Infectious Diseases and Government Growth

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In response to the coronavirus disease 2019 (COVID-19) pandemic, governments around the world adopted a variety of policies, including but not limited to state-imposed stay-at-home orders, the shuttering of nonessential businesses (as determined by government officials), and lockdowns of varying degrees. New state powers require new forms of enforcement, and many governments have adopted police-state powers to enforce these orders (Coyne and Yatsyshina 2020). These powers include direct and indirect surveillance, fines, exclusion from government services as punishment, and the use of physical force against violators (see, for instance, Amnesty International 2020; Habeeshian and McDade 2020; Kallingal 2020; Neil 2020; Pasley 2020; Speri 2020; Tuccille 2020). In some instances, such as in Poland and Russia, political officials have used the pandemic as justification to institutionalize expanded state powers by changing rules about elections, placing allies in key judicial positions, and silencing critical media coverage (see Figlerowicz 2020; Nadeau 2020).

As the COVID-19 experience makes clear, policy responses to public-health crises can have real effects on the scope of government power. Some of these effects are immediate and observable. Others, however, are not readily observable and appear only over time. The purpose of this paper is to explore these long-run consequences, with specific focus on how institutional changes can persist after a public-health crisis ends. Our central argument is that state expansion during a pandemic can alter the constraints

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faced by future political decision makers, causing increases in state power. These changes can undermine the liberties of future persons and disrupt bottom-up, nonstate processes of social coordination.

To develop our argument, we draw on both theory and history. The economic historian Robert Higgs (1987, 2004, 2007) has extensively studied crises and the growth of government. He argues that during a crisis government power increases in both scale (i.e., size) and scope (i.e., the range of activities undertaken). Although some of these expansions are rolled back once the crisis subsides, some persist. New agencies, interest groups, legal precedents, and changes in ideology regarding the state–citizen relationship contribute to a postcrisis growth path that involves larger government, in both scale and scope, compared to what would have occurred absent the crisis. We extend this framework to the issue of pandemics and infectious-disease outbreaks to understand how public-health crises can lead to increases in state power.

Our analysis also contributes to two other literatures. The first is the literature on the trade-off between individual freedom and public health as it relates to infectious disease (Troesken 2015). The logic underlying this trade-off is that individuals and local governments are unable to sufficiently deal with infection externalities, whereas the central government is better able to internalize these externalities through policies such as quarantines and compulsory vaccinations. These policies increase public health by reducing individual rights and freedoms. We contribute to this literature by clarifying the costs associated with the trade-off between public health and liberty. Our analysis demonstrates that the costs to freedom, which are often long, variable, and unanticipated, will tend to be understated, sometimes severely.

The second is the literature in economic epidemiology on the optimal control of infectious diseases (see Weimer 1987; Gersovitz 1999, 2011; Goldman and Lightwood 2002; Francis 2004; Gersovitz and Hammer 2003, 2004, 2005; Barrett and Hoel 2005; Rowthorn, Laxminarayan, and Gilligan 2009). This literature typically models the state as a benevolent social planner with access to a social welfare function. Given these assumptions, the analyst is able to determine the optimal government responses to infectious disease. According to this approach, concerns about the perverse consequences of permanent expansions in government power are a nonissue because a benevolent and omniscient public-health planner adopts *only* those policies that maximize social welfare (see Coyne, Duncan, and Hall 2020). We contribute to this literature by offering a more complete understanding of policy making and how decisions by social health planners in responses to infectious-disease outbreaks can have long-lasting and potentially perverse consequences.

We proceed as follows. In the first section, we offer a theoretical framework for understanding how crises contribute to the growth of government. We also explore some short-run and long-run consequences associated with this type of crisis-induced government growth. The second section applies this framework to three historical cases of infectious-disease outbreaks to illustrate the dynamics of government growth: (1) the bubonic plague in Cape Town, South Africa, in 1901 and its influence on apartheid; (2)

the emergence of modern zoning and urban planning in the United States in response to the cholera, typhoid, smallpox, and tuberculosis epidemics; and (3) compulsory vaccination in response to the smallpox epidemic of 1902. The third section concludes with the implications of our argument.

Crises and the Growth of Government

Crises, whether real or perceived, provoke members of the public to call for a response. During crises, people fear for their lives and their livelihoods, and they understandably want people they view as having expertise to "do something" to address the crisis. The specific source of this response can vary and may include private-collective responses or government initiatives or some mix of the two. Higgs (1987, 2008) emphasizes that in the face of a crisis, ideology—beliefs about social relations and all involved in those relations—shapes the solutions people seek and support.

Higgs (1987) provides examples prior to the Progressive Era, when widespread beliefs about the limits of federal power prevented the federal government from creating new programs in response to crises. The beliefs and norms of both officials and members of the public placed constraints on federal actions, which held even during perceived crises. In other words, before the Progressive Era prevailing ideologies placed limits on the governmental responses that citizens and officials advocated during crises.

Robert Conquest makes a similar point about robust democracy, noting that a "democratic community enjoying political liberty is only possible when the attachment of the majority of the citizens to political liberty is stronger than the attachment to specific political doctrines" (2001, 30–31). As Conquest notes, liberty requires the virtue of apathy toward elaborate policies intended to achieve grand societal outcomes. Where such apathy exists, democracies tend to protect constitutionally enumerated rights because no group is empowered to "reconstruct the social and political order by sacrificing the minority" (30). Conquest explains, however, that crises draw the attention of the general populace to the political instrument, making them less apathetic and more prone to bouts of extremism that can result in marked change of the governing order, which often takes the form—in the twentieth century at least—of a loss or erosion of individual rights, especially for political minorities.

Ideologies are not static. Prevailing beliefs change over time. During the Progressive Era, many people became convinced that the federal government ought to manage a wide range of social and economic issues under the guise of "scientific management" (Taylor 1911). They believed that government must take proactive steps to avoid crises and that federal officials must take bold steps to address the emergency when crisis did occur. The theory of scientific management by experts using public officials as their proxy instruments culminated in the economically interventionist policies during the Great Depression and the influence of Franklin Delano Roosevelt's "Brain Trust" in making those policies, many of which were fashioned on the apparent economic success stories of nouveau fascism in interwar Europe (White 2012, 99–125).

Comparably expansive views on the role of the federal government and the necessary influence of experts in governance, both domestic and international, persist today (see Easterly 2014; Levy and Peart 2016; Koppl 2018). The result is that public officials, incentivized by people's beliefs regarding the appropriate and acceptable role of the state and its experts, are more willing to enact interventionist policies to address crises, which sets the stage for both short-term and long-term increases in the overall size of government.

Interventionist policies can cause two forms of government growth. They can increase the *scale,* or size, of government—essentially the amount of resources used for governmental activity. The scale of government is typically measured by government spending as a percentage of gross domestic product or by how many bureaucrats a government agency hires. By contrast, the *scope* of government refers to the range of powers government officials possess. If a police force retains the same budget and labor force but acquires new powers to surveil citizens, then the *scope* of its power has increased even though the *scale* of its budget remains the same. Scale and scope can be correlated but need not be. Government budgets may remain flat, while the range of state activities undertaken with that budget may change and expand.

As government grows on the scale–scope margins, multiple changes can occur. First, the ideology of members of society—citizens, elected officials, and nonelected bureaucrats—can change regarding the expectations of acceptable government activity. Before officials initiate a new policy during a crisis situation, that intervention might seem radical or invasive. After the crisis erupts, however, the intervention becomes normalized. People now might view it as necessary and see it as the only way to solve the problem it seeks to address. This shift in ideology makes it less likely that the intervention will be fully rolled back after the crisis subsides. It also reinforces interventionist premises, which makes new interventions more likely during future crises.

Similarly, a new intervention can alter legal precedents regarding the scope of governmental activity. If an intervention is contested in court, a judge may uphold the constitutionality of that intervention, which creates precedent that will then shape future legal decisions about the scope of government. Since precedents often relate to abstract constitutional rules rather than just to narrow policy issues, an intervention meant to address one crisis may have long-run consequences for seemingly unrelated policy issues.

Expansions in government also create vested interests that work to preserve or maintain the benefits associated with expanded state activities. For example, if a new bureaucracy or a new group within an existing agency is created to combat a specific health issue, its employees will have incentives to maintain and increase their agency's budget: they want to keep their jobs and to obtain additional resources and discretionary power. This means that even if the new bureaucracy was originally intended to address a temporary public-health crisis, its employees will engage in rent-seeking behavior to maintain and expand the bureaucracy even after the crisis subsides.

Together, these factors interact such that interventions introduced during a crisis will often not be fully rolled back after the crisis. Some aspects of the intervention will recede. Stimulus spending may be discontinued after a recession, as might conscription after a war ends. However, although the overall size of government will often decline after a crisis ends, it tends not to return to its precrisis growth path. Instead, for the reasons discussed earlier, the interventions pursued during a crisis create long-term institutional changes that leave government permanently larger than it would have been absent the crisis (Higgs 1987).

Experts in economics, political science, and international relations are currently voicing concerns about how policy measures enacted during the COVID pandemic may lead to bigger governments and more surveillance (see, e.g., Walt et al. 2020). They expect an increase in location tracking and health checks during travel, permanent intervention into the workplace, the establishment of social network surveillance to manage future pandemics, further intervention into supply-chain management in the form of tariffs and export bans (particularly in medical supplies), subsidies to close overseas plants and to open plants on national soil (as is already being seen in Japan [Reynolds and Urabe 2020]), large welfare states characterized by socialized medicine and wealth redistribution, a larger role for centralized technocratic rule, new and more direct power by financial regulators and centralization of agency power, nationalistic localism of production and the disintegration of global trade, a permanent degradation of the democratic process by virtue of COVID-era executive orders, and the end of digital medical privacy. Although it remains to be seen if and how these changes will manifest, what is clear is that the institutional fabric of domestic and international life will change in response to government policies adopted during the COVID-19 pandemic.

In the following case studies, we show that government growth in the wake of infectious diseases is not just a possibility but a historical reality. In the past, responses to infectious diseases contributed to institutionalizing racial apartheid, implementing residential segregation through zoning, and eroding civil rights and bodily autonomy through compulsory-vaccination jurisprudence.

Historical Cases

The Sanitation Syndrome: The Cape Town Plague of 1901 and Apartheid

"Sanitation syndrome" is an erroneous sociopolitical and scientific belief that conflates minority racial and ethnic characteristics and communities with disease risk, in particular infectious diseases that spread to the wider community (Swanson 1977). In Léopoldville, the capital of the Belgian colony now known as the Democratic Republic of the Congo, for example, a *cordon sanitaire* of uninhabited ground was enforced within the city in the early 1960s to "prevent the spread of African disease into the white

residential areas" (La Fontaine 1970, 19). Maynard Swanson (1977) describes a great many examples of sanitation syndrome entangling racism with fear of epidemic throughout the nineteenth and twentieth centuries, but the sanitation syndrome is perhaps best exemplified by the Cape Town plague of 1901, which laid the foundation for apartheid in South Africa.

The bubonic plague, likely imported with Argentinian fodder for the British troops' horses, reached Cape Town in 1901 during the Second Boer war. British officers were quick to place blame on the "slums" populated mainly by "Kafirs," the derogatory name used by the British to refer to black South Africans. Cape Town's medical officer of health Dr. John Gregory was already biased against the African residential areas, calling them "scattered nests of filth" (qtd. in Swanson 1977, 392). As Swanson notes, "[T]he plague itself did not create anxieties full-blown, but it focused them sensationally" (1977, 393). Not only were African residential areas the focus of sanitary measures regardless of the parity of infections between white and nonwhite South Africans, but Africans were soon the subject of mass removal to a residential location outside the Cape Town urban and suburban limits by virtue of the Public Health Act (which was originally inspired by an epidemic of smallpox in 1882–83). Between six and seven thousand Africans were removed forcibly from their homes to live in horrible conditions at a sewage farm called Uitvlugt (Swanson 1977, 393).

Soon after the removal, Dr. Gregory and many other colonial officials became proponents of maintaining the segregation. The main arguments for the legislation enacting compulsory race-based segregation mention, in some form or another, the theory that Africans spread or incubated infectious disease. Thus, the Higgsian hypothesis of ideology (racism) interacting with an event (the plague) given a particular institutional context (wartime colonialism) led distinctly to a socially destructive apartheid whose negative consequences are still felt by South African citizens today.

Infectious Disease as the Impetus for Zoning and Urban Planning

"In many respects, sanitary engineers were the first urban planners in America," note Wendy Perdue, Lesley Stone, and Lawrence Gostin (2003, 1390). In contrast to modern urban planners' call for an increase in walkable neighborhoods in cities today to improve the healthfulness of inhabitants (Schilling and Linton 2005), including with reference to improving COVID pandemic outcomes (Loh, Love, and Vey 2020), experts of the Progressive Era were arguing *against* dense and walkable urban neighborhoods. The path from public-nuisance jurisprudence laid down in English common law to modern unwalkable and segregationist zoning plows straight through the sanitation and hygiene concerns of densifying cities during the Industrial Revolution and Progressive Era. Modern zoning would not have come to pass without the cholera, typhoid, smallpox, and tuberculosis epidemics, which were used as Progressive Era justifications for zoning and urban planning, and such reasoning behind zoning

continues to be held even though the science of "miasma" behind Progressive urban planning has been long since disproved.

Modern city zoning and urban planning has its roots in the sanitary engineers of the Progressive Era, who effectively moved residential areas out and away from businesses and created the modern "unwalkable" American city. The "City Beautiful" movement during the Industrial Revolution exemplifies the sanitation syndrome in city planning as sanitation concerns rooted in epidemic spread were used to justify prevailing Progressive beliefs that immigrant and poor populations in high-density and cheaper housing were incubators and spreaders of infectious disease (Nolan 1916; Scott 1971). The science of the era largely stressed the miasma theory that "bad air" from particles of decomposing matter was to blame for epidemics, a belief echoed by architects and doctors alike (Fogelson 2001).

Jacob Riis's sensational book *How the Other Half Lives,* originally published in 1890, blamed the lack of light and fresh air in the cheap and dense housing occupied by immigrants in New York City in the late nineteenth century for epidemics of cholera, smallpox, and tuberculosis and noted that the "dread of advancing cholera" correlated with dark and stagnant tenements was the primary justification for the Tenement House Act of 1867 (Riis [1890] 2011, 69). Although there is a correlation between relative lack of light and air, on the one hand, and infectious diseases spreading through dense tenements, on the other, the association is not plausibly causative, as advancements in the study of infectious diseases later showed. The much more likely cause of infectious-disease spread in dense housing of the era was the tendency to place outhouses next to water cisterns in the tiny tenement backyards. Further legal measures based in sanitation theory culminated in New York City's Tenement House Act of 1901, focused largely on de-densification through "setbacks," or the requirements that all rooms have windows, that lot size be increased and the building-to-lot ratio significantly decreased, and that each apartment have its own toilet facilities. "Old-law" tenements refitted to comply with the new law saw monthly rents rise from about $9.50–13 ($291.50–400 in 2020 dollars) prior to the act to $10–15 ($304–460 in 2020 dollars) after the act was passed (Hopkinson 2003, 29).

Zoning was a logical step in the progression of Progressive de-densification justified by infectious-disease spread, with the primary effects of making private-market urban housing less affordable to the poor and segregating residential areas based on race and ethnicity. The U.S. Supreme Court case *Ambler Realty Co. v. Village of Euclid* (272 U.S. 365 [1926]) is the benchmark zoning case that allowed the zoning of private property on the bases of health and public-welfare grounds, despite a lower court observing that the practical aims of Euclid's zoning were clearly to enforce racial segregation (Rothstein 2017, 52–53). These beliefs persisted through the Great Society era—the creation of San Francisco housing projects in the 1960s was partially justified as improving urban sanitation (Shah 2001).

Although the racial and epidemiological beliefs that motivated early zoning statutes eventually ended, zoning laws did not. Zoning laws have instead become even

more restrictive. From 1950 to 1970, housing prices and construction costs grew at around the same rate. However, after 1970 housing prices skyrocketed, especially in large coastal cities, while construction costs declined in real terms. This divergence is largely a result of regulatory barriers to housing construction. One reason for this increasing restrictiveness is that homeowners have become more effective at influencing government, which is consistent with an interest-group explanation (Glaeser, Gyourko, and Saks 2005; Lindsey and Teles 2017). Restrictive zoning laws have benefitted homeowners by increasing the market values of their homes, but these laws have significant costs. In particular, they reduce access to affordable housing (Glaeser and Gyourko 2003), which has further adverse consequences. People are often more productive when they congregate together in cities, but zoning laws make moving to highly productive cities unaffordable for many, thus adversely affecting economic growth while restricting mobility, which contributes to substantial income inequality between regions (Lindsey and Teles 2017). Some zoning regulations may have emerged absent infection disease, but many of the laws that exist today find their origins in responses to public-health crises and are shaped by the dominant ideologies at the time they were passed. Consistent with our theoretical framework, these laws have outlived their initial justifications due to the influence of interest groups, such as homeowners, and to the normalization of zoning laws as a part of life.

Compulsory Vaccination and the Power of Precedent

In the midst of a smallpox epidemic in 1902, the Board of Health in Cambridge, Massachusetts, ordered "all inhabitants who had not been vaccinated within the past five years to submit to the procedure at once or incur a $5 fine, provided for by the Massachusetts compulsory vaccination law" (Willrich 2011, 285). At the time, "the average weekly wage of an American factory worker was about $13," so that $5 fine was significant (Willrich 2011, 285).

Pastor Henning Jacobson, a forty-five-year-old Swedish immigrant who lived in Cambridge, "had not been vaccinated since childhood." Dr. E. Edwin Spencer, the chairman of the Board of Health, offered to vaccinate Pastor Jacobson without charging him for the vaccination. Jacobson refused this offer. As a result, Jacobson "was later summoned to court, tried, and found guilty of 'the crime of refusing vaccination.'" He then refused to pay the fine, instead choosing to appeal the ruling (Willrich 2011, 285, 286).

Jacobson was concerned about adverse side effects from the vaccination. As a child in Sweden, he had been vaccinated and experienced "great and extreme suffering" that he attributed to the vaccine. One of his children also "suffered adverse effects from a childhood vaccination, convincing the minister that some hereditary condition in his family made vaccine a particular hazard for them" (Willrich 2011, 287 [quoting Jacobson], 288).

Alongside several other vaccine resisters, Jacobson was tried in the Third District Court of Eastern Middlesex County. He spoke in his own defense in the courtroom. He and his codefendants were found guilty and ordered to pay the $5 fine. Jacobson appealed the ruling. He was represented by James Winthrop Pickering of the Massachusetts Anti–Compulsory Vaccination Society. By the winter of 1903, the smallpox epidemic in Cambridge had concluded, but the appellate legal battles had not. Pickering and his co-counsel Henry Ballard prepared briefs to oppose compulsory vaccination before the Massachusetts Supreme Judicial Court. Although the epidemic was over, the case concerned broader constitutional questions. Assistant District Attorney Hugh Bancroft, who represented the Commonwealth of Massachusetts, argued that "[t]he legislature has an extensive undefined power, usually called the police power, to pass laws for the common good" (qtd. in Willrich 2011, 299). The ideology of progressivism, which was growing in strength, supported an expansive view of the police power grounded in clear legal precedents.

The Supreme Judicial Court ruled unanimously in favor of the Commonwealth of Massachusetts. In the decision, Chief Justice Marcus P. Knowlton wrote that "[t]he rights of the individual must yield, if necessary, when the welfare of the whole community is at stake" (qtd. in Willrich 2011, 320). After his loss, "Jacobson appeared for sentencing in the Middlesex County Superior Court." He was fined $5, after which his new attorney, George Fred Williams, "filed a petition for a writ of error to the U.S. Supreme Court." The Supreme Court took the case. It had no other option because "Congress did not give the Court power to pick and choose its own constitutional cases until 1925" (Willrich 2011, 322).

Before the Supreme Court, Williams presented arguments based on the Fourteenth Amendment: "[B]y entrusting local boards with arbitrary powers to inoculate a healthy individual with disease—without making any exception for adults with special health conditions—the Massachusetts legislature had deprived Jacobson of his liberty without due process of law" (Willrich 2011, 324). Moreover, he argued that the law violated the Equal Protection Clause because it offered health exceptions only for children.

In a seven-to-two opinion, the Supreme Court ruled in *Jacobson v. Massachusetts* (197 U.S. 11 [1905]) that compulsory vaccination did not violate the Fourteenth Amendment. As Associate Justice John Marshall Harlan wrote in the majority opinion, "Upon the principle of self-defense, of paramount necessity, a community has a right to protect itself against an epidemic of disease which threatens the safety of its members" (qtd. in Willrich 2011, 328). Harlan rejected the Fourteenth Amendment arguments against compulsory vaccination and compared epidemics to times of war. Although he argued that officials had the power to mandate vaccination, Harlan treated this power as contingent on the crisis. He also established that if a compulsory vaccination would harm the health or life of an individual, then judges could "interfere and protect the health and life of the individual concerned." However, despite this openness to medical

exemptions, Harlan argued that Jacobson did not qualify for such an exemption because he was "in perfect health and a fit subject for vaccination" (qtd. in Willrich 2011, 329).

On its face, the decision appeared simply to authorize compulsory vaccination and even to place some limits on that power. Had the decision only narrowly affected compulsory vaccination, perhaps few people would take issue given the positive-externality aspects of vaccination against disease.[1] However, *Jacobson v. Massachusetts* set a precedent that affected the scope of state power far removed from questions of vaccination against infectious disease.

Throughout the Progressive Era, government officials and experts alike promoted eugenics and advocated extreme abuses of civil liberties such as compulsory sterilization to achieve eugenic objectives (see Leonard 2016; Koppl 2018). *Jacobson v. Massachusetts* was used as precedent to uphold compulsory sterilization. In 1927, Justice Oliver Wendell Holmes Jr. wrote the majority opinion in *Buck v. Bell* (274 U.S. 200), ruling that officials from the state of Virginia could forcibly sterilize Carrie Buck on the grounds that she was "feeble-minded." Holmes wrote in his majority opinion, "The principle that sustains compulsory vaccination is broad enough to cover cutting the Fallopian tubes" (qtd. in Willrich 2011, 334). He cited *Jacobson v. Massachusetts* to support his ruling. Indeed, *Jacobson v. Massachusetts* was the *only* case law that he cited (Willrich 2011, 334). More than two decades after the smallpox epidemic ended, a legal response to that crisis justifying expanded state powers was used as precedent to uphold eugenic sterilization. This case illustrates how expansions in the scope of government to address one crisis situation can lead to unanticipated and unknowable expansions in state power in the future.

Jacobson v. Massachusetts has been cited in numerous other Supreme Court cases to justify expansive government powers. In addition to its use to uphold forced sterilization, the case has been presented "to support the claim that warrantless entry by law enforcement officials may be legal when there is a compelling need and little time, and, in a recent dissent, to defend the federal government's right during the twenty-first century war against terror to detain a U.S. citizen as an 'enemy combatant' without due process" (Willrich 2011, 335). When a policy expands the scope of government to address an immediate emergency, it creates institutional precedent that can have subsequent wide-reaching consequences for civil liberties, especially when the policy is evaluated and upheld by the Supreme Court.

Conclusion

The costs of government responses to health crises will initially be understated because the long-term effects are long and variable and will become evident only in the future.

1. For instance, Jason Brennan discusses a range of arguments for compulsory vaccination, including arguments built on duties to serve the common good, consequentialist arguments based on cost–benefit analysis, and a libertarian argument that "antivaxxers are wrongfully imposing undue harm upon others" (2018, 37).

Expansions in government power are reversible but are often sticky due to corresponding changes in people's ideology regarding the appropriate role of the state in relation to the citizenry and to political economy factors such as vested interests and legal precedents regarding acceptable behaviors by the state (Higgs 1987). Moreover, expansions in state power associated with responses to infectious disease can expand into other areas of life and persist for decades after the public-health crisis ends.

These realities offer reason for prudence and caution during public-health crises, where there are often calls for government to act quickly and decisively. Both infectious disease and the various institutions that constitute human society are complex systems. Given limited human reason, interventions will necessarily be simple relative to the complexity of the systems being intervened upon. This discrepancy will result in a range of unknowable and possibly negative "system effects" (Jervis 1977), which can be both immediate and long term.

This matters for the way social scientists approach issues of economic epidemiology. The orthodox model of optimal disease control assumes the existence of a benevolent social planner with access to a given social welfare function. From this perspective, health planners adopt only those policies that (they think) maximize social welfare (Coyne, Duncan, and Hall 2020). But as our analysis makes clear, there is no way for health planners in the present period to know or anticipate the full consequences of their policies. Policies can have a range of short-term and long-term effects that harm human welfare.

Infectious disease poses a unique threat to a free society. On the one hand, infectious diseases are characterized by "infection externalities" whereby individuals do not internalize the full costs of their behaviors. Many believe that the state is necessary to internalize these externalities. Empowering the government to do this, however, creates space for expansions in state power that can generate undesirable outcomes. The maintenance of a free society requires simultaneously appreciating that collective-action solutions are necessary in dealing with infectious diseases and that the concentration of political power to provide these solutions creates a threat to individual liberty and freedom.

To begin to resolve the tension between these two realities, one might start with the work of Elinor Ostrom (1990), who demonstrated that private people are often able to resolve collective-action problems despite the predictions of theory to the contrary. Moreover, recent research in public administration emphasizes the importance of polycentric systems for addressing the diverse and heterogenous nature of collective-action problems (Boettke 2018; Aligica, Boettke, and Tarko 2019). This certainly applies to infectious disease, where the nature of the infection externality and the related collective-action challenges vary not only across societies but within societies (see Coyne, Duncan, and Hall 2020). Given the potential costs of choosing top-down government solutions to the spread of infectious disease, these alternative institutional arrangements that emphasize bottom-up diverse solutions may be preferable both for dealing with public-health issues and for maintaining a free society.

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