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**How Government Leaders Violated Their Epistemic Duties  
during the SARS-CoV-2 Crisis**

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[This is an advance copy of an article that will appear in print in September 2020 as part of the KIEJ’s special double issue (<https://kiej.georgetown.edu/special-issue-covid-19/>) on Ethics, Pandemics, and COVID-19.]

ABSTRACT. In spring 2020, in response to the COVID-19 crisis, many world leaders imposed universal lockdowns. We argue that these restrictions have not been accompanied by the epistemic practices morally required for their adoption or continuation. While in theory lockdowns can be justified, governments did not meet and have not yet met their justificatory burdens. We will not argue that less stringent policies were optimal or better justified. Rather, we explain how government leaders failed and have continued to fail to meet their epistemic duties by relying upon data, models, and evidence of insufficiently good quality to justify their actions.

*Sovereign is he who provides the exception...The exception is more interesting than the rule. The rule proves nothing; the exception proves everything. In the exception the power of real life breaks through the crust of a mechanism that has become torpid by repetition.* (Schmitt 2010, 1, 15)

## 1. INTRODUCTION

In spring 2020, in response to the COVID-19 crisis, world leaders imposed severe restrictions on citizens' civil, political, and economic liberties. These restrictions went beyond less controversial and less demanding social distancing measures seen in past epidemics. Many states and countries imposed universal lockdowns. Lockdowns, as we define them here, require people to stay home; in some countries and places, citizens must have *ad hoc* licenses to leave their homes for any reason. Citizens are often forbidden from playing outside, e.g., by jogging alone in the park. Citizens are forbidden from gathering in groups larger than ten, and in some cases they are forbidden from visiting friends and family even in small groups. Lockdowns do not merely prohibit large gatherings, such as conferences or concerts, but also prohibit small backyard parties. Most places of work are ordered to close, resulting in mass unemployment.

In this paper, we argue that these restrictions have not been accompanied by the epistemic practices morally required for their adoption or continuation. While in theory, lockdowns can be justified, governments did not meet and have not yet met their justificatory burdens.

This paper will not attempt to assess or determine which suppression mechanisms governments ought to have imposed, either in light of the information they had or have now. We will not argue that less stringent policies were optimal or better justified. Rather, our goal is to explain how government leaders failed and have continued to fail to meet their epistemic duties. We will argue that states relied upon bad data and flawed models, and they

lacked the other kinds of evidence they would need to justify lockdowns. Again, we do not thereby claim that lockdowns were bad policy, nor are we assessing how dangerous COVID-19 is. Instead, we argue that most governments have failed to meet their epistemic duties.

As a partial analogy, imagine the state strongly suspects a person is a dangerous serial killer. Suppose there is indeed some evidence he is. To ensure he does not further endanger the public, they arrest and detain him. Months later, however, he remains in prison, yet the state has not convicted him; in fact, it has barely begun to collect the evidence it needs to demonstrate his guilt. Moreover, suppose we learn that the state has made demonstrable errors in its reasoning in accusing the person of the killings. Here, civil rights lawyers might well complain that the state has not met the epistemic obligations needed to hold the prisoner. This does not mean the lawyers necessarily deny the suspect is a killer. They may not even want him set free. But to justify infringing the suspect's rights, the state needs to be more than factually correct: it needs to have strong epistemic grounds for its claims. For state agents to imprison someone without proper evidence is a severe ethical failing. Note that we are not, in this analogy, claiming that lockdowns are equivalent to imprisonment; our point is simply to provide an example where governments are required to possess a certain level of justification before they may restrict citizens' liberties.

## **2. BASIC LIBERTIES, CONSTITUTIONAL RIGHTS, AND PUBLIC JUSTIFICATION**

Liberal political philosophies regard liberty as the fundamental political value. All citizens possess an extensive sphere of individual liberty. Governments may restrict such liberties only in exceptional cases and upon meeting high justificatory burdens.

Consider John Rawls's theory as an exemplar. Rawls's theory claims that each person is "entitled to a fully adequate scheme of equal basic liberties...compatible with like liberties for all" (2001, 42). "Basic liberty" here is a technical concept, referring to a liberty which may not easily be overridden by concerns for social stability, economic efficiency, economic fairness, or general welfare. While non-basic liberties (such as the right to invest) may be restricted in order to promote other values (such as equity or welfare), basic liberties may not. Any reduction of basic liberties must meet standards of strict scrutiny. While trade-offs among the basic liberties are permitted, trade-offs between the basic liberties and various other social goals generally are not, except perhaps in extreme cases.

Rawls claims that not all liberties are basic. He defends an enumerated list of particular liberal freedoms, including liberty of conscience, freedom of thought, freedom of association, rights of due process and equal protection under the rule of law, freedom of occupation, and a right to own personal property (Rawls 1996; Freeman 2006, 46).

Of course, a major debate within liberalism is which liberties are “basic” in Rawls’s sense. We will not resolve this debate here. We simply remark that lockdowns restrict and reduce citizens’ basic liberties according to any major liberal theory.

The equivalent of the distinction between basic and non-basic liberties appears in most liberal democratic constitutions. For instance, in the United States, political speech is more strongly protected than commercial speech, while the right of free association for religious, political, or social purposes is more strongly protected than commercial freedom of association. For Congress to restrict citizens’ religious expression or to forbid their gathering for friendship or private events, the state must meet a high burden of justification, both in terms of the values it purports to promote through such restrictions, and in terms of the evidence it must give in support of any causal claims (Killion 2019).

Liberals have a variety of grounds for such views. Some appeal to the long run utility of rights (Mill 1859; Schmidtz 2008), others to autonomy, equality, and personhood (Rawls 1971; 1996; Gaus 2011). Others claim rights prevent state overreach (Spaulding 2009).[2]

Note, however, that the liberal position is not that basic liberties can be impeded or reduced only under conditions of strict scrutiny, while all other liberties can be reduced at will. Instead, all liberals believe in a “presumption of liberty” (Feinberg 1984, 9; Benn 1988, 87; Gaus 1996, 162–66; Rawls 2001, 44, 112; Gaus, Courtland, and Schmidtz 2018): Liberty is presumed to be normatively basic. By default, citizens are presumed free to do as they please, and by default, liberty does not need to be justified. However, any restrictions on liberty must be justified by appeal to various public values. Basic liberties can be restricted only if justifications survive strict scrutiny, while restrictions on non-basic liberties still require significant justification. The stronger the imposition and the greater the potential harm it imposes, the stronger the needed justification.

Our discussion here abstracts from these theoretical details in order to appeal to the generic principles that liberals share, and which supposedly undergird modern democratic nation-states. Liberals and constitutional democrats generally believe that (a) all restrictions on freedom must be justified, and (b) freedom cannot easily be overridden or silenced in the name of the common good, though some freedoms are more easily restricted than others. Further, liberals believe that (c) the justifications governments offer for overriding basic rights must be grounded in and appeal to public reasons and information that is appropriately available to all citizens.

### **3. JUSTIFYING RESTRICTIONS IN PRINCIPLE**

Nevertheless, many liberals *do* believe that restrictions on basic liberties, including forced quarantine and social isolation (Parmet and Sinha 2020), are in principle justifiable. Even many libertarians, whose rejection of state interference is especially strong, share this view. For instance, although Robert Nozick argues that the state may not violate rights just because doing so produces better consequences, he suggests that rights may be violated to “avoid catastrophic moral horror” (Nozick 1974, 31). Along similar lines, Jessica Flanigan (2014; 2017) and Jason Brennan (2018) argue that mandatory vaccination can be justified. Although both reject paternalistic grounds for mandatory vaccination, they agree that states may mandate vaccines to prevent citizens from imposing undue risk onto others. Flanigan argues that firing a gun in the air over a crowded place imposes an undue risk of harm upon innocent bystanders (Flanigan 2014, 6). She claims that infected people who venture into crowds behave analogously. Brennan (2018) revises Flanigan’s argument by accounting for problems of uncertainty, collective action, and overdetermination, but reaches a similar conclusion.

Thus, even libertarian liberals, despite their anti-statism, often defend restrictions on basic liberties, particularly in the name of preventing harm. In the case of mandatory vaccination, this argument is made on the grounds that the people have no right to expose others to undue risk of infection. Considering these arguments, then, one might think it trivial to justify COVID-19 lockdowns on the same grounds. Such restrictions on liberty prevent citizens from exposing their neighbors to undue risk—potentially resulting in catastrophic moral horror as infections spread rapidly through the population—and thus they are justified from a liberal point of view.

#### 4. EPISTEMIC CONSTRAINTS ON STATE POWER

Liberals and constitutional democrats agree that under the right conditions, states may restrict or remove people’s liberty, force them to accept medicines, deprive them of their jobs, imprison them, or even kill them. But in order to do these things justifiably, the state must meet certain conditions, including certain *epistemic* conditions. For example, it may not mandate an untested vaccine. It may not imprison a suspected killer without proving his guilt. It may not start a war concerning possible weapons of mass destruction on poor intelligence. It may not place citizens in internment camps on mere suspicion of disloyalty.

Epistemic norms are sometimes also *moral* duties (Chignell 2018). In some cases, individuals or groups have moral duties to collect good evidence, reason carefully about that evidence, engage in proper self-skepticism, and overcome their cognitive biases. This often occurs when one person is the fiduciary of another, when one person exerts significant power and authority over another, or when two people have certain contracts with each other. For instance, parents owe their children duties of care; these duties of care require parents to

reason properly about issues related to their children's welfare. Similarly, a financial advisor owes it to her clients to assess possible investment plans with high levels of competence and rational evaluation.

In recent work, Jason Brennan (2011; 2016) argues that governments have strong epistemic duties when making high stakes decisions. He motivates this idea with the example of a murder trial.

Imagine a defendant is charged with first degree murder. During the trial, both sides present evidence, question witnesses, and make arguments. The defendant will likely be executed or imprisoned for life if found guilty. Suppose the members of jury find him guilty. However, they are ignorant of the facts of the case, decide on the basis of false or pseudoscientific information, lack the cognitive capacity to understand the case, or process the information presented in the trial in irrational and biased ways. Alternatively, suppose they have improper motivations, such as malice toward the defendant, a conflict of interests, or simply want to please the judge and the press with a guilty verdict regardless of the defendant's actual guilt.

If we knew a jury found the defendant guilty for any of these reasons, we would conclude they have acted unjustly. The jurors owe it to the defendant—and to society, as our representatives—to conduct a fair, impartial, and unbiased trial, and to reason in truth-conductive, reliable ways. In this case, we would conclude the jury's decision should be thrown out and the trial conducted again. This judgment is reflected in the laws of many US states, which entitle a defendant to a new trial if he shows his jury had these problems.

We would not excuse the jury's behavior if they claimed they acted on the best information available, but the available information was very bad. For instance, suppose the trial is held three days after capturing the defendant. Because of the lack of time, neither the prosecution nor the defense have much evidence for their side, and the evidence they have is of poor quality. In this case, if the jurors find the defendant guilty, they act wrongly. Saying they acted on the best available information is not sufficient justification. Instead, the evidence must meet an objective rather than relative standard; in this case, there must be no reasonable doubts that the defendant is guilty.

It would not be acceptable for a government to convict a person on the basis of poor evidence, and then collect good evidence later, after the fact. If critics complained about this behavior, it would make little sense for apologists to say, "Sure, everyone admits the government needs better evidence, which thankfully they are now, two months after the conviction, starting to collect." The evidentiary bill comes due before conviction. Even if we

discover later that the defendant was guilty, any liberal or constitutional democrat must nevertheless condemn the state's behavior and demand the state follow pre-established rules of evidence in the future.

Liberals or democrats in the public reason tradition (e.g., Benhabib 2002; Christiano 2010; Eberle 2002; Estlund 2008; Freeman 2009; Gaus 1996; 2003; 2011; Habermas 1995; 1996; Larmore 2008; Rawls 1996; 2001; Tomasi 2001; 2012; Vallier 2018)—now the dominant paradigm in English-language political philosophy—hold that governments are subject to additional constraints. When they impose policies upon citizens, these policies must be justifiable to those citizens in light of certain publicly shared values and publicly available evidence which all reasonable citizens can accept. Governments are generally forbidden from acting on private, inaccessible, or non-public sources of information. They must instead appeal to widely shared values implicit in a democratic conception of personhood, which views everyone as free and equal (Rawls 1996; Gaus 2011). Public reason liberals in particular have reason to avoid claiming that citizens should blindly follow government leaders without demanding a public justification for their decisions.

Note that in using these analogies, we are not claiming that COVID-19 lockdowns are like imprisonment or punishment, though governments' use of the word 'lockdown' does tend to push public rhetoric in that direction. Nor are we arguing that the appropriate remedy here is the same as in the case of a trial. In the case of a trial, if the state fails to meet its epistemic duties, the defendant goes free. We are not arguing that when the state fails to meet its epistemic duties, a quarantine must be immediately ended. Instead, Brennan argues that the point about the capital murder trial generalizes. When governments make high-stakes political decisions, decisions which can greatly harm people, or deprive them of livelihood, property, liberty, or even life, they are morally obligated to make such decisions competently and in good faith. What should happen when the state fails to meet its duties is a separate question that we do not address here. We simply argue that meeting the epistemic duty means relying on good information—not the best information available, but good information, period. The jury example motivates this intuition, but it generalizes to a wide range of political decisions. Below, we will explain why the COVID-19 lockdowns are “high stakes” in the relevant way, though we suspect this point is obvious.

Liberal democrats have good reason to endorse something like this in light of their own principles. They hold that certain liberties are basic and that liberty in general is normatively fundamental. Overriding, silencing, or forfeiting freedom requires that governments meet a strong justificatory burden. Governments must make such decisions using proper epistemic reasoning procedures, on the basis of good information, and while acting in good faith.

The foregoing comments provide the basic normative background of our argument. Appealing to ideas and principles shared within democratic or liberal traditions, we will show why governments have failed to meet the justificatory burdens required to legitimate the COVID-19 lockdowns. First, we will argue that the quality of the data and models used by officials was poor. We will argue that work on the philosophy of science and the reliability of experts gives us further reason to be cautious in deferring to such models. Second, we will argue (though this is far more obvious) that the decisions were extremely high stakes, imposing significant harms and costs upon people everywhere, especially those in extreme poverty. Together, this provides strong evidence that governments violated the Competence Principle and have failed to meet their justificatory burdens. We will not try to draw a precise line at which governments would meet their epistemic obligations to justify the lockdowns. Any precise line would be controversial. Instead, we will argue the information, models, etc., that governments used were sufficiently poor that they fall below any plausible line we might draw.

One might object to this entire line of argument by saying that while imprisoning a defendant is “high stakes,” so is letting him go. In the same way, lockdowns are high stakes—involving mass suppression of freedom of movement and association, serious psychological trauma, and severe economic loss—but refusing to impose lockdowns is also high stakes—as it could lead to serious death. First, as we have emphasized, we do not argue for the analog of “letting the suspect go.” We argue for no general form of remedy to the situation of states failing to meet their epistemic duties when they deprive their citizens of rights. Second, even though it is true that there is a parity of risks, it also misses the point. If one simply rejects the ideals of constitutional democracy or simply rejects liberalism, then the question of whether to impose lockdowns or not becomes a utilitarian issue. At the time lockdowns were imposed, the quality of information in support of any choice was quite poor (as we will explain below), and so from a utilitarian standpoint, it is just as difficult to justify staying open as it is to justify closing things down. But our point here is that constitutional democrats and liberals do not take all options to start on equal footing. They regard freedom as the default from which departures must be justified; the greater the imposition, the stronger the justification needed. While not all readers are liberals or constitutional democrats, these are nevertheless the dominant paradigms in political philosophy and actual political practice in the West.

## **5. PROBLEMS WITH THE SARS-CoV-2 DATA AND THE MODELS**

Cooper/Smith epidemiologist Dylan Green reports the following:

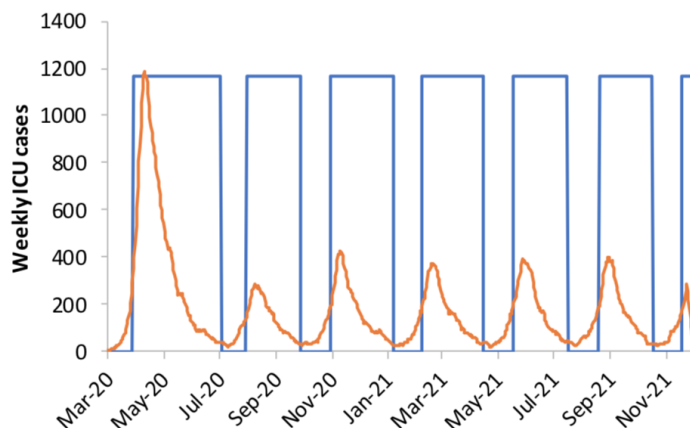


I've been asked to generate modeling results in a matter of weeks (in a disease which I/we know very little about) which I previously would have done over the course of several months, with structured input and validation from collaborators on a disease I have studied for a decade. This ultimately leads to simpler rather than more complicated efforts, as well as difficult decisions in assumptions and parameterization. We do not have the luxury of waiting for better information or improvements in design, even if it takes a matter of days. (Cowen 2020)

When epidemiologists model an emerging epidemic, data are sparse. In constructing their models to make forecasts, they have myriad methodological decisions to make, many of which are unconstrained by data or existing background knowledge.

Consider the Imperial College London (ICL) model, which had significant impact on policy decisions in the UK and US.[3] The model was used to estimate what public interventions would be needed to prevent hospital systems from becoming overwhelmed. The model's primary job was to predict the impact of various policy choices on demand for hospital beds, intensive care unit (ICU) beds, and the like. Thus, the model needed inputs for the expected death rate, hospitalization rate, and ICU admittance rate for each 100,000 people infected. In all, the model employed almost 700 different parameters.

At the beginning of the COVID-19 epidemic, and even now as we write this sentence, these magnitudes were not well estimated. The WHO's early estimates used case rates from China and other early areas of infection. But case rates are directly a product of surveillance /selection bias. When medical professionals predominantly test people who demand care, the resulting data are biased toward more severe results. Not all infected people become sick, and not all sick people need treatment, but the most severely ill people are most likely to seek treatment. Early WHO estimates were extremely high, with fatality rates as high as 3.4% and hospitalization rates well into the double-digit percentages. The correct numbers are still unknown, but early estimates were clearly too high.[4]



**Figure 4: Illustration of adaptive triggering of suppression strategies in GB, for  $R_0=2.2$ , a policy of all four interventions considered, an “on” trigger of 100 ICU cases in a week and an “off” trigger of 50 ICU cases. The policy is in force approximate 2/3 of the time. Only social distancing and school/university closure are triggered; other policies remain in force throughout. Weekly ICU incidence is shown in orange, policy triggering in blue.**

Figure 1. (Ferguson et al. 2020)

The ICL model is a massive extension of so-called “SIR” models. SIR models divide an epidemiological population into three groups: Susceptible, Infected, and Recovered. SIR models excel at explaining, in *retrospect*, why epidemics tend to fit a familiar curve pattern. But to be useful for making policy recommendations, such as closing schools, ordering people in general to stay home, ordering the elderly in particular to stay home, closing restaurants, etc., SIR models must be considerably more complex. Each of the three main groups must be now divided—for example, into age categories, into those that stay at home, go to school, go to work, etc.

Let’s examine the ICL model in further depth. The ICL code creates a hypothetical random population for each country it models. Each individual is assigned to a household and, depending on age, to a school/university or workplace. (The sizes of these are chosen in proportion to their real values in the world.) The model is then simulated in six-hour steps; it determines the probability that each individual gets infected based on where s/he is in the model, and then randomly decides (against a background probability estimate) whether each individual is infected, and what happens to infected individuals (hospitalization, death, etc.).

There are a huge number of decisions behind such models. One must choose and code in a death rate, hospitalization rate, and rate of admittance to intensive care; one must choose a time step (which can have a large impact, since people move around in the world on a diurnal basis, and the time step is a significant fraction of the day), as well as the probability of infection at work, school, or at home.

For example, the ICL model assumes that when people socially distance, their probability of getting infected at home increases by 25%. But why 25%? Why not 35%? In fact, there is no data or research to support any particular choice in the model, since we have few well-established rates for any past virus, let alone rates for the novel SARS-CoV-2 virus. In retrospect, it appears now that SARS-CoV-2 is particularly virulent at home, relative to other places and relative to other viruses (Qian et al. 2020). There was enormous uncertainty concerning nearly every parameter built into the model's coding. Most modeling choices were relatively unconstrained by data or background knowledge; when there was data, it was of poor quality. Our complaint here is not that the ICL model relied upon hundreds of parameters, but that the inputs into these parameters were largely arbitrary and unsupported by evidence.

A single run of the ICL model requires about 20,000 processor hours. It was impossible, on short notice, to explore how varying the (largely arbitrary) parameter values would impact the model's predictions.[5] It was impossible to determine to what extent the model's predictions were robust under varying parameter values. Indeed, now that a cleaned-up version of the model's code is available, it is clear that the ICL model can generate significantly different estimates even with the *same* parameters inputted. In the end, therefore, the outcome of the simulation was highly dependent on the largely unconstrained choices that the modelers had to make, as well as on chance.

In a recent working paper, economists Christopher Avery et al. (2020) identify many other shortcomings of the major models, including the ICL model. These include failing to account for heterogeneity in degree of viral exposure, failing to account for endogenous behavioral changes (such as that people will self-isolate or reduce their contact with others as the disease spreads), a lack of parameters for hospital capacity, and a lack of parameters for underlying comorbidities. The authors complain, as we do, that many of the assumptions in the SIR and related models are *ad hoc* and unsupported by evidence, that the arbitrary choice of parameter values greatly changes the models' predictions, and further that the data fed into these models suffer from heavy selection bias. They conclude that the "each type of model can be reasonably well-calibrated to an initial period of spread of disease, but further assumptions, often necessarily *ad hoc* in nature, are needed to extend either type of model to later phases of an epidemic" (Avery et al. 2020, 13).

It is no wonder, then, that the model performed poorly at anticipating ICU demand, which was at the heart of the policy recommendations that emerged from the model. Recall that the ICL scientists recommended a policy of "maximum suppression"(Ferguson et al. 2020). This was the most draconian set of policies the group imagined. They anticipated that even maximum suppression would at first barely avoid overwhelming the UK's existing ICU and ventilator capacity, and it would then require cycling the economy on and off until a vaccine was

available. Despite less than maximum suppression, this did not occur. It projected, for the US, that unless *maximum suppression measures* were used to “reverse epidemic growth, reducing case numbers to low levels and maintaining that situation indefinitely,” the US would experience over a million deaths (Ferguson et al. 2020). On March 20, 2020, Ferguson told reporter Nicholas Kristof that the US’s “best-case” scenario with moderate social distancing would be 1.1 million deaths (Kristof 2020).

A strong indictment of the ICL model comes from examining what it would have predicted for Sweden, which has not implemented any lockdowns. Of course, ICL never ran their model on Sweden, but the model has few country-specific inputs. A group of epidemiologists based in Sweden, Belgium, and the United States (Gardner et al. 2020, 31) ran a model very closely based on the ICL model[6] using parameters adjusted for Sweden’s population density, demographics, etc. They reported, “Our model for Sweden shows that, under conservative epidemiological parameter estimates, the current Swedish public-health strategy will result in a peak intensive-care load in May that exceeds pre-pandemic capacity by over 40-fold, with a median mortality of 96,000 (95% CI 52,000 to 183,000).” Their best-case estimate, if Sweden used maximal suppression and lockdown techniques, was that Sweden would have over 15,000 deaths by the end of April. Of course, Sweden is not actually suffering from overload of its healthcare system. According to their article, Sweden under its current policies should be crossing 70,000 deaths sometime in the next week. As of this writing on May 19, 2020, Sweden has experienced 3,743 deaths from COVID-19.

It’s unclear what the ultimate death toll will be in the US or the UK. But it is clear that this and other models’ projections of ICU and ventilator demand were overly pessimistic. (See Figure 1 above.) Note, also, that the ICL and most similar models did not make projections for deaths of individuals in nursing homes or other critical care facilities.

Another egregious (though not particularly exceptional) example of modeling failure can be seen in the projection stated by New York State Governor Andrew Cuomo on March 25, 2020, that, unless the state went into severe lockdown, it would need 40,000 ventilators by April 7, but that the best case scenario was a need for 40,000 ventilators by April 14. Here are the actual data according to [covidtracking.com/data/](https://covidtracking.com/data/)

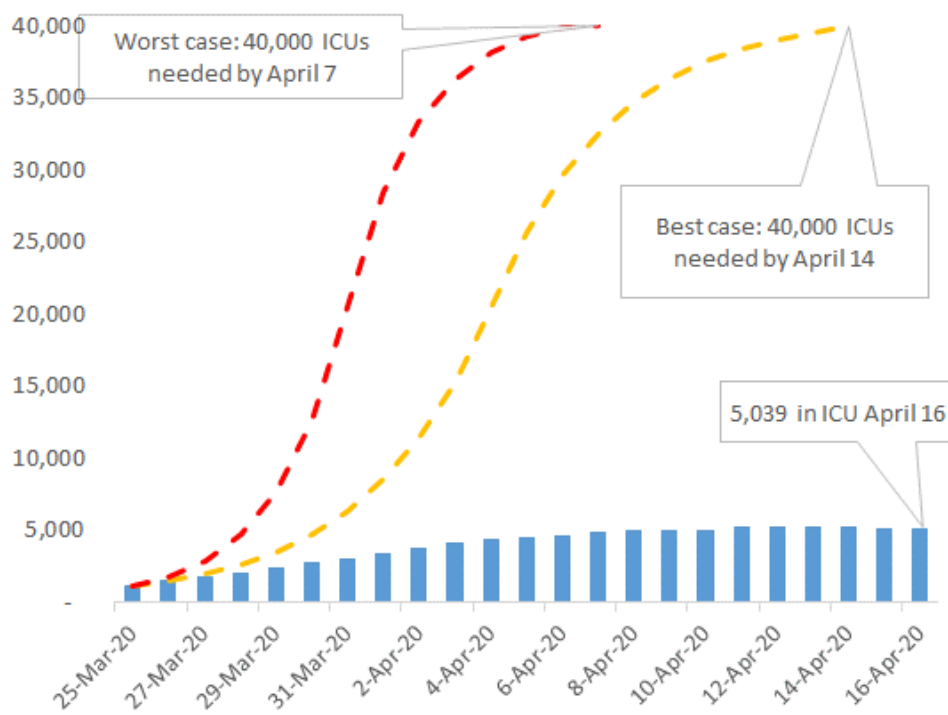


Figure 2. (Adapted from <https://twitter.com/ElonBachman> (<https://twitter.com/ElonBachman>).

Here, Cuomo relied on a regression model of the kind used by the now famous Institute for Health Metrics and Evaluation (IHME). The IHME is a “mixed effects non-linear regression framework” (IHME 2020). It basically takes death, hospitalization, ICU, and ventilator data, as well as the date that particular location has gone on lockdown as inputs, and then fits it to a modified Gaussian curve that looks like the red and yellow lines in Figure 2. The projections of the IHME models of hospitals’ needs, ICU needs, and deaths, for each state, are now legendary for their poor performance and frequent massive updating. These failures have not been limited to New York. For example, consider the IHME’s central projections for how many ICUs the state of Florida would need on April 20, 2020. On the April 7 version of the projection, it was 2,409 units. By April 13, that number had fallen to 763. By the seventeenth, it had fallen again to 354.[7] These were not minor changes, given that Florida was said, at the time when the first projections were released, to have only 1,695 ICU beds available. So, the model predicted on the seventh a large and rapidly approaching shortage, which turned on the thirteenth into a long-delayed shortage, and then finally into a lasting surplus on the seventeenth. As one recent survey put it, “the true number of next day deaths fell outside the IHME prediction [95% confidence] intervals as much as 70% of the time, in comparison to the expected value of 5%” (Marchant et al. 2020). The IHME model has consistently performed far worse than chance, even as the modelers revise it in light of new data.

Given the internal deficiencies of the models being used to justify the policy responses to COVID-19 (such as lockdowns), we might hope that the models themselves (and the policy recommendations stemming from them) would be bolstered by empirical evidence from past

pandemics. However, a literature search reveals there are no published, peer-reviewed papers demonstrating the effectiveness of universal lockdown procedures to combat any epidemic. To be clear, there are papers showing that closing schools reduces flu transmission in children (e.g., Chowell et al. 2014). There many papers demonstrating the effectiveness of centralized quarantines, in which infected individuals are confined in designated state facilities. But we lack empirical evidence that extensive lockdown policies or maximal suppression work *at all*, never mind that they are superior to other, less draconian practices. In *Paediatric Respiratory Review*, Rashid et al. (2015) survey and review eighty major studies examining various kinds of mild to moderate social distancing (though not lockdown) measures imposed in response to the 2009 influenza pandemic. They note that most papers conclude that social distancing measures are “moderately effective,” but at the same time, they find that “overall, the quality of the evidence was quite weak, drawing primarily on observational or simulated data.” Only *one* of the eighty papers used “more established methods” such as quasi-randomized control trials (Rashid et al. 2015).

The best paper we can find defending lockdowns is a working paper by Friedson et al. (2020), but this paper has significant limitations. In particular, it counts drops in deaths five days after California’s closing as evidence that lockdowns work. Since the virus takes longer than that to incubate, this drop could not have been caused by the lockdowns.

Issues like these are not unique to the field of epidemiology. On the contrary, we have strong grounds in general to be skeptical about experts’ predictions on hard problems. For instance, in *Expert Political Judgment*, Philip Tetlock (2005) examined nearly 83,000 predictions made by experts in a variety of fields. He focuses on what the experts themselves consider hard problems rather than easy problems. In general, he finds that on such questions, experts performed poorly, barely better than Berkeley undergraduates. Tetlock’s work warns us against simply “deferring to the science” on hard predictions, since the science in fact shows the scientists are bad at such predictions.

Basic liberties are not to be suspended lightly. Governments must meet high standards of evidence before doing so. We might debate just what the standards need to be to justify lockdowns. However, as the forgoing discussion shows, the actual quality of evidence was quite poor. No plausible theory claims governments may engage in the mass suppression of civil and economic liberty on the basis of poor evidence.

## 6. PROBLEMS WITH THE MODELERS AND POLICYMAKERS

Why did so many expert epidemiologists fail so badly, or rely on speculative parameters within their models? Why did so many liberal democracies massively restrict their citizens’ civil and economic liberties on the basis of poor levels of information? Here, we turn from

critiquing the models to reminding readers of what the literature on the philosophy of science tells us about the modelers themselves (Douglas 2000; 2009; Winsberg 2012; 2018; Parker and Winsberg 2018; Rudner 1953; Hempel 1965). Philosophers of science have long recognized that when scientists face unconstrained modeling decisions, their choices are often strongly influenced by their social and ethical values—as well as the various pressures the scientists are under. Insofar as the way we design our models has a strong effect on which policies the models will tend to make look attractive or unattractive, these underlying choices can play an important role in determining how useful a model is for guiding complex public policy decisions.

By way of illustration, suppose you would like to use a scientific model to help decide which of two policy choices you ought to implement. But in making the model, there are two ways you can proceed. On the first way of designing the model, the first policy option ends up looking attractive. On the second approach, the second policy option looks more attractive. Which model do you go with? What if both approaches seem reasonable on the basis of the limited evidence you have? This kind of dilemma is very common when model builders face methodological choices.

One way of resolving this dilemma is to ask which version of the model aligns the balance of inductive risks in the way that accords with your values. For instance, consider the ICL model and the choice of value for the parameter representing the probability of infection transmission at home while socially isolating. If you assume that the probability of getting infected at home goes up by 25% while socially isolating, this makes social isolation look far more attractive than if you assume that the probability of getting infected at home goes up by 35% while socially isolating. If you think that social isolation is the more prudent policy, because you think that risking losing lives to disease is a more serious risk than risking losses to the economy or to political freedoms, this may be reason enough to choose the former specification. The reader might think this is a small change. And indeed, maybe it is. But a model with almost 700 such unconstrained choices, each of which produces non-linear effects on the model output, creates a highly flexible model.

Alternatively, you might consider what will happen if you choose the *wrong* approach. Imagine that you are an epidemiologist who faces the kind of pressures that Dylan Green describes—asked to instantaneously deliver policy-defining predictions about a disease you know little about, with potentially hundreds of thousands of lives on the line. What are you to do, particularly when you have no independent evidence upon which to determine the correct value of that parameter? Any choice you make will reflect a value decision about the danger of overpredicting deaths vs. the danger of underpredicting deaths. We hope it will not be terribly controversial to say that epidemiologists, faced with Green's pressures, are inclined to avoid *under*predicting rather than overpredicting deaths (see, e.g., Green and

Farahany 2014). They will be inclined to recommend policy choices that minimize the risk of death as opposed to, say, minimizing the chances of overreaction. Moreover, they will focus primarily on reducing the risk of death *by disease*—given that this is the subject of their expertise—and not on potential collateral damage resulting, for example, from hunger and dislocation that might result from an overly aggressive policy choice. The nature of the work they do directs their attention more to the damage caused by viruses like COVID-19 than to damage done by economic loss or reduction of political freedom. The consequences to themselves, their careers, their discipline, their own sense of moral culpability will be much larger if they underpredict rather than overpredict death by disease. It is the primary social role and responsibility of epidemiologists to focus on avoiding disease. It is their role to make their best guess when information is lacking. In contrast, it is the social role and responsibility of policymakers, and our political representatives, to make policy decisions that reflect the whole spectrum of our moral values. It is their role and responsibility to make the hard decisions and to take uncertainty and scientific ignorance into account.

Given these influences, it is unsurprising to find a great deal of evidence from past experiences that epidemiologists favor a balance of inductive risks that leads to overforecasting the severity of diseases. The infection fatality rate of Mad Cow Disease, H1N1, H5N1, H7N9, and MERS all were considerably lower than what epidemiologists predicted. And while SARS 2002 actually ended up being twice as fatal as originally predicted, its infectious spread was tiny compared to what they predicted (Yu et al. 2013; Wang, Parides, and Palese 2012; Lipsitch et al. 2015; Cauchemez et al. 2014). Repeated cases of overprediction can even be diagnosed in single individuals. For example, Neil Ferguson, the famous epidemiologist behind the ICL model, has often overestimated disease dangers. To cite one example, he claimed in a 2001 *New York Times* article that it would be “unjustifiably optimistic” to think Mad Cow Disease would kill only a few thousand people; his group claimed it would kill around 136,000 (Blakeslee 2001). So far, the actual number of deaths, after 20 years, is under 200. In 2005, he told the BBC that the deaths from bird flu could be between 5,000,000 and 150,000,000; the actual number was around 300 (Sturcke 2005).

These reflections should give us pause in endorsing restrictions on citizens’ basic liberties that are rooted *solely* in expert policy recommendations during crises. Government leaders may claim that their actions are justified purely in deference to expert recommendations regarding SARS-CoV-2. But we have strong empirical evidence that experts in most fields are systematically awful at making predictions in difficult situations that require them to predict the effects of untried policy measures on a brand new, poorly studied, and poorly understood problem. As a general matter, the demand that we simply defer to what scientists tell us is based on a largely falsified theory of scientific expertise.



Even so, it might be appropriate, at the beginning of a potential catastrophe, for policymakers to adopt a very cautious stance. In doing so, it might be excusable to accept, provisionally, the extremely cautious predictions of epidemiologists, despite the problems in their data and models. It might be fine to act first and ask questions later. It should be stressed that even this concession is questionable—after all, governments must have strong and solid evidence, rather than poor evidence, that a potential disaster of a certain size is occurring in order to justify their behavior. Historically, “we must avert disaster” has been the main excuse for government overreach. But even so, as Nozick (1974) rightly observes, the potential to avert “catastrophic moral horror” through speedy action can license many responses that would normally go beyond the pale.

Regardless, this kind of justification will not do beyond the very short term. Even in the direst emergencies when immediate action is required, we expect policymakers to supply the needed justification shortly thereafter, to rely upon established standards of evidence, to rely on high quality evidence, and to show their work in which they balance various social and ethical values against each other.

For all the reasons outlined above, it will not do, in more than the very short run, for policy makers to declare, as Governor Newsom of California has done, that they are simply “following the science” in responding to a crisis like the COVID-19 pandemic. In the interest of transparency, they should make it clear that they are adopting precautionary reasoning and inform their constituents what the plan is to quickly move to a more substantive cost-benefit analysis—and explain what values are to undergird that analysis. But states are under more substantive obligations as well. They should begin collecting the data needed to properly assess their strategies and determine whether continued restrictions of citizens’ basic liberties are justified. The longer they neglect to take measures like these, the more their impositions look incompatible with the foundational commitments of liberalism.

Making decisions under uncertainty is hard. It is likely impossible to avoid over- or undervaluing various considerations depending on social mood and other similar factors. But one thing that can help mitigate the influence of individual scientists’ values on the advice they offer to policy makers is to follow established methodological standards.

Policy makers have a moral obligation, as soon as they are even considering restricting the political and economic rights of citizens, to immediately begin gathering the best and most systematic data available. We do not try suspected criminals in the absence of standards of how to evaluate DNA or fingerprint evidence. Likewise, we should not be reacting to fears of pandemics by limiting people’s rights in the absence of clear standards regarding how to collect and evaluate evidence of the severity of the threat we face from such a pandemic. In

responding to the 2020 SARS-CoV-2 pandemic, however, Western governments have largely failed to put such standards in place, or even to collect evidence in a minimally adequate way.

Consider that it quickly became clear that SARS-CoV-2 case counts undercount actual infections. To some extent, this undercounting was inevitable: we could have easily predicted that some amount of infection would be asymptomatic, and the widespread lack of adequate testing capacity meant that tests could not be administered to all suspected victims. But it is indisputable that undercounting went beyond these factors. In every case where there have been “natural experiments” with SARS-CoV-2 infections—on cruise ships, navy ships, among women giving birth in hospitals, in testing people experiencing homelessness, prisons, etc.—it has been made clear that infection is much more widespread than case counts suggest, although we do not know quite by how much.

One very promising avenue for filling this hole is antibody serological testing. If you can test a representative sample of a population of people with such tests, and you know their rate of false positives and false negatives, you can very easily, with a reasonably large sample, get a very good picture of how much infection there is. But very little of this testing has taken place, and what testing has been done has failed to appease skeptics who have legitimate worries about how representative the sampling is. As a general matter, we know that small  $n$  studies will be biased toward false positives. Worse, we still have no clear sense of what the rate of false positives and false negatives of these tests are.

Yet, these problems would be relatively trivial for well-organized policy makers to fix. Around the world, governments have imposed unprecedented and dramatic restrictions on citizens' civil and economic freedom. For instance, at least 30 million Americans have so far lost their jobs. Governments could easily have opened a few blood banks storing SARS-CoV-2-free blood and run 5000 tests on these antibody kits to determine their rate of false positives. They could have done extensive *representative* sampling of citizens in various locations around the country and sample the rate of infection using both blood testing and PCR testing. But governments have not done this, even now. They should have done much of this testing beforehand. The balance of civic considerations here makes little sense. It is as if generals decided to invade a foreign shore but chose not to acquire aerial photographs of the enemy's defenses.

We have been criticizing the major public models and data which various world leaders reference as justifying their actions. We admit it is possible government leaders have private, classified, and otherwise non-public data and models of higher quality which would justify their actions. Nevertheless, we remind readers that in liberal, democratic, constitutional governments, acting on such private information and refusal to disclose such information is

prohibited except in truly exceptional circumstances. We can understand not disclosing military secrets, but the SARS-CoV-2 is not a strategic actor which would take advantage of classified information. Governments must disclose their best information to the public.

Before moving on, it should be emphasized that while although we have criticized the quality of the COVID-19 data and the models which policymakers have used—and while we criticize policymakers' deference to such models—our core contention is not that the danger of SARS-CoV-2 has been overstated, or that lockdowns were the wrong policy to adopt. Nor is our aim to establish what the optimal suppression strategy would have been in light of what information governments had. (Doing so would require an extensive cost-benefit analysis, which would take another paper's worth of work at least.) Our concern is more procedural in nature. Whether or not governments have encountered correct information or adopted the right policies, the process by which they have made their determinations cannot be reconciled with basic liberal commitments. States must meet strong epistemic standards if they are to justifiably restrict their citizens' basic liberties, and they have failed to do this. This failure cannot be dismissed by saying that the governments got it right in the end. By analogy, if we criticize a colleague's data and evidence, her model, and her reasoning process, we are not thereby claiming to know the paper's conclusion is false. A poorly researched paper could still have a correct conclusion. But without performing the appropriate epistemic work, our colleague would still be unjustified in *drawing* that conclusion, and we would be justified in criticizing her right to assert it.

Academics frequently make bold claims in journals or public opinion pieces, and the bolder an academic's claims the more likely he will receive attention for his work. For academics, there are often no negative consequences for being wrong, even horribly wrong. But for policymakers, especially chief executives, the story is far different. State governors, mayors, and other chief executives can order their citizens to stay in their homes, to close their businesses, and otherwise make themselves dependent on the state for their survival because all of these orders can be backed up by overwhelming force. Even when policymakers do not issue formal orders but provide strong suggestions for how citizens should behave, these suggestions are taken seriously by most people and impact how they choose to live their lives.

## 7. THE HIGH STAKES

As of April 20, 2020, governors of 42 US states have issued stay-at-home orders to slow down the spread of COVID-19 (Mervosh, Lu, and Swales 2020). Political leaders around the world implemented similar measures. Almost without exception, political leaders claim such drastic measures are necessary because people will otherwise die. But the lockdown has caused and will cause deaths as well—along with a range of other maladies. Deaths

connected to layoffs that are the result of COVID-19 might already be in the same ballpark as the number of deaths caused by the virus itself (Cordle 2020), and, over the long-term, we are likely to see more deaths and a decreased life expectancy connected to rising unemployment (Forster 2018). Reports of child abuse and domestic violence have both increased significantly since the stay-at-home orders have taken effect (Taub 2020; Da Silva 2020). Hospitals are laying off staff and closing from a lack of revenue as most procedures are postponed. Deaths from untreated cancer will increase in the long-run. Many businesses deemed “nonessential” will also die because they have been forced to close, even if there was no good reason to close them—hobby shops, specialty food stores, cobblers and tailors, art studios, various factories. We do not equate the death of a business with a death of a person, of course. But for many business-owners, their businesses are not merely the means to support their families but also life projects from which they derive meaning and fulfillment. Further, mass job losses and workplace closures will have serious negative effects on citizens’ welfare. These decisions should not be taken lightly, especially as we do not know how to model the long-term economic effects of shutdowns.

The stakes are higher in poorer places. UN officials complain that the COVID-19 shutdowns may lead to “famines of biblical proportions” (McNamara 2020). Of course, such dramatic claims partnered with requests for money should be taken with a grain of salt. (After all, the same dynamics that led epidemiologists to overpredict the impacts of SARS-CoV-2 hold for the UN’s forecasts.) Nevertheless, the point remains that putting, say, 30 million relatively rich Americans out of work is one thing; putting those in extreme poverty out of work (while also possibly shutting down food supply chains) is another.

As we have emphasized throughout this paper, these mandates also impact civil liberties. Evacuation and shelter-in-place orders normally are issued when there’s an immediate threat that is visible or otherwise easily recognized by everyone in the community—natural disasters, active shooters, etc. For the COVID-19 pandemic, there were far more unknowns than knowns about the level of the danger when shutdown orders were given. Citizens will tolerate government restrictions to basic civil liberties from immediate, known dangers. But when we allow these restrictions even under circumstances where there are so many unknowns, we create conditions susceptible to abuse and oppression, especially for members of historically disadvantaged groups. And we are seeing this situation play out now. Expanding the conditions under which the state is willing to impinge on civil liberties requires us to broaden the conditions under which agents of the state are directed to use force against citizens who are not complying with these mandates. In the US, this will often create situations in which citizens are subjected to police interventions. Invariably, some of these end in the death of citizens who are unarmed or otherwise doing nothing wrong. These encounters are especially dangerous for members of historically disadvantaged groups.

Initial data surrounding the enforcement of COVID-19 orders have shown that these orders have been disproportionately enforced against minority citizens. In New York City, nine out of ten people arrested for COVID-19-related issues have been Black or Hispanic (Associated Press 2020). In Ohio, Black Americans were four times more likely to be charged with violating stay-at-home orders than White Americans (Kaplan and Hardy 2020), even though in Ohio White Americans make up 79% of the population while Black Americans make up only 12% (State of Ohio 2019). As more arrest data starts to trickle out in the coming weeks and months, similar data is likely to come out from cities across the US.

It's clear that lockdown orders are high-stakes decisions which significantly harm certain people, impede their liberties, and deprive them of their livelihoods. They reduce people's freedom to work, freedom to associate, and freedom of movement. To what degree they impede basic vs. non-basic liberties will vary from liberal theory to liberal theory. Our point here is simply that these are high-stakes decisions, and thus subject to the epistemic considerations we defended above.

## 8. SUMMARY AND CONCLUSION

Government officials must meet certain evidentiary standards before they detain someone. They must meet stricter standards before they arrest them. They must meet stricter standards to hold that person in prison before trial. They must meet even stricter standards to convict that person and imprison them over the long term. Even if one thinks a particular suspect is in fact guilty, it is nevertheless crucial in the name of preserving the rule of law and protecting constitutional rights to hold the government accountable if it fails to meet its epistemic duties. Likewise, in cases of such failure, it is important to demand better behavior in the future. Emergencies and dangers are often pretexts for government overreach and abuses of power, and it is precisely when the stakes are highest that government officials must use the best possible epistemic practices.

This paper offers a general indictment of government leaders across the world, though the specifics vary from leader to leader. The models and data used in support of lockdowns were poor. There was not sufficient evidence to justify lockdowns over other less restrictive policies. Governments did not and have not yet collected the data needed to continue their practices. Even if aggressive actions were initially excusable in the name of precaution, such pretexts cannot be sustained now that governments have broadly failed to remedy the deficiencies in their epistemic positions. Even if governments had acted on the *best available evidence* at the time—a highly controversial claim—nevertheless, the information and evidence available was objectively poor, as we argued above. To suppress liberty, they must act on sufficiently *good* information, not merely the best available information.

Again, we are not thereby making any claims about which suppression policies governments should have implemented in the short or longer term. We claim only that governments have systematically failed to meet their epistemic obligations in this crisis and that, for this reason, their actions cannot be reconciled with the values of a free society.

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[1] Authors' names appear in random order.

[2] See also *In re Winship*, 397 U.S. 358 (1970).

[3] See (Ferguson et al. 2020). See also (Lemoine 2020) on which we draw heavily for this section.

[4] In places where testing is extensive, even case fatality rates are lower than this. There is much debate about various serological testing, but little disagreement that it indicates an upper bound of at most 1%.

[5] In climate science this is called running a “perturbed physics ensemble” and it plays a central role in estimating model forecast uncertainty (Winsberg 2018).

[6] “We employed an individual agent-based model based on work by Ferguson et al. Individual-based models are increasingly used to model epidemic spread with explicit representation of demographic and spatial factors such as population distribution, workplace data, school data, and mobility” (Gardner et al. 2020, 8).

[7] Source <http://www.healthdata.org/covid/data-downloads> (<http://www.healthdata.org/covid/data-downloads>). This is not even a tiny bit cherry picked. We picked Florida because the author who researched this lives in Florida and the date for its humorous overtones. Any other state and date could have revealed a similar pattern.

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