

Decentralized response as a pandemic second-best: The case of Russia

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Abstract

Centralized state response is almost universally considered as the first best option for managing pandemics. This paper argues that in reality, states fall short of this ideal. Knowledge problems hinder the government's disease acknowledgement, resource allocation and feedback, while compulsion, political predation, and corruption exacerbate the situation further. On the other hand, a decentralized, voluntary response may overcome knowledge problems and opportunism through effective signals such as prices, better incentives, local knowledge, and internalization of disease-related externalities. This results in a speedier, more effective, and responsive pandemic management, which also accounts for differences in risk preferences, and becomes a feasible second-best option. I then apply these insights to Russia and its history of disease management. I focus on three diseases: plague, cholera, and COVID-19, which results in a historical analysis that spans multiple centuries and different institutional settings. I show that government-led pandemic response in Russia has been riddled with knowledge problems, abuse, political predation, and violence. On the other hand, a decentralized response was quicker and more effective at managing the disease, often emerging even in the most unfavorable circumstances.

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1 | INTRODUCTION

Centralized state response is almost universally considered as the first best option for managing pandemics. A logic of effective collective action centered around coercion supports such views. Compulsion enables the state to smooth out positive and negative disease-related externalities through measures such as “quarantine, curfews, mandatory tests, mandatory vaccination, mandatory disclosure of health status, mandatory acquisition of certain items” (Geloso & Murtazashvili, 2020, p. 55). Through taxation, the state funds important public programs such as vaccine development, which would, according to conventional theory, remain underprovided via voluntary efforts. With the onset of the COVID-19 pandemic, governments across the globe were also encouraged to support aggregate demand by protecting jobs, providing unemployment benefits, and being transparent about their policies (International Labor Organization, 2020).

In reality, government response to pandemics may be far removed from the perceived ideal. Fundamentally, governments struggle with knowledge problems in acknowledgment, resource allocation, and feedback. This slows down decision making, causes suboptimal resource allocation and protracts the duration of ineffective pandemic solutions (Sobel & Leeson, 2007, pp. 520–521; Storr et al., 2021, pp. 1234–1237). Beyond knowledge problems, classical public choice considerations also play a role. The self-interest of political agents further distances governments from achieving an ideal pandemic response (Boettke & Powell, 2021, pp. 1099–1102), while political predation extracts more resources from the populace, subjects it to violent abuse and demands excessive conformity (Geloso & Murtazashvili, 2020, p. 55).

Such developments, nevertheless, do not suggest that agents are stuck in a state-centered dichotomy of either enjoying an ideal pandemic response or suffering a predatory pandemic response as the second-best option. I argue that a voluntary, decentralized response may constitute a feasible alternative to compulsion-based pandemic management by the state. Through a classical Hayekian line of reasoning, it can be postulated that agents operating voluntarily within a decentralized system are better equipped to process knowledge and act upon it. Agents will more swiftly acknowledge disease-related circumstances and formulate an appropriate response utilizing local knowledge and experimentation with different approaches to disease management. Resource allocation and feedback will be more effective due to reliance on effective signals and incentives such as prices, profits, and alternative feedback mechanisms. Supplemented with mechanisms of informal governance and mutual aid considerations, the decentralized response in disease management further gains in its effectiveness.

In this paper, I apply such argumentation to the history of pandemics in Russia. My analysis deals with three most critical diseases in Russia's history: plague, cholera, and COVID-19. Historical evidence, spanning across four centuries and three different governance systems, shows that the government response to these diseases in Russia has been extremely flawed. At the

same time, a decentralized, voluntary response produced better outcomes, emerging in even the least favorable conditions.

From a theoretical standpoint, my analysis is supported by Sobel and Leeson (2007) and Coyne and Lemke (2012), whose analysis of government's knowledge problems in disaster relief management I transpose onto pandemics. The research of Coyne et al. (2021) and Storr et al. (2021) further supplements these views. The studies of Geloso and Murtazashvili (2020), Boettke and Powell (2021), Leeson and Rouanet (2021) and Leeson and Thompson (2021) add insights to the public choice dimension of disease management. Insights by Carson (2016, 2020) help understand the possibility of private involvement in pandemics. Toelstede (2019) uncovers the dynamics of political predation in pursuit of state efficiency. Watanabe and Yabu (2020) show that private response to pandemics often precedes centralized measures.

For historical evidence on plague, I rely on Vasiliev and Segal (1960), Alexander (2002), and Melikishvili (2006), who supply general accounts of the events in both 17th and 18th centuries. Vysotskiy (1879) provides useful data on plague mortality in the 17th century. Sirotkin (2014) highlights the nuances of Moscow plague riots in the 18th century. Raskov (2012) contributes with accounts of Russian Old Believers' private responses to the plague, while Skryabin (2019) describes the disease management work of peasant councils in villages.

For cholera, McGrew (1962) and Henze (2011) shed light on the catastrophic scope of the Russian government's failure in tackling the disease. Patterson (1994) supplies maps of the disease spread. Zhabankov (1893) and Frieden (1977) provide important accounts regarding the autonomy of Russian medical professionals in the 19th century. Milenushkin (1954), Narkevich et al. (1993), and Brainerd (2010) assess the state of USSR's disease management. Ursu (2014) documents in detail the pandemic mismanagement in the city of Odessa.

For COVID-19, I rely on reports from Russian news outlets such as Znak (2020), Kommersant (2020), Interfax (2020a, 2020b), and TASS (2020a, 2020b), which provide information about the Russian government's pitfalls against COVID-19. Malenkij (2020) highlights the Russian government's doublespeak in regard to pandemic response, while Dyer (2020) reports the understatement of pandemic-related deaths in Russia. The Ural Federal University report (2020) documents the failure of support measures from the Russian government. Official website of Russian government purchases (Goszakupki, 2020a; Goszakupki, 2020b) and the Organized Crime and Corruption Reporting Project (2020) provide information about embezzlement of funds during the pandemic. The report of the Higher School of Economics (2020) on the other hand, highlights a positive trend in the voluntary response to the COVID-19 pandemic, involving efforts from both the private sector and non-profit organizations.

The main weakness of my analysis lies in the nature of the historical evidence employed. Studies of pandemics in Russia contain largely government-centric accounts of disease management, and the overall level of government control, which often stamped out or reduced the scope of a decentralized response. As such, the availability of information regarding the decentralized response varies greatly from one disease to another. However, even in cases where information is sparse, the contours of the decentralized response's effectiveness can still be seen.

2 | THE THEORY OF CENTRALIZED AND DECENTRALIZED PANDEMIC RESPONSE

The primary constraint standing in the way of an ideal government management of pandemics is epistemic, manifesting on three levels. First, the government needs to recognize whether a

pandemic is really happening and on what scale. Second, the government needs to identify a proper course of action to deal with the pandemic and allocate resources accordingly. Finally, the state must be receptive to feedback in order to evaluate the effectiveness of its strategy and modify it if necessary.

On the first level, the government may acknowledge the pandemic's onset with a significant time lag. In general, governments are ill-suited for a "rapid adaptation to changes in the particular circumstances of time and place" (Hayek, 1945, p. 524). Lacking heuristics such as the profit and loss mechanism in the market economy, governments instead utilize layers of formal rules and protocols for coordination and information processing, all of which require approval from the higher-ranking officials. All of this substantially slows down decision-making to the point where no pandemic may even exist until a government official, "who is reached in the final stage of the bureaucratic procedure, has officially declared it" (Sobel & Leeson, 2007, p. 522). Government officials also do not usually share the same risks and the same sense of urgency as individuals experiencing the disease-related consequences, which further slows down the acknowledgement process. Finally, differences in perception at various levels of government may also clash. Disease may not present as pressing of a problem for an official on a federal level, while on a local level, the acknowledgement and curbing of the disease may be the most pressing need.

On the second level, government officials lack guidance about where the disease relief is needed the most. Governments may collect and process vast quantities of information, but without a signal similar to market prices and/or profits, state officials cannot prioritize and guide resources to their best possible allocation. The state fundamentally cannot know "whether the resources used in production, or the final outputs themselves, are allocated in a manner that maximizes social welfare" (Coyne et al., 2021, p. 1124).

Finally, while political agents may know the financial costs of their actions, they do not have reliable mechanisms which would inform them of their effectiveness. This results in weak feedback for government in its resource allocation, which leads to slowness and overall misuse of scarce factors of production. Feedback may also be stifled through political incentives to not "spoil" the relevant metrics and thus lose access to more funding, political prestige and so forth. In some cases, officials may underreport the true magnitude of the situation, or not acknowledge it altogether. Bureaucratic metrics by themselves may also be an unreliable indicator of progress. For instance, government agency that develops a vaccine under a set amount of time will fulfill the necessary metric, however, the actual efficacy of such vaccine may be questionable.

Overall, bureaucratic management of pandemics creates a wedge between private and political knowledge, and "the bigger the bureaucratic knowledge wedge becomes" (Sobel & Leeson, 2007, p. 523), the less likely it is for the government response to be ideal.

Knowledge problem constitutes the core failure of the government's pandemic response. However, this failure can be augmented even further by the self-interest of political agents. Rent seeking may force government officials to allocate resources not to areas which need them the most, but to areas which yield the most political gain and support the regime's stability, or to interest groups which excel at lobbying.

Unchecked political power and corruption, which are rarely discussed in the existing literature, also create perverse incentives, and cause political agents to become predatory.¹

¹The scope of this phenomena in general is very prevalent, as a large share of existing governments in the world is classified as predatory by the Index of Fragile States (2021).

Worldwide calls for more “efficient” statism (Toelstede, 2019, pp. 18–20) during a pandemic may further embolden predatory governments to expand their predation to an even greater extent.

Sometimes, predation may arise from the plain cruelty of state enforcers, who may derive utility from harming others and often face no costs for such actions. As a result, pandemic-related measures and punishments for rule-breaking may become very expensive for the populace. Agents will not only suffer from the disease, but also incur the costs of abuse and endure difficulties such as procuring food and other necessities, for instance, if quarantines become too strict. Abuse of force can also be more targeted. Predatory states may utilize healthcare and sanitary measures to violently disperse unwelcome political gatherings under the guise of protecting the populace, and further subdue their political opponents.

Pandemics may also serve as a pretext for unchecked political agents to extract even more resources from its citizenry. Funds received for vaccination development and other disease management programs may be embezzled. Medical officials may purchase drugs, masks and equipment of lesser quality than stipulated in order to pocket the price differential. Disproportionate fines for breaking rules will benefit state enforcers, while state-licensed doctors can extract money from the population through covert means, for instance, by issuing fake vaccination passports. At the same time, high costs of monitoring corruption, rational voter ignorance² (Caplan, 2011), and low probability of changing the regime may often preclude any meaningful punishment to the offending government employees.

We can see how removed the actual government response may be from its perceived ideal. However, can a decentralized response fare better and become a second-best? At a decentralized level, agents are likely to better acquire, manage and use knowledge. Individuals, for whom pandemics come with significant private costs, will swiftly assess their pandemic-related circumstances, and act accordingly. Individuals may also leverage their local and tacit knowledge to manage the disease, and experiment with different resource allocations based on such knowledge, as decentralization actively encourages a multifaceted approach to pandemic management.

For example, agents may self-impose relevant infection-reducing measures by keeping social distance and avoiding areas with high disease incidence (Leeson & Rouanet, 2021, pp. 1108–1115), or spontaneously organize into groups for pandemic management, driven by risk considerations and mutual aid. Decentralized disease-managing behavior often occurs before government processes all the relevant knowledge, and issues corresponding orders. Literature shows that in countries like United States and Japan, government measures account for a much lower reductions in the daily infection amount for COVID-19, while voluntary efforts in reduction of social activity account for a much larger share (Watanabe & Yabu, 2020). As such, decentralized action often makes government involvement superfluous at best. At the worst, however, belated government mandates and directives, which by default do not consider the local conditions, may override important local or tacit knowledge which could have helped manage the disease. Agents may sometimes go against the existing regulations and utilize their knowledge regardless, however, contingent on the severity of punishment for rule-breaking, such course of action may not always manifest. Furthermore, as government solutions are usually designed as a “one-size-fit-all” solution, they may fail to satisfy “a variety of preferences while dispersing risk”

²Even then, if such employees could be punished by voting them out of the office, such costs are incomparable to, for instance, a businessman facing bankruptcy. Furthermore, through connections and the use of insider information, ex-government officials may easily find employment in private sector, despite their previous shortcomings (Wedel, 2009).

(Coyne et al., 2021, p. 1132). Some agents may not attach much cost to disease-related events and may want to opt for different solutions if the demand and resources for such solutions exist, while dispersing or internalizing the risk of such solutions.

Finally, agents will have better incentives to allocate pandemic-related resources, and “contract with other units if the size of the externality necessitates it” (Coyne et al., 2021, p. 1132). Businessmen may temporarily close their properties or move to contactless commerce. Alternatively, entrepreneurs may reduce on-site risks through private regulation up to the point at which an individual's opportunity cost of patronizing their business becomes lower than the individual's opportunity cost of staying at home. Firms may require their clients to minimize the disease spread by wearing masks, sanitizing their hands, and keeping social distance.³ In the latter case, patrons completely internalize disease-related externalities, as they voluntarily agree to enter the shop.

At the same time, pandemic-related “bad apples,” which do not act prudently, are likely to be filtered out through prompt feedback. Businesses that falsely advertise secure premises and sell inadequate disease-management goods will incur losses, while those that correctly grasp the entrepreneurial opportunities will receive profits. Additional monetary incentives may also be supplied. For instance, investment in relevant sanitary and health infrastructure may be lucrative due to improvements in property values. Carson (2016, 2020, p. 154) shows that American firms in the early 20th century realized that private control of malaria-spreading mosquitoes increased the value of nearby land and property, thus encouraging more investment in disease prevention to reap the corresponding benefit. Even non-profit agents such as charities may also have strong incentives to not engage in opportunistic behavior. Poorly performing charities may have their benefactors and donors withdraw, leaving them without future funding for disease management (Sobel & Leeson, 2007, p. 525).

Even without first-best signals such as prices and profits, alternative feedback mechanisms “such as status and reputation within the community, can serve as cognitive tools that allow people to allocate their efforts and resources toward achieving their desired ends” (Coyne & Lemke, 2012, p. 224). Flatter hierarchical relations within informal groups may also allow for faster resource allocation and feedback. Outside of monetary incentives, individuals may coordinate disease-reducing behaviors through informal norms such as shaming and ostracism, receiving subjective benefits such as the feeling of solidarity, or by factoring the utility of others into their own utility maximizing decisions (Becker, 1976).

Thus, at least theoretically, private response can be a second-best in a pandemic. I now apply this framework to the history of pandemics in Russia to provide the empirical backing for it.

3 | A HISTORICAL ANALYSIS OF THREE PANDEMICS IN RUSSIA

3.1 | The plague

Even though plagues occurred in Russia as early as the 14th century, the plague of 1654 is the first that was thoroughly documented. The plague emerged in Moscow in August 1654 and

³Outside of pandemics, privately regulation of externalities is commonplace in business. Smoking bans in restaurants, regulation of noise levels, and dress codes all serve to reduce relevant externalities for visitors (Leeson & Rouanet, 2021, pp. 1112–1113).

TABLE 1 Plague in Posads across Russia, 1654–1655.

Posad	Deaths	Survivors	Mortality rate, %
Zvenigorod	164	197	45.42
Ruza	376	106	78
Kaluga	1836	930	66.37
Tver	336	383	46.73
Torzhok	224	686	24.61
Uglich	319	376	45.89
Tula	1808	760	70.40
Novosil	278	513	35.14
Zaraisk	597	116	83.73
Karachev	154	238	39.28
Mzensk	244	258	48.60
Yuryev-Polsky	1148	409	73.73
Pereslavl-Zalessky	3627	939	79.43
Pereslavl-Ryazanskiy	2583	434	85.61

Source: Based on Vysotskiy (1879, pp. 21–22).

spread to other regions of the country, such as Tver, Ryazan, Vladimir, Tula, Tambov, Chernigov, Yaroslavl, and Nizhniy Novgorod (Melikishvili, 2006, p. 20), illustrated in Figure A1. Appendix A contains a map, which shows the geographical spread of the disease.

The plague continued throughout 1655 and continued to briefly flare up until the disease finally subsided in 1657. The populations of Posads—small settlements adjoining towns, and noble estates, from 1654 to 1655 hints at the average mortality of around 58% across Russia, as shown in Table 1.

The government's response to the plague was riddled with knowledge problems. The bureaucracy was slow to acknowledge the beginning of the disease and to act on it. In his letters, Moscow prince Pronskiy pleaded with tsar Alexei to react to the plague, however, the order to quarantine Moscow was issued only after the city and its neighboring regions were already devastated by the plague and Pronskiy himself was dead from the disease (Vasiliev & Segal, 1960, pp. 55–56).

It could be argued that the slow response by the state was due to tsar Alexei's presence on the frontlines during a war with Poland. Yet, the extent of the bureaucracy in plague-related decision-making was startling. Consider the document handling by the tsar's government. All received reports from the infested areas were re-written, often in numerous copies. Then, a written response had to copy the entirety of the initial report, with all the previous copies attached to it. As a result, the documents often comprised large manuscripts of 40–60 pages. The report was then checked by a government clerk. Any errors in the documents necessitated a complete re-writing, especially if it concerned errors in the tsar's name and numerous titles. If all was correct, the manuscript was sent to a noble in tsar's administration, who approved of the document or not. In case of approval, the document had to be re-written again and given to the noble, who finally reported to the tsar. These administrative delays were also complicated by the vast territory of the Russian tsardom, the poor state of its infrastructure and slow means of travel (Vasiliev & Segal, 1960, p. 86).

Resource allocation was likewise lacking. The state was unwilling to waive any payment obligations for the common populace and continued to collect taxes and resources from it (Vasiliev & Segal, 1960, pp. 78–80). One of the first decrees by tsarina during the onset of the plague in Moscow was to scour the city clean by leaving no “money and gold” in it, and to then stash the funds in Spasskiy Monastery (Vysotskiy, 1879, p. 13).

Lack of adequate feedback also caused some pandemic measures to become excessive very quickly. The Russian government instituted quarantines and roadblocks across the diseased areas, which in some cases became extreme. Noncompliance with quarantines in some areas was punished by the death penalty. The movement of goods including food into the quarantined zones was also prohibited, which led to bread shortages in large cities such as Yaroslavl (Vysotskiy, 1879, p. 17). Residents of the Troitsko-Sergievskiy monastery complained that state enforcers would block them from getting to “mills, lumber and hay,” causing people to “die from starvation and cold and having nothing to feed animals with” (Vysotskiy, 1879, p. 17).

Corruption also undermined the Russian state’s efforts to control the plague spread. In contrast to the excessive quarantine efforts in some regions, Vysotskiy (1879, p. 15) notes the organization of secret transportations across quarantine borders via bribes or outright neglect of quarantine zones by state enforcers, who often fled from the disease themselves.

In the 18th century amidst wide-scale reforms, the Russian government attempted to improve its disease management efforts and devised a set of measures to implement at the “first sign of plague” (Melikishvili, 2006, p. 22). After the Astrakhan plague in September 1727, Emperor Peter II issued decrees that standardized the response to a disease outbreak (Vasiliev & Segal, 1960, p. 106). These decrees demanded swift correspondence between the regional governors and the emperor, with continuous updates on the number of infected. Suspected disease carriers were to be isolated immediately and the plagued cities quarantined. Field hospitals and “plague houses” were to be set up immediately as well. One of the more novel measures to battle the plague consisted of burning the houses of infected persons, “along with all of the personal property they contained, including farm animals and cattle” (Melikishvili, 2006, p. 23).

Yet, the government failure in pandemic response persisted, most visibly during the next significant onset of the plague from 1770 to 1771). The plague advanced throughout the Russian Empire, reaching Moscow and its neighboring regions by November 1770. The map of the geographical spread of the plague is demonstrated in Appendix B (Figure B1). The details of plague affecting Moscow are especially well-documented, as the city was hit hard by the plague, compared relative to other infected areas of the country. As such, focus on Moscow forms the crux of the historical information in the following paragraphs.

The government was again late in acknowledging the disease’s onset, and for a long time, remained largely skeptical of the plague’s presence in Moscow. “Bureaucratic inertia, faulty coordination, and high-level connections” (Alexander, 2002, pp. 130–131) overall prevented the government’s acknowledgement of the disease’s onset. Empress Catherine II was hesitant to admit that plague was spreading, and the decree instituting quarantine measures was only issued in late December. On the 7th of February 1771, Governor-General of Moscow Saltykov was quick to proclaim on that the crisis had been averted, which led to the removal of disease-related restrictions (Alexander, 2002, p. 121). Likewise, on the 22nd of February, Empress Catherine also affirmed the end of the disease (Sirotkin, 2014, pp. 132–133), while the death toll was in fact slowly ramping up.

However, the visibility of the rising death toll was, perhaps, obscured by the lengthy winter of 1771, the fear of individuals to become targets of oppressive government measures, as well as

the opinions of some state doctors that claimed the disease was not plague, but instead some type of a putrid fever. In March, after an outbreak on the Big Woolen Court, one of Moscow's manufactories, sanitary surveillance measures were instituted, but they were quite ineffective. According to Alexander (2002, pp. 152, 166–167), state officials did not become “alarmed until late June; even then their suspicions crystallized so slowly that another month passed before they renewed extraordinary precautions,” and even then, the disease “baffled them all until the third week of August.”

Resource allocation by the government was likewise largely ineffective. Vasiliev and Segal (1960, p. 106) note a complete deficit of medical personnel in hospitals and plague houses. More importantly, the medical treatment in such quarantines was not free, and patients had to pay 1 kopek a day to remain there. This made such facilities unaffordable for the majority of the common populace. Emergency aid was likewise distributed slowly and in insufficient quantity. In a letter to the Empress in August 1771, Governor-General Saltykov complained about a complete lack of resources to curb the disease and the inefficiency of state control over the quarantined Moscow (Vasiliev & Segal, 1960, pp. 143–144). Financial aid to Moscow was provided in late September 1771, when Count Orlov departed to the city with 100,000 rubles (Vasiliev & Segal, 1960, p. 146). However, this sum was not nearly enough to compensate for the loss of human life in the prior months.⁴

Knowledge feedback mechanisms were unreliable, as state officials were often misled by the information collected about the plague's scale. The officials tracked the infected population and reported these numbers to Saint-Petersburg. However, the orders to burn down the houses of the diseased incentivized the individuals to hide their actual status from the state officials. The wealthy population could avoid getting their house burnt down or get quarantined by bribing the state officials, while the common populace simply did not report the infected members of their families to state enforcers and buried their dead in their backyards. In Moscow's case, such underreporting was deadly. Low numbers of the diseased caused optimism in the Moscow state officials and governor general Saltykov reported to the Empress in late May that the situation in the city was stable, with a daily number of deaths as low as 25 to 47 individuals, while streets were being littered with corpses (Vasiliev & Segal, 1960, pp. 137–139).

The new plague measures allowed the government officials and the military forces to exercise an unprecedented degree of violence upon the general populace, as properties were burnt and individuals forcibly isolated. Such measures for handling the plague ultimately resulted in a plague riot in Moscow on September 15, 1771 (Alexander, 2002, p. 26), where a raging crowd beat up the city watch and the clergy and took over by September 16 (Sirotkin, 2014, p. 137). Only after quelling the riot, Catherine II dispatched Count Orlov with financial aid to the city.

What about the decentralized response to the plague? From the available historical information, individuals were quicker to react to the disease than the government, acting upon their local knowledge. For instance, let us consider the development of plague in Moscow during 1654. The plague began in August 1654, and during that time, individuals already began to flee or self-isolate, and merchants stopped trade in the city. In the first half of September 1654, the plague continued its spread, and Prince Pronskiy, left in charge of the city, died. Only in second half of September 1654, a cordon was belatedly established around Moscow to prevent individuals from leaving. Plague began to abate in October 1654, and tsar Aleksei reentered Moscow only in February 1655 (Alexander, 2002, pp. 18–19).

⁴A calculation based on the estimates of Mironov (2012, p. 205) gives us the tentative number of 1,028,499 rubles lost because of deaths in Moscow alone.

During development of plague in Moscow during 1770–1771, according to Alexander (2002, p. 166), “muscovites perceived the threat at the same time” as the government officials. As plague ramped up in July and August of 1771, individuals began to flee or self-isolate. Toward the end of August, local communities and entrepreneurs organized their own quarantines, which often “supplanted the despised government facilities” (Alexander, 2002, p. 169). Such behavior was noted by Governor-General Saltykov, who stated that “the government should halt the policy of compulsory quarantine and allow people to take their own precautions, as the manufactory operators and merchants ... were *already* [emphasis of the author] doing” (Alexander, 2002, p. 185).

Religious groups with strong tendencies toward self-governance, such as Old Believers, also created private quarantines which provided shelter to the poor and sick, and were “guarded, staffed, provisioned, and administered without state aid.” The incentive to do so was strong, as services were provided in exchange for conversion to the Old Belief faith (Raskov, 2012, p. 233). The project grew in the future into two major Old Believer communities of Preobrazhenskoe and Rogozhskoe.

Villages, surrounding Moscow, also responded, for instance, by establishing their own quarantines. Vasiliev and Segal (1960, p. 140) characterize such peasants as often being more “far-sighted and clever than their masters and foreign doctors,” who lost time and held back the pandemic response by arguing “about what type of disease raged in Moscow.” Alternatively, the peasants also exercised desertion as a disease preventing measure. For instance, in the second half of August 1771, residents of village Pushkino fled to a secret residence in the woods. Having waited the plague out, the “village suffered no permanent loss of population or industry” (Alexander, 2002, p. 236).

On the other hand, many villages realized that by rejecting potential plague carriers, they may be foregoing some benefits of sheltering the fleeing individuals. As such, the Nikol'skoe village in Yaroslavl, saw profit opportunities in harboring individuals fleeing from the plague in November of 1771. Through a meeting of their village commune, peasants decided to give shelter to the merchant family of Ivan Kniazev, that fled from plague-infested Moscow, and even rejected the officials' “demand for documentation of the newcomers' right to enter the area” (Alexander, 2002, p. 241). As such, villages decided upon their own optimal response for tackling the pandemic and avoided or internalized the relevant disease-related costs.

Alexander (2002, p. 230) also notes that the Russian countryside was overall much safer than urban areas during the plague pandemic, partially attributable to smaller populations and remoteness. However, decentralized response may have had a role to play in the overall safety of the villages. While deprived of many functions and rights by the landed aristocracy, village councils could still influence peasant behavior (Skryabin, 2019, p. 17). During the times of plague, state and noble control also weakened, especially due to the chaos in the central administration. This enabled some autonomous decision-making in public-health matters for the villages.

3.2 | Cholera

3.2.1 | Cholera in the Russian Empire

While the plagues largely abated, cholera became the most exceptional disease of the 19th century in Russia. The first cholera outbreak in the Russian Empire occurred in 1823 and was

TABLE 2 Cholera, its death toll, and the number of affected governorates across the Russian Empire.

Outbreak period	Death toll	Affected governorates
1823	205	1
1829–1838	242,912	48
1847–1859	1,032,864	49
1865–1872	326,968	49
1892–1895	381,100	77

Source: Based on Vasiliev and Segal (1960, p. 250).

relatively mild, infecting only the governorate of Astrakhan due to an unusually cold winter (Henze, 2011, p. 12). Future outbreaks throughout the 19th century, however, were much more devastating. Table 2 shows the staggering cholera death toll and its spread throughout Russia in the 19th century. As cholera appeared in Russia all throughout, this paper offers a snapshot of the disease spread for 1892 in Appendix C (Figure C1), and refers the readers to Patterson (1994, pp. 1175–1188), for maps of cholera spread in other years.

The government response to cholera continued the trend of failures from the mismanagement of plague. While government officials demonstrated “an acute awareness of the threat” (Henze, 2011, p. 12), the actual response to the pandemic often lagged behind. The state was often delayed by political considerations and the need to consolidate power and move troops, for instance, in 1848, after a revolutionary tide which engulfed Europe. At times, the Russian government engaged in a different extreme in being too quick in their decision making. In December of 1851, the state pronounced the end of cholera in Warsaw governorate, only for the disease to reappear shortly afterwards in the most devastating wave of illness in the region in 1852, leading to 105,377 infections and 48,579 deaths (Vasiliev & Segal, 1960, p. 261).

Disease resource management by the state during cholera times was chaotic. The Russian state frequently vetoed important sanitation projects and underfinanced healthcare, usually diverting funds to finance wars and the expenses of the monarch. “Medical facilities and medical care in Russia’s cities were in shambles,” (Henze, 2011, p. 47) with the sick quarantined in poorly funded and understaffed hospitals. In these institutions, “the unfortunate soul would encounter the disease if he was healthy and encounter an almost inevitable death if he was sick” (Vasiliev & Segal, 1960, p. 258). The quarantined individuals would often starve, and their belongings were under the risk of being stolen. Quarantines were often accompanied with resource destruction of food products which were thought to be key in transmitting the disease, such as fruits, vegetables, and fermented drinks. This often led to hunger in numerous governorates, and in 1833, many peasants in the European part of Russia made bread from tree bark and acorns to avoid starvation. In response, the government allocated resources to supply peasants not with bread, but with leaflets about making bread from hay (Vasiliev & Segal, 1960, p. 256).

Resource misallocation also aggravated panic and social tension. In 1892, the Russian government halted ships in the Astrakhan harbor with thousands of passengers, which had to pass examination at an understaffed local medical station. The process was so lengthy that food and water for the passengers became scarce. A government ship was eventually sent to the city with aid, however, instead of provisions, the vessel was loaded with another resource—coffins, which induced a full-fledged panic among the passengers and the harbor itself (Frieden, 1977, p. 546).

Feedback was often delayed due to disease-related information passing through an immense number of administrative offices and committees spawned by the tsarist regime, to the point where the government “paralyzed itself,” and “the administration received the information on which it had to act days and even weeks after the need for decision had arisen” (McGrew, 1962, p. 234).

The government’s violence also greatly exacerbated the disastrous effects of cholera. Because of a lack of funding for medical personnel, quarantines were enforced by both the military and police. The police indiscriminately captured those who disturbed the quarantine and sent them to the understaffed hospitals. Compulsory hospitalization, confiscation of patient’s possessions, and forcible intrusion of the infected homes for disinfection also bred anger and fear. As Henze (2011, p. 16) writes, “This policy was a complete failure. As the epidemic advanced through European Russia, military coercion aggravated the crisis. Terrified by a deadly disease and threatened by military force, the population not only hid the infected from the government officials, but also responded with outbursts of collective phobia and fury directed at physicians and officials.” Vasiliev and Segal (1960, p. 258) add that the “dumb efforts and lawlessness” of state officials led to cholera riots across the country in the third and fourth cholera outbreaks. In turn, the riots were quelled with mass arrests, death penalties and labor camps, propagating more distrust and anger toward the Russian state.

In some regards the decentralized response to cholera mimicked the plague times. Individuals often acted upon the disease before the Russian state did. Henze (2011, p. 81) writes that in Saratov in June of 1892, “in stark contrast to official authorities, Saratov’s population had been stirred up by the cholera news since the beginning of June.” Meanwhile, Saratov’s authorities only began to implement anti-cholera measures in the second half of the month, with significant delays and brutal methods of enforcement. Population acted accordingly to cholera, either fleeing the diseased areas or “barring themselves in their houses ... and not leaving without extreme need for it.” (Vasiliev & Segal, 1960, p. 264).

Cholera also showed that an effective decentralized response was contingent on the status of the medical profession in Russia as a whole. Doctors in Russia were largely subservient to the state, which exercised extensive control over their lives. The Russian state “sponsored all medical education, was the sole dispenser of medical licenses and the primary employer of physicians” (Frieden, 1977, p. 539). Doctors became a part of the government machine, and few opportunities remained to find employment outside of the Russian state system.

The doctors had no decision-making autonomy, as “their activity was highly dependent not only on the decisions of municipal, but also of provincial authorities” (Henze, 2011, p. 47). The opinions of the bureaucrats were “considered higher than the opinion of physicians, even in particular questions.” In case some ideas were not outright discarded by the officials, approval could take significant amount of time, and likewise, the lag to have these ideas manifest in reality was substantial. For instance, in Kherson, physicians struggled for “many years” to set up medical stations for migrant workers, before finally getting approval in 1891 (Frieden, 1977, p. 544). Peasants were also distrustful of the physicians due to their “stigma of the bureaucrat” and the overall attitude of the government to pandemic management, with its exercise of brute force (Frieden, 1977, p. 547).

Even the newly constituted institutions of local self-government (*zemstvos*), introduced in 1864 during the time of Alexander II’s reforms, changed little. *Zemstvos* had a limited ability to influence medical programs to begin with, and in the areas where they could change matters, their organizational structure got in the way of utilizing medical knowledge. Being able to vote on medical projects or becoming a member of the *zemstvo* governing board required land

holdings, which physicians usually did not have. As such, doctors continued to have limited sway over medical developments, and “zemstvo officials often reacted with hostility” to new suggestions and ideas of medical professionals, which could “expand health care beyond curative medicine” (Frieden, 1977, p. 541).

The only exception to the rule was the situation in Moscow, which historically grew out of the plague management efforts of the Old Believers during the 18th century. The success of Old Believer managed quarantines began attracting merchants, who, according to Raskov (2012, p. 233), were often drawn to the Old Belief due to their humble origins. This development determined the source of financing for Moscow healthcare in the future, which would be almost entirely funded through merchant capital (Resnyanskiy & Shapkin, 2021, p. 229), and secured the relative autonomy of Moscow physicians compared to other parts of the Russian Empire. Moscow physicians had an influential presence in the Moscow Cholera Council (McGrew, 1962, p. 234), and later within the zemstvos, which culminated in the organization of a medical bureau organized in the 1870s and revamped in 1885. While neither the Cholera Council nor the subsequent bureau were completely free of local government involvement, the institution functioned “all but autonomously” from the central administration (McGrew, 1962, p. 234). As such, Moscow physicians readily tapped into their professional and local knowledge for pandemic management and organization of important healthcare projects, and actively solicited private donations to “advance the cholera fight” (McGrew, 1962, pp. 234–235). As a result, the Moscow governorate suffered less from cholera than other governorates. For instance, in 1892, Moscow had registered only 654 cases of cholera, while the total country-wide cases for the year amounted to 433,643 (Zhbakov, 1893, p. 1378).

Such developments hinted at a strong positive association between decentralization and effective disease management. Many physicians thus sought to achieve the same autonomy as their Moscow counterparts, and some doctors even wanted to take it a notch further, desiring complete autonomy and freedom in managing healthcare without any government control.

The opportunity, albeit brief, presented itself as the fifth cholera pandemic struck in 1892, and the Russian state *de facto* admitted the powerlessness of its centralized approach to the pandemic. The death toll for year 1892 alone amounted to 300,300 people (Mironov, 2012, p. 472). The severity of the crisis “forced the state to recognize ... at least temporarily ... physicians’ autonomous role in conjunction with the zemstvos, or in some instances, with local medical societies” (Frieden, 1977, p. 542). The medical societies were organizations voluntarily established by the physicians themselves for an independent management of health-based affairs at a local level. In 1905, at the Pirogov Society congress, the drive for autonomy ultimately culminated in a peculiar development, where

Russian medical scientists and community physicians entirely bypassed the official anti-epidemic agencies of the government and created an alternative institutional network by which the scientific understanding of disease could be applied quickly and consistently at the local level.

Merchants often joined the medical societies as donors and assisted with investment in public sanitation projects and other related infrastructure (Frieden, 1977, p. 551). Ultimately, “contrary to all expectations,” cholera was almost stamped out by year 1895, where deaths dropped to 12,011. The disassociation from the government also helped regain trust toward physicians in the eyes of peasants. Consider the following recollection:

One physician ... recalled that his wife had asked some peasants why, in contrast to their former distrust of physicians, they had learned to trust her husband during the cholera epidemic. "But he is a free (vol'nyi), not a government physician," they answered, "What interest does he have in killing people?" (Frieden, 1977, pp. 549-550).

However, physician autonomy presented a political danger to the autocratic tsarist regime, which soon rolled back the newly granted freedoms for medical professionals. After the revolution of 1905, many autonomous sanitary organizations were destroyed, and "physicians became much sought-after targets for recrimination in the wave of reprisals that swept the country" (Henze, 2011, p. 138).

3.2.2 | Cholera in the Soviet Union

The creation of the Soviet Union and drastic institutional shifts also failed to eliminate inefficiencies in state response to pandemics, and cholera in particular. The USSR-promoted image of its rapidly developing science, supported by the "creative dynamic provided by Marxist-Leninist ideology and Soviet-Socialist institutions," (McGrew, 1962, p. 244) along with rapid industrialization and tightly controlled borders created an impression of a country that would easily overcome pandemics.

However, despite the great confidence from some microbiologists that USSR would forever be free of cholera (Milenushkin, 1954, p. 68), the USSR lagged behind Western countries in its attempts to control disease outbreaks. The best example of the Soviet Union's failure in pandemic management is the cholera outbreak during the period 1970-77, which affected 80 regions of the country. The spread of the disease is provided in Appendix D (Figure D1).

Archival work by Ursu (2014, pp. 234-236) on the cholera outbreak in the city of Odessa from August to September of 1970 demonstrates in detail the degree of the state's inefficiencies in managing the disease. From the onset, pandemic acknowledgement issues began. The first checks for cholera vibriion began on July 26, the first infected appeared on August 3, and six more individuals were classified as infected by cholera on August 6, with 12 more following on August 7. Up until then, the Soviet state vehemently denied the outbreak and instead dubbed cholera cases as acute infections of the small intestine. The regional anti-epidemic commission finally decided to quarantine the city on the 6th of August, but the quarantine was not officially announced by the regional committee of the Communist Party, which led to further confusion. Additionally, individuals could still leave the city via the airport, the railway station and the port. Only on the 8th of August the city was fully cordoned off.

Resource allocation for cholera management was likewise inefficient, with the key culprit being the overall poor sanitary conditions in Odessa. Even across the USSR, water supply and sewage facilities in most towns and villages were classified as "unsatisfactory" (Narkevich et al., 1993, p. 193). Odessa, being far removed from critical administrative centers in the Soviet Union, was no exception. According to Ursu (2014, pp. 244-45), the sanitary conditions in the city and its treatment of waste were horrific, which made the city especially predisposed to a disease outbreak. The arms race against the West also compounded the problem through a lack of funding and manpower to organize a swift response to cholera, and there was no unified system of medical checkpoints to timely identify the infected. While Odessa was eventually supplied with necessary funds and medical personnel of 14,000 for the construction of field

hospitals and isolation wards, as well as cleaning out 3210 tons of garbage from the city streets (Ursu, 2014, p. 237), such decision was made only after stringent critique of the situation in the city from the Communist Party, 2 weeks into cholera's onset. Afterwards, the USSR Health Ministry further supplied Odessa with 4 million packages of tetracycline, however, the antibiotic was not freely distributed to the populace, citing the expensiveness of such policy.

Feedback mechanisms also failed, as the local administration meetings often did not even consider the cholera outbreak as a top discussion point (Ursu, 2014, pp. 234–235). Furthermore, feedback could have been disrupted due to the overall unreliability of Soviet data and the incentive to conceal political failures by the regional party apparatchiks. Such circumstances often misled both the public and medical professionals. The official count of those infected with cholera in Odessa amounted to 126 people with 20 deaths. The overall number of those admitted to hospitals under suspicions of being infected or having had contact with the diseased amounted to 8481 people. Considering the overall poor response to cholera in Odessa, Ursu (2014, p. 245) calls it a “wonder” that the number of infected was as low as the government data shows. Additionally, the USSR's overall secrecy and employment of data-collection methods which contradicted the recommendations of the WHO (Brainerd, 2010, p. 108), further cast doubt on the validity of the government's cholera-related statistics.

Corruption also played a factor, as cholera was used as a cover-up for nepotism. During the rampaging disease, the local administration meetings were engaged in “elephant distribution,” a free and a non-queue-based allocation of apartments (Ursu, 2014, p. 245).

To the limited extent possible, Odessa's residents attempted to address the situation in a decentralized manner. It is documented that individuals isolated themselves voluntarily or fled the city before the announcement of the poorly managed quarantine (Ursu, 2014, p. 238). And though the Health Ministry ordered the population of Odessa to take the tetracycline antibiotic from the 15th to 18th of August, the populace began purchasing the drug much earlier than the state ordered, and on the 9th of August alone, 204 thousand packs of the drug were sold (Ursu, 2014, p. 239).

Outside of Odessa, cholera had to be managed by outright rule breaking. The inefficient response of the Soviet administration in Novosibirsk was overcome by the actions of doctor Petr Burgasov, who urged the industrial factories to dump acid waste into the sewers to halt the spread of cholera (Makarov, 2016), despite going against the government's directives.

3.3 | COVID-19 pandemic

During the COVID-19 pandemic, the Russian state's response was similarly lacking (see Appendix E (Figure E1) for a map of the disease spread). While the Russian state showed awareness of the pandemic as it began, its doublespeak led to substantial confusion and slowed down the response to the disease. Preventative measures were announced in late March, on the 28th, and instead of “quarantine,” the government utilized the phrase “paid non-work week,” and despite admitting the onset of an emergency event within the country, formally, the emergency situation was never declared (Malenkij, 2020).

Resource misallocation and misappropriation once again proliferated. The government announced credit and tax holidays and lowered interest rates for wage-fund loans. It offered subsidies to key enterprises, bonuses to medical personnel, and greater unemployment benefits. However, the report of the Center of Macroeconomic Analysis and Short-Term Forecasting (2020) shows that the true extent of these measures has been quite minimal. The report

estimates that the stimulus package, along with the increased health care spending, equaled just 1.8% of GDP (Center of Macroeconomic Analysis, 2020, pp. 6–7). The maximum amount of the unemployment benefit was set at 12,130 rubles, or roughly \$170. Families with children could get an additional 3000 rubles, or approximately \$42 per child, for support (Government of the Russian Federation, 2020). Presidential Commissioner for Entrepreneurs' Rights Boris Titov reported that 25% of all business applications for wage-fund loans were declined by banks (Budushee Rossii, 2020), and successful loans were often given to large, established businesses (Ural Federal University, 2020). Additionally, not all medical personnel received the promised bonuses for working with COVID-19 patients (Official Website of the President of Russia, 2020).

Economic stimulus was also directed into questionable areas. For instance, the website on official government purchases contains an entry of 451 million rubles in spending on meteorological defense for the Victory Day parade in May, while the country's population was prohibited from attending the event (Goszakupki, 2020a). Another entry on the website details that 470 million rubles was spent on advertising the population census of 2020 (Goszakupki, 2020b), despite the cancelation of the event. Organized Crime and Corruption Reporting Project (2020) reports that government officials in Russia embezzled pandemic funds by purchasing cheaper Chinese-made coronavirus tests while filing their purchases as the more expensive Dutch-made tests.

Feedback mechanisms were also disrupted due to poor information flows. Some companies, especially the nonprofit ones, complained about not having enough information and assistance in receiving government support. In case when support was provided, it was often belated. For instance, the report on COVID-19 by Ural Federal University (2020) states that “There was no sense in providing exemptions on rent payments for organizations. Many nonprofit organizations already lost their premises by the time the exemption started functioning.” Furthermore, the numbers of deaths from COVID-19 were understated, which also led to deficiencies in policy response and dulled the danger perception of the disease by the country's population (Dyer, 2020).

Political predation also proliferated during the COVID-19 pandemic. The government's attempts to enforce mask wearing financially drained the population. In Moscow alone, from April to August 2020, local authorities fined individuals and businesses some 210 million rubles for breaking the rules related to mask-wearing (Interfax, 2020a). From September to October, fines amounted to 50 million rubles (TASS, 2020a). Health and sanitation laws were often utilized to quash political unrest and imprison political opposition, and the referendum on the resetting of presidential terms was also arranged during the pandemic. To the credit of the government, it created numerous COVID-19 vaccines, such as Sputnik-V, EpiVakKorona and KoviVak. However, public distrust of the government, and a lack of transparency about the clinical trials cast a negative light on these efforts. Polls showed that approximately 52% to 58% of respondents were not planning to use a Russian-made vaccine against COVID-19 (Kommersant, 2020).

On the other hand, the decentralized response to COVID-19 sprung up almost immediately. Many individuals began to voluntarily self-isolate or moved away from large cities to wait out the pandemic in the Russian countryside houses called dachas. According to Nikolaeva and Rusanov (2020, pp. 186, 188), migration to the countryside began as early as February 2020, when “without waiting for official decisions and recommendations, many Muscovites with dachas began to move out themselves, as well as to remove elderly relatives,” and “several million people (at least 5–6) left the two Russian capitals within a month and a half.”

Voluntary projects such as COVIDarnost (Covidarnost, 2020) offered non-state funded aid to individuals above 60, single parents and people on strict quarantine, with an assortment of services, from psychological help and provision of food to drug purchases and childcare. Private companies also got involved. Mask and protective equipment producing businesses sprung up in February and March 2020, albeit the medical application of these products was held up by licensing requirements (Rossijskij sojuz promyslennikov i predprinimatelej, 2020). Restaurants and non-profit organizations established expansive programs of free meals for doctors and emergency service workers, taxi companies offered free services, and automobile companies leased their cars to clinics and laboratories for free (Higher School of Economics, 2020). Donations to the poor and to medics were also organized by companies such as Mega and IKEA, and volunteer groups were also quick to respond to the needs of hospitals in supplying them with protective gear (Higher School of Economics, 2020).

The Russian government actively interfered with the decentralized response (TASS, 2020b). Businesses were unable to formulate their own responses to the virus and instead were heavily fined by the Russian state for not adhering to its centralized protocols (Kommersant, 2020). The government also brought many volunteer groups under its control, while hindering groups that were not state led. Some non-state volunteers were denied COVID-19 passes for free movement, while volunteers of the Alliance of Doctors (Interfax, 2020b) were fined for trying to alleviate a shortage of medical masks in Novgorod. Open Russia's assistance to the Ivanovo region with mask and hazmat suits was met with a court case for the spreading of fake information (Znak, 2020). Doctors that tried to exercise autonomy and utilize their knowledge in response to the pandemic policies of the Russian state were pressured by the authorities. For instance, the efforts of the head of a hospital in Krasnoyarsk to oppose the conversion of a ward "to house coronavirus patients because of a shortage of trained personnel and protective equipment" ultimately failed (Khurshudyan, 2020).

4 | CONCLUSION

The thread that seems to run through all the pandemics studied here is that Russia's state has had a long history of failure in achieving the ideal pandemic response, instead leaving the country with the predatory, inefficient response. I attempted to show that the decentralized response had a potential to be a second-best option. However, how that option's full potential can be unlocked while the Russian economy is heavily state controlled, and autonomy is often quelled, remains a difficult question.

To conclude, I want to discuss a potential point of criticism in me focusing on just three diseases. Maybe the Russian government performed really well in tackling the diseases I omitted? A cursory glance at other diseases across the Russian Empire, the Soviet Union and the Russian Federation does not improve the overall picture. For instance, taking a look at typhus outbreaks in the Russian empire, we can see that the imperial government issued a series of decrees to combat typhus as early as 1837; however, because of a lack of medical personnel and hospitals, and because of bureaucratic disinterest, these decrees were never implemented. Vasiliev and Segal (1960, p. 320) note, for instance, that the Perm region, with a population of 2 million, had only 1 rural doctor. As a result, typhus cases and mortality rates reached a peak in 1892, with 184,142 cases and an estimated mortality rate of 15.5 deaths per 100,000 residents.

Smallpox might have set a different path for tsarist administration. Indeed, Catherine II herself set an example by getting inoculated for smallpox in 1768 and issuing numerous decrees

that made smallpox vaccination mandatory in religious and educational institutions. The vaccination policy saw great success, with up to 938,000 children getting inoculated from 1805 to 1810, but the enthusiasm faded by 1821 for financial reasons and because of bureaucratic inefficiency. Many smallpox committees that had been instituted to keep track of the vaccination campaign ceased operations, and in some regions, only 19% of children received a vaccine (Gamaleya, 1934, p. 47). Some corrupt state physicians also found a way to earn money from the vaccination process. Exploiting the low level of education in rural regions, doctors lied that vaccination had to be performed with grisly tools, from saws to butcher knives. After instilling fear in the populace, the physicians then offered a chance to let the terrified people off the hook for a bribe (Vasiliev & Segal, 1960, p. 289). Such acts often caused aversion to the medical profession and a distrust of vaccines. As a result, mortality remained high: from 1901 to 1910, smallpox caused the deaths of some 414,000 people (Mironov, 2012, p. 292).

For the Soviet Union, Feshbach (1990, p. 11) argues that lack of syringes, inadequate refrigeration, and “sheer indifference” hampered antimeasles efforts. Simultaneously, the number of annual cases for pertussis, polio, and diphtheria “were well in excess of those in the United States” (Hoch, 1997, p. 9). Baroian (1968, pp. 41–42) shows that diphtheria cases peaked at 120,000 cases per year up through the late 1950s. Furthermore, the Soviet Union’s vaccination policy relied on a large degree of coercion against the populace. Hoch (1997, pp. 3–4) claims that for the Soviet Union, vaccination efforts “became a prominent measure of its political success regardless of the actual efficacy of these vaccines” and that “no vaccine anywhere was of substantial benefit.” Even with the USSR joining the World Health Organization (WHO) in 1958 and redoubling its immunization efforts, such measures were still ineffective, largely because of the failures of central planning. Starting in 1974, the USSR outright stopped publishing infant mortality rates and other key demographic data. Resumption of publication in the mid-1980s revealed declines in male life expectancy and rising infant mortality rates, “both nearly unprecedented developments in industrialized countries” (Brainerd, 2010, p. 87). The damage done to medical science through political predation of individuals such as Trofim Lysenko also cannot be ignored.

In the modern days, one of Russian government’s most pressing failures is that of the HIV/AIDS mismanagement. According to HIVRussia (2021), 1,122,879 Russians lived with HIV at the date of June 30, 2021. Pape (2022) claims that by “politicizing the epidemic, silencing activist groups and organizations, and stigmatizing vulnerable populations, Russia’s government has ignored the scale of its HIV/AIDS crisis, undermined vulnerable populations, and erased critical prevention programs.”

As such, even a cursory glance at other diseases in Russian history continues to paint a bleak picture. However, a deeper study of these diseases may prove a fruitful continuation to my research efforts.

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APPENDIX A

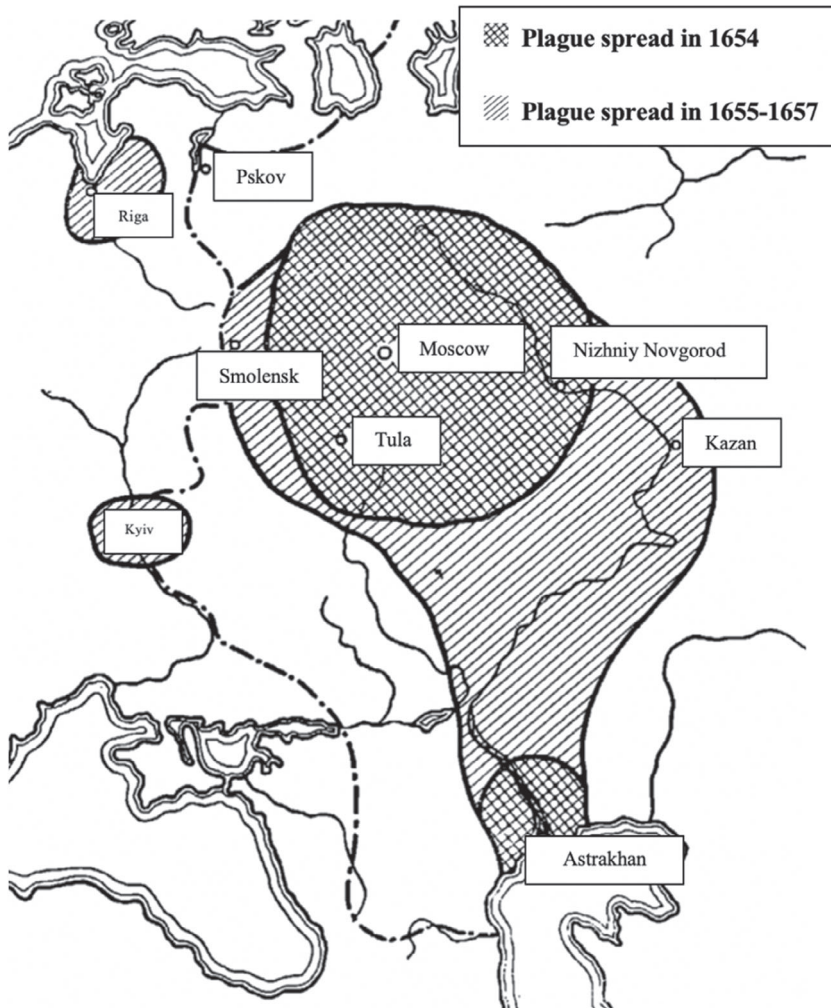


FIGURE A1 Plague spread in Russia, 1654–1657. *Source:* based on Vasiliev and Segal (1960, p. 53).

APPENDIX B

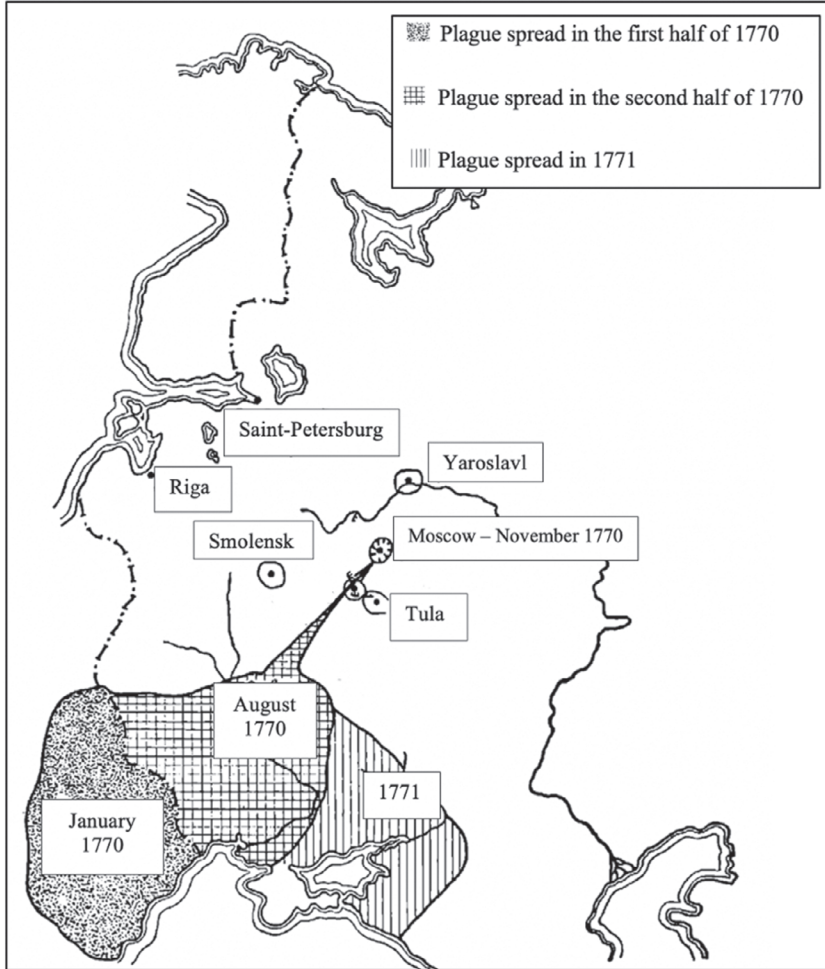


FIGURE B1 Plague spread in Russia, 1770–1770. Source: based on Vasiliev and Segal (1960, p. 125).

APPENDIX C

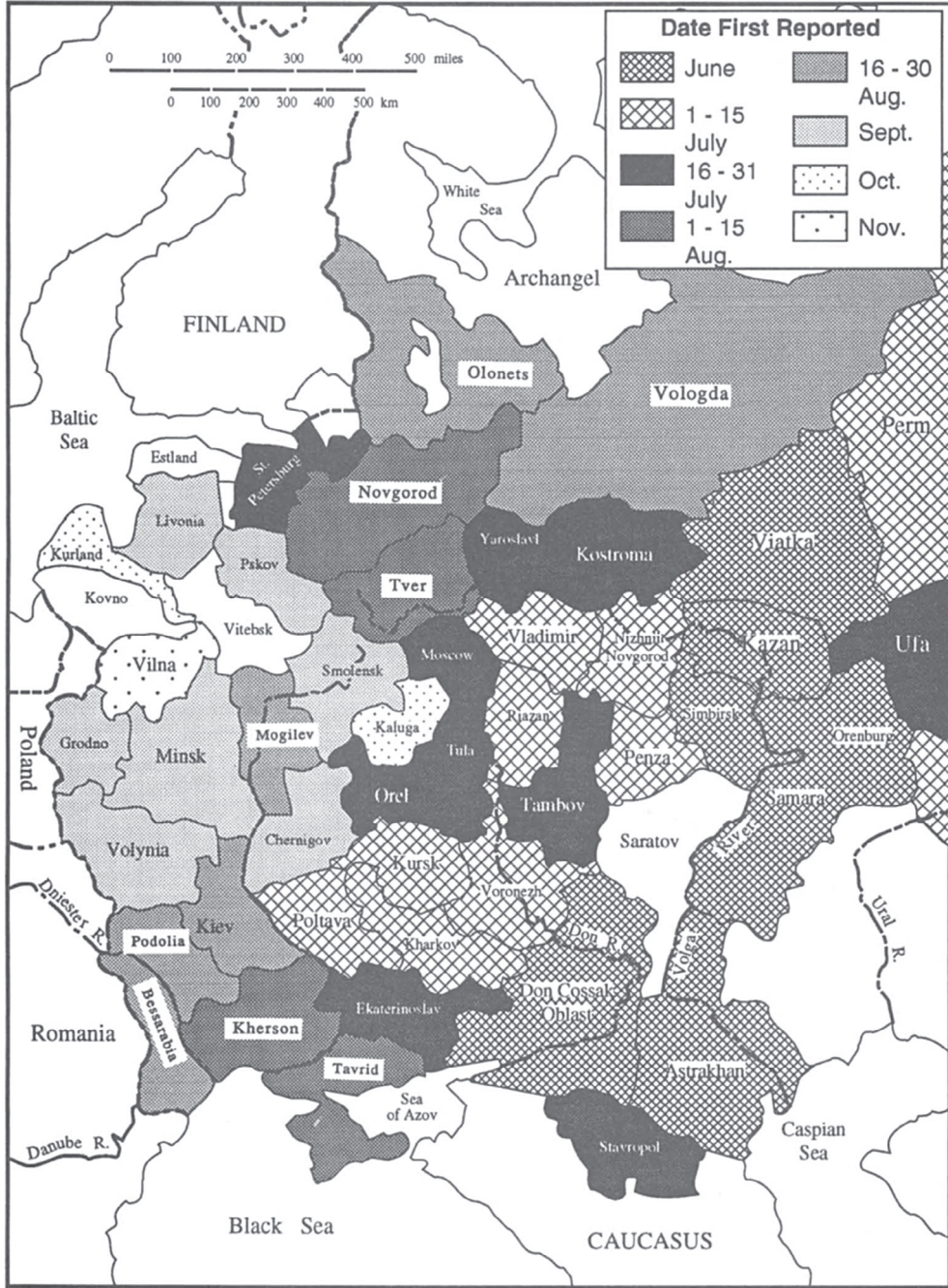


FIGURE C1 The spread of cholera across Russia in 1892. Source: Patterson (1994, p. 1184).

APPENDIX D



FIGURE D1 The spread of cholera across the USSR, 1969–1989. *Source:* Narkevich et al. (1993, p. 195).

APPENDIX E

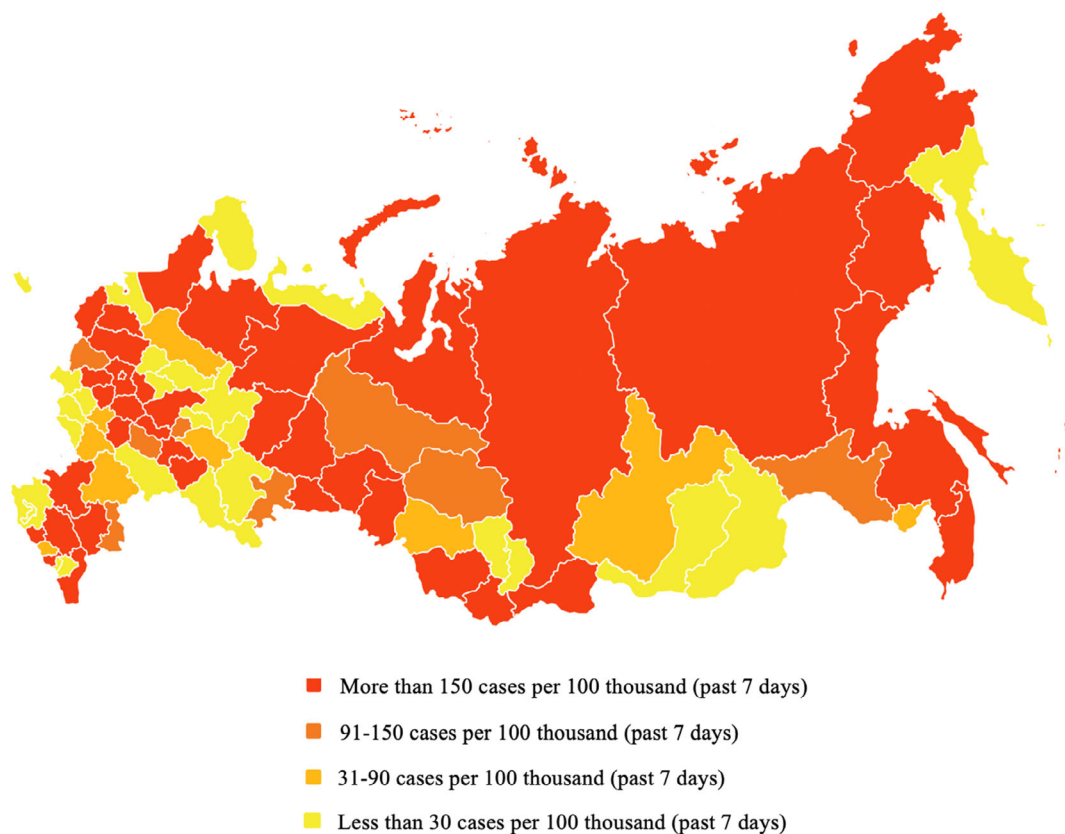


FIGURE E1 The spread of COVID-19 across Russia as of 15.11.2022. *Source:* <https://стопкоронавирус.рф/information/> (Accessed 15th November 2022). [Color figure can be viewed at wileyonlinelibrary.com]