Disease Mix and How Economic Freedom Matters for Health Outcomes

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Disease Mix and how Economic Freedom Matters for Health Outcomes

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Abstract: We investigate the institutional foundations of public health. We argue that a key distinction in analysis of disease is between diseases of commerce (diseases associated with movement of people and with affluence) and diseases of poverty (primarily noncommunicable diseases that depend on wealth and income). We show that the mix of disease – the ratio of communicable diseases and those associated with longevity to diseases of poverty – increases in economically free countries. We argue that increasing burdens of diseases of commerce reflects the quality of institutions, as those diseases are better than living shorter, brutish lives where diseases of poverty claim many lives. This analysis also highlights an institutional trade-off: economically free institutions reduce certain types of disease while contributing to others.

Keywords: Public health, economic freedom, pandemics, communicable disease, noncommunicable disease

JEL Codes: I10, I15, I18.

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1 Introduction

What is the relationship between economic freedom (i.e., secure property rights, limited regulation, sound money, free trade, etc.) and public health? This question is fundamental as economic freedom is a key characteristic of most liberal democracies. If economic freedom is tied negatively to public health, then there is a critique of liberal democracy to be made from a public health perspective.

In this paper, we argue that answering this question depends on the types of disease. We emphasize that the key divide is between diseases of commerce and diseases of poverty and argue that economic freedom reduces diseases of poverty but increases or has an ambiguous effect on diseases of commerce. We use diseases of commerce to refer to those diseases associated with movement of people and with affluence. Diseases of poverty, in contrast, refers primarily to noncommunicable diseases that depend on wealth and income. This former type of diseases can increase with economic freedom. Freedom to trade, for example, allows some of these diseases to spread faster. This can be thought to include all pandemic- and epidemic-prone diseases (e.g., COVID-19, measles, SARS, plague) which spread through interactions between people. Hence the "commerce" part of the label. In contrast, by raising incomes, freedom to trade reduces diseases of poverty (e.g., malnutrition-related diseases). Hence the "poverty" part of the second label.

This categorization is helpful as it enables a richer institutional analysis of the disease burden. Does economic freedom in democratic societies (i.e., liberal democracies) limit effective government responses to epidemics and pandemics? We argue that, yes, it does. Liberal democracies are limited in their abilities to deploy public health measures that combat infectious diseases. Are liberal democracies better at improving health outcomes? We also argue that, yes, they are. How can the answers to both questions be positive? The answer is that the institutions that underlie economic freedom affect the mix of diseases in favor of more infectious diseases while also reducing the overall mortality level.

It is the effect of economic freedom on the mix of diseases that we test. Diseases of poverty —which speak largely to diseases of malnutrition, high physical stress, poor medical care, exposure to pollutants etc. – are highly sensitive to income levels. The general consensus that economic freedom is tied with higher incomes and faster income growth (Hall and Lawson 2014; Alvarez et al.

2023) suggests that economically free societies would have lower death rates from these diseases (i.e. via income growth). Diseases of commerce spread regardless of income level (i.e., rich and poor are, all else constant, equally likely to be infected). The moniker "commerce" in the label speaks to the idea that they spread through exchange between individuals. States that can control exchanges can more easily control the spread of diseases of commerce. However, controlling diseases of commerce and reducing their prevalence require strong states that can regulate exchanges. The problem is that states that can easily control economic activity to reduce the prevalence of diseases of commerce can also control economic activity for less noble reasons. The result of that double-edge sword is that these states are less likely to permit rapid economic growth such that diseases of poverty will be more prevalent.

This speaks to the idea of why liberal democracies are limited in their abilities to deal with diseases of commerce. Due process of law, doctrines regarding legislative takings, checks and balances, doctrines regarding delegation of powers, legislative procedures regarding the powers of regulatory agencies, etc. all limit the state's ability to intervene against outbreaks of infectious diseases. However, these same barriers to government intervention are growth-enhancing such that diseases of poverty are more effectively combatted. In other words, there is a choice: either one enjoys fast economic growth under liberal democracy (and thus lower rates of deaths from diseases of poverty) or one enjoys lower prevalence levels of diseases of commerce under less liberal regimes. This is a bleak trade-off that has been noted and debated in the public health and economics literature (Arthi and Parman 2021; Chapelle 2020; Geloso et al. 2022; Candela and Geloso 2021; Geloso and Bologna Pavlik 2021; Koyama 2021; Barro 2022; Correia et al. 2022).

There is, however, a possible twist as diseases of commerce and diseases of poverty are interrelated through comorbidities. If diseases of poverty positively affect diseases of commerce, then reductions in the former reduce the latter as well by a small degree. Regimes that promote economic growth, notably by securing high and stable levels of economic freedom, generate reductions in diseases of poverty that will reduce diseases of commerce in smaller proportions. This means that the mix of diseases will be tilted towards a greater share of deaths stemming from diseases of commerce in liberal democracies. However, the level of deaths of commerce will be lower than in illiberal regimes due to this comorbidity channel (if it is strong enough).

This yields several testable implications that constitutes the empirical component of the present paper. First, economically free societies (one of the components of liberal democracy) will have a ratio of diseases of commerce to diseases of poverty that is higher than economically unfree societies. Second, economically free societies should have lower levels of mortality from diseases of poverty but there should be smaller or zero differences with regards to diseases of commerce. Using the Global Burden of Disease (GBD) Survey that covers the period from 1950 to today in conjunction with the economic freedom of the world (EFW) survey produced by the Fraser Institute, we formally test this hypothesis. Our results align with our theoretical exposition. In terms of the diseases of commerce/diseases of poverty, economic freedom reduces diseases of poverty and either increases or has no effect on diseases of commerce.

Why, and how much, does this hypothesis matter? It matters because it shows that economic freedom and liberal democracies may appear hindered in dealing with epidemics and pandemics even though they are not. Their strength and capabilities are in creating resilience in the long run. Simply put, they may appear to be less effective in combating diseases of commerce in the short-run but that is because they are geared to produce much superior long-run outcomes. The degree to which this matters is immense because it shows that, during the pandemic, governments may have been too willing to sacrifice long-run benefits for immediate gains.

2 Institutional Bundles and Diseases

2.1 *Conceptualizing the Relationship Between Institutions and Diseases*

Infectious diseases have long been used in economics to illustrate policies dealing with the management of externalities. Investments by a single person in combating a nutritional disease (e.g., obesity) generate returns that are largely captured by that person. There are little externalities in such a case. However, combating some diseases tends to come with externalities. For example, swamp draining and the use of larvicides to combat malaria by a single person on his property generates benefits for others. This causes incentives to free ride on another person's investment and the societal under-provision of these services (Buchanan 1968).

This view is standard and has been used to provide a positive theory supporting state intervention. It is why numerous health organizations consider the combatting of infectious disease as a form of public good (e.g., Smith 2003; de Vries et al. 2021). However, this is somewhat premature and short-sighted because it does not consider the trade-offs associated with governments taking over a more active role in combatting diseases that have clear externalities (both through contagion and/or remedial solutions).

The ability of the state to provide a given activity entails giving its agents certain powers. These powers can, in turn, be used for other purposes that could – on net – delay progress in combatting other types of diseases regardless of whether they come with externalities or not. Take the case of epidemic and pandemic-prone diseases. The policy tools that government must deploy to act in their quashing go from disease surveillance, people tracking, quarantines, lockdowns, mandates, business closures, etc. These tools might be effective in quashing a given disease (we do not dispute their efficacy in this paper nor do we see a reason to). However, they offer tools to governments to do other – less enlightened – actions. For example, disease surveillance requires the use of mass data (e.g., biometric and geolocalization to do contact tracing). These data can be used to quash political opposition, enforce stricter policing and be used well after an epidemic ended thus outliving its initial purpose (see Coyne et al. 2021). This is why Freedom House published a report during the early days of the COVID-19 outbreak to warn against the potential use of data for political surveillance under the guise of public health (Shahbaz and Funk 2020). While this is not a fatality (i.e., governments may return emergency powers or refuse to use them for other purposes)[†], it is a possibility whose costs in terms of health outcomes should be considered. If there are costs, this means that there are trade-offs.

If governments have strong powers to fight contagious diseases, the same powers can be used to limit business activity, protect legislated monopolies, expand state intervention in the economy, regulate businesses, raise taxes, erect barriers to entry for new competitors, erect trade tariffs, seize property etc. All of these actions reduce "economic freedom" (i.e., the aggregate measure of business freedom, property right security, openness to trade, tax levels and sound money) which is itself intimately associated to economic growth (De Haan and Sturm 2000; Hall and Lawson 2014; Grier and Grier 2021; Alvarez et al. 2023). Reductions in economic freedom would thus lead to *lower* income levels. This is the potential trade-off highlighted by Troesken (2015) and Geloso et al. (2022)[‡] who used the case of smallpox in the 19th century to point out that the constitutional limitations that made America economically free and richer than the rest of the world

† The empirical literature is divided on this possibility of a "ratchet" effect – see Higgs (1987), O'Reilly and Powell (2015), Young and Bologna (2016), Bjørnskov and Rode (2019)

‡ Although Furton (2022) has expressed doubt over the validity of this trade-off in the specific case of smallpox.

were the same limitations that made it harder for government to combat smallpox (and thus have higher rates of mortality and prevalence from that disease than other countries).

However, this trade-off has important ramifications – the object of this article —that are not well understood. To understand these ramifications, it is necessary to divide diseases into three categories; diseases of poverty, diseases of commerce, diseases of affluence. All three must be understood as how they speak to the elasticity of prevalence/mortality to changes in income levels. For the time being, assume that all three types of diseases have independent causes (i.e., no relations between them) and that there are no diseases that overlap across categories. Moreover, for our purposes, the bulk of our attention is dedicated to the first two types of diseases whereas the third constitutes a necessary adjustment to properly test for the mechanisms we outline in this paper. Diseases of affluence will be discussed in more details in section 2.2 below.

Diseases of poverty are the most sensitive to income levels. This can be thought to include malnutrition-related diseases and deaths. Institutions that promote faster economic growth will thus enjoy stronger declines in these sources of mortality (Goklany 2017; Naanwaab 2018; Sharma 2020). In contrast, diseases of commerce are far less sensitive to income-levels. More importantly, diseases of commerce are made more deadly through economic interaction as they can circulate more easily (hence the moniker we assign to them). Pandemics and epidemics fit the bill: the black death fits an example of a disease that discriminated little between rich and poor (i.e., higher incomes would have negligible effects on its incidence) (Curtis and Roosen 2017) and that trade and pilgrimages explained the contagion pattern of the disease (Bossak and Welford 2009; 2010; Jedwab et al. 2022). However, other diseases such as smallpox could also fit the same bill. Some evidence has surged that economic freedom had either no effects on COVID-19 spread (conditional on some factors) (Huang et al. 2022) or had negative effects (Dempere 2021; Viscusci 2021). There is also evidence that democratic societies fared worse during the COVID-19 pandemic (Karabalut et al. 2021).

These two types of disease will react differently to different types of institutional settings. When property rights are secured and numerous constraints are placed on governments to restrict their abilities, economic growth is faster and so we can expect better outcomes with regards to diseases of poverty. However, when a disease of commerce breaks out, the inability of governments to restrain exchange entail higher mortality rates with respect to that disease. Troesken (2015) and Geloso et al. (2022) thus argue – to varying degrees – that the question becomes "which diseases matter most". Both used smallpox in the 19th century as a disease of commerce and typhoid fever in the same period as a disease of poverty.[§] Because typhoid fever took a far heavier toll than smallpox, they argued that the institutions that made America richer and more prone to smallpox also made it far less vulnerable to typhoid fever. The trade-off was thus higher income, higher death rates from smallpox and lower death rates from typhoid fever on the one hand or lower income, lower death rates from smallpox and higher death rates from typhoid fever on the other hand.

If there are no links between the two types of diseases, the trade-off is fully evaluated by comparing the effects of institutions on growth and the different types of diseases. However, there are potential links through comorbidities. Vulnerability to diseases of commerce can be tied to diseases of poverty. For example, vulnerability to smallpox is greater when one was in a situation of malnutrition (Duncan et al. 1993). Such a link would entail that economic growth can reduce diseases of commerce through its effect on the reduction of diseases of poverty. However, that reduction – by virtue of being indirect – is smaller than for diseases of poverty. An uneven reduction in death rates across all diseases can thus be expected. This would fit with (contested) evidence from some the recent COVID-19 pandemic that economically freer and richer countries had lower death rates (Levin et al. 2022).[**]

To properly visualize our argument, consider Figures 1 and 2. Figure 1 depicts – in a highly simplified format -- the causal mechanisms using a directed acyclical graph. Economic freedom is assumed to be inversely related to the state's coercive ability which is why $\beta_1 < 0$. Coercive abilities are, for their parts, inversely associated with diseases of commerce such that economic freedom's effects are $\beta_1\beta_4 < 0$. Economic freedom is also – as per the general consensus in the empirical literature – positively associated with development (ergo $\beta_2 > 0$). Economic freedom's effect on disease is indirect and materializes through economic development such that $\beta_2\beta_3 < 0$. Assuming independence between disease types means that economic freedom's net health outcomes are $\beta_2\beta_3 - \beta_1\beta_4$. Because both terms are expected to be < 0, we expect that a sum < 0 means that economic freedom is, on net, beneficial. If the sum is > 0, then economic freedom is, on net, detrimental. However, because of comorbidity, there is dependence (going from diseases of poverty

[§] Typhoid fever is contagious but higher-income levels make it possible to invest in expensive water treatment facilities – hence the labelling as "disease of poverty".

[**] We say "contested" because there are some articles showing the opposite (Dempere 2021) which implies that the comorbidity channel is too weak to offset.

to diseases of commerce) between the diseases. As such, the effect of economic freedom through development are, on net, $(\beta_2\beta_3 + \beta_5) - \beta_1\beta_4$. This graph simplifies and assumes that economic freedom has no direct effect on diseases even though there are reasons to believe that the ability to organize private property in some ways yields reductions directly (Carson 2016; 2020; Candela and Geloso 2021; Leeson and Thompson 2021; Paniagua and Rayamajhee 2022; Furton 2022). As we will see below, there is some evidence for a direct effect on diseases of poverty (but not diseases of commerce as we expected) – albeit a very small one.

From this visualization comes a clear prediction. If $\beta_2\beta_3 - \beta_1\beta_4 < 0$ but $|\beta_5| < |\beta_1\beta_4|$, then the reduction in mortality types will be uneven. This uneven reduction, depicted in Figure 2, is what we exploit here. Indeed, we expect rich and economically free societies to have a different *mix* of diseases relative to poor and economically unfree countries. In Figure 2, the high-economic freedom country has lower mortality rates than the low economic freedom country for both diseases but the difference is smaller for the diseases of commerce. As such, if the mechanisms we underlined above are correct, we can predict two things: a) all else being equal, economic freedom strongly reduces diseases of poverty but has either no effect (if $\beta_5 = 0$) or a small decreasing effect on diseases of commerce (if $\beta_5 > 0$); b) the ratio of diseases of commerce to diseases of poverty increases with economic freedom.

Figure 1: Stylized Depiction of the Relationship Between Diseases and Institutions

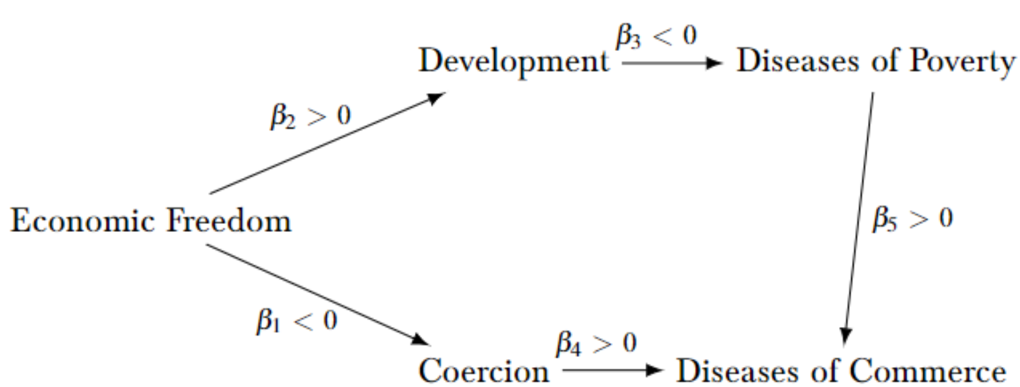
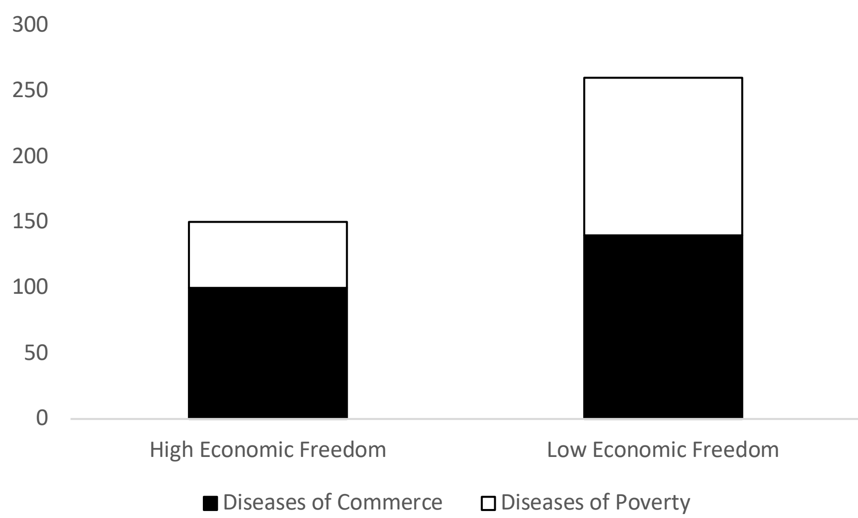


Figure 2: Stylized Depiction of the Disease Mix Expected Under Different Institutional Arrangements



2.2 *Organizing the Classification of Diseases for Testing the Effect of Institutions*

To test these predictions, we must generate an actual classification of diseases. It is best to start with the disease of commerce category. The main feature of a disease of commerce is that it must spread indiscriminately of income-level and has to increase with the frequency of human interaction (notably through trade). They must also be easily combatted by strong government interventions regardless of a country's income level. The World Health Organization's (WHO) list of pandemic and epidemic prone diseases are obvious candidates for these (see notes to table 1 below). All of these diseases can be combatted by coercive measures that can be employed by governments of rich and poor countries alike as testified during the recent COVID-19 pandemic when governments across the world used relatively similar policy tools. Henceforth, we will label those diseases as DOCP.

While there are some expansive definitions of diseases of poverty, most lists tend to include the same core diseases: AIDS-HIV, Malaria, Tuberculosis, parasitic diseases (e.g., tapeworm, schistosomiasis, guinea worm)[††], yellow fever, dengue, treatable childhood diseases (e.g., pneumonia, sepsis, pertussis, rotavirus) respiratory infections such as pneumonia, diarrhea, nutritional

†† The Center for Disease Control (CDC) provides a complete list of parasitic diseases here: https://www.cdc.gov/parasites/

deficiencies and perinatal and maternal conditions (see Dorlo et al. 2016). This is the list we will use for diseases of poverty which we will henceforth refer to as DOPP.

However, these definitions are going to be problematic for two reasons. First, we must relax the assumption mentioned in section 2.1 that a disease cannot be in both in categories. Frequently circulated lists of diseases of poverty include diseases that also fall within the category of pandemic and epidemic-prone diseases. For example, measles, poliomyelitis, yellow fever and HIV-AIDS could fit both categories. As such, we create two additional categories for testing our hypothesis above. First, we narrow the disease of poverty category to exclude the diseases that are in both DOPP and DOCP. This new category for diseases of poverty will be labelled DOP. We also create an additional category for diseases of commerce that are income-sensitive (by virtue of being also labelled diseases of poverty). We label those PDOC (for poverty-disease of commerce). This approach should allow us to capture the different effects of institutions on mortality types.

Secondly, there are definitely some elements of arbitrariness in our definitions above as should be expect from any attempt at creating boxes to sort diseases. As such, we will employ a less arbitrary definition by simply using the Global Burden of Disease Study (Roth et al. 2017) and its categories of "communicable" and "non-communicable" diseases. In a naïve way, we can make "communicable diseases" synonymous with "diseases of commerce" and "non-communicable disease" synonymous with "diseases of poverty." This generates what we will refer to as ANCD (all non-communicable disease) and ACD (all communicable disease). We say "naïve" because the ANCD definition assumes that the relationship *all* non-communicable diseases have with income remains negative (more income, fewer diseases). However, many non-communicable diseases should be expected to increase with income. This is the case for example with obesity-related diseases which are definitely a larger problem in richer countries (and also in freer countries – see Lawson et al. 2016 and Aydin 2019). This is also the case with cancers which are likely to increase with economic growth (by lengthening life expectancy at advanced ages). This is why we mentioned *three* categories of diseases in section 2.1 and said that the third one – diseases of affluence – would be discussed in the present section. If we assumed that all non-communicable disease are poverty diseases, we would be mixing diseases whose prevalence increases with income (within a certain income range)[♯] with diseases that decrease with income. As such, we construct a narrower definition of ANCD (which we call ANCDN) where easily-identifiable diseases of affluence (e.g. cancer, see notes to table 1) are excluded from the list.

Table 1 below shows the comparison of the average death rates world-wide of the different definitions (acronyms included) of diseases that we use to attempt to test our argument regarding the trade-offs associated with economic freedom and strong state capacity in the management of public health problems.

Table 1: Definitions (and rates) for diseases in this paper

Definitions	Death Rate in 2015 (per 1000)	Acronym in this paper
Diseases of Poverty (Definitions for this Paper)		
Diseases of poverty (Dorlo et al. 2016)	0.67	DOPP
Diseases of poverty narrow (This paper)	0.64	DOP
All non-communicable diseases	6.49	ANCD
All non-communicable diseases minus affluence diseases	1.14	ANCDN
Diseases of Commerce (Definitions for this Paper)		
Pandemic and epidemic-prone diseases (WHO 2022)	0.0437	DOCP
Income-sensitive diseases of commerce / Poverty diseases of commerce	0.0363	PDOC
All communicable diseases	0.49	ACD
Global Death Rates (all causes)	7.619	N/A

Note: **Diseases of poverty (Dorlo et al. 2016)** includes AIDS/HIV, Malaria, Tuberculosis, Parasitic Diseases, other tropical diseases including dengue and yellow fever, treatable childhood diseases, respiratory infections (e.g., pneumonia), diarrhoeal diseases, nutritional deficiencies, perinatal and maternal conditions; **Diseases of Poverty Narrow (This paper):** This list takes that of Dorlo et al. (2016) and excludes AIDS-HIV, dengue, yellow fever, poliomyelitis and measles; **All non-communicable diseases:** This list takes the ICD codes from the Global Burden of Diseases and their own classification of communicable and non-communicable as is. **All non-communicable diseases minus affluence:** As some diseases are diseases of affluence due to rising income, we excluded them from the total. These are cancers, coronary heart disease, cerebrovascular diseases, peripheral vascular disease, and diabetes. **Pandemic and epidemic-prone diseases** come from the World Health Organization (2022) and include AIDS/HIV, Anthrax, Avian Influenza, Chikungunya, Cholera, Coronavirus, Crimean-Congo Haemorrhagic fever, Dengue, Diptheria, Ebola, Hepatitis, Influenza, Measles, Meningitis, Middle East Respiratory syndrome coronavirus, plague, poliomyelitis, rift valley fever, SARS, typhoid fever, viral haemorrhagic fevers, yellow fever, zika virus; **Income-sensitive diseases of commerce**: The list of Dorlo et al. (2016) includes AIDS-HIV, dengue, yellow fever, poliomyelitis and measles that the WHO considers as pandemic and epidemic-prone diseases. As such, we assume that among the pandemic and epidemic-prone disease, these are the most sensitive to income changes. We thus separate them from the previous definition to test their effect separately; **All communicable diseases:** This list takes the ICD codes from the Global Burden of Diseases and their own classification of communicable and non-communicable as is.

3 Data and Methodology

Our approach is a panel approach with the following specification:

1) $D_{i,t} = \beta_o + \beta_1 EFW_{i,t} + \beta_2 X'_{i,t} + \beta_3 V_i + \beta_3 V_t + \epsilon_{i,t}$

[♯] We add this qualifier because we expect to observe that richer countries have more cancer deaths but that there must be a point where income will be high enough to start reducing cancer-deaths.

where we explain the death rates (or ratios of death rates) by cause (as defined in table 1) by the level of economic freedom conditional on other control variables that would speak to country-specification conditions. The coefficients β_3 and β_4 are included to capture state-fixed and year-fixed effects. The vector of variables in X are the covariates. This setup may appear simple at first glance but we are not trying to make a causal claim here. The mechanisms described in section 2 require only observational validity – namely whether economically free countries have a different mix of diseases than economically less free countries.

Our measurement of economic freedom comes from the Fraser Institute's *Economic Freedom of the World* (EFW) index (Gwartney et al. 2020). EFW measures a simple average of five components: 1) legal structure and security of property rights (LSPR); 2) sound money; 3) freedom to trade internationally; 4) freedom from regulation and 5) size of government. Under the last component, smaller governments (as a share of GDP) get higher scores. The index is scored from 0-10, with higher scores corresponding to more economic freedom. The EFW is the most frequently used measure of economic freedom. There are others, notably the Heritage Foundation's index, but they have some elements of arbitrariness that make us prefer the EFW over them. The EFW starts in 1970, so we must use Murphy and Lawson (2018) to extend to 1950.

To create our main variable, we used the Global Burden of Diseases (henceforth GBD) produced by the Institute for Health Metrics and Evaluation (IHME). The GBD is published recurrently and its results are often summarized in top journals such as *The Lancet* (see Vos et al. 2020; Roth et al. 2018). The GBD classifies 286 causes of death, 369 diseases and injuries and numerous risk factors for 204 countries and territories. The survey has high quality data starting from 1990 but it can go as far back as 1950 for many countries. The key to using the GBD are the International Classification of Diseases (ICD) codes. The ICD codes essentially allow us to create the definitions highlighted in table 1 above.[§§] The GBD also provides us with the means to create age-adjusted death rates which we will rely on for results presentation.

Two problems must be discussed beforehand. The first is that the GBD offers an annually unbalanced panel of countries. Some countries offer observations for all years (e.g., Belgium) whereas others (e.g., Bosnia-Herzegovina) offer observations more sparingly. This unbalanced

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§§ Roth et al. (2018) provide a categorization of diseases of their own. However, that categorization is not suited for the purposes of the tests we need to conduct. Hence the classification in table 1.

aspect of the data is biased against testing our hypothesis in the sense that most of the countries that offer sparser data are also countries with lower economic freedom levels. As such, we are relying on variance within a group of free countries. We have been unable to devise a reasonable solution to this issue but note that, since it plays against our stated premise, it makes our results *more* conservative (i.e., lower-bound).

Secondly, if specification (1) is run without income included, the estimate found for economic freedom's effect on D will capture any direct effect and the indirect effect through income. This is why we run a first set of regressions without any controls and then a second set with all controls (defined below) except income. However, if (and when) income is included, the coefficients for EFW will reflect only its direct effect. For reasons discussed in section 2, we believe the direct effect will be smaller (or even null – which is why there are no paths in figure 1 connecting EFW to diseases) than the indirect effect. To capture the indirect effect of economic freedom through income, we use two separate strategies.

The first strategy to arrive at an estimation of the indirect effect of EFW through income is to adapt the strategy of Tavares and Wacziarg (2001). The strategy they used was in order to measure the effect of democracy on growth. They pointed to a similar problem as ours as democracies could invest more in human capital formation which, in turn, stimulates economic growth. This is an indirect effect of democracy. Their strategy consisted in regressing democracy (separately) on factors such as human capital. A second regression was then performed with the dependent variables from the first step now being used as independent variables. To illustrate, take the example of human capital in their article. In the first regression, they find that a one-point increase in democracy improves human capital by 0.4363 points. In the second regression, a one-point increase in human capital increases growth by .5669 percentage points. Multiplying the two coefficients says that a one-point increase in democracy increases growth by roughly 0.25 percentage points. As such, we conduct the following two steps with the same variables from

2) $Y_{i,t} = \beta_o + \beta_1 EFW_{i,t} + \beta_2 X'_{i,t} + \beta_3 V_i + \beta_3 V_t + \epsilon_{i,t}$

3) $D_{i,t} = \hat{\beta}_o + \hat{\beta}_1 Y_{i,t} + \hat{\beta}_2 X'_{i,t} + \hat{\beta}_3 V_i + \hat{\beta}_3 V_t + \epsilon_{i,t}$

and we will take the product of β_1 and $\hat{\beta}_1$ as our indirect effect of economic freedom through income. While this strategy is instructive, it suffers from the problem that significance tests can only be performed in each regression separately. Statistical significance tests cannot be used on the final result.

As a result of this first limitation, we adapt a second strategy borrowed from Gwartney et al. (2006) and Callais and Geloso (2022). Both articles assess the relationship between economic freedom and economic outcomes where a strong indirect effect is present. Gwartney et al. (2006) point out that economic freedom increases growth directly but also indirectly by stimulating investments (and making them more productive). As investments are also affected by economic freedom, regressing economic freedom on growth rates while including investment as a control mutes the coefficient of economic freedom. Callais and Geloso (2022) for their part point out that economic freedom directly improves intergenerational income mobility by placing fewer hurdles but also indirectly by increasing economic growth which increases resources that are more valued lower down the income ladder. Controlling for income per capita hides the indirect effect which they argued mattered most. For both, they provide two relatively similar solutions. First, they estimate the effect of economic freedom on the variable on the indirect path (i.e., investment for Gwartney et al. and income per capita for Callais and Geloso). Fitted values from that regression are then used as a control in a second regression where the end variables (i.e., GDP growth for Gwartney et al. and intergenerational income mobility for Callais and Geloso) were the dependent variables instead. This provides the estimate of the indirect effect of economic freedom. The second strategy was to use the residuals from the first regression as a control instead of the fitted values. The assumption was that the residuals represented the variations on the variable on the indirect path that were *not* correlated with economic freedom. With the residuals, the variations in either income per capita (in Callais and Geloso) or investment (in Gwartney et al.) associated with cross-country differences in economic freedom were captured giving the sum of the direct *and* indirect effects.

We employ these two strategies as well by estimating the effects of economic freedom on income per capita estimated first:

$$4)\quad Y_{i,t} = EFW'_{i,t}\delta_1 + e_{i,t}$$

From that regression, we extract the fitted values of income $(\hat{Y}_i)$ and the residuals $(\hat{e}_i)$ and use them as independent variables on death rates from different types of diseases in two separate regressions:

$$5)\quad D_{i,t} = \hat{Y}'_{i,t}\delta_2 + X'_{i,t}\tilde{\beta} + e_{i,t}$$

$$6)\quad D_{i,t} = \hat{e}'_{i,t}\delta_3 + X'_{i,t}\tilde{\beta} + e_{i,t}$$

Our control variables are the log of GDP per capita, the level of schooling, the proportion of the urban population in the total population, the food supply and the polity index. The GDP data are taken from the Maddison Project Database – a standard source used by economic historians and economists studying long-term economic growth. The level of schooling is taken from the Barro and Lee (2013; Lee and Lee 2016) dataset of human capital achievements from 1870 to 2010 and the update to 2015.[***] The urban population is taken from the United Nations' *World Urbanization Prospect* (2018). The food supply data is taken from Follett and Geloso (2023) who merged multiple sources from the Food and Agriculture Organization (FAO) and the World Bank. The Polity index is taken from the Center for Systemic Peace (2020) in its fifth update of the dataset (Polity V). Table 2 below shows the descriptive statistics.

[***] These can be found here: https://barrolee.github.io/BarroLeeDataSet/LongTermData.html and https://barrolee.github.io/BarroLeeDataSet/BLv3.html

Table 2: Descriptive Statistics

	Obs	Mean	S.D.	Min	Max
Mortality All Causes (Age-Adjusted)	2581	0.02	0.01	0.00	0.07
EFW	2581	6.52	1.24	2.00	8.80
GDP per capita ($)	2581	15954.01	11963.19	952.07	81668.00
Schooling	2581	8.17	2.88	0.71	14.10
Urbanization	2581	65.42	17.37	16.40	100.00
Food Supply	2581	2963.49	450.95	1575.00	3828.00
Polity Index	2581	6.73	5.42	-10.00	10.00

4 Results

Our results are illustrated below. Table 3 shows our results using all variables separately with only country-fixed and year-fixed effects. No other controls are employed. We use Conley standard errors with radius of 1,500km. At first glance, it appears that economic freedom reduces diseases of poverty (DOPP and DOP) as a one-point increase in EFW reduces death per 1,000 rates by 0.11 and 0.12. It is not associated with any effect on other types of causes of deaths. This is consistent with our main claim that economic freedom is associated with reductions in diseases of poverty but may have negative or insignificant effects on diseases of commerce. These results suggests that EFW will also affect the mix of diseases without increasing any types in a significant manner.

In table 4, we show the effects once all controls are included except income per capita. Again, we use Conley standard errors and add controls for year-fixed and country-fixed effects. The results are similar to those in table 3 but slightly smaller: economic freedom reduces only certain types of diseases.

In table 5, we add income per capita as a control to the specification of table 4. As we pointed out above, this naively and implicitly assumes that there is no indirect effect of EFW on different types of death rates through income. As such, the coefficient in table 5 can be interpreted as the *direct* institutional effects and will underestimate the *total* effect of institutions. Nevertheless, the *direct* effect remains quite strong although slightly smaller than in table 4. Again, the results suggest that EFW has an uneven effect on the different types of death rates.

In tables 6, we report the indirect effect of EFW through income as per the Tavares and Warcziarg (2001) strategy. Again, we report only the product of the coefficients β_1 and $\hat{\beta}_1$ discussed above (and, also as discussed above, we cannot report statistical significance). The result suggests that an extra point of economic freedom has an indirect effect through income that reduces death rates from the diseases of poverty categories ANCDN and ANCD (but not DOPP and DOP) by 0.02 to 0.03 deaths per 1,000. This is noticeably larger than the effect of extra income on diseases of commerce (somewhere between 0.002 and 0.006 fewer deaths per 1,000 from a one-point increase in EFW). This difference in effect would affect diseases ratio. For illustration, if the deaths rates from the different diseases of poverty and diseases of commerce all start at 1 death per 1,000, the ratios are equal to 1. The effect of an extra point of economic freedom would raise the ratio as far as 1.04 which suggests that the mix is affected by economic freedom.

In table 7, we report the results from adapting the approaches of Gwartney et al. (2006) and Callais and Geloso (2022). In the first row, we report the effect of EFW on the log of GDP per capita. In the second row, we report the effect of the fitted values of GDP per capita (as explained by EFW) from the first row on the different death rates. This gives the indirect effects of EFW through income. In this specification, EFW has a strong indirect effect on diseases of poverty (DOPP and DOP) but no indirect effect on any other diseases. In the third row, we report the coefficients if we use the residuals of the results in the first row. As all variations in income *not* due to EFW are included, the coefficient for EFW captures the total effects. Here, the results are slightly different. There is no longer a significant effect on DOPP and DOP. However, there are strong effects on other income-sensitive diseases of poverty (ANCD and ANCDN). More importantly, the total effects suggest that the possible mitigating force through comorbidities is too weak to offset the institutional downsides of EFW. Indeed, the coefficients for the diseases of commerce are significant and positive suggesting that economically free liberal democracies are able to strongly reduce non-communicable diseases but that this comes at the cost of being institutionally limited in the ability to deal with diseases of commerce.

What are the limitations of our results and do they affect our conclusions? There are, for sure, some limitations. The most important ones are tied to the quality of the income data for two reasons. First, for some years now, economists have been aware of the important upward manipulations of GDP numbers by dictatorial regimes (Magee and Doces 2015; Guriev and Treisman 2019; 2020; Martinez 2022). Dictatorial regimes also exhibit low scores of economic freedoms. All our regressions that include income as part of their strategy are thus going to be biased against finding any effects of economic freedom. This suggests that our results are most likely downwardly biased in tables 6 and 7 (i.e., we underestimate the effects of economic freedom).

Second, data quality considerations for mortality are also in play. The GBD reports that some causes of deaths in certain countries are poorly recorded in vital statistics. In some cases, like cardiopulmonary failures, this is not a problem for us because we do not need more granular details. However, there are some cases that are more complicated to deal with. The GBD deals with them by different means: proportionate redistribution, fixed proportion redistributions based on published studies or statistical algorithms. These solutions may create some problems in terms of quality. However, we expect their coverage problems to cause a bias in earlier years when vital statistics were of lower quality for a larger number of countries. In recent years, improvements in registration would tend to minimize this problem (see Mikkelsen et al. 2015 for trends in registration performance). Another issue, of greater importance, is that breakdowns of causes of death are not available for *all* countries continuously. To circumvent this problem, we attempted to replicate our results *only* with post-1990 results. These are available in appendix 1. However, this solution does not address the possibility that the numbers reported are outright fabrications. As Geloso et al. (2020) and Berdine et al. (2018) pointed out, some dictatorial regimes such as Cuba provide highly suspicious information about mortality rates. As such, mortality in dictatorial regimes – which also tend to be unfree economically and poorer – is likely understated. This increases the magnitude of the understatement of the effect of economic freedom on income-sensitive diseases. However, these problems work favorably for us. Indeed, any solution that would deal with the misreporting of economic and demographic data by dictatorial regimes – by virtue of our knowledge of which the misreporting goes and the effects reported above – would strengthen our results. Simply put, our results are conservative and confirm that economic freedom unevenly reduce mortality types.

Table 3: Effect of EFW on diseases types without controls

	DOPP	DOP	ANCD	ANCDN	DOCP	PDOC	ACD
Effect of EFW	-0.114**	-0.120**	0.173	-0.075	-0.003	0.003	-0.051
Controls	NO	NO	NO	NO	NO	NO	NO
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Country-Fixed Effects	YES	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Effect of EFW on diseases types with all controls except income

	DOPP	DOP	ANCD	ANCDN	DOCP	PDOC	ACD
Effect of EFW	-0.096**	-0.101**	0.117	-0.055	-0.001	0.003	-0.033
Controls (without income)	YES	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Country-Fixed Effects	YES	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Effect of EFW on diseases types with all controls with log of GDP per capita

	DOPP	DOP	ANCD	ANCDN	DOCP	PDOC	ACD
Effect of EFW	-0.099**	0.103**	0.147	-0.039	-0.005	0.001	-0.0039
Controls (without income)	YES	YES	YES	YES	YES	YES	YES
Year-Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Country-Fixed Effects	YES	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Indirect effect of EFW following Tavares and Wacziarg (2001)

	DOPP	DOP	ANCD	ANCDN	DOCP	PDOC	ACD
Indirect Effect of EFW	0.002	0.001	-0.029	-0.017	0.004	0.002	0.006

Table 7: Using the Gwartney et al. (2006) and Callais and Geloso (2022) approach to estimate the indirect effect and total effect of economic freedom

	DOPP	DOP	ANCD	ANCDN	DOCP	PDOC	ACD
Effect of predicted values of income on *y* (indirect effect)	-0.219**	-0.232**	0.268	-0.127	-0.003	0.006	-0.075
Effect of EFW when residuals of EFW on income is used on *y* (total effect)	-0.036	-0.070	-0.446**	-0.363***	0.075***	0.044***	0.083

*** p<0.01, ** p<0.05, * p<0.1

5 Conclusion

In this paper, we aimed to expand on the work of Troesken (2015) and Geloso et al. (2022) who argued that liberal democracies with high levels of economic freedom lock away some possible institutional responses to communicable diseases (which we call diseases of commerce). In their works, they explained that these polities would, however, be richer and better able to deal with other types of diseases that are less communicable and more sensitive to income levels. This is because the protection of property rights, the limits on government and the limited regulatory powers permit wealth creation while deterring effective combat against communicable diseases such as pandemic prone-diseases. As such, there is an institutional trade-off – so they argue – whereby they must choose between greater wealth, fewer deaths from disease of poverty (i.e., income-sensitive) and more deaths from diseases of commerce on the one hand and less wealth, more deaths from diseases of poverty and fewer deaths from diseases of commerce on the other hand.

We expanded on their claims by explaining how this trade-off overstates the difficulties of liberal democracies. This is because they disregard how diseases of poverty increase vulnerability to diseases of commerce. By reducing mortality from diseases of poverty, economically free liberal democracies indirectly reduce mortality from diseases of commerce. However, that indirect effect is smaller than the direct on diseases of poverty. As such, the overall level of mortality falls but the *mix* is altered with liberal democracies having a larger share of fewer deaths from diseases of commerce.

Our evidence shows that the features of liberal democracy and economic freedom do work as hypothesized. If correct and confirmed by further improvements to our methodology, this means that liberal democracies pay a very small price for their inabilities to deal effectively with pandemics. Whether this price is worth it in the long run is for societies and policymakers to decide.

REFERENCES

Alvarez, S., Geloso, V., & Scheck, M. (2023). *Economic Freedom Matters A Lot More for Economic Growth Than You Think!* Working Paper, George Mason University Department of Economics.

Aydin, M. (2019). The effect of economic growth on obesity for the most obese countries: new evidence from the obesity Kuznets curve. *European Journal of Health Economics*, *20*(9), 1349-1358.

Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics*, *104*, 184-198.

Barro, R. J. (2022). Non-pharmaceutical interventions and mortality in US cities during the great influenza pandemic, 1918–1919. *Research in Economics*, *76*(2), 93-106.

Bjørnskov, C., & Rode, M. (2019). Crisis, ideology, and interventionist policy ratchets. *Political Studies*, *67*(4), 815-833.

Bossak, B. H., & Welford, M. R. (2009). Did medieval trade activity and a viral etiology control the spatial extent and seasonal distribution of Black Death mortality?. *Medical Hypotheses*, *72*(6), 749-752.

Bossak, B. H., & Welford, M. R. (2010). Revisiting the medieval Black Death of 1347–1351: spatiotemporal dynamics suggestive of an alternate causation. *Geography Compass*, *4*(6), 561-575.

Buchanan, J. M.. (1968). *The demand and supply of public goods*. Chicago: Rand McNally.

Callais, J.T. and Geloso, V. (2022). "Intergenerational Income Mobility and Economic Freedom" *Southern Economic Journal.*

Candela, R. A., & Geloso, V. (2021). Economic freedom, pandemics, and robust political economy. *Southern Economic Journal*, *87*(4), 1250-1266.

Carson, B. (2016). Firm-led malaria prevention in the United States, 1910-1920. *American Journal of Law & Medicine*, *42*(2-3), 310-332.

Carson, B. (2020). Privately Preventing Malaria in the United States, 1900-1925. *Essays in economic and business history*, *38*(1), 142-192.

Centre for Systemic Peace. (2020). *The Polity Project.* Available online at https://www.systemicpeace.org/polityproject.html (consulted September 1st 2022).

Chapelle, G. (2020). The Medium Run impact of Non Pharmaceutical Interventions. Evidence from the 1918 Influenza in US cities. *Covid Economics*, 109.

Correia, S., Luck, S., & Verner, E. (2022). Pandemics depress the economy, public health interventions do not: Evidence from the 1918 flu. *The Journal of Economic History*, *82*(4), 917-957.

Coyne, C. J., Duncan, T. K., & Hall, A. R. (2021). The political economy of state responses to infectious disease. *Southern Economic Journal*, *87*(4), 1119-1137.

Curtis, D. R., & Roosen, J. (2017). The sex‐selective impact of the Black Death and recurring plagues in the Southern Netherlands, 1349–1450. *American Journal of Physical Anthropology*, *164*(2), 246-259.

De Haan, J., & Sturm, J. E. (2000). On the relationship between economic freedom and economic growth. *European Journal of Political Economy*, *16*(2), 215-241.

Dempere, J. (2021). Control of the first wave of COVID-19: Some economic freedom-related success factors. *Journal of International Studies*, *14*(4).

Dorlo, T. P., Fernández, C., Troye-Blomberg, M., De Vries, P. J., Boraschi, D., & Mbacham, W. F. (2016). Poverty-Related Diseases College: a virtual African-European network to build research capacity. *BMJ Global Health*, *1*(1), e000032.

Duncan, S. R., Scott, S., & Duncan, C. J. (1993). The dynamics of smallpox epidemics in Britain, 1550–1800. *Demography*, *30*(3), 405-423.

Ezzati, M., Vander Hoorn, S., Lawes, C. M. M., Leach, R., James, W. P. T., Lopez, A. D., ... & Murray, C. J. L. (2005). Rethinking the "diseases of affluence" paradigm: global patterns of nutritional risks in relation to economic development. *PLoS medicine*, *2*(5), e133.

Follett, C. and Geloso, V. (Forthcoming). *The Inequality of Human Progress Index: Global Inequality in Wellbeing Has Decreased Across Many Dimensions.* Cato Institute.

Furton, G. L. (2022). The pox of politics: Troesken's tradeoff reexamined. *Public Choice*, 1-23.

Geloso, V., & Bologna Pavlik, J. (2021). Economic freedom and the economic consequences of the 1918 pandemic. *Contemporary Economic Policy*, *39*(2), 255-263.

Geloso, V., Hyde, K., & Murtazashvili, I. (2022). Pandemics, economic freedom, and institutional trade-offs. *European Journal of Law and Economics*, *54*(1), 37-61.

Goklany, I. (2017). Wealth, health and the cycle of progress. In *Fighting the diseases of poverty* (pp. 1-34). Routledge.

Grier, K. B., & Grier, R. M. (2021). The Washington consensus works: Causal effects of reform, 1970-2015. *Journal of Comparative Economics*, *49*(1), 59-72.

Guriev, S., & Treisman, D. (2019). Informational autocrats. *Journal of Economic Perspectives*, *33*(4), 100-127.

Guriev, S., & Treisman, D. (2020). A theory of informational autocracy. *Journal of Public Economics*, *186*, 104158.

Gwartney, J. D., Holcombe, R. G., & Lawson, R. A. (2006). Institutions and the Impact of Investment on Growth. *Kyklos*, *59*(2), 255-273.

Hall, J. C., & Lawson, R. A. (2014). Economic freedom of the world: An accounting of the literature. *Contemporary Economic Policy*, *32*(1), 1-19.

Higgs, R. (1987). *Crisis and leviathan: Critical episodes in the growth of American government.* New York: Oxford University Press.

Huang, G., Yu, X., Long, Q., Huang, L., & Luo, S. (2022). The impact of economic freedom on COVID-19 pandemic control: the moderating role of equality. *Globalization and health*, *18*(1), 1-17.

Jedwab, R., Johnson, N. D., & Koyama, M. (2022). The economic impact of the Black Death. *Journal of Economic Literature*, *60*(1), 132-78.

Karabulut, G., Zimmermann, K. F., Bilgin, M. H., & Doker, A. C. (2021). Democracy and COVID-19 outcomes. *Economics Letters*, *203*, 109840.

Lawson, R. A., Murphy, R. H., & Williamson, C. R. (2016). The relationship between income, economic freedom, and BMI. *Public health*, *134*, 18-25.

Lee, J. W., & Lee, H. (2016). Human capital in the long run. *Journal of Development Economics*, *122*, 147-169.

Leeson, P. T., & Thompson, H. A. (2021). Public choice and public health. *Public Choice*, 1-37.

Levin, A. T., Owusu-Boaitey, N., Pugh, S., Fosdick, B. K., Zwi, A. B., Malani, A., ... & Meyerowitz-Katz, G. (2022). Assessing the burden of COVID-19 in developing countries: systematic review, meta-analysis and public policy implications. *BMJ global health*, *7*(5), e008477.

Magee, C. S., & Doces, J. A. (2015). Reconsidering regime type and growth: lies, dictatorships, and statistics. *International Studies Quarterly*, *59*(2), 223-237.

Martinez, L. R. (2022). How much should we trust the dictator's GDP growth estimates?. *Journal of Political Economy*, *130*(10), 2731-2769.

Mikkelsen, L., Phillips, D. E., AbouZahr, C., Setel, P. W., De Savigny, D., Lozano, R., & Lopez, A. D. (2015). A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *The Lancet*, *386*(10001), 1395-1406.

Murphy, R. H., & Lawson, R. A. (2018). Extending The Economic Freedom Of The World Index To The Cold War Era. *Cato Journal*, *38*(1), 265-284.

Naanwaab, C. (2018). Does economic freedom promote human development? New evidence from a cross-national study. *The Journal of Developing Areas*, *52*(3), 183-198.

O'Reilly, C., & Powell, B. (2015). War and the Growth of Government. *European Journal of Political Economy*, *40*, 31-41.

Paniagua, P., & Rayamajhee, V. (2022). A polycentric approach for pandemic governance: nested externalities and co-production challenges. *Journal of Institutional Economics*, *18*(4), 537-552.

Roth, G. A., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., ... & Borschmann, R. (2018). Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *392*(10159), 1736-1788.

Shahbaz, A., & Funk. A. (2020). *False Panacea: Abusive Surveillance in the Name of Public Health*. New York: Freedom House.

Sharma, A. (2020). Does economic freedom improve health outcomes in sub-Saharan Africa? *International Journal of Social Economics*, *47*(12), 1633-1649.

Smith, R. D. (2003). Global public goods and health. *Bulletin of the World Health Organization*, *81*, 475-475.

Troesken, W. (2015). *The Pox of Liberty*. University of Chicago Press.

Viscusi, W. K. (2021). Economic lessons for COVID-19 pandemic policies. *Southern Economic Journal*, *87*(4), 1064-1089.

Vos, T., Lim, S. S., Abbafati, C., Abbas, K. M., Abbasi, M., Abbasifard, M., ... & Bhutta, Z. A. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, *396*(10258), 1204-1222.

de Vries, L., Koopmans, M., Morton, A., & Van Baal, P. (2021). The economics of improving global infectious disease surveillance. *BMJ Global Health*, *6*(9), e006597.

Tavares, J., & Wacziarg, R. (2001). How democracy affects growth. *European Economic Review*, 45(8), 1341-1378.

United Nations. (2018). *2018 Revision of World Urbanization Prospects*. United Nations Department of Economic and Social Affairs.

Young, A. T., & Bologna, J. (2016). Crises and government: some empirical evidence. *Contemporary Economic Policy*, *34*(2), 234-249.