FEATURED ARTICLE

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The political economy of COVID-19

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Editor in Charge: Craig Gundersen

Abstract

We assess the economic and health costs of COVID and policy responses to COVID. Based on initial estimates of health and economic costs, social distancing policies were justified, but these estimates now seem too high because of learning by doing. Significant differences in mortality rates across US states and countries can be explained by population density, climate, exposure, and policy. Regions that were able to contain the disease early have seen fewer deaths and lower economic losses. Some developing countries initially imposed drastic, costly measures, perhaps motivated by political economy. We also find that there has been underinvestment in prevention and mitigation that could have reduced the cost of adaptation and suggest that there is a lesson for climate change policies.

KEYWORDS
COVID-19, economic costs, political economy, social distancing, value of life

JEL CLASSIFICATION
I18; I31; J17; J18

The most significant medical shock of the 20th century was the Spanish Flu of 1918–1920, which killed around 50 million people, more than the First World War (CDC, 2020a). Scientists warned that similar pandemics might recur, and indeed in 2020 we encountered COVID-19, which has devastated health and economic activity globally and forced governments to counter

with measures to slow the spread of the disease until a vaccine or cure became available. But social isolation measures have many costs, and their design is a significant policy challenge.

Optimal resource allocation suggests policies where marginal benefits equal marginal costs. Unfortunately, data limitations do not allow us to compare the marginal benefits and costs of various interventions. In this paper, we assess the costs of the pandemic in terms of the lives lost and reduced economic activities and explore factors that explain different policies and outcomes across the United States and globally. Our approach can be useful to consider questions such as the following: How much social isolation should countries impose? How do policies affect risk to life and economic well-being? Should policies vary between high- and low-income countries, and how? What are the policy and research implications? Responses to a pandemic like COVID reflect political considerations, and therefore we assess the political motivations underlying some policy choices we have observed.

Our analysis suggests that strict shelter-in-place measures introduced in the United States were reasonable based on initial estimates of risk to life, but some developing countries with younger populations have lower mortality risks than developed countries, leading us to question the draconian social isolation policies in India that may be motivated by political economic considerations. We conclude that the political establishment in most countries is ready to pay a high economic price to contain the disease, implying that a medical solution is a significant priority. The high cost of adaptation to the pandemic is partially a result of underinvestment and preparation. Fortunately, we have made tremendous progress in our medical knowledge and technology, and, despite the pain of the current pandemic, its cost in terms of human life will be much smaller than that of the Spanish Flu.

1 | VALUE OF STATISTICAL DEATH AND COVID-19

One significant role of government is to provide public goods: goods that benefit everybody without the possibility of exclusion. National defense is one example. Others include basic non-patentable knowledge and public health measures. Policymakers need precise assessments of the benefits and costs of public goods to determine how much to invest in them. Since public goods like defense and basic medical knowledge save lives, it is useful to have a measure of how much people are willing to pay to decrease their mortality risk. One such measure is the value of statistical life (VSL), which can be thought of as the economic gain to society of eliminating mortality risk by one death. A large body of literature relies on various market outcomes (e.g., the extra payments workers receive for risky activities, insurance premiums) to estimate VSL, and these estimates vary by age (Viscusi & Aldy, 2003).

The US Environmental Protection Agency (EPA, 2014) uses a baseline VSL of $9.5 million ($7.9 million in 2008 dollars). In cases where we know the age distribution of those at risk, we can employ an age-dependent measure of the VSL. In their article comparing the costs and benefits of social distancing, Greenstone and Nigam (2020) combine a distribution of COVID deaths with an age-dependent VSL based on Murphy and Topel (2006). Their analysis implies that the average VSL of a COVID mortality is $4.5 million, which we refer to as "COVID-weighted VSL".[1] In our analysis of COVID-19 policies, we can test to what extent current social distancing regulations are consistent with this value.

Policymakers considering social distancing measures were forced to act at the beginning of the pandemic when there was significant uncertainty about the impact of COVID. In a *New York Times* interview in late March 2020, Dr. Fauci stated that with social distancing the

number of COVID fatalities in the United States would be between 100,000 and 240,000, but without social distancing the pandemic could cost 2.2 million lives. These estimates are consistent with the predictions of an early epidemiological study (Ferguson et al., 2020) and suggest that social distancing policies would save 2 million lives. Thus, social distancing could be estimated to provide economic benefits of $9 trillion using a COVID-weighted VSL of $4.5 million.

We doubt the accuracy of these early predictions for two reasons. First, the epidemiological estimates of fatalities may have underestimated the capacity of society, and the medical system in particular, to adjust to the pandemic. In a study using data from New York City, Horwitz et al. (2020) found that the mortality rate for COVID patients, adjusted for observable risk factors, fell from 23% in mid-March 2020 to 8% in June 2020, suggesting a high rate of learning-by-doing on the part of medical professionals. Second, VSL estimates are equilibrium outcomes that may change after the economy is subject to a large shock like a pandemic or recession.

What are the costs of social distancing measures? One approximation uses the estimated impact on GDP. The OECD (2020) estimated that COVID containment measures would cost the United States a 25% decrease in GDP. These estimates were available when social distancing regulations were considered, so they provide a good proxy for analyzing policy decisions. With an annual GDP of $21.5 trillion in 2019, this implies a monthly cost of $0.45 trillion in the United States. Based on these initial estimates, the gains from social distancing are $9 trillion, making the case for up to 20 months of rigorous social distancing measures. As we will discuss below, the costs and benefits of social distancing are continually updated, but the case for social distancing remains very strong.[2]

Thus far, our analysis has suggested a tradeoff between economic activity and public health. If true, we might expect the pandemic's effects on GDP to be inversely correlated with a country's COVID deaths per capita (i.e., countries that enact stronger social distancing suffer fewer deaths but also see larger decreases in GDP), a hypothesis that we can test using cross-sectional, country-level data from *The Economist*'s intelligence unit[3] and the Worldometer.[4] To estimate the effect of the pandemic on GDP, we assume that growth rates in 2020 would have remained the same as in 2019 had the pandemic not occurred (e.g., US growth was 2.3% in 2019 and its
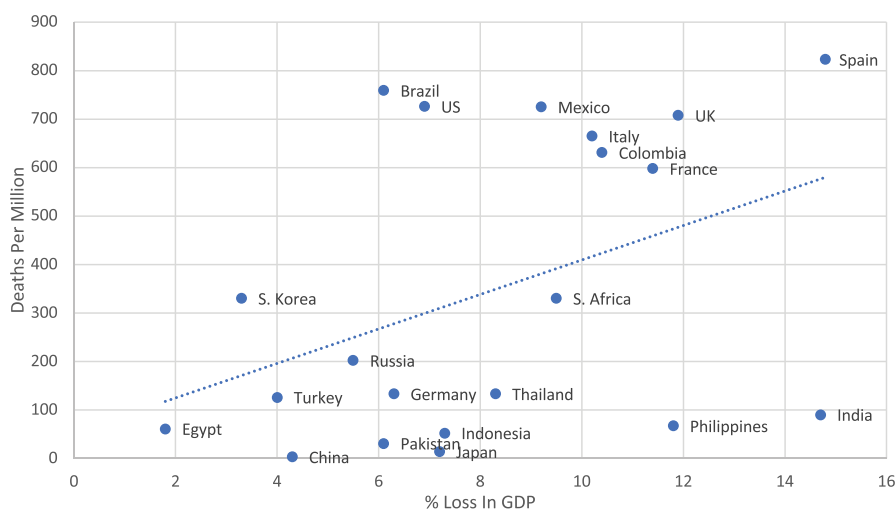

FIGURE 1 Tradeoff between COVID-19 deaths and cost [Color figure can be viewed at wileyonlinelibrary.com]

GDP is projected to decline by 4.6% in 2020 for a loss of about 6.9% of GDP). Figure 1 plots the relationship between the percent decline in GDP and COVID deaths per million for selected countries. Casualty data were collected on November 6, 2020, and will continue to change, but their basic message is unlikely to change. We observe the opposite relationship: countries closer to the origin have seen lower mortality rates and lower losses in GDP. For example, China, South Korea, and Germany seem to have performed much better than the United States, which in turn performed better than some Western European countries like Spain, the United Kingdom, and France. Figure 1 includes a simple regression line[5] which illustrates that mortality rate and GDP loss are in fact positively correlated, so countries that were able to control the pandemic better and earlier suffered less economically.

We can also assess how the economic losses due to the pandemic compare with the gains in terms of lives saved. We estimate that US GDP has declined by about 7%, or $1.5 trillion. Using the COVID-weighted VSL of $4.5 million, these losses in GDP were well invested so long as at least 330,000 lives were saved. It is impossible to know how many would have died of COVID without social distancing and restrictions on economic activity, but 330,000 is significantly lower than the ex ante predictions that social distancing would save 2 million lives, suggesting that social distancing policies paid off.

The analysis thus far has emphasized differences within and across countries. We continue by exploring the sources of these differences.

2 | HETEROGENEITY

To understand why COVID has affected some countries more than others, we apply lessons from the economic literature on risk, or the probability of a bad outcome (e.g., death, disease). Models of risk assessment are used in various applications, including to regulate food safety, environmental quality, and construction standards. One approach models risk as the outcome of multiple random processes, for example, exposure probability and vulnerability (Lichtenberg & Zilberman, 1988; Wilson & Crouch, 1987). In the case of COVID-19, exposure probability appears to be associated with travel, population density, and weather. Using data from 20 countries, Sarkodie and Phebe (2020) found that various weather conditions, including low temperature, wind speed, and precipitation, prolong the activation and infectivity of the COVID-19 virus. This supports the theory of the "second wave" in the Northern Hemisphere, which has corresponded with cooler weather. Vulnerability is related to demographic factors, such as age, and health history, such as immune deficiency (Yang et al., 2020). Both exposure and vulnerability can be affected by policy. For example, organized quarantine and contact tracing can reduce exposure, and a vaccine could reduce vulnerability.

Research in agricultural economics also provides useful insights. Olmstead and Rhode's book *Arresting Contagion* (Olmstead & Rhode, 2015) analyzed the control and eradication of multiple livestock infections from the 1880s to the 1950s. They find that policymakers play for time, aiming to contain the disease until vaccination and cures are available, and interventions were often costly, limiting individual freedom and requiring swift action. They argue that effective policy necessarily includes consistent monitoring and rapid intervention. Effective enforcement was essential to overcome non-cooperation and avoidance behavior. Policymakers may have more degrees of freedom in addressing animal diseases, but the basic principles of controlling an outbreak also apply to the COVID pandemic.

TABLE 1 COVID statistics for 30 most populous countries and US states, as of November 6, 2020

Country	Total cases	Cases/1 M	Deaths/1 M	State	Total cases	Cases/1 M	Deaths/1 M
Spain	1,366,000	29,210	823	New Jersey	253,000	28,459	1862
Brazil	5,614,000	26,347	759	New York	556,000	28,566	1736
US	9,920,000	29,907	726	Massachusetts	165,000	23,962	1463
Mexico	949,000	7,335	725	Connecticut	77,000	21,614	1306
UK	1,123,000	16,515	708	Louisiana	186,000	39,973	1290
Italy	825,000	13,650	665	Arizona	253,000	34,727	836
Colombia	1,118,000	21,891	631	Illinois	454,000	35,808	814
France	1,601,000	24,514	598	Georgia	400,000	37,639	808
Iran	655,000	7,763	438	Florida	827,000	38,523	790
South Africa	732,000	12,296	330	Michigan	218,000	21,855	784
South Korea	732,000	12,296	330	South Carolina	182,000	35,279	775
Russia	1,713,000	11,735	202	Pennsylvania	226,000	17,630	704
Germany	619,000	7,381	133	Maryland	150,000	24,805	692
Thailand	619,000	7,381	133	Indiana	196,000	29,140	670
Turkey	387,000	4,569	126	Texas	998,000	34,416	656
India	8,412,000	6,075	90	Alabama	199,000	40,618	617
Philippines	390,000	3,540	67	Missouri	203,000	33,055	528
Egypt	109,000	1,054	61	Tennessee	272,000	39,796	514
Indonesia	426,000	1,551	52	Ohio	235,000	20,120	471
Bangladesh	416,000	2,517	36	Minnesota	165,000	29,233	463
Pakistan	340,000	1,530	31	California	959,000	24,268	452
Myanmar	58,000	1,062	25	North Carolina	286,000	27,237	434
Kenya	60,000	1,100	20	Virginia	187,000	21,932	432
Japan	104,000	822	14	Colorado	121,000	21,013	409

(Continues)

TABLE 1 (Continued)

Country	Total cases	Cases/1 M	Deaths/1 M	State	Total cases	Cases/1 M	Deaths/1 M
Ethiopia	98,000	849	13	Wisconsin	250,000	42,924	377
Nigeria	64,000	306	6	Oklahoma	130,000	32,821	357
China	86,000	60	3	Kentucky	115,000	25,802	343
DR Congo	11,000	127	3	Washington	117,000	15,342	320
Vietnam	1,000	12	0.4	Utah	124,000	38,769	197
Tanzania	500	8	0.3	Oregon	48,000	11,342	168

The lessons of these literatures provide a useful framework for interpreting the impact of the pandemic across states and countries. Table 1 identifies several patterns. First, states in the Northeast United States (New York, New Jersey, Massachusetts, Connecticut) have the highest death rate per million, perhaps because these states had high early exposure rates to the infections and were not prepared and did not benefit from learning-by-doing. The high population density and relatively colder temperature from February to April also likely contributed to the high fatalities rates. Some European countries, such as Spain, Italy, and France, were in a similar position to the northeast US, with high rates of early exposure, cool spring weather, and older populations.

Second, states that emphasized early social distancing fared better. California and Washington had high early infection rates but have significantly lower mortality rates than the Northeast United States, perhaps because of early strict social distancing and warmer weather, and owing to early exposure to the virus while enacting rigorous distancing and monitoring strategies. Third, Southern US states have seen high rates of infections but fewer deaths per infection. This is likely due to later exposure to the virus and less emphasis on social distancing. The lower death rate per infection may also reflect learning-by-doing by medical professionals. Similarly, China, Germany, and Japan emphasized more self-protective behavior as people become more aware of the disease. Later arrival and less social distancing also describe countries like Brazil, Mexico, and Colombia, which have experienced high mortality rates. Fourth, there have been fewer cases and deaths in developing countries, especially in Africa, reflecting less travel, younger populations, and experience with responding to previous epidemics such as Ebola. Obviously, this analysis suffers from low testing and imperfect record-keeping, especially in developing countries, that may lead us to underestimate the impact of the pandemic. But these observations are consistent with the lessons of the risk management literature, and there is ample opportunity for future statistical research to establish firmer relationships.

There is also significant heterogeneity in sharing the costs and benefits of social distancing among different age groups—older individuals (above 60) benefit from reduced mortality risks. In comparison, younger individuals bear much of the cost of unemployment associated with social distancing. These differences have political-economic implications.

3 | POLITICAL ECONOMY

The political economy literature (Alesina & Rosenthal, 1995) recognizes that the world is not run by economists, and political economists have developed models of policy formation where politicians consider—in addition to public safety—economic well-being and quality of life when deciding between policy alternatives. These models emphasize that politicians aim to attain and sustain power and improve their financial well-being, and they imply that politicians prefer policy outcomes that favor their donors and voters, subject to informational, technological, economic, and political constraints.

Political and economic considerations likely affected COVID policy choices in all countries. Chinese politicians appear to have listened to public health professionals, and, importantly, they had the power to enforce a national shutdown of the economy. This was done at a significant price, but by August 2020 China's economy was returning to full operation. The US response initially suffered from inadequate testing and ineffective communication between federal and state agencies. Furthermore, President Trump seemed concerned that heavy restrictions would damage the economy and his chances for reelection. Consequently, there was less

emphasis on federal coordination and the use of personal protective measures (e.g., masks), and the United States had one of the highest mortality rates in the world (see Table 1). Brazil's approach to the disease mirrors that of the United States, and Brazil has also seen a similarly high rate of fatalities. Initially, Sweden and the United Kingdom introduced lighter regulations than other European countries, but later strengthened them after severe outbreaks. Still, some democracies responded very well to the pandemic (Alon et al., 2020). Taiwan, Japan, Germany, and South Korea developed testing and tracing infrastructures early and effectively, generated public awareness and cooperation, and were able to contain the disease relatively well. In Italy, strict regulations and public cooperation led to the containment of what was a devastating and rapidly spreading outbreak.

Since the costs of disease control can be quite substantial, policy responses should vary across locations. Strict social distancing strategies introduced in Western Europe, where safety nets are relatively effective and populations are older, may not be appropriate for developing countries, where populations tend to be younger and poorer. As we see in Figure 1, both India and the Philippines have paid a heavy price in terms of economic activity. The drastic economic shutdown in India is likely to increase food insecurity, employment, and poverty, perhaps resulting in more fatalities than the disease itself (Mobarak & Barnett-Howell, 2020; Sly, 2020; Tripathi & Sindher, 2020). This is true of many developing countries, and, in particular, the poor in these countries have lost much of the progress in terms of food security and income that they had gained in recent years.[6]

Why did some developing countries impose such harsh controls? There was a legitimate concern that their medical infrastructures may not be able to cope with a large number of cases, and many public health professionals recommended a cautionary approach. Yet, Reardon et al. (2020) suggest that much of the burden of unemployment associated with social distancing in India and other developing countries will be borne by more impoverished individuals in traditional informal sectors. Another possible reason for strict social distancing in these countries is that older and wealthier individuals benefit disproportionally from social distancing measures. The urban elite and middle class wield much political power and can capture agencies that make policy decisions (Acemoglu & Robinson, 2006).

The challenge facing India and other developing countries is to develop policy responses to COVID-19 that take into account the epidemiological nature of the disease while balancing the benefits and costs associated with the well-being of all groups. Finding the right balance between control of the disease and sustaining livelihoods is an enormous challenge, but meeting the challenges of hard times is the ultimate test of political leadership (Lodge & Boin, 2020).

4 | GLOBAL PUBLIC GOODS

Political systems view social distancing as a temporary situation and develop policies to buy time until vaccines and treatments are available. In addition to accelerating the development of a vaccine, governments are challenged to better recognize and respond to future health crises. Unfortunately, global systems were unprepared to alert and respond to the COVID-19 crisis,[7] likely because governments were underinvesting in preparatory measures. How much should society invest in these measures? Following the avian flu crisis, Sproul et al. (2012) suggested global investment in research and monitoring of zoonotic diseases. Based on the distribution of lives lost to zoonotic disease over the last 100 years and a conservative estimate, they find that a yearly investment of $10 billion in research and monitoring of zoonotic diseases will be

TABLE 2 Number of lives lost from pandemics and their economic valuations from 1918 to 2020

Name	Date	Fatalities	2020 equivalence	Cost of lives lost in million dollars
Spanish Flu	1918–20	50 million	216,000,000	$290,535,429
Asian Flu	1957	1.1 million	2,960,000	$3,981,411
Hong Kong Flu	1968	1 million	2,190,000	$2,945,706
Swine Flu	2009	350,000	395,000	$531,303
COVID-19	2020	1,400,000	1,400,000	$1,883,100
Total			222,945,000	$299,876,950
Total since WWII			6,945,000	$9,341,521

worthwhile if it reduces fatalities by 10%. We can take a similar approach in light of the COVID pandemic and compare the expected annual costs to the current levels of investment.

According to the CDC, there have been five pandemics in the 102 years from 1918 to 2020, beginning with the Spanish Flu and concluding with the COVID-19 pandemic.[8] For each pandemic, Table 2 presents the number of global fatalities, the number of 2020-equivalent deaths, which adjusts for population growth,[9] and the cost of lives lost in 2020 dollars. The value of lives lost is the number of lives lost times the average global value of statistical life (AGVSL). To compute the AGVSL, we multiply the COVID-weighted VSL ($4.5 million) by the ratio of the global average purchasing power per capita ($18,831, IMF, 2019) divided by US GDP per capita (about $63,000), implying an AGVSL of about $1.3 million.[10]

If we consider all pandemics averaged over 102 years, we find an annual average cost of almost $3 trillion, an incredible sum. It is clear that this estimate is driven in large part by the Spanish Flu pandemic, which would cost nearly $300 trillion if a similar catastrophe occurred today. If, instead, we restrict ourselves to pandemics since World War II averaged over 75 years (1945–2020), we estimate the annual average cost in terms of lives lost to be close to $125 billion. However, the loss of lives is not necessarily the highest cost associated with the pandemic. The global GDP in PPP was about $136 trillion in 2019, and at 3% growth, would have been $140 trillion in 2020. Instead, it is projected to be $130 trillion in 2020, implying a loss of $10 trillion, which is much larger than the cost in terms of lives lost to COVID (about $2 trillion).

With such high costs, it is worthwhile to invest significantly in research and development to reduce the risk and costs of influenza pandemics, to introduce improved monitoring technologies, and to develop cures and vaccines. We use a conservative estimate of $125 billion for the global annual cost of an influenza pandemic as a modest benchmark to assess the order of magnitude of current spending on research and development on solutions to flu pandemics. The US share of global GDP adjusted for purchasing power is about 15%, so its share of the annual cost is $18–19 billion.

How does this average annual cost compare with how much the United States invests annually? US influenza research spending was planned to be below $3 billion in fiscal year 2020.[11] The share of public sector basic research in the United States is estimated to be 44% (Mervis, 2017), which suggests that annual expenditure on Influenza-related research is about $6.8 billion (3/44)—significantly lower than the $18–19 billion average cost of pandemics for the United States. The global situation is likely much worse. Silverstein et al. (1995) argue that the US government is by far the largest and most important supporter of medical research in the world. Had the rest of the world contributed proportionately as much as the United

States for influenza-related research, the global expenditure would have been $45.3 billion, which is much less than a $125 billion average annual cost. These relatively small financial commitments, compared to the damage of a pandemic, are not likely to yield much support in addressing the COVID-19 challenge. The United States and the world were not well prepared for the COVID-19 pandemic, and we are continuing to pay a high price.

5 | CONCLUSION

Influenza pandemics are a global risk. They can be addressed by prevention and mitigation, which would reduce the likelihood of occurrence, magnitude, and need for adaptation. Our experience in 2020 is that adaptation can be very expensive. In 2020, we suffered over 1.5 million fatalities globally and trillions of dollars in economic losses. As vaccines are introduced, this pandemic is likely to end. The bulk of fatalities have occurred in high-income countries, but food insecurity and poverty have been exacerbated in low-income countries. It is continuing to devastate economies and disrupt our usual way of life, especially impacting the vulnerable. We have underinvested in mitigation, which has led to incredibly high costs of adaptation. This suggests a very important lesson for a similar phenomenon: climate change. The cost of mitigation is supposedly quite high, and we continue to underinvest in it. Most countries are far behind their Paris Agreement targets, and the level of carbon in the atmosphere is rising. COVID-19 suggests that the cost of adaptation will be much more severe and affect everyone, especially the vulnerable. The global nature of both COVID-19 and climate change requires international collaboration and partnership in research on mitigation in order to build a safe and better future.

Despite the insufficient preparation and misguided policies that have contributed to the high costs of addressing the COVID-19 challenge, our medical and public health sectors have made tremendous progress. While the Spanish flu decimated 1%–3% of the global population, the fatality rate of COVID-19 is not likely to exceed 0.1% of global population. Yet, the economic and political implications are likely to be substantial. Apart from the tragic health effects, there is reason to be concerned about economic and political effects of the pandemic. The coronavirus is likely to change our education and business systems; hopefully it will make the American and global health systems more inclusive, efficient, and well prepared so that when the next pandemic strikes, we can be proud of our response.

ENDNOTES

[1] Greenstone & Nigam, 2020, following Ferguson et al., 2020 divide the population into nine groups. Each group has a known VSL and a probability that a prevented COVID fatality is from the group. For example, 7.6% of prevented deaths are estimated to be from the 50–59 age group, and this group has an estimated VSL of $10.3 million. Summing the VSLs weighted by probability gives a COVID-weighted VSL of $4.5 million.

[2] Thunström et al. (2020) use early COVID data and estimate the net benefits of social distancing to be $5.2 trillion. This estimate is consistent with our own that the gross benefit of social distancing is $9 trillion and 8.5 months of social distancing ($9 T – 8.5 × $0.45 T = $5.2 T).

3 *The Economist* November 7, 2020 and *The Economist* December 23, 2019.

4 See https://www.worldometers.info/coronavirus. Accessed November 6, 2020.

5 The formula for the regression line is Deaths/million = 35.6(% Decrease GDP) + 53.5. This regression is purely descriptive.

6 See https://blogs.imf.org/2020/10/29/how-covid-19-will-increase-inequality-in-emerging-markets-and-developing-economies

7 See https://www.newyorker.com/magazine/2020/04/13/the-quest-for-a-pandemic-pill

8 See https://www.cdc.gov/flu/pandemic-resources/basics/past-pandemics.html

9 Fatalities in 2020 = (Global population in 2020/Global population in year t) × Fatalities in year t.

10 Because COVID has affected older populations more than past pandemics, the COVID-weighted VSL is a conservative estimate.

11 The CDC was allocated $962 million for emerging zoonotic infections and global disease protection, the National Institute of Allergy and Infectious Diseases was allocated $1.5 billion for bio-defense and emerging infectious disease (CDC 2020b), and the NIH was allocated $423 million for influenza research. (https://report.nih.gov/categorical_spending.aspx).

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