since attention is widely distributed, a missing or weakly developed action centre has an adverse effect on the intervention function. In defiance of all network rhetoric, the global fight against pandemics cannot proceed without the structural principles of hierarchy and the distribution of tasks. According to the IHR, after being informed of a positive risk assessment by local organizations, the WHO has to provide them with further information and instructions and send experts to the affected regions (WHO 2005a, pp. 11–15, 31–34, 40–42). The WHO is the ‘obligatory passage point’ (Callon 1984) for this process. A combination of the network, hierarchy and the distribution of tasks aims to make rapid intervention possible.

Even though the WHO wants, in principle, global traffic to flow without any hindrance, in some cases a temporary interruption of the circulation of goods and people may be considered necessary to protect global public health (Stephenson 2011; Opitz 2015). The IHR and national regulations therefore stipulate travel restrictions on certain people and allow measures like quarantine and isolation to be imposed.⁴ In an age of global flows and a greater awareness of fundamental rights, this specific kind of intervention has to some extent become problematic. As the first principle of the IHR states ‘The implementation of these

Regulations shall be with full respect for the dignity, human rights and fundamental freedoms of persons' (WHO 2005a, p. 10). Similarly, the WHO (2013, p. 47) explained in 2013: 'In emergency situations, the enjoyment of individual human rights and civil liberties may have to be limited in the public interest. However, efforts to protect individual rights should be part of any policy. Measures that limit individual rights and civil liberties must be necessary, reasonable, proportional, equitable, non-discriminatory and in full compliance with national and international laws.' Besides these reservations, the global fight against pandemics cannot proceed without restrictive measures, as the SARS pandemic and Ebola outbreak have shown.

Emergency Planning

Although a concentrated global effort has been made to prevent pandemics via early detection and rapid response, the actors in charge expect them to happen. It is only a matter of time, they believe, until the next health emergency occurs. 'Influenza experts agree', the WHO (2005b, pp. vi–vii) warned in 2005, 'that another pandemic is likely to happen but are unable to say when. The specific characteristics of a future pandemic virus cannot be predicted. Nobody knows how pathogenic a new virus would be, and which age groups it would affect.' Although its exact time of emergence, etiological nature and epidemiological distribution pattern may be unpredictable, it is considered a fact that the next pandemic will occur in the near or not so distant future (see also MacPhil 2010). A glossy brochure on pandemic planning by the US Department of Homeland Security (2006, p. 10) presented a similar way of looking at things. In a quotation in the brochure, the US Secretary of Health and Human Services, Mike Leavitt, states: 'Some will say this discussion of the Avian Flu is an overreaction. Some may say, "Did we cry the wolf?" The reality is that if the H5N1 virus does not trigger pandemic flu, there will be another virus that will.'

This statement demonstrates that the general trend of thinking about emergencies and accidents as 'normal' has permeated the field of global public health (Calhoun 2004; Lakoff 2007). In the 1970s, in many areas

of public life, the future was already perceived as unsafe and potentially catastrophic, and this view was intensified after the year 2000 (Aradau and van Munster 2011; Horn 2014). Although the future horizon has darkened with the looming prospect of ecological, political and economic crises, not all hope is lost. The occurrence of (massive) harm might be inevitable, but what can yet be prevented is the worst-case scenario. It is assumed that through emergency planning, the severity of the potential damage can be lessened. This is what ‘preparedness’ means: acting, deciding and governing under conditions of insecurity (Lentzos and Rose 2009; Anderson 2010). As the WHO explained in 2005: ‘Although it is not considered feasible to halt the spread of a pandemic virus, it should be possible to minimize its consequences through advance preparation to meet the challenge’ (WHO 2005c, p. 3). In his address to the 62nd World Health Assembly in 2009, the UN Secretary-General, Ban Ki-moon, posed the same question: ‘How do we build resilience in an age of unpredictability and interconnection?’ Through emergency planning is his answer. ‘This is how we will make the global community more resilient. This is how we ensure that wherever the next threat to health, peace or economic stability may emerge, we will be ready.’

Of special interest in this regard are critical infrastructures, such as water supply, that might be affected by a severe disease outbreak.⁵ Local public health emergency centres, which the WHO (2015) assembled as a global network (EOC-Net) in 2012, are responsible for the planning process. As well as taking stock of the available resources and contingents in a country or region, scenario planning and agent-based computer simulations are of fundamental importance⁶; they enable us to imagine possible scenarios via enactment and visualization without the necessity of making any probability assumptions. It is believed that in order to be prepared for future emergencies, the organizational imagination must to some extent be liberated from restrictions imposed by past experiences.

Organizations are of crucial importance for the planning process. For instance, the WHO guidelines, *Whole-of-Society Pandemic Readiness*, aim ‘to support integrated planning and preparations for pandemic influenza across all sectors of society, including public and private sector organizations and essential services’ (WHO 2009, p. 5). To strengthen organizational resiliency against the stresses and strains that may result from a

pandemic, thorough preparation is required. 'In the absence of early and effective planning, countries may face wider social and economic disruption, significant threats to the continuity of essential services, lower production levels, distribution difficulties, and shortages of supplies' (p. 5). Emergency planning is furthermore imperative since '[t]he failure of businesses to sustain operations would add to the economic consequences of a pandemic. Some business sectors will be especially vulnerable (e.g. those dependent on tourism and travel), and certain groups in society are likely to suffer more than others' (p. 5). The 'Readiness Framework' therefore asks all organizations that provide basic services such as food, water, health, defence, law and order, finance, transportation, telecommunications and energy to prepare for pandemics via simulation exercises and drills based on different scenarios. Furthermore, business continuity plans have to be developed. For this purpose, a pandemic coordinator should be assigned to oversee the planning process. All organizations that are crucial for public life are strongly advised to prepare themselves for the next pandemic. Given the interdependencies between these organizations, general preparedness is the only way to prevent a complete breakdown. Or, as the guidelines put it: 'It is prudent to plan for the worst, while hoping for the best' (p. 8).

Pandemics in a Society of Organizations

According to Lakoff (2010), today's highly differentiated field of global health is characterized by, among other things, the juxtaposition of two regimes: global health security and humanitarian biomedicine. 'Each of these regimes', he elaborates, 'combines normative and technical elements to provide a rationale for managing infectious disease on a global scale. They each envision a form of social life that requires the fulfillment of an innovative technological project. However, the two regimes rest on very different visions of both the social order that is at stake in global health and the most appropriate technical means of achieving it' (p. 59). While global health security turns its attention to emerging infectious diseases, 'which are seen to threaten wealthy countries, and which typically (though not always) emanate from Asia, sub-Saharan Africa, Latin

America', humanitarian biomedicine deals with 'diseases that currently afflict the poorer nations of the world, such as malaria, tuberculosis, and HIV/AIDS' (p. 60).

In addition to Lakoff's (2010, see also 2007) distinction between the two regimes of global health, my analysis highlights two layers that are encompassed by one of these regimes, the global fight against emerging infectious diseases. The two modes of organizing of such pandemics are not organizations themselves. They are programmes that structure the organizational decision-making and the corresponding membership roles. In analysing these programmes, the focus lies not so much on the actual operation of the system—since it is always a creative translation of cognitive and normative schemes into concrete practice—but rather on the intended actions of the system. A first line of defence is defined through early intervention. For this purpose, a wide and ramified organizational network is put in place. It allows pandemics to be detected while they are still emerging, and this makes it possible to limit the potential scope of their spread. Because the goal is to prevent a further unfolding of potential threats into actual damages, time is of the essence in detection. The organizations must react quickly while ensuring, at same time, that the information they generate, process and communicate to others is reliable. The strategies they decide to follow also have to be effective. Otherwise the primary goal is not achieved: preventing pandemics from happening.

In reality, this highly ambitious goal cannot always be met. But the organizations in charge know their limitations and are therefore requested to install a second line of defence: emergency planning. All organizations that are critical for society are asked to have emergency plans in place so that, in the case of a pandemic, they would still be able to react. The goal here shifts from preventing the spread of disease towards securing the 'autopoiesis' (Maturana and Varela 1987, pp. 47–52) of the system, meaning its ability to reproduce itself even under enormous environmental pressures. While early intervention requires organizations to be capable of acting quickly, pandemic preparedness aims to produce robust systems that are immune to breakdown.

Despite operating from different angles, these two modes of organizing pandemics are complementary. Early intervention relates to preventable damages. The underlying assumption is that pandemics can be

avoided through early detection and rapid response. The future scenario of early intervention is therefore an altogether positive one, in which organizations are capable of doing their job in the face of danger, namely containing infectious diseases. Pandemic preparedness, in contrast, works not with one but with two kinds of damages: *primary damages*, which cannot be prevented, and *preventable consequential damages*, which pose an existential threat. The aim is still to prevent harm, but preparedness does not focus on the pandemics per se but on the fatal repercussions that they might have for societies. This is a minimal form of prevention, and it is no longer believed that it is possible to escape such a pandemic unscathed. Both modes of relating to the future do not exclude but rather complement each other. If early intervention does not work in a specific scenario, there is still a second prevention strategy, which, of course, can only partially contain the effects of the pandemic since (massive) harm will have already occurred. But by strengthening the resilience of organizations and societies, pandemic preparedness aims to preserve existential functions and operations.

In his by now classic essay from 1991, Charles Perrow describes organizations, especially large ones, as a key element of modern societies. According to Perrow, fundamental social functions are maintained by private and public organizations. This also holds true for responding to pandemics. In a 'society of organizations' (Perrow 1991), it is organizations and their professionals who manage pandemics. But two kinds of organizations have to be distinguished which correspond to the two modes or programmes for managing emerging infectious diseases: first, organizations and professionals in the public health sector try to prevent pandemics through early intervention (and further preventative measures, such as vaccination programmes). It is their job to protect the general public from health risks; this is the purpose of these specialized organizations and the goal of their corresponding professional activities. Second, and in contrast, all organizations that provide basic services for society are asked to make emergency plans and prepare themselves for the next pandemic. This includes public health organizations but is also addressed to, first and foremost, private and public organizations that provide food, water, defence, law and order, finance, transportation, telecommunications and energy.

The second programme is no less ambitious than the first. Organizations and professionals in the public health sector may not always succeed in preventing pandemics: as we have seen, they are well aware of this fact, and that is why emergency plans are developed in the first place. But this implies that, in principle, all organizations that provide basic services for society have to professionalize themselves in this specific area. One could describe this as a ‘colonization’ of non-health organizations through public health imperatives. This is, of course, not a completely new development if one considers, for instance, company doctors or health and safety officers. Furthermore, many large organizations have undergone a professionalization in areas that do not traditionally belong to their core activities, such as when they maintain legal, public relations or research departments, or when they offer childcare or psychological counselling to their employees. To some extent, this is a likely consequence of the ‘functional differentiation of modern societies’ (Luhmann 1997): even if organizations are typically specialized in providing only one or two services, they have to take further social functions into account. What is new here is the kind of task, that is, preparing for pandemics in order to prevent the worst-case scenario—a complete breakdown of the system that would result from the absence of employees due to illness. In a society of organizations, the autopoiesis of society as whole cannot be separated from the autopoiesis of its organizations. Preserving society in a public health emergency depends on keeping organizations functional.

Notes

1. In the empirical reconstruction of these strategies I use material and passages from my book *Die Zeit der Prävention* (2017, pp. 258–264).
2. The implementation of the IHR in Germany is regulated by the following laws: the ‘Gesetz zu den Internationalen Gesundheitsvorschriften (2005) (IGV)’ of 2007 and the ‘Gesetz zur Durchführung der Internationalen Gesundheitsvorschriften (2005) und zur Änderung weiterer Gesetze’ of 2013.
3. For a list of the so-called coordinating competent bodies of each member state, see European Centre for Disease Prevention and Control (n.d.).

4. For measures of disease assessment and control in Germany, see the 'Gesetz zur Neuordnung seuchenrechtlicher Vorschriften' of 2000.
5. For a discussion of how biosecurity intertwines the field of public health with the security sector, see also Fidler and Gostin (2008).
6. See, for example, Orbann et al. (2017).

References

- Anderson, Ben. 2010. Preemption, Precaution, Preparedness: Anticipatory Action and Future Geographies. *Progress in Human Geography* 34: 777–798.
- Aradau, Claudia, and Rens van Munster. 2011. *Politics of Catastrophe: Genealogies of the Unknown*. London: Routledge.
- Bynum, William F. 1993. Policing Hearts of Darkness: Aspects of the International Sanitary Conferences. *History and Philosophy of the Life Sciences* 15: 421–434.
- Calhoun, Craig. 2004. A World of Emergencies: Fear, Intervention, and the Limits of Cosmopolitan Order. *Canadian Review of Sociology/Revue canadienne de Sociologie* 41: 373–395.
- Callon, Michel. 1984. Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. *The Sociological Review* 32: 196–233.
- Deleuze, Gilles, and Félix Guattari. 2005. *A Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press.
- Department of Homeland Security. 2006. *Pandemic Influenza: Preparedness, Response, and Recovery; Guide for Critical Infrastructure and Key Resources*. Washington, DC: Department of Homeland Security.
- European Centre for Disease Prevention and Control. n.d. Competent Bodies. <https://ecdc.europa.eu/en/about-us/governance/competent-bodies>. Accessed 31 July 2017.
- Fenner, Frank, Donald Ainslie Hendemon, Isao Arita, Zdeněk Ježek, and Ivan Danilovich Ladnyi. 1988. *Smallpox and Its Eradication*. Geneva: WHO.
- Fidler, David P. 2005. From International Sanitary Conventions to Global Health Security: The New International Health Regulations. *Chinese Journal of International Law* (2): 325–392.
- Fidler, David P., and Lawrence O. Gostin. 2008. *Biosecurity in the Global Age: Biological Weapons, Public Health, and the Rule of Law*. Stanford: Stanford Law and Politics.

- Hobbes, Thomas. 1651. *Leviathan or the Matter, Forme & Power of a Commonwealth Ecclesiasticall and Civil*. London: Crooke.
- Horn, Eva. 2014. *Zukunft als Katastrophe*. Frankfurt am Main: Fischer.
- Howard-Jones, Norman. 1975. *The Scientific Background of the International Sanitary Conferences 1851–1938*. Geneva: WHO.
- Ki-moon, Ban. 2009. Resilience and Solidarity: Our Best Response to Crisis. Address to the 62nd World Health Assembly, May 19, 2009. http://www.who.int/mediacentre/events/2009/wha62/secretary_general_speech_20090519/en/. Accessed 31 July 2017.
- Koch, Tom. 2015. Mapping Medical Disasters: Ebola Makes Old Lessons, New. *Disaster Medicine and Public Health Preparedness* 9: 66–73.
- Lakoff, Andrew. 2007. Preparing for the Next Emergency. *Public Culture* 19 (2): 247–271.
- Lakoff, Andrew. 2010. Two Regimes of Global Health. *Humanity* 1: 59–79.
- Lakoff, Andrew, Stephen J. Collier, and Christopher Kelty, eds. 2015. Ebola's Ecologies. *Limn* 5, Special issue.
- Leanza, Matthias. 2017. Die Zeit der Prävention. *Eine Genealogie*. Weilerswist: Velbrück.
- Lentzos, Filippa, and Nikolas Rose. 2009. Governing Insecurity: Contingency Planning, Protection, Resilience. *Economy and Society* 38: 230–254.
- Luhmann, Niklas. 1964. *Funktionen und Folgen formaler Organisation*. Berlin: Duncker & Humblot.
- . 1997. *Die Gesellschaft der Gesellschaft*. Frankfurt am Main: Suhrkamp.
- Mackenzie, John S., Patrick Dury, Ray R. Arthur, Michael J. Ryan, Thomas Grein, Raphael Slattery, Sameera Suri, Christine Tiffany Domingo, and Armand Bejtullahu. 2014. The Global Outbreak Alert and Response Network. *Global Public Health* 9: 1023–1039.
- MacPhil, Theresa. 2010. A Predictable Unpredictability: The 2009 H1N1 Pandemic and the Concept of 'Strategic Uncertainty' Within Global Public Health. *Behemoth* 3 (3): 57–77.
- Massumi, Brian. 2005. Fear (The Spectrum Said). *Positions: East Asia Cultures Critique* 13: 31–48.
- Maturana, Humberto R., and Francisco J. Varela. 1987. *The Tree of Knowledge: The Biological Roots of Human Understanding*. Boston: Shambhala.
- Ong, Aihwa. 2009. Assembling Around SARS: Technology, Body Heat, and Political Fever in Risk Society. In *Ulrich Becks kosmopolitisches Projekt: Auf dem Weg in eine andere Soziologie*, ed. Angelika Pofel and Nathan Snaider, 81–89. Baden-Baden: Nomos.

- Opitz, Sven. 2015. Regulating Epidemic Space: The *nomos* of Global Circulation. *Journal of International Relations and Development* 18 (1): 1–22.
- Orbann, Carolyn, Lisa Sattenspiel, Erin Miller, and Jessica Dimka. 2017. Defining Epidemics in Computer Simulation Models: How Do Definitions Influence Conclusions? *Epidemics* 19: 24–32.
- Perrow, Charles. 1991. A Society of Organizations. *Theory and Society* 20: 725–762.
- Smith, Richard D. 2006. Responding to Global Infectious Disease Outbreaks: Lessons from SARS on the Role of Risk Perception, Communication and Management. *Social Science & Medicine* 63: 3113–3123.
- Stephenson, Niamh. 2011. Emerging Infectious Diseases/Emerging Forms of Biological Sovereignty. *Science, Technology, & Human Values* 36: 616–637.
- WHO. 1962. International Sanitation Regulations. *Treaty Series* 22.
- . 2000. *Global Outbreak Alert and Response: Report of a WHO Meeting*. Geneva: WHO.
- . 2005a. *International Health Regulations*. Geneva: WHO.
- . 2005b. *WHO Checklist for Influenza Pandemic Preparedness Planning*. Geneva: WHO.
- . 2005c. *WHO Global Influenza Preparedness Plan: The Role of WHO and Recommendations for National Measures Before and During Pandemics*. Geneva: WHO.
- . 2009. *Whole-of-Society Pandemic Readiness*. WHO Guidelines for Pandemic Preparedness and Response in the Non-Health Sector. Geneva: WHO.
- . 2012. *Rapid Risk Assessment of Acute Public Health Events*. Geneva: WHO.
- . 2013. *Pandemic Influenza Risk Management: WHO Interim Guide*. Geneva: WHO.
- . 2015. *Framework for a Public Health Emergency Operations Centre*. Geneva: WHO.
- . n.d. Global Outbreak Alert and Response Network-GOARN: Partnership in Outbreak Response. <http://www.who.int/csr/outbreaknetwork/goarnenglish.pdf>. Accessed 31 July 2017.
- Youde, Jeremy. 2012. *Global Health Governance*. Cambridge: Polity Press.
- Zimmer, Thomas. 2017. *Welt ohne Krankheit: Geschichte der internationalen Gesundheitspolitik 1940–1970*. Göttingen: Wallstein.