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The Unintended Health Consequences of Lockdown

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The World Food Program estimates that 265 million people worldwide could face hunger and starvation due to lockdown-related disruptions in the food supply. Business writer Tom Keane suggests, based on a study linking death rates to unemployment, that pandemic-related job losses in the U.S. alone could translate to an extra 815,000 deaths over the next 10 to 17 years.

The current COVID-19 pandemic has caused a flurry of new guidelines and mandates in order to minimize cases and deaths from the disease. These policies have been in place for up to nine months so far in many areas, causing economic, social, and psychological distress of a type most living people haven't before experienced. This raises the question, at what point do policies designed to prevent death from disease become deadly themselves? In other words, how do we respond to a deadly disease without causing even more harm? The World Health Organization and United Nations agree that this will not be our last global pandemic, and we need to be prepared for the next one.[i] The successful – and unsuccessful – aspects of our response to COVID-19 should inform how policymakers address future pandemics.

The most visible and intrusive policy responses to COVID-19 have been mandatory stay-at-home orders and orders limiting gatherings in businesses, homes, places of worship, and outdoor settings. These policies have colloquially been referred to as lockdowns. Unless we are able to get more and better data on the consequences of mandatory lockdowns, we will be no further in the next pandemic toward optimal policies. In this paper, we review the impacts of the COVID-19 lockdowns in the US, and we find that a "health localism" approach is a best practice to guide lockdown policies in the event of future pandemics.

Unintended Consequences

Lockdowns are not quarantines; quarantines keep sick people away from well people. By lockdowns we mean "a temporary condition imposed by governmental authorities (as during the outbreak of an epidemic disease) in which all people are required to stay in their homes and refrain from or limit activities outside the home involving public contact (such as dining out or attending large gatherings)."[ii] Basically, we are separating everyone from everyone.

During the current Covid-19 pandemic, reports of unintended consequences from lockdowns are beginning to trickle out. Although there are sporadic descriptions of income losses and objections to restrictions on liberty, there has been no systematic analysis of if or when a lockdown could increase overall health risks.

Obviously, there are many different versions of lockdowns across the U.S.[iii] There are also different levels of enforcement with some police stating that they have higher priorities than sending people back to their homes and others pulling solo surfers off of their boards.[iv] At least two California sheriffs announced in November and December that they will not enforce lockdown restrictions, with another two saying they will rely on voluntary cooperation with the restrictions.[v]

Lockdowns can raise health risks, although unintentionally, and those risks are not always readily intuitive. In fact, in some cases imagination is required to identify these types of risks. These "unintended consequences" are responses to private or government decisions that "always have effects that are unanticipated or unintended."[vi] They are often not taken into account when decision makers, or those advising them, are not willing, or trained to think about responses to decisions other than those that satisfy their policy goal. Some examples of unintended consequences will illustrate unplanned problems that are difficult, but not impossible, to imagine.

Rather than invoking Newton's Third Law, "for every action, there is an equal and opposite reaction," the principle for unintended consequences should be called *The Law of "Whac-a-Mole*." This is an arcade game where, every time you hit a pop-up mole with a mallet, another one emerges. This happens frequently when we try to control risks.

In their 1997 book, *Risk vs. Risk*, John Graham and Jon Wiener call the pop-up risks "countervailing risks," meaning that as one risk decreases, another one increases. For example, when the insecticide DDT was eliminated, other toxic pesticides were used in its place. Some were also less effective, resulting in an increase in malaria.[vii]

The Food and Drug Administration faced problems of produce coming from Mexico that was contaminated; much of it with pathogens from feces. From in-person interviews with Mexican field workers, FDA scientists determined that the workers would deliberately defecate in the fields because they knew the owners did not want them to – it could affect sales. They confessed to the American interviewers that they did it because they were being beaten by the owners. Beating workers led to contaminated produce, an unintended consequence.

In another instance, FDA's attempt to make infant formula safer would have raised the costs of infant formula because of new regulations. But doing so would raise prices causing less well-off mothers to extend the infant formula by adding water. Adding additional water dilutes the essential nutrients that are carefully calculated for infants, leading to much greater harm than anything the regulations addressed.[viii]

An example more to the point occurs in the book *Factfulness*, the Swedish physician Hans Rosling describes his work on the east coast of Africa in the port city of Nacala, Mozambique.[ix] He had been trying to diagnose patients with paralyzed legs and

blindness. Unsure whether the disease was infectious, the mayor of the small town wanted to prevent it from reaching the city. He consulted with Hans who agreed that a lockdown must be put in effect by blocking the roads leading to the city. When 20 women and children could not get to the city to sell their wares because the road was blocked, they loaded up small boats. The overloaded boats capsized, and they all drowned.[1]

Two final regulatory examples of unintended consequences should have been easier to anticipate. The first is activists warning about the dangers of animal fats in the 1980s. Manufacturers responded by replacing them with hydrogenized vegetable fats, i.e., trans fatty acids.[x] Transfats are worse than animal fats for health.

A similar thing happened with Corporate Average Fuel Economy (CAFE) rules. To meet the higher mileage targets, manufacturers produced smaller, lighter cars that are not as safe.[xi] When DOT economists were asked by one of the authors why they did not look at the higher risks of smaller and lighter cars likely to be produced due to Corporate Average Fuel Economy rules, they replied, "no one asked for it."[xii]

Many of these types of unintended consequences are difficult to know in advance but, making matters worse, scientists or other decision makers are often under intense political pressure to decide quickly. Under these circumstances, they are often unwilling to think about or even hear about unintended consequences. This is referred to by sociologist Robert K. Merton, who, in 1936, coined the term 'unintended consequences' as the "'imperious immediacy of interest,…where the actor's paramount concern with the foreseen immediate consequences excludes the consideration of further or other consequences of the same act."[xiii]

We are seeing similarly unintended, yet mostly foreseeable, consequences with current COVID -19 lockdowns. Cases and deaths from coronavirus are easier to see and count, but morbidity and deaths from loss of income or lack of social interaction and other changed behavior do not appear to have been taken into account.

<u>Health Localism</u>

The US has seen a variety of responses to the COVID-19 pandemic including state responses that have varied widely.

[1] It turns out that the people were not suffering from an infectious disease but had been eating unprocessed casava root, which is poisonous if eaten raw. While Dr. Rosling and the mayor could not be faulted for not being sure about the cause of the symptoms, it may have been possible to ask the villagers about the potential consequences of the lockdown.

California and Texas have been polar in their COVID-19 responses. Both states and their governors have received criticism for their responses; Texas for being too lax and California for being too severe.

California has been one of the strictest states in its COVID-19 response. The governor issued an indefinite stay-at-home order in March. It saw a partial reopening that began in May, though, as of December 3, about 85% of its residents are still under a stay-at-home order that continues through the holidays. The state has issued a universal masking guidance and many businesses have been forced to cease functioning under the governor's orders. Schools have been closed since April.

Texas has imposed fewer restrictions, and has imposed those restrictions for shorter periods. It also had a stay-at-home protocol from March through the end of April. Schools closed from April through the end of the 2019-20 school year. It restricted business operations, though allowed businesses to resume at least 50% capacity operations on June 3 before tightening restrictions again in response to a spike in cases following the relaxing of restrictions. As of October, most businesses are able to operate at 75% capacity, with some operating with no restrictions. In-person K-12 instruction was allowed to resume for the 2020-21 school year, though some school districts chose to adopt distance learning or distance learning options for at least part of the school year.

To be sure, California and Texas have different demographics and challenges. For example, California has a larger dense population area, as well as denser cities. The states do have similarities, though. Both are home to three of the top ten US cities by population. Both are agriculture-dependent. Both have large at-risk populations due to their large minority populations, large number of elderly residents, and higher-than-average poverty rates.

The two states saw similar COVID-19 rates despite their different responses, as shown in Figure 1. Though the rates per million were fairly similar, the small differences add up over the course of the pandemic to substantial differences in magnitude of cases per million and deaths per million, as shown in Figure 2.

Figure 1: COVID-19 Cases per Million in Texas and California (7 day moving average)

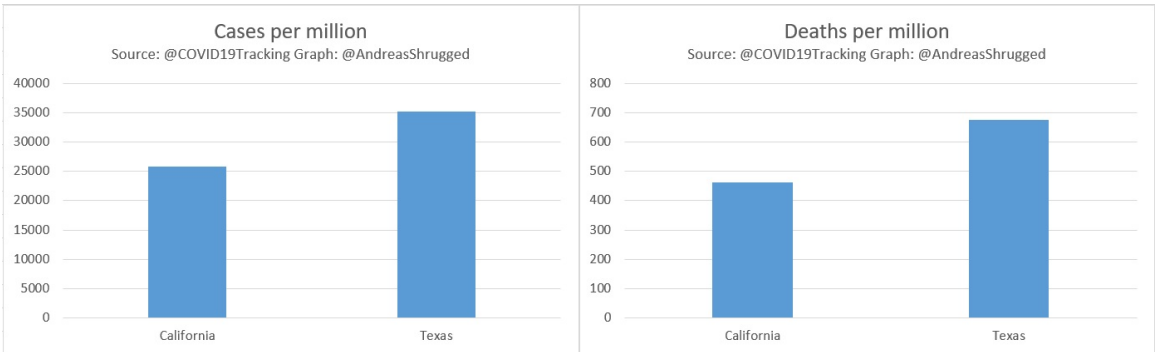
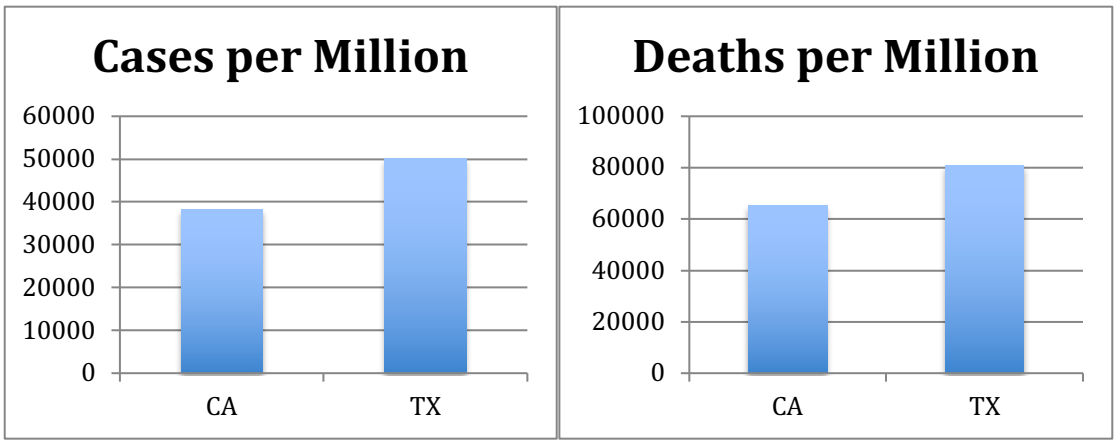


Figure 2: Cases and Deaths Per Million in California and Texas



Source: The COVID Tracking Project at *The Atlantic*[xiv]

Allowing states and localities to customize their COVID-19 responses allows us to look back and determine policies that were more or less effective. Seeing two opposing policies in action gives real, though imperfect counterfactuals for comparison. If the federal government had issued a blanket policy that did not allow for customization at state and local levels, it would be very difficult to parse out the impact of different policies.

Examining different policies also allows us to view the impact of policies holistically. Seeing the impact in economic, social, and psychological parameters gives context to the risk tradeoffs of a given policy. In a world of constraints, understanding tradeoffs allows us to make informed decisions, even when those decisions are difficult.

In the United States, the federal role is to provide guidance, with states having the primary role. Some state courts have overturned local lockdowns, e.g., Wisconsin.[xv] In South Carolina, Charleston and Columbia mayors issued stay-at-home orders

prior to the governor doing so and was challenged by the Attorney General of South Carolina.[xvi]

We believe that a "health localism" approach is the most effective policy for minimizing target pandemics and their unintended consequences. We define health localism as allowing the lowest level policymakers, where the populations are reasonably separate, to implement – or not –coercive policies. Mandates should be reserved for the local level, whereas guidelines are typically more appropriate at the state and federal levels.

Local policymakers are better able to discern the variability of their population's susceptibility to both target viruses and the unintended consequences of lockdowns in smaller populations. They will also have better information on how likely their constituents are to follow orders and how best to enforce those orders. They were also be more familiar with the underlying medical and other supporting facilities for the different risks.

Health localism could be a single policy affecting an entire geographic population or allowable activities or health conditions within a geographic location. The choice of geographical unit affected should be largely driven by the characteristics of where people routinely interact with one another.

One advantage of this approach is that it allows people to vote with their feet more easily, particularly if a lockdown is expected to last a long time.

Health localism also allows autonomy for businesses. Each supplier, public or private, must make choices about the types of risk their facility will allow and make decisions about whether to be open or shut, to have masks, to have social distancing, or have limitations on health conditions (e.g., customer's temperature). Where allowed by local policymakers, further restrictions by businesses must be viewed as a property right. In this, non-compliance could be viewed as trespassing. Businesses will weight their penchant for risk with their competitor's restrictions and allowances.

The decisions by employees are also driven by maximizing their income and minimizing their risks. This is exactly what is currently done in normal private markets where some people accept higher risks for higher pay. Similarly, each employee must factor in their own underlying health status and quality of health care, which will vary.

One way to help open other facilities such as parks, recreation facilities, and government buildings, could be to allow some to open so that those at lower risk can self-select to use them. A similar solution could be used for schools with some open, some on-line, and some socially distanced with masks.

This approach is largely supportive of the Global Outbreak Alert and Response Network (GOARN) who suggest that "Lockdowns and border closures are not a desirable long-term strategy," and they are supportive of "local ownership of outbreak control measures."[xvii]

A few suggestions for how larger governments should be involved comes from the Ayn Rand Institute.

> "The proper goal of government in an infectious disease pandemic, (therefore,) is neither *coercively* to save every life it can at all cost nor *coercively* to balance lives and livelihoods and "flatten the curve." *The proper goal (remains as previously defined) is to preserve each individual's freedom to think and act by removing the threat posed by carriers of the disease. If it is unable to test, isolate and track carriers, it doesn't acquire a new goal or new powers."*[xviii]

The above author also suggests that governments should "identify and eliminate the governmental controls that were preventing swift action on the part of private actors, from the controls prohibiting private laboratories from developing tests to the controls interfering with companies' ability to produce drugs, masks, hand sanitizers and physical barriers like plastic dividers. Lifting these controls would have made it easier for private actors to take effective countermeasures early in the pandemic."[xix]

Health localism allows for, ideally, nuanced understanding of a locality's characteristics and movement patterns to impact its pandemic response. A study in *Nature* modeling Sars-COV-19 spread using cell phone location data found that a "minority of POIs [Points of Interaction] account for the majority of the predicted infections... for example, in the Chicago metro area, 10% of POIs accounted for 85% of the predicted infections at the POIs." The study goes on to find that "reducing the maximum occupancy substantially reduced the risk without sharply reducing overall mobility: capping at 20% of the maximum occupancy in the Chicago metro area reduced the predicted number of new infections by more than 80% but only lost 42% of overall visits."[xx] Similar nonlinear response was found in other metro areas.

With the majority of disease spread occurring at few locations, decision makers with local knowledge will be most effective at tailoring restrictions. Local knowledge will allow for mitigation from the highest-impact points of interaction while minimizing negative impacts such as business closures, job losses, and inconvenience.

<u>Benefits of U.S. Lockdowns</u>

The original purpose of lockdowns was not just to decrease the cases and deaths but also to ensure that hospitals would not be overwhelmed, i.e., to flatten the curve. Early evidence from some countries show that this was effective although it was not clear that it always worked in the United States.[xxi] Alternatively, a subsequent report found that the combined effect of closing restaurants, bans on large gatherings and sheltering-in-place, all part of lockdowns, found evidence that flattening the curve worked."[xxii]

The COVID-19 death rate has decreased since it entered the US, but we now know that survivors can see long-lasting effects. Reports from the U.S. show that as many as 1 in 3 patients who have recovered from COVID-19 could have neurological or psychological after-effects including headache, dizziness and lingering loss of smell or taste, mood disorders and cognitive impairment.[xxiii] Others report include muscle weakness and nerve damage - making walking impossible.[xxiv] Doctors have also reported lasting damage to hearts, kidneys, and liver from inflammation and blood clotting. One doctor from the University of Maryland School of Medicine suggests that between 30% and 50% who have been infected will have a mental health issue such anxiety or depression but also fatigue or sleep issues.[xxv] Fewer infections due to lockdown procedures has led to fewer Americans with lingering conditions.

In addition to prevention of illnesses, there are positive environmental effects of lockdowns. With fewer people driving, pollution has gone down and many people are enjoying working from home. In fact, the average American normally spends 225 hours commuting per year with many having a one-way commute of more than 60 minutes.[xxvi] Although weight has gone up, some have found more time to exercise and cook at home more.[xxvii]

The chart below outlines the benefits of lockdowns.

Table 1: Benefits from Lockdowns

Lockdown Benefits	Evidence
Less pollution	25% reduction in NO_2 and significant reduction in $PM_{2.5}$ in urban counties and those with non-essential business closures[xxviii]
Health benefits from increased exercise and home cooking	Qualitative
Fewer cases, hospitalizations and deaths from COVID-19.	Possibly 60 million cases[xxix] Currently: CDC - (Dec 8, 2020)[xxx] 14, 636, 914 cases 281,253 Deaths

Fewer cases of influenza and other contagious diseases	CDC Down from 14.9% positive to 2.1%
Fewer chronic sequelae including fatigue, dyspnea, chest pain, joint pain, cough and other from COVID-19 (From an Italian Study in JAMA[xxxi]	Qualitative
Fewer chronic sequelae including encephalitis, GBS, Reye's syndrome or Parkinsonian symptoms from flu[xxxii]	Qualitative

The number of cases of COVID-19 is staggering but there is a tremendous amount of uncertainty in both the case and death counts. In one instance, a hospital reported a mistake of their "positivity rate"[2] being 9.4%, not 98% An analysis from the state of Florida found that the rate of infections for the state were overstated by 30%.[xxxiii] In June 2020, the Centers for Disease Control said that the infection rate may be 10 times higher than reported.[xxxiv] David Katz reported that the official tally in September of 6.5 million cases is not just wrong, "but absurdly wrong," and it's more likely to be 65 million cases Americans (1 in 5).[xxxv]

A huge cohort of people who have died from coronavirus also had underlying conditions. The most common underlying conditions are heart disease (32 percent), diabetes (30 percent) and chronic lung disease."[xxxvi] Deaths among those with underlying conditions were 12 times higher than for those without. It is possible, although highly uncertain, to predict that some of those deaths would have occurred because of the underlying condition with or without the virus infection. Where this happens, the death count from coronavirus will be an overestimate. Of course, where COVID-19 was missed, an underestimate is also possible.

Making the case for the benefits of lockdowns is made more difficult because even when laws are the same, there are different levels of enforcement and compliance.[xxxvii] While comparison, such as Texas and California above are useful, we must acknowledge the uncertainty in those numbers.

Some remediation steps, such as wearing masks, goggles, social distancing, not vacationing, avoiding indoor gatherings other than with immediate family, washing hands frequently, not sharing personal items, avoiding touching your face,

[2] A high positivity rate suggests that there has been rapid transmission of the virus meaning more testing should be done and there should be no relaxation of restrictions.

disinfecting surfaces in your house and routinely monitoring your health have merit, but lockdowns produce the most impactful countervailing risks.

Unintended Harms of U.S. Lockdowns

During the period from early February to December when the U.S. began to implement lockdowns, there were negative consequences. The discussions below reflect the author's searching through print, on-line and other media, but they do not constitute a systematic review.

The unintended consequences fall generally into five categories: lack of care, isolation, wealth/health loss, psychological harm, and harm to children.

Lack of care

Some Americans have not been able or willing to seek necessary medical and dental care during the lockdowns. It is not clear whether fear or actual lockdowns prevent people from seeking medical care. Certainly, fear plays a big role in making people stay home[xxxviii] but requiring lockdowns may also cause people to be even more fearful. One issue may be fear of contracting the virus in a doctor's office or hospital.[xxxix]

Many health care procedures have been canceled or postponed due to the pandemic. According to the Ambulatory Surgery Center Association, the US Surgeon General on March 13 issued guidance to avoid "non-essential adult elective surgery and medical and surgical procedures, including all dental procedures."[xl] Following that guidance, at least 36 states and the District of Columbia issued orders delaying or canceling elective procedures.[xli] Elective procedures as a category includes serious, necessary treatments such as some cancer treatments. Postponing them can cause a tangible decrease in health and quality of life. Indeed, some health systems that had restarted elective procedures are postponing them again in advance of an expected surge from the holiday season.[xlii]

Because the number of people being treated for severe heart attacks dropped by 40% in March and April, there are likely to be people who have left heart disease untreated.[xliii] In addition, 45.5% of adults in families who have reduced or lost income avoided going in for medical care, and even 31% who did not lose income did not go for medical care.[xliv]

In two months, March through April of 2020, researchers from Virginia Commonwealth University School of Medicine estimated that fully one-third of the 87,000 excess deaths in those two months did not result from Covid-19.[xlv] They suggested that the excess deaths were from heart disease, diabetes and other deaths. This suggests about 87,000 excess deaths from those causes for a six-month period.

Another study in Science predicts that we can expect to see 10,000 additional deaths from breast and colorectal cancer deaths in the next decade resulting from lockdowns.[xlvi] Yet another study finds that there may be 33,890 excessive cancer deaths in the United States.[xlvii]

At a higher end estimate, Robert Zoellick estimated that supply chain disruptions could also be an issue with untreated chronic diseases. With 23 million Americans with cancer, 30 million with heart disease, 34 million with diabetes and 35 million with chronic lung disease, it is likely that 70 to 80 million are being treated for one or more of these diseases. If just one in 100 die because they cannot get their medicine or hospitals cannot take them, that would lead to 750,000 deaths.[xlviii]

Nationwide, April saw a 42% decline in emergency department use, which is 900,000 fewer visits compared to the same time a year ago.[xlix] Some of the declines were due to nonspecific chest pain and acute myocardial infarction, which may result in chronic conditions showing up later.

Physicians from the Cleveland Clinic report a four- fold increase, from 1.7% to 7.8%, in cardiomyopathy (broken heart syndrome) which can occasionally be fatal.[l]

Table 2 in the Appendix shows some of the symptoms that were not examined during lockdowns.

Isolation

A survey by Northeastern, Harvard, Rutgers, and Northwestern Universities found that 39.6% of Americans aged 18-24 had suicidal thoughts in October, up from an estimated 3.4% of adults before the pandemic in 2013-2014.[li] The same group in May found that depression rates across age groups were more than three times higher than normally observed – up from 8% to 27%.[lii]

In one major study, the *Well Being Trust* estimated between 27,644 (quick recovery, smallest impact of unemployment on deaths of despair) to 154,037 (slow recovery, greatest impacts) deaths from drugs, alcohol and suicide can be expected as a result of lockdowns. The mean is approximately 58,000 deaths.[liii]

Unfortunately, for those people who are suffering from separation anxiety, evidence has shown that opiates reduce separation distress behavior in animals.[liv] In fact, increased opiate abuse is exactly what has been happening with people who have been locked down.

White House “drug czar” Jim Carroll told Politico that an analysis from the Office of the National Drug Control Policy found an 11.4 percent year-over-year increase in opioid-related overdose deaths during the first four months of 2020.[lv] Kentucky has seen a 25 percent increase in overdose deaths during the first four months of this

year, and West Virginia saw a 50 percent increase in deaths since the beginning of the year. The data are incomplete as not all states have reported in.

Mr. Carroll attributed much of the increase in the overdose rate to anxiety, social isolation, and depression resulting from the COVID-19 pandemic. But he also noted that, after a one-year pause in 2017, the overdose death rate resumed its climb in late 2018 and 2019.[lvi] And methamphetamine-related deaths have been surging for the past few years.

Research has shown that overdose deaths from the non-medical use of licit or illicit drugs have been on a steady, exponential increase since at least the late 1970s—with different drugs dominating at different periods.[lvii]

The CDC reported that a survey of adults over 18 between Jun 24-30 found that 30.9% reported anxiety or depressive symptoms, 26.3% reported trauma and stressor related disorder and 13.3 reported increase illegal drug or alcohol abuse.[lviii] To be sure, the COVID-19 pandemic is exacerbating the situation.

While it remains popular to attribute the opioid-related overdose crisis to doctors prescribing pain relievers to patients, the evidence shows there is no correlation between prescription volume and the nonmedical opioid use or opioid use disorder.[lix] People with substance use disorder need to feel connected with others and themselves to overcome the problem. Isolation, loneliness and the anxiety and depression associated with lockdowns, and the resultant economic dislocations are the opposite of what people suffering from addiction require.[lx]

Add to that the fact that the pandemic response has hampered the smooth operation of harm reduction programs, despite efforts to mitigate the disruption with the temporary relaxation of many federal regulations.[lxi] The Substance Abuse and Mental Health Services Administration report that many first responders are reluctant to respond to overdose calls with the antidote naloxone.[lxii] Apparently, they fear they may contract COVID-19 during the resuscitative process.

Wealth/Health Losses

Although there is no breakdown of how federal expenditures are spent dealing with the current crisis, some money no doubt is headed for economic relief from the lockdowns. Congress has allocated $4 billion so far, with $884 billion going as direct relief to households. The rest was allocated for businesses, health care costs, and state governments and public agencies.[lxiii] Of the $4 trillion allocated, $3.1 trillion will not go to family budgets.

In addition, despite these expenditures, the Commerce Department estimates perhaps a six percent decline in GDP because of a slowed economy (although there is uncertainty whether this will materialize). [ii] Assuming GDP was the same as in 2019, it would have been $21.43 trillion.[iii] The slowdown would reduce GDP by

about $1.2 trillion. Together, these two losses add to approximately $4.3 trillion, over $33,000 per household.

When government takes resources out of the hands of individuals, at least a part of those resources would have been spent on reducing risks. For example, if you increase taxes by 10 percent, a small fraction of that 10% might have been spent on safer cars, living in safer neighborhood or medical check-ups. In effect, the government crowds out those private risk-reducing expenditures.

In a recent paper by Broughel and Viscusi, government expenditures increase mortality risk by one for about $108.5 million.[iv] That means that for every tax or regulation that takes $108.5 million out of the hands of private individuals, statistically, we can estimate that this results in one loss of life because of fewer private risk reducing measures. This suggests that 27,000 deaths could result from the reduced income we've already seen. Slowed economic recovery could increase this number.

The financial ramifications will be seen in the form of poverty as many lose income for months on end. Poverty kills people. As University of Maryland professor Michael Reisch said in his 2013 Senate testimony, "poverty not only diminishes a person's life chances, it steals years from one's life itself."[lxiv] The economic fallout from widespread, extended lockdowns will push more people into poverty, taking years off of people's lives and leading directly to poorer health outcomes.

Psychological harm

Finally, the lockdowns cause psychological harms that will play out over years and perhaps decades. We will most likely discover more psychological impacts over time.

The World Economic Forum published an article in April entitled, "Lockdown is the world's biggest psychological experiment - and we will pay the price."[lxv] They suggested with some 2.6 billion people around the world in a lockdown, we can expect a secondary epidemic of burnouts and stress-related absenteeism.

A review in *Lancet* looked at past quarantines and the psychological impacts on mental health and psychological wellbeing.[lxvi] The authors reviewed 24 studies and found several chronic conditions that persisted well after the end of the lockdown. These included:

- Twenty-two percent more adults were diagnosed with a trauma-related mental health disorder compared to those who were not locked down.
- Nearly 60% of a group who had been locked down had high depressive symptoms whereas only 15% of those locked down had low depressive symptoms.

- Symptoms identified as post lockdown included "general psychological symptoms, emotional disturbance, depression, stress, low mood, irritability, insomnia, post-traumatic stress symptoms, anger, and emotional exhaustion."[lxvii]

Another study done in Toronto found that 28.9 percent of people who had been locked down for SARS had post-traumatic stress and 31.9 percent suffered from depression.[lxviii] In February, the Chinese Psychology Society found that 42.6 percent were positive for anxiety.[lxix]

A Lancet study found that nine percent more adults had symptoms of depression three years after being locked down; that health-care workers were abusing alcohol three years after quarantines; and that people avoided crowds many months after lockdown.[lxx]

Harm to children

The American Academy of Pediatrics issued a report that warned about lockdown issues affecting school-age children. Students with disabilities will need help with the "social and emotional aspects of transitioning out of and back into the school setting. Some students will suffer from "prolonged limited access to critical school-based mental health services."[lxxi]

Other issues include, "Lengthy time away from school and associated interruption of supportive services often results in social isolation, making it difficult for schools to identify and address important learning deficits and child and adolescent physical or sexual abuse, substance use, depression, and suicidal ideation. This places children and adolescents at considerable risk of morbidity and, sometimes, mortality."[lxxii]

In addition, in the U.S., 20% of reports of abuse and neglect to child protective services are made by educational personnel, making educators one of the country's primary reporters. This means that, because of lockdowns, these cases may go unchecked. Evidence that the incidence of child abuse and neglect has substantially increased during the COVID-19 pandemic comes in the initial stages of lockdown where Connecticut, California, Michigan, Kentucky, New Hampshire, and Louisiana all reported double-digit percentage *decreases* in reports to child maltreatment hotlines.[lxxiii]

Even if increases in the incidence of child maltreatment are short lived, their effects are not. Child abuse and neglect can lead to myriad long-term health consequences, including mental health disorders, sexually transmitted infections, unwanted pregnancies, and substance abuse.[lxxiv]

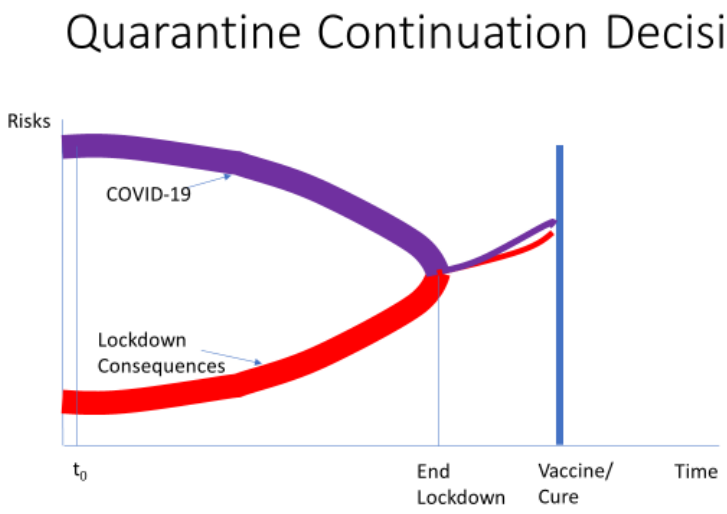
By comparison, as of November 16, 2020, just over 1 million young people have had COVID-19 with 20 deaths.[lxxv]

Other issues that have diminished health during 2020 lockdowns are listed in the appendix.

Discussion

The decision to continue a lockdown is complicated and fraught with uncertainty. Figure 3 suggests one way to think about this decision.

Figure 3: Quarantine Decision



The lines are deliberately drawn "thick" because, as we have seen, COVID-19 cases may change due to seasons or different measures being taken and lockdown consequences may similarly be affected by public health or other measures. As we are now beginning to understand, these shapes may change dramatically.

Both the COVID-19 consequences and the health consequences from lockdown must be projected forward from time t_0 to include current cases and projected cases, chronic sequelae and when a likely vaccine (or cure) is forthcoming. At any point in time, an end to the lockdown will change the curves to shift the COVID-19 rate of decrease up and slightly decrease the rate of lockdown consequences down.

As time goes on, lockdown unintended consequences increase due to increased exposure to the lockdown-related risks, as well as compounding risks in some cases. For example, isolation-driven risks may increase at an increasing rate due to the nature of isolation. A person who is a little bit lonely after two weeks of isolation may be truly depressed after two months of isolation. In the case of missed medical

treatment, cancer treatments that were halted as elective procedures may have allowed cancers to become more severe and less possible to treat effectively.

At some point, if the lockdown continues, the health consequences of lockdowns will become worse than consequences of the virus.

Beyond consideration of lockdowns on COVID-19 and unintended consequences of lockdowns, there is also variability of populations.. For example, another way to think about these curves is that they could be for individual decisions. For a population, the curves represent the sum of individual effects from lockdowns. But the effects of a lockdown differ by individual based on their mental and other health susceptibilities related to both the virus and unintended consequences.

Some individuals will voluntarily stay locked down but others will not do so, whether out of disregard for their own welfare or because they understand their likely small personal health consequences from avoiding other people. Some will not do so because they do not understand the consequences.

Managing risks at the most local level using local information will increase the chances that the risks associated with lockdowns will not exceed the risk of viral spread.

Summary

Health localism allows for policies to fit the local region's needs and preferences. Given the imperfect data and limited knowledge available to decisionmakers and the public during the early days and months of a pandemic, following a local area's risk preferences allows some areas to be extra cautious. In the case of COVID-19, this would mean that a dense area with many elderly residents would most likely institute a stricter lockdown than a sparsely populated region elsewhere in the state.

Allowing those with the most localized knowledge also minimizes the downside of ineffective policies or policies that become ineffective by extending them too long. By limiting the reach of any given policy, it allows for many types of policies to be tried. The good ones can be replicated by other localities while the ineffective ones will be rejected.

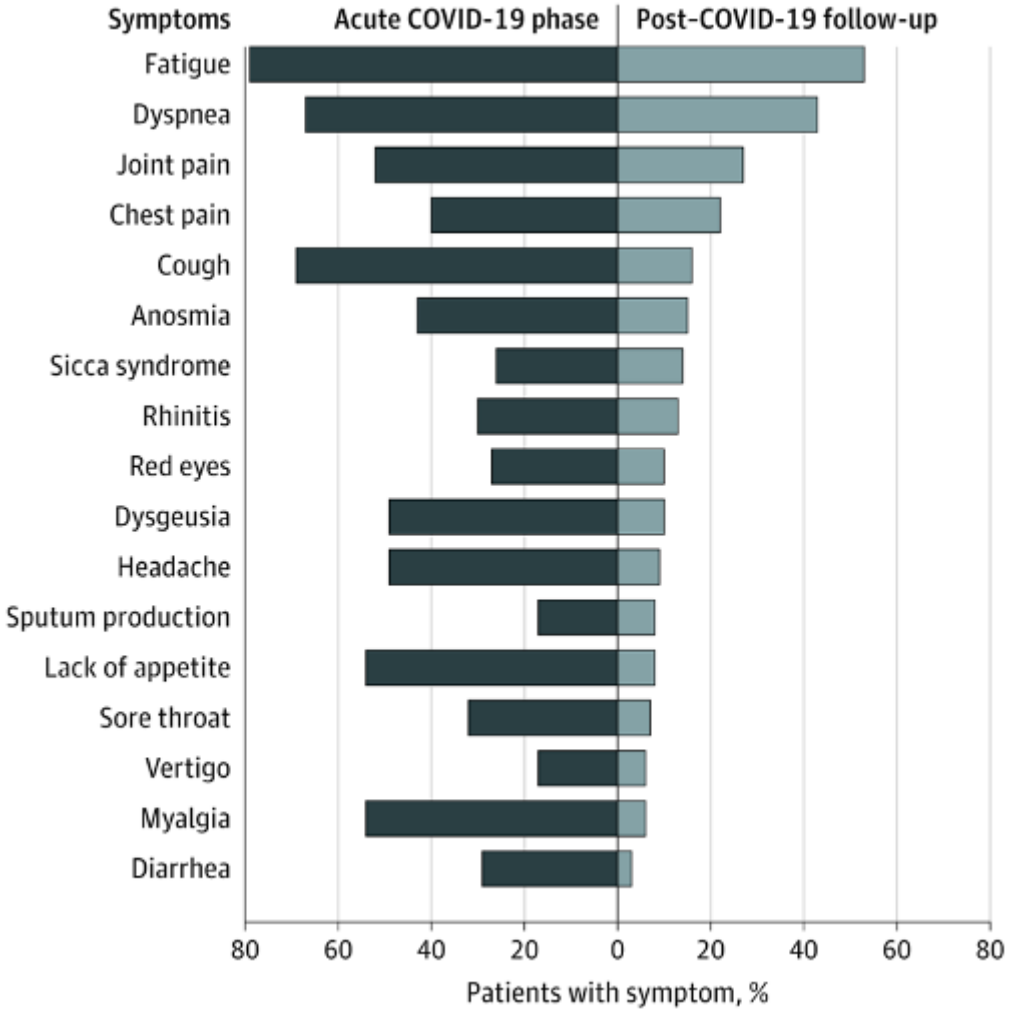
This is considerably different from the U.S. experience so far where states have taken the lead on lockdowns and presidential candidates have suggested it should be done at the federal level.
The role of larger entities should be to study the problem and work to produce vaccines or cures.

Since 1918, we have had five pandemics (1918, 1957, 1968, 2009 and 2019). Given that international travel continues to grow, we can expect more of these. If we don't understand the negative consequences of lockdowns, we will continue to have unnecessary illnesses and deaths.

Appendix

Figure 4 below shows a more comprehensive look at symptoms that occur after lockdowns from a post-acute follow-up from one hospital in Italy.[lxxvi] Fifty-five percent of former patients had 3 or more of the symptoms listed in the chart below.

Figure 4: COVID-19 Chronic Sequalae



[xxvii]

Table 2: Top 20 categories with lower visit counts during the early pandemic period
(Mar 31-Apr 27)

Top 20 categories with lower visit counts during the early pandemic period
(Mar 31-Apr 27)

Abdominal pain and other digestive or abdomen signs and symptoms −66,456
Musculoskeletal pain, not low back pain −52,150
Essential hypertension −45,184
Nausea and vomiting −38,536
Other specified upper respiratory infections −36,189)
Sprains and strains, initial encounter†† −33,709
Superficial injury; contusion, initial encounter −30,918
Personal or family history of disease −28,734
Headache, including migraine −27,458
Other unspecified injury −25,974
Nonspecific chest pain −24,258
Tobacco-related disorders −23,657
Urinary tract infections −23,346
Asthma −20,660
Disorders of lipid metabolism −20,145
Spondylopathies/Spondyloarthropathy (including infective) −19,441 0.78 (0.77–0.79)
Otitis media†† −17,852
Diabetes mellitus without complication −15,893
Skin and subcutaneous tissue infections −15,598
Chronic obstructive pulmonary disease and bronchiectasis −15,520

Other top 10 lowest prevalence ratios

Influenza†† −12,094
No immunization or under immunization†† −1,895
Neoplasm-related encounters†† −1,926
Intestinal infection†† −5,310
Cornea and external disease†† −9,096
Sinusitis†† −7,283
Acute bronchitis†† −15,470
Noninfectious gastroenteritis†† −11,572

Table 3: Unintended lockdown consequences – general population

Cognitive Decline - Alzheimer's	15,000 deaths from Alzheimer's and Dementia People with weaker social ties are 30% more likely to die early or develop it cardiovascular disease.
Skipped Medical Care	48% percent say they or someone in their household skipped medical care. [lxxviii] 11% say they or a family's member's condition got worse because of skipping health care.[lxxix]
Failure to seek Medical Care – Heart Disease and Cancer	94,000 deaths from heart disease and cancer 87,000 deaths from heart disease, diabetes and other 10,000 excess deaths from breast and colorectal cancer 33,890 excess cancer deaths. 750,000 deaths from all causes 1.7% to 7.8% increase in cardiomyopathy 27.4% decrease in pancreatic cancer diagnoses compared to 2018
Failure to seek dental care	Can cause periodontitis which may lead to sepsis and complications in pregnancy May lead to undetected oral cancer May lead to undetected oral infections in immunocompromised patients
Despair – Drugs, Alcohol and Suicide	58,000 deaths (27,644 to 154,037) 11.4% increase in deaths from opioid use
Depression and Suicidal Thoughts	39.6% of Americans aged 18-24 had suicidal thoughts in October, up from an estimated 3.4% of adults before the pandemic Depression rates increased from 8% to 27%
Spousal Abuse	1.8% increase in intimate partner stabbings, strangulation, gunshots or burns
Weight gain	Average 8 pounds

Failure to get Dental Care	Sepsis
Reckless Driving Fatalities	Rate up 14%[lxxx] Increase in average speeds Increase in extreme speeds Drivers in severe crashes 2x as likely to be under influence of opioids and 50% more likely to be under influence of marijuana.
Chronic -depression, insomnia, anger, irritability, emotional exhaustion, heart disease	32% suffered from depression 43% suffered from anxiety
Chronic – loss of income	27,000 deaths
Post-traumatic stress	Four times higher in quarantined children
Spousal abuse	1.8 percent increase in intimate partner violence over a two-month period.[lxxxi]
Weight gain	76 percent of Americans have gained weight, up to 16 pounds more (average 8 pounds).[lxxxii]
Burnout	Secondary epidemic of burnout and stress-related absenteeism expected[lxxxiii]

Table 4: Unintended lockdown consequences - children

Failure to get vaccinations	Vaccinations down 42 to 73% in April[lxxxiv]
Food insecurity	Increased unemployment and poverty[lxxxv]
Failure to get social support	AAP warns of social, emotional, and mental-health suffering for school-age children due to lockdown[lxxxvi]
Child abuse	Increase in child neglect Reporting of abuse and neglect is down due to school closures (educators are the primary reporters of abuse and neglect)[lxxxvii]
Post-traumatic stress	Post-traumatic stress symptoms were four times higher in children who were quarantined than not quarantined.[lxxxviii]
Lack of early child socialization	Children age 2-5 who are denied play are more likely to suffer anxiety, depression, and have sensory, motor and

	cognitive issues, like inability to control their emotions and a deficient memory.[lxxxix]
Educational and safety losses for children	Missed diagnoses of learning disabilities, physical or sexual abuse, substance use, depression, and suicidal ideation[xc] Loss of 5.5 million years of aggregate life expectancy because of school closures[xci]
Suicide	"About one in 4 teens have seriously considered suicide as youths are cut off from peers and caring adults.[xcii]

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