

Strategies of Epidemic Control and Histories of Disease

In this short essay, I place the diversity of international responses to Covid-19 into the longer history of epidemic control strategies. Following a brief discussion of such strategies prior to the twentieth century, I focus on the trajectory of the idea of eradication throughout the twentieth and into the twenty-first century. I examine why elimination and eradication were seen as achievable epidemic control objectives in the mid- to late 20th century, and why that, by and large, has ceased to be the case in recent decades.

Introduction

In early 2020, the novel pathogen SARS-CoV-2 spread nearly simultaneously throughout the world.¹ The spectrum of available anti-epidemic strategies ranged from the “hands-off” approaches of monitoring and surveillance; minimal interventions with the goal (or hope) of attaining “herd immunity”; to the more aggressive strategies of suppression and, finally, elimination and eradication.² Elimination in epidemiology means the reduction of disease or infections in a defined geographical area to zero; eradication is the permanent reduction of the worldwide incidence (i.e., new occurrences/cases) of infection to zero. These strategies relied on classical epidemiological tools that seek to contain the pathogen’s spread by restricting human movement and gathering, quarantining the infected, contact tracing and using personal hygiene measures, including masks. In the course of the pandemic, new technologies enhanced old tools: digital technologies extended the reach of contact tracing; mRNA vaccines, in development since the 1980s, provided a way

¹ WU 2020.

² See, e.g., DOWDLE 1999: the Centers for Disease Control (CDC) divide strategies into control (the reduction of disease incidence, prevalence, morbidity or mortality to a **locally acceptable level**, as a result of deliberate efforts) and elimination as **reduction to zero (of either disease, or infections) in a defined geographical area**. Global and permanent elimination equal eradication. “Herd immunity” by contrast is not an epidemiological approach to epidemic management. It is a **target** of epidemiological **interventions** – namely vaccination – as the evidence has shown that immunizing a certain proportion of a population and/or key sub-population breaks the chain of transmission. See FINE, EAMES & HEYMANN 2011.

to produce vaccines rapidly and safely.³ Yet the basic epidemiological choice, whether to aim for pathogen eradication or for pathogen control, remains.

While the threat was uniform and shared, the responses of national governments were diverse.⁴ This diversity received considerable public attention, especially where strategies were deemed exceptionally successful, unusual or failed: the examples of Taiwan, Sweden and the United States or Brazil come to mind.⁵ Simple and intuitively reasonable arguments made headlines: a study that found that “female-led countries handled coronavirus better” was widely shared, with the effect of female leadership explained as a result of its empathic, caring, low-risk nature.⁶ Yet the choice and success of an epidemic strategy cannot be explained by a single factor. Political ideologies likely played a role: libertarians and “small state” governments supported “herd immunity” and “hands-off” strategies, while strong suppression or elimination were usually linked to collectivism, associated with either social-democratic or authoritarian governments. Yet while many saw elimination and/or strict containment as a goal unattainable for, and incompatible with, democratic regimes, two countries that pursued it, Australia and New Zealand, score highly at democratic indicators.⁷ Geography certainly helped but perhaps not in the obvious ways: New Zealand likely pursued an elimination strategy not (only) because it is an island country – the United Kingdom chose an entirely different path – but because of its high attentiveness to developments in China.⁸ The most interesting examinations of the epidemic response are those that look at a broad range of factors underlying a specific national strategy: a recent study identified the statist approach with a high level of public compliance in Taiwan’s “control” strategy, Germany’s “consensus” approach characterized by much negotiation in the public space, yet also high levels of trust and the state’s focus on job protection, and the “chaos” of the United States, where biomedical and scientific expertise were greatly contested.⁹

History and memory both played a role in the response to this pandemic: as the cultural historian Jay Winter noted, “memory is always about the future.”¹⁰

³ CHEN & WIDIA THIO 2021; DOLGIN 2021.

⁴ ALLEN 2020; Capano 2020 as well as other essays in that special issue.

⁵ On the ways in which the confluence of historical geopolitical factors informed Taiwan’s response, see LIN 2020; on the assumptions “under the hood” of Sweden’s “relaxed” approach to Covid-19, see GIRITLI NYGREN & OLOFSSON 2020; on the political institutions that abetted the discourse of Donald Trump and Jair Bolsonaro and “management” of the pandemic, see BÉLAND 2021.

⁶ GARIKIPATI & KAMBHAPATI 2020.

⁷ On New Zealand’s Covid-19 response, see BAKER 2020. On the state and satisfaction with democracy in New Zealand and Australia, see FOA 2020 and Democracy Index 2020: 8.

⁸ The Detail February 2021.

⁹ JASANOFF 2021.

¹⁰ BEINER 2022: xxv.

Experiences of past epidemics shaped responses to this one. Although scientists have warned of the high risk of a novel coronavirus with pandemic potential for decades, pandemic preparedness plans in the West were based on influenza. Influenza assumed the central place not only because of the recent threats of bird and swine flu, or the somewhat more remote pandemics of 1957 and 1968, but because the largest and most significant pandemic in the modern Western history was the influenza pandemic of 1918-1920.¹¹ Historians are only beginning to disentangle the profound repercussions of the pandemic from those of the First World War.¹² More recently, the rapid, stringent and at least for a while successful response by East Asian countries was arguably shaped by the relatively recent coronavirus epidemics (SARS).¹³ And finally, the much criticized WHO recommendation early in the pandemic, to continue air travel, was shaped by the lessons learned during the Ebola epidemic in 2014–2015.¹⁴

In this essay I look at history to answer the frequently posed question: why do few countries consider elimination an achievable goal, and why has eradication not been pursued as a global goal, especially once vaccines were on the table? Following a brief introduction of the strategies of epidemic control before the twentieth century, I will then focus on the trajectory of the idea of eradication over the twentieth and into the twenty-first century. This brief essay is not meant to be a comprehensive argument. By taking a global approach, it aims to contribute to the discussion about the drivers of diverse approaches and the inability of the international community to unite around a shared goal and why it failed to respond to Covid-19.

Strategies of containment

Infectious diseases have been a constant of human history, but for an outbreak to become an epidemic, a complex set of ecological conditions and human practices must coincide. For instance, the transformation of a plague outbreak into a pandemic required not only the evolution of a microbe capable of provoking severe disease in humans (in this case *Yersinia pestis*) but also a sufficiently large population of an animal reservoir (the black rat). To the same extent, it required a sufficiently large and dense human population, including immunologically “naïve” population groups, to sustain a spread that we would classify as an epidemic (or, indeed, a pandemic). The pathogen that would go on to cause the Second Plague Pandemic likely existed within animal reservoirs for several hundred years, perhaps

¹¹ HONIGSBAUM 2020.

¹² HONIGSBAUM 2013; BEINER 2022.

¹³ See e.g. LIN 2020.

¹⁴ GHRF Commission 2015: 6, 56-7.

causing isolated outbreaks in its homeland in the west of today's People's Republic of China.¹⁵ It required the westward movement of human populations, toward the trade routes, for the outbreak to gain momentum and transform into a pandemic.

At the time when the Black Death first struck, the medical theory of infectious disease was based on the idea of "miasma", that is, that the cause of the infectious disease was corrupt, poisonous air.¹⁶ This model of epidemics governed public and medical responses to the novel disease in 1348. In an epidemic with such a high mortality, where entire households and street blocks were dying, the explanation of the airborne spread of toxic miasmas was just as plausible as infection via direct contact.

The wealthy northern Italian cities, Florence and Venice, drafted and enforced measures to remove potential sources of corrupt air even before the contagion reached them at the first news of its appearance in southern Italy.¹⁷ They ordered the cleaning of streets; collecting waste; draining sewers; regulating sales of fresh food (meat, produce); and, vitally, banning the admittance of travellers from cities that had succumbed to the disease.

These measures were not successful. Indeed, since we lack written records from the time when the plague had its most severe impact, the summer of 1348, we do not even know whether everyday public life continued and whether these cities had the workforce to implement preventative measures. Moreover, even after Europe emerged from the pandemic in the early 1350s – demographically, socially, and economically devastated – it was still not over. Indeed it was only the first (albeit the worst) in a series of plague outbreaks and epidemics.¹⁸ During new waves later in the 14th century, cities experimented with new measures: barring entry of people from certain cities, or even confining infected people in their homes.

The crucial innovation turned out to be a measure enacted in Dubrovnik, also known as Ragusa, a tiny city-state on the eastern shore of the Adriatic. The economy and the city's very survival depended on trade: it became an important intermediary between the Italian cities and the Western Mediterranean. Like its counterparts across the Adriatic, the city invested in the health and welfare of its citizens.¹⁹ It funded a public hospital (alongside those funded by religious orders and private bequests), paid a communal physician and surgeon, and maintained an orphanage.²⁰

¹⁵ The First Plague Pandemic was the Plague of Justinian in the late Roman Empire: see MITCHELL 2014. For a recent comprehensive argument to expand study of the Second Pandemic in terms of geography, chronology and methodology (taking a broad multidisciplinary approach), see GREEN 2015.

¹⁶ COOMANS & GELTNER 2013; CONRAD & WUJASTYK 2002.

¹⁷ CARMICHAEL 1983.

¹⁸ See CARMICHAEL 2015 for consideration of the recurrence and persistence of the plague in Europe after 1348.

¹⁹ VEKARIĆ 2011.

In 1377, the ruling council adopted a thirty-day isolation period for all incoming ships.²¹ The regulation required both the crews and cargo to remain isolated on small islands just opposite the harbour, initially for 30 days (later extended to 40). Open-air temporary shelters became proper houses first on the islands, then on the outskirts of the city, including the mountains that separated the city from the hinterland. By the 16th century, an entire block of stone buildings, including hotels for people and warehouses for goods, were built in the city harbour: they were accessible by sea and vessels on one side, and could be locked from the city side.²²

Historians have highlighted how Dubrovnik's city officials built on their empirical observations, whereby they could reject the prevailing medical theory of the miasmatic spread of disease in favour of the understanding that contagion spread by direct contact.²³ Perhaps less appreciated were the factors that allowed these officials to make these observations. One was geopolitics. As an independent city on a rock jutting into the Adriatic, separated from the hinterland by mountains and from the overseas possessions of Venice by the sea, Dubrovnik could obtain a far more precise idea about the direction whence an outbreak arrived as compared to inland cities situated at the intersection of roads.

Another factor was the nature of the disease. As the plague became less lethal – likely due to accumulated immunity in the population, but also due to economic and social developments, including public health measures and surveillance in particular²⁴ – it was becoming more obvious that the plague would strike in a particular urban neighbourhood or household, while sparing neighbours. Miasmatic theory now appeared less plausible compared to direct contact. Other cities in close communication with Dubrovnik also introduced the quarantine: Milan, Perugia, Forlì (1424), Venice (1426), Mantua (1428).

The “Second Plague Pandemic” continued periodically for centuries. The last recorded outbreaks in Western Europe occurred in Marseille in 1720-1722, though it persisted longer in Europe's east. The last plague outbreak in the territory of today's Croatia occurred in Čepikuće near Dubrovnik in 1815.²⁵ With new European conquests and new trade and military routes, novel diseases began to circulate. The tools developed to deal with the plague were now applied more broadly to a variety of infectious diseases.²⁶

²⁰ BENYOVSKY & BUKLIJAŠ

²¹ GRMEK 1980.

²² BLAŽINA TOMIĆ & BLAŽINA

²³ GRMEK 1980.

²⁴ CARMICHAEL 2015.

²⁵ VEKARIĆ 1988.

²⁶ BASHFORD 2016.

It was also around this time that the cause of contagions was decisively attributed to microorganisms, most famously through the work of French chemist Louis Pasteur.²⁷ This research then provided the basis for a suite of new advancements in the diagnostics and treatment of contagious diseases – of which vaccines and then antimicrobial drugs would form the core – as well as a theoretical explanation for the empirical observations made earlier, such as the notion of contagion through contact that drove the establishment of the quarantine. Importantly, by the end of the nineteenth century, the microbiological theory of contagion inspired the first campaigns to eliminate infectious disease – that is, to reduce the number of new cases of infectious disease to either zero or an acceptable small and stable number.

Campaigns against malaria in the Mediterranean around 1900, including Dalmatia, showed that a short-term push could produce a significant initial reduction in disease incidence. But long-term success required an extended commitment combining individual treatments (administering antimalarial drugs to broad swaths of the population, especially children, in affected areas) with environmental modifications, in particular draining wetlands and spraying the stagnant water where mosquitoes breed with insecticides. As we shall see in the following section, it was the extended commitment to public health rather than the diversity of utilized technologies that posed a problem.

The first wave of eradication efforts: Interwar international public health and eradication campaigns

The first proposals to eradicate diseases – thus giving local efforts an international scope —were made in the 1920s by international organizations leading the campaign against infectious disease: the Rockefeller Foundation and the League of Nations Health Organization.²⁸ Eradication is often associated with technological innovation, although similar to the campaigns to eliminate malaria, the technologies used were frequently simple and inexpensive. In the first wave, which built on successful regional and national efforts, the targets of eradication campaigns were by and large vector-transmitted and parasitic infectious diseases controllable through improved sanitation. More importantly, they depended on political support in national contexts and international collaboration.

The early eradication campaigns in the southern United States, Latin American countries and the Kingdom of Yugoslavia targeted the hookworm (*Ancylostoma duodenale* and *Necator americanus*). This endemic parasite spends a part of its lifecycle in the soil before invading human organisms through bare feet. It travels

²⁷ DUGAČKI 2005.

²⁸ See WEINDLING 2009, and the on Rockefeller-led eradication in particular, CUETO 2009.

through the bloodstream to the small intestine to access a continuous supply of nutrients at the expense of the host.²⁹ The key eradication tools were, thus, latrines and shoes. In Central America, eradication campaigns targeted yellow fever, an acute haemorrhagic disease caused by a virus and transmitted by mosquitoes. While eradication campaigns used medical treatments and early vaccines against yellow fever, much of their toolbox relied on simple sanitary techniques such as drying up accumulated water in which mosquitoes bred.

Many eradication campaigns, notably those in Latin American countries, focused on those diseases seen as public health problems yet also perceived to be amenable to intense short-term interventions without longer-term investment in improving environmental and living conditions. However, as in the case of malaria a few decades earlier, short-term interventions invariably produced short-term results. Campaigns against hookworm in Latin America failed not in terms of distribution of antiparasitic drugs but in terms of the requirement for the population to wear shoes – which were too expensive or too cumbersome in their environment. Eradication campaigns in the 1920s and 1930s went through boom and bust cycles, in which impressive initial successes were followed by the rapid return of disease incidence to earlier levels. Technological and environmental measures could yield temporary elimination. However, swift campaigns were not sufficient for permanent eradication, and longer-term efforts that engaged with the community's cultural peculiarities and socioeconomic conditions were necessary.³⁰ The economic crisis of the early 1930s was followed by political crises, the rise of totalitarianism, and finally an all-encompassing war, so that eradication campaigns were temporarily abandoned.

The second wave of disease eradication: Failures and successes

The second global attempt at disease eradication began after the Second World War. In contrast to the 1920s, though, this “wave” proceeded within the context of growing Cold War tensions wherein the great powers used public health for political gain. For example, the U.S. work with the World Health Organization and the Pan American Health Organization was meant to enhance the country's image of humanitarianism while promoting political and economic modernization

²⁹ BIRN & SOLORZANO 1997.

³⁰ The situation in the Kingdom of Yugoslavia was different. Although the eradication campaigns – and much of the public health infrastructure – were paid for, and supported by, the Rockefeller Foundation, their development was driven by local people and institutions and had political support through the 1920s. Political turmoil and then the war impacted public health campaigns in the 1930s and 1940s, but a commitment to the eradication of infectious diseases was revived after the Second World War. See BOROWY 2009, DUGAC 2005 and GRMEK 1966.

that followed the Western rather than the socialist/Soviet model.³¹ The Soviets, by contrast, capitalized on the rise of anti-colonial movements and the disintegration of the European empires. Crucial to both was firm belief in the power of science and technology to solve any problem, and, especially for the Western/U.S. sponsored eradication campaigns, to do so without significant changes to social and economic conditions. This section briefly discusses the benefits and limitations of this model.

The first post-war eradication campaign targeted yaws, a painful and disabling condition transmitted through direct contact and caused by a *Treponema* bacterium closely related to the microbe causing the sexually transmitted disease syphilis. Yaws destroyed the skin, left the bones exposed and mutilated the face in severe cases. While previously no drugs had been available to treat it, in the 1950s it was found that it responded to penicillin. This newly developed antibiotic could be administered safely and cheaply. Eradication campaigns worldwide were launched with national governments collaborating with international organizations such as the WHO, Pan American Sanitary Bureau and UNICEF. In Haiti, the prevalence rate dropped from between 30-60% around 1950 to 0.32% in 1958; in Indonesia, it fell from 15% in the early 1950s to under 1% five years later.³² Yet no public health infrastructure was left behind once the campaign was completed. Epidemiological surveillance was not sustained, so the contagion began to spread from the few remaining cases, asymptomatic carriers, or from monkeys who were discovered to be the animal reservoir. Sixty years after this initial campaign, in 2012, the WHO announced a new global effort to eradicate yaws by 2020, a goal that has not been achieved.³³

The yaws campaign had all of the elements of a so-called “vertical” programme:

1. It was a project with clearly delineated objectives and deadlines
2. It proceeded simultaneously across an entire country or countries
3. It relied on easy-to-deliver technology
4. It did not seek to integrate with other health and community programmes

The yaws campaign ultimately failed because of its lack of connection to a healthcare system to ensure continuous monitoring. Nonetheless, the “vertical” approach remained the cornerstone of eradication campaigns. It was next applied to possibly the most significant public health challenge worldwide, malaria. Previous local and international campaigns had achieved localized successes, yet it remained a serious threat worldwide. Indeed, the argument for malaria eradication was made not in terms of reducing human suffering but rather its economic

³¹ CUETO, BROWN & FEE 2019: 86.

³² Ibid., 94.

³³ See WHO 2021.

impact.³⁴ The first major post-World War II campaign was organized by the Pan American Sanitary Bureau in both Americas. It relied on the massive spraying of DDT, which killed adult mosquitoes and broke the chain of infection. This approach was preferred because it was seen as more suitable than giving anti-malarial medications to people in countries with little drug production of their own and a weak health infrastructure. Furthermore, DDT and related insecticides were produced by large US petrochemical companies.³⁵ Malaria “aid” and eradication campaign expenditures went back to US industry.

However, the programme was immediately compromised because mosquitoes developed resistance to DDT. The commitment to global eradication was dropped, with the U.S.-led campaign focusing on Southeast Asia and the Western Pacific.³⁶ Significantly, these were also regions of high significance to the U.S., where the communist sympathies of new postcolonial regimes and China’s growing influence threatened the U.S. geopolitical interests. The malaria eradication campaign became part of the broader strategy of “winning hearts and minds” against the communist peril. The initial results were promising. Local residents recruited to work as DDT sprayers became well-known and respected figures in their communities.³⁷ However, certain varieties of *Plasmodium*, the parasite causing malaria, again evolved to resist DDT, while the toxicity and carcinogenicity of DDT were increasingly recognized as an issue. The campaign also failed to engage with local ways of life. For example, in rural dwellings built of mud, spraying walls did not work as well as expected. Furthermore, in tropical regions, many people slept outdoors and lived nomadic lifestyles, so spraying walls and distributing nets had limited effects. Notably, while malaria was understood as an “economic burden” and its impact on economic development was used to justify the eradication campaign, other development projects undermined its goals.³⁸

The malaria campaign was ultimately unsuccessful; in 2021, malaria remains a major health issue worldwide. What distinguishes it from the yaws campaign is that tensions between two distinct groups became visible: those who believed that the focus should be on strong vertical campaigns in countries lacking health infrastructure, and those who emphasized ongoing surveillance and the need to build a health infrastructure. In the remainder of this section I will discuss the first successful campaign of infectious disease eradication, against smallpox, through the 1960s and 1970s. While the success of this campaign is widely known, the reasons for its success are not commonly understood. However, understanding

³⁴ Ibid., 96.

³⁵ Ibid., 98.

³⁶ PACKARD 2021.

³⁷ CUETO, BROWN & FEE 2019: 101.

³⁸ PACKARD 1997.

why it succeeded where other campaigns failed helps us appreciate when and why we should expect eradication campaigns to work.³⁹

Smallpox is a dangerous, highly infectious disease caused by the inhalation of the airborne variola virus, which occurs in two strains; variola major, causing the clinically severe form, and variola minor, with milder symptoms. For centuries, many cultures and countries practiced inoculation, a practice of taking the dried-up scabs of smallpox patients and introducing them into healthy individuals. A more effective medical intervention ('vaccination') was developed in late 18th century. This intervention involved material from the related but – to humans – harmless cowpox, producing immunity to smallpox at lower risk.

Many European countries introduced immunization to smallpox (via cowpox) in the late 19th century. They achieved local elimination; however, outbreaks still occurred when travellers arrived from countries where it was endemic. After the war, a global campaign to eradicate was proposed, although the WHO did not think it was feasible. Yet its position changed in the late 1960s. The main driver of this shift was the onset of the political era of détente, i.e., the improved relationship between the Soviet Union and the United States after the Cuban missile crisis. While both powers continued to engage in proxy wars and continued nuclear proliferation, they also sought areas of technical collaboration and international health was one such arena. Each of these big powers also realized that if the campaign was successful and only one power took part in it, that power would reap significant foreign policy benefits.

Smallpox had many "advantages" over malaria: humans were the sole reservoir of the virus; victims were easily identifiable; and there was a well-tested, widely available vaccine. A tool for rapid immunization was invented that automated part of the vaccination process and thus allowed teams to vaccinate up to 1,000 people/hour. Yet, the most crucial element that distinguished the smallpox campaign was recognition of the importance of careful epidemiological surveillance so that any outbreaks could be contained. During work in Africa, it was recognized that accessing isolated population groups that could act as disease reservoirs was more important to eradication than a high level of overall immunization.⁴⁰ This campaign was different not in size, but in kind, from those against malaria.

Just as the campaign was getting fully underway, European countries in particular received an important reminder of the urgency of global eradication for their own safety. The largest outbreak of smallpox in Europe in several decades took place in Yugoslavia in 1972 with 175 cases, 35 of which ended in death.⁴¹

³⁹ The discussion of the smallpox eradication campaign largely relies on CUETO, BROWN & FEE 2019: 115-145.

⁴⁰ CUETO, BROWN & FEE 2019: 128.

⁴¹ This section is largely based on the original report that was submitted to the WHO after the outbreak (LITVINJENKO, ARSIĆ & BORJANOVIĆ 1973).

Smallpox was brought into the country by a religious pilgrim, a resident of the Autonomous Province of Kosovo. On his way back from Mecca, he visited shrines in Iraq where smallpox was endemic. The well-documented outbreak – recalled in a 1982 feature film, *Variola Vera* – demonstrated to the world the fragility of the modern “epidemic-free” state that relied on the error-free performance of a chain of actors and institutions. First, the vaccination of pilgrims travelling to areas with endemic smallpox was required. Although the pilgrim was immunized, either the vaccine itself or the immunization process was faulty. Furthermore, while Yugoslavia had strict regulations for the public health surveillance of pilgrims, they were not enforced. Notably, while the country had mandatory immunization against smallpox, vaccination coverage decreased among the younger population, spurred by the perception that smallpox no longer presented a serious threat. At the same time, immunity in the older population grew naturally weaker.⁴² Finally, because the disease had been eliminated in Yugoslavia, with the last case before the outbreak recorded in 1930, physicians were not trained to recognize its symptoms and signs. The detailed history of the outbreak paints a vivid image of the importance of institutional memory. Namely, a man infected in Kosovo was transferred from hospital to hospital, city to city – from Novi Pazar, to Čačak, to Belgrade, as physicians tried to make sense of his worsening symptoms. Initially, they ascribed them to an unusually severe reaction to penicillin (prescribed to treat the rash). The patient travelled by bus, then by an ambulance that also transported a pregnant woman. After his death, his body was sent back home, where it was buried with all religious rites. In the course of his travels, he infected 38 persons.

Yet while epidemiological surveillance failed, the country was very well prepared to respond to outbreaks. It had modern virus diagnostics (including the National Reference Laboratory for Smallpox) in Belgrade’s Institute of Virology. It had its own production of vaccines and sera in the Immunological Institute in Zagreb.⁴³ It had a well-established public health system with a network of epidemiological institutes and stations, and an elaborate schedule of mandatory immunizations. The robustness of the health/epidemiological system proved vital to the rapid response to the outbreak. Once the nature of the disease was established, a set of measures was quickly implemented to contain and then extinguish the outbreak. Borders were closed, public gatherings were prohibited, 16,000 people were quarantined and the population of 18 million was vaccinated within weeks. As the

⁴² The vaccination schedule stipulated the administration of the first dose between 3 months and 3 years of age and then again at the age of 7 and 14 (as the immunity conferred initially was inadequate). Men were reimmunized during army service, at 18 years of age. While a number of people who were ostensibly immunized contracted smallpox, the fatality rate among the immunized was far lower than among the non-immunized.

⁴³ DUANČIĆ, IVČIĆ & VRAČAR 2021.

report to the WHO concluded, “the relatively rapid extinction of the epidemic was possible thanks to the efforts made by special control units at all political and social levels, solidarity of health services of the republics, provinces and the army, as well as international solidarity and assistance provided by the WHO.” But it also indicated that elimination was not a permanent state: the immunity conferred by vaccine would diminish over time. The only thing that conferred a degree of biological security was a well-prepared and integrated system of disease prevention and surveillance – or global eradication.

The outbreak provided further fuel for the smallpox eradication campaign. New knowledge on surveillance and containment that originated in Africa was accepted as the global model by the early 1970s. Crucially, this approach would likely not have found such broad support were it not for comprehensive international support for broad, “horizontal”, community-based health and social services.⁴⁴ By 1975, India, which had had the largest number of cases, eliminated smallpox in 1975. The world’s last case was reported in Somalia in October 1977. Following a two-year wait to ensure that the disease would not reappear, the World Health Organization proclaimed eradication at the 33rd World Health Assembly in May 1980.

Epilogue and conclusion

Smallpox eradication took place following the unsuccessful campaigns against yaws and malaria. It advanced the belief that diseases can be eradicated, and it enhanced the reputation of the World Health Organization. It showed that the international community can, if it decides to do so, prioritize and solve a global health problem. Yet this high point was followed by a swift decline. The détente of the 1970s was followed by the renewed Cold War tensions between 1979 and mid-1980s, and then the new worldwide political and economic arrangement known as globalization. The competition between the two political blocs was replaced by a complex network of relationships and changing alliances of multiple actors. Market-oriented economic theories that reduced the size of the state and supported the private sector, first pioneered in the United Kingdom and its former settler colonies, were exported around the world. They profoundly shaped the way that societies internationally operate, barring some significant exceptions, such as China. Looking at public health and disease prevention, the broad grass-roots model of primary care uniting social and health services championed by the WHO through the 1970s was set aside in the 1980s and 1990s in favour of a technocratic orientation based on the principles of neoliberal economics. Broad support for social and health services was replaced by targeted interventions into

⁴⁴ BIRN 2009.



Two hospital staff members in protective clothing in the emergency smallpox hospital. Source: WHO/16090, EURO, smallpox Yugoslavia. Credit National Library of Medicine Digital Collection. <https://collections.nlm.nih.gov/catalog.nlm.nlmuid-101437260-img>

‘at risk’ groups, based in cost-benefit assessments.⁴⁵ This policy shift, together with the other consequences of the “neoliberal” transformations of public health – such as the globalization and privatization of vaccine production – have made the campaigns for disease elimination and eradication unlikely, if not impossible. It is no coincidence that the currently most successful disease eradication campaign was not against malaria, but against an infection prevalent in the Western countries – hepatitis C. It is also no coincidence that it relies on expensive antiviral drugs, making the treatment inaccessible in poorer countries.⁴⁶

This brief essay has examined the history of strategies of disease control using an intentionally wide angle, temporally and geographically, to consider the fundamental factors of the response to disease. The successful, or unsuccessful, approach to epidemic management in the Covid-19 pandemic is often ascribed to a limited set of drivers: the type of political leadership, prevailing ideology, or recent experience with epidemics. While these are important, a consideration of the broader global political and economic setting is necessary to understand the scope of possibilities. The current political and economic conditions make the global efforts aimed at eradication of Covid-19 unlikely, if not impossible. A question that remains is whether the pandemic, if it persists longer, can lead to new global arrangements in which eradication becomes a possibility once again.

⁴⁵ CUETO 2004.

⁴⁶ DOUGLASS 2018.

Bibliography

- ALLEN, Kristiann, BUKLIJAS, Tatjana, CHEN, Andrew, SIMON-KUMAR, Naomi, COWEN, Lara, WILSDON, James and Peter GLUCKMAN. 2020. *Tracking global evidence-to-policy pathways in the coronavirus crisis: A preliminary report*. Auckland: International Network for Government Science Advice.
- BAKER, Michael, KVALSVIG, Amanda, VERRALL, Ayesha, TELFAR-BARNARD, Lucy and Nick WILSON. 2020. New Zealand's elimination strategy for the COVID-19 pandemic and what is required to make it work. *New Zealand Medical Journal* 133 (1512): 10–14.
- BASHFORD, Alison (ed). 2016. *Quarantine: Local and global histories*. London: Bloomsbury.
- BEINER, Guy (ed.) 2022. *Pandemic re-awakenings: The forgotten & unforgotten "Spanish" flu of 1918-1919*. Oxford: Oxford University Press.
- BÉLAND, Daniel, ROCCO, Philip, IANNI SEGATTO Catarina and Alex WADDAN. 2021. Trump, Bolsonaro and the framing of the covid-19 crisis: How political institutions shaped presidential strategies. *World Affairs* 184(4):413-440.
- BENYOVSKY, Irena and Tatjana BUKLIJAŠ. 2004. Domus Christi in late medieval Dubrovnik: A therapy for the body and soul. *Dubrovnik Annals* 8: 81-107.
- BIRN, Anne-Emmanuelle. 2009. The stages of international (global) health: Histories of success or successes of history? *Global Public Health* 4(1): 50-68.
- BLAŽINA-TOMIĆ, Zlata and Vesna BLAŽINA. 2015. *Expelling the plague. The Health Office and the Implementation of Quarantine in Dubrovnik 1377-1533*. Montreal: McGill-Queen's University Press.
- BOROWY, Iris. 2009. *Coming to Terms with World Health: The League of Nations Health Organization 1921–1946*. Frankfurt am Main: Peter Lang.
- CAPANO, Giliberto, HOWLETT, Michael, JARVIS, Darryl SL, RAMESH, M and Nihit GOYAL. 2020. Mobilizing policy (in)capacity to fight COVID-19: Understanding variations in state responses. *Policy and Society* 39(3): 285–308.
- CARMICHAEL, Anne G. 1983. Plague legislation in the Italian Renaissance. *Bulletin of the History of Medicine* 57(4): 508-525.
- CARMICHAEL, Anne G. 2015. Plague persistence in Western Europe: A hypothesis. In *Pandemic disease in the medieval world: Rethinking the Black Death*, ed. Monica Green, 156-191. Kalamazoo: Arc Mediaeval Press.
- CHEN, Andrew Tzer-Yeu & Kimberly WIDIA THIO. 2021. Exploring the drivers and barriers to uptake for digital contact tracing. *Social Sciences & Humanities Open* 4(1): 100212.
- CONRAD, Lawrence and Dominik WUJASTYK (eds). 2000. *Contagion: Perspectives from pre-modern societies*. London: Routledge.
- COOMANS, Janna and Guy GELTNER. 2013. On the street and in the bathhouse. *Anuario de Estudio Medievales* 43(1): 53-82.
- CUETO, Marcos. 2004. The origins of primary health care and selective primary health care. *American Journal of Public Health* 4(11): 1864-1874.

- CUETO, Marcos. 2009. The cycles of eradication: The Rockefeller Foundation and Latin American public health, 1920-1934. In *International health organizations and movements, 1918-1939*, ed. 222-243. Cambridge: Cambridge University Press.
- CUETO, Marcos, BROWN, Theodore & Elizabeth FEE. 2019. *The World Health Organization: A history*. Cambridge: Cambridge University Press.
- DEMOCRACY INDEX 2020. London: The Economist Intelligence Unit.
- DOLGIN, Elie. 2021. The tangled history of mRNA vaccines. *Nature* 597: 318-324.
- DOUGLASS, C.H., PEDRANA, A., LAZARUS, J.V. et al. 2018. Pathways to ensure universal and affordable access to hepatitis C treatment. *BMC Med* 16, 175: <https://doi.org/10.1186/s12916-018-1162-z>
- DOWDLE, Walter R. 1999. The principles of disease elimination and eradication. *CDC MMWR* 48 (Suppl 01): 23-7.
- DUANČIĆ, Vedran, IVČIĆ, Snježana and Ana VRAČAR. 2021. The failed promises of a brighter future: The Institute of Immunology in Zagreb from a public asset to a privatized burden. In *Immunization and states: The politics of making vaccines* eds. Stuart Blume and Baptiste Baylac-Paouly, 89-109. London: Routledge.
- DUGAC, Željko. 2005. *Protiv bolesti i neznanja: Rockefellerova fondacija u međuratnoj Jugoslaviji*. Zagreb: Srednja Europa.
- DUGAČKI, Vladimir. 2005. Akcija dr Rudolfa Battare u Ninu godine 1902., prvi sustavni pokušaj borbe protiv malarije u Hrvatskoj. *Medicina Jadertina* 35(1-2) Supplement: 33-40.
- FINE, Paul, EAMES, Ken and David L. HEYMANN. 2011. "Herd immunity". A rough guide. *Vaccines* 52: 911-16.
- FOA Roberto S., KLASSEN, A., SLADE, M., RAND, A. and R. COLLINS. 2020. "The Global Satisfaction with Democracy Report 2020." Cambridge, United Kingdom: Centre for the Future of Democracy.
- GARIKIPATI Supriya and Uma KAMBHAMPATI. 2021. Leading the fight against the pandemic: Does gender 'really' matter? *Feminist Economics* 27(1-2): 401-418.
- GHRF COMMISSION (Commission on a Global Risk Framework for the Future). 2015. The neglected dimension of global security: A framework to counter infectious disease crises. <http://nam.edu/GHRFreport> (doi: 10.17226/21891).
- GIRITLI NYGREN, Katarina and Anna OLOFSON. 2020. Managing the Covid-19 pandemic through individual responsibility: The consequences of a world risk society and enhanced ethopolitics. *Journal of Risk Research* 23 (7-8): 1031-1035.
- GREEN, Monica (ed.) 2015. *Pandemic disease in the medieval world: Rethinking the Black Death*. Kalamazoo: Arc Mediaeval Press.
- GRMEK, Mirko Dražen (ed.). 1966. *U borbi za narodno zdravlje: Izabrani članci Andrije Štampara*. Zagreb: Škola narodnog zdravlja "Andrija Štampar" – Medicinski fakultet.
- GRMEK, Mirko Dražen. 1980. Le concept d'infection dans l'antiquité et au moyen âge, les anciennes mesures sociales contra les maladies contagieuses et la foundation de la première quarantaine à Dubrovnik (1377). In *Radovi sa Međunarodnog simpozija u povodu šestote obljetnice dubrovačke karantene: Dubrovnik, 29. i 30. rujna 1977,*

- Rad Jugoslavenske akademije znanosti i umjetnosti*, 384: 9–55. Zagreb: Jugoslavenska akademija znanosti i umjetnosti.
- HONIGSBAUM Mark. 2013. *A history of the great influenza pandemics: death, panic and hysteria, 1830-1920*. London: I. B. Tauris.
- HONIGSBAUM Mark. 2020. Revisiting the 1957 and 1968 influenza pandemics. *The Lancet* 395(10240): 1823-1826.
- JASANOFF, Sheila, HILGARTNER, Stephen, HURLBUT, J. Benjamin, ÖZGÖDE, Onur and Margarita, RAYZBERG. 2021. *Comparative Covid response: Crisis, knowledge, politics*. Interim Report 12 January 2021. Harvard Kennedy School.
- LIN Ching-Fu, WU, Chien-Huei and Chuan-Feng WU. 2020. Reimagining the administrative state in times of global health crisis: Anatomy of Taiwan's regulatory actions in response to COVID-19. *European Journal of Risk Regulation* 11(2): 256–272.
- LITVINJENKO, S., ARSIĆ, B. and S. BORJANOVIĆ. 1973. Epidemiologic aspects of smallpox in Yugoslavia in 1972.
- MITCHELL, Stephen. 2014. *A History of the Later Roman Empire, AD 284–641*, 2nd ed. (New York: Wiley-Blackwell).
- PACKARD, Randall M. 1997. Malaria dreams: Postwar visions of health and development in the third world. *Medical Anthropology* 17 (3): 279-296.
- PACKARD, Randall M. 2021. *The making of a tropical disease: A short history of malaria*. 2nd edition. Baltimore: Johns Hopkins University Press.
- THE DETAIL. 2021. Tracking a pandemic. The Detail Radio New Zealand Podcast 5 February 2021, <https://www.rnz.co.nz/programmes/the-detail/story/2018782111/tracking-a-pandemic>.
- VEKARIĆ, Nenad. 1988. Kuga u Čepikućama 1815/6 godine. *Zbornik Dubrovačkog primorja i otoka* 2: 135-139.
- VEKARIĆ, Nenad. 2011. *Vlastela grada Dubrovnika, 1. Korijeni, struktura i razvoj dubrovačkog plemstva*. Zagreb-Dubrovnik: Zavod za povijesne znanosti HAZU u Dubrovniku.
- WEINDLING, Paul (ed.) 2009. *International health organizations and movements, 1918-1939*. Cambridge: Cambridge University Press.
- WHO. 2021. Yaws. <https://www.who.int/news-room/fact-sheets/detail/yaws>
- WU, Fan, ZHAO, Su, CHEN, Yan-Mei, WANG, Wen, SONG Zhi-Gang et al. 2020. A new coronavirus associated with human respiratory disease in China. *Nature* 579: 265-269.

Strategije epidemijske kontrole i povijesti bolesti

Ovaj pregledni rad razmatra raznolikost odgovora pojedinih država na naizgled jednaku epidemijsku prijetnju izazvanu novim korona virusom SARS-CoV-2. Ta se raznolikost potom promatra u duljem povijesnom kontekstu strategija epidemijske kontrole, od “druge pandemije kuge” s početkom u 14. stoljeću nadalje. Nakon kratkog razmatranja strategija korištenih prije modernog razdoblja te faktora koji su utjecali na strategije, poput geopolitike i biološke evolucije odnosa domaćina i uzročnika bolesti, ostatak rada usredotočen je na ideju eliminacije i eradikacije zaraznih bolesti u 20. stoljeću. Prikazuju se rane kampanje iskorijevanja malarije, žute groznice i parazitskih crva u međuratnom razdoblju te, potom, opsežnije i uspješnije svjetske kampanje nakon 1945, prvo protiv malarije i frambezije te, na koncu, dosad jedina potpuno uspješna svjetska akcija eradikacije protiv velikih boginja, službeno završena godine 1980. U radu se zaključuje da je za uspjeh eradikacije na svjetskoj razini bila presudna povoljna međunarodna politička situacija 1970-tih, karakterizirana zatopljenjem odnosa između velikih sila, te orijentacija ka primarnoj zdravstvenoj zaštiti i socijalnim uzrocima zdravstvenih problema u međunarodnom zdravstvu. Nasuprot tomu, u 21. stoljeću, kad se odnosi između velikih sila ponovno zaoštravaju, a zdravstvo je zasnovano na načelima neoliberalne ekonomije, provođenje sličnih globalnih kampanja eradikacije uključujući onu SARS-CoV-2, bitno je otežano ili čak nije moguće.

Ključne riječi: povijest medicine, epidemije, kuga, malarija, velike boginje, frambezija, eliminacija, eradikacija, karantena.

Keywords: history of medicine, epidemics, pandemics, smallpox, malaria, yaws, plague, eradication, elimination, quarantine

Tatjana Buklijaš
The Centre for Informed Futures & Global Studies
The University of Auckland
Auckland 1010
New Zealand
t.buklijas@auckland.ac.nz

FILOZOFSKI FAKULTET SVEUČILIŠTA U ZAGREBU

ZAVOD ZA HRVATSKU POVIJEST
INSTITUTE OF CROATIAN HISTORY
INSTITUT FÜR KROATISCHE GESCHICHTE

RADOVI

53

BROJ 1

ZAVOD ZA HRVATSKU POVIJEST
FILOZOFSKOGA FAKULTETA SVEUČILIŠTA U ZAGREBU

The logo for FF press, featuring the letters 'FF' in a stylized font with a horizontal line through them, followed by the word 'press' in a lowercase sans-serif font.

ZAGREB 2021.

Poseban broj

*Prema povijesti „nevidljive“ prijetnje: epidemije i
pandemije u Srednjoj Europi i Mediteranu*

Special Issue

*Towards an History of “Invisible” Threat: Epidemics
and Pandemics in Central Europe
and the Mediterranean*

RADOVI ZAVODA ZA HRVATSKU POVIJEST
FILOZOFSKOGA FAKULTETA SVEUČILIŠTA U ZAGREBU

Knjiga 53, broj 1

Izdavač / Publisher

Zavod za hrvatsku povijest
Filozofskoga fakulteta Sveučilišta u Zagrebu
FF-press

Za izdavača / For Publisher

Domagoj Tončinić

Glavna urednica / Editor-in-Chief

Inga Vilogorac Brčić

Gosti urednici/Guest Editors

Nikola Anušić i Filip Šimetin Šegvić

Izvršna urednica / Executive Editor

Kornelija Jurin Starčević

Uredništvo / Editorial Board

Jasmina Osterman (stara povijest/ancient history), Trpimir Vedriš (srednji vijek/medieval history), Hrvoje Petrić (rani novi vijek/early modern history), Željko Holjevac (moderna povijest/modern history), Tvrtko Jakovina (suvremena povijest/contemporary history), Silvija Pisk (mikrohistorija i zavičajna povijest/microhistory and local history), Zrinka Blažević (teorija i metodologija povijesti/theory and methodology of history)

Međunarodno uredničko vijeće / International Editorial Council

Denis Alimov (Sankt Peterburg), Živko Andrijašević (Nikšić), Csaba Békés (Budapest), Rajko Bratož (Ljubljana), Svetlozar Eldarov (Sofija), Toni Filiposki (Skopje), Aleksandar Fotić (Beograd), Vladan Gavrilović (Novi Sad), Alojz Ivanišević (Wien), Egidio Ivetić (Padova), Husnija Kamberović (Sarajevo), Karl Kaser (Graz), Irina Ognyanova (Sofija), Géza Pálffy (Budapest), Ioan-Aurel Pop (Cluj), Nade Proeva (Skopje), Alexios Savvides (Kalamata), Vlada Stanković (Beograd), Ludwig Steindorff (Kiel), Peter Štih (Ljubljana)

*Izvršni urednik za tuzemnu i inozemnu razmjenu /
Executive Editor for Publications Exchange*

Martin Previšić

Tajnik uredništva / Editorial Board Assistant

Dejan Zadro

Adresa uredništva/Editorial Board address

Zavod za hrvatsku povijest, Filozofski fakultet Zagreb,
Ivana Lučića 3, HR-10 000, Zagreb
Tel. ++385 (0)1 6120191

Časopis izlazi jedanput godišnje / The Journal is published once a year

Časopis je u digitalnom obliku dostupan na / The Journal in digital form is accessible at
Portal znanstvenih časopisa Republike Hrvatske „Hrčak“
<http://hrcak.srce.hr/radovi-zhp>

Financijska potpora za tisak časopisa / The Journal is published with the support by
Ministarstvo znanosti, obrazovanja i športa Republike Hrvatske

Časopis je indeksiran u sljedećim bazama / The Journal is indexed in the following databases:
Directory of Open Access Journals, EBSCO, SCOPUS, ERIH PLUS, Emerging Sources Citation
Index - Web of Science

Naslovna stranica / Title page by

Marko Maraković

Grafičko oblikovanje i računalni slog / Graphic design and layout

Marko Maraković

Lektura / Language editors

Samanta Paronić (hrvatski / Croatian)

Edward Bosnar (engleski / English)

Tisak / Printed by

Tiskara Zelina d.d., Sveti Ivan Zelina

Naklada / Issued

200 primjeraka / 200 copies

Ilustracija na naslovnici

Muza Klio (Alexander S. Murray, *Manual of Mythology*, London 1898)

*Časopis je u digitalnom obliku dostupan na Portalu znanstvenih časopisa
Republike Hrvatske „Hrčak“ <http://hrcak.srce.hr/radovi-zhp>*

*The Journal is accessible in digital form at the Hrčak - Portal of scientific
journals of Croatia <http://hrcak.srce.hr/radovi-zhp>*