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Risk Tradeoffs and Equitable Decision-Making in the COVID-19 Pandemic

Lawrence O. Gostin & Sarah Wetter

Given all that we have experienced throughout COVID-19, what have we learned about making hard risk-risk tradeoff decisions when the next health crisis hits? Should government open schools, risking spread of a deadly disease? Or should schools educate children remotely, with inferior pedagogy, no socialization, and leaving poor and minority families behind? Should government shutter “non-essential” businesses to stem viral spread – risking job insecurity, impoverishment, and economic collapse? If vaccines are produced in record time, should regulatory agencies move full speed ahead or should they “pause” at every safety signal? Should the agency have expedited full licensure, and should it now move rapidly toward authorization for children, ages 5-12, or even younger?

These are among the agonizing risk-risk tradeoffs all of society has faced since the very first moments of the COVID-19 pandemic. And we still don’t fully know the answers now. How can ethics help us think about hard tradeoffs that weigh competing values, and which have deep consequences for society and particularly the most disadvantaged?

Let’s begin with what we *don’t* know, and how to act under conditions of scientific uncertainty, as well as rapidly evolving scientific understandings. During the COVID-19 pandemic, decisionmakers have had to act before scientific certainty was established on basic epidemiological facts. Early on, public health agencies advised that aerosolized spread of SARS-CoV-2 was unlikely. It is now regarded as a primary mode of transmission. We had high hopes that vaccines would virtually block spread. We now understand that individuals with breakthrough infections carry similar viral loads as the unvaccinated and are capable of efficient transmission.

If everyone masked-up would it impede viral spread? At the start of the epidemic, both the US Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) said “no,” and then equivocated. Until recently, these two major scientific agencies have issued conflicting advice, with WHO urging fully vaccinated individuals to continue masking and CDC disagreeing. (CDC has now changed its guidance for the third time in recent months). Shifting, even conflicting, scientific recommendations have sown seeds of doubt in the public and split communities along political and philosophic divides. There’s so much even now we don’t fully understand. What is the optimal interval for administering a two-dose vaccine, and can different vaccines be mixed? And now we are wrestling with the decision of giving third mRNA doses, to whom, and when.

In this article, we discuss the challenges of making policy tradeoffs amidst scientific uncertainty. While there may be no perfect formula for deciding what to do and when, we propose four key considerations for assessing tradeoffs, and apply those considerations to the areas of education, economies, healthcare, travel and migration, social engagement, and medical countermeasures.

Pandemic Policy Approaches: The Precautionary Principle and “Playing it Safe”

In a health emergency, our instincts may drive us to take decisive action, even in the face of scientific uncertainty. Under the precautionary principle, preventative action is encouraged to avoid an emerging hazard that could potentially cause catastrophic or irreversible damage, even where scientific understanding is lacking. Exercise of the precautionary principle comes in various forms, such as delaying or pausing new innovations to review their safety, or stringently regulating to contain a health hazard whose impacts are not fully known. Put simply, the precautionary principle can be understood as “playing it safe.” It favors erring on the side of overreacting to control a threat while it is still being understood, rather than underreacting and allowing the threat to spread. Yet while similar rationales have been accepted in various policy realms (e.g., environmental policy), it has less traction in infectious disease control.

The reason, of course, is that “playing it safe” to reduce the risk of a spreading infection involves major tradeoffs across nearly every sector of society (see Table)—and it is hard to know which course will lead to the greatest benefits or harms. “Playing it safe” in terms of controlling a spreading virus may feel right, but there are hidden (and not so hidden) costs. We could have dramatically slowed SARS-CoV-2 by locking down hard and long. But we would have (and probably did) leave a generation of school children behind, and forced countless people into unemployment, unstable housing, and food insecurity. Lockdowns cause deep loneliness and social isolation, restrict travel, and impede constitutionally protected rights to pray and assemble.

While usually there are deeply consequential risk-benefit dichotomies from both action and inaction, sometimes well-targeted interventions can produce benefits to multiple sides of complex problems. Many commentators have pitted public health against the economy, suggesting that stronger mitigation measures harmed productivity and created unemployment. Yet, many countries – particularly in Asia and the Pacific – that acted decisively to control the virus fared far better economically.

Weighing the Ethics and Evidence for Risk-Risk Tradeoffs

Looking ahead to the next epidemic or pandemic, how should governments weigh often-competing considerations amidst scientific uncertainty and divergent value judgements? When there is suffering on both sides of the equation, how many lives, how much educational loss, and how much economic hardship are we, as a society, willing to risk to stem a widely circulating virus? Often, there is no “right” answer and different societies may weigh the tradeoffs differently—for example, liberal democracies might prize freedom over health; and lower-income countries or communities may not have the economic cushion to withstand a wholesale shutdown the way that the better-off could. While we can’t provide the “right” answers, we offer key ethical and empirical considerations to help evaluate the hard tradeoffs.

1. How likely will the intervention achieve its public health goal?

Tradeoffs are not worth the costs unless the public health intervention is likely to achieve its goal of controlling viral spread, and to what extent. Thus, understanding the evidence base for a risk mitigation measure is a crucially important first step. While scientific evidence may be gradually evolving, do extant understandings provide clear evidence that the proposed measure will be effective? Is the benefit significant (e.g., saved hospitalizations and deaths), widespread (benefitting the entire population or a sub-section of it), and equitably distributed? Put bluntly, it is not worth the economic and social costs of a public health measure unless we have good evidence that measure will be effective.

2. *Are there any less restrictive methods to achieve the goal as well or better?*

If the tradeoffs entailed in a public health intervention can be eliminated or reduced, there is an ethical obligation to use a less intrusive measure. A public health intervention should be necessary to avert a real harm, proportionate to the harm it seeks to avoid, and only as restrictive as needed to achieve the desired end. Using overly restrictive, or overly broad, measures when a more limited or targeted intervention would work as well, or better, is ethically problematic.

3. *Will the intervention carry foreseen or unintended harms, and to what extent?*

Even before an intervention is imposed, the public health agency should anticipate harms that might result, whether foreseeable or unintended. Harms can come in a variety of ways, and each illustrates a tradeoff between the value of the public health measure and the burden it creates. Unintended harms can include economic, educational, and personal (e.g., autonomy, privacy, or liberty). Health-health tradeoffs are also a major concern. Measures that may be effective to curb the spread of a novel pathogen could create health risks of a different sort, including delayed diagnosis or treatment, mental distress, child or partner neglect or violence, or alcohol and substance misuse. And these are exactly the kinds of harms that occurred throughout the COVID-19 pandemic, as well as past epidemics, such as the West African Ebola epidemic. In fact, an all-consuming focus on prevention of SARS-CoV-2 has reversed many global health and development achievements, including reductions in poverty, food security, maternal/child deaths, and childhood vaccination coverage.

4. *Are the benefits and burdens of the intervention fairly distributed?*

Even before the COVID-19 pandemic, the prevailing global narrative was one of profound inequities, where large swaths of the population were left behind in virtually every realm, from socio-economic, housing and education, to poorer health outcomes and life expectancy. Thus, equity must be embedded into public health interventions, making sure that the benefits accrue fairly, and ameliorating the burdens that are disproportionately felt by disadvantaged and marginalized populations. COVID-19 itself took roughly twice the lives per capita for racial minorities in the United States as for white Americans.¹ That was the product of systemic racial injustice in the health system as well as in society as a whole.² But even the interventions to stem COVID-19 were inequitable. On one level, “we are in this together” is true. But on another

level, a person of privilege could weather a lockdown with a stocked fridge, steady income, and a virtual workplace. The same is not true for “essential workers.” And when highly effective vaccines were rolled out, the benefits accrued mostly to the well-off, especially through a global lens. While most of the US population is vaccinated or has access to vaccines, many lower-income countries are not on track to be anywhere near high vaccine coverage for several years.

Many of these inequitable benefits and burdens can be significantly ameliorated. Governments can ramp-up social support services for essentials like income, food, housing, and health (physical and mental). When we roll out pharmaceutical interventions like diagnostics, treatments, and vaccines, priority could be given to historically disadvantaged populations within and among nations.³

These four steps in understanding risk-risk tradeoffs – effectiveness, less restrictive means, harm identification and amelioration, and equitable distribution – are not purely empirical endeavors. They also need to account for public trust and confidence. Even highly effective and safe vaccines under empirical standards cannot work if there is high vaccine hesitancy. Masks and distancing may be scientifically valid and important, but if people won’t mask-up or distance, the virus will spread exponentially. Thus, a lack of public trust could destroy the utility of even the soundest public health intervention, which is why sound risk-communication and public engagement are crucial to successful pandemic responses.

Risk-Risk/Risk-Benefit Tradeoffs: What’s at Stake?

The four questions posed above are useful in examining governments’ tradeoff decisions during the COVID-19 pandemic, and determining how responses to the next major outbreak could be improved. If there were a single observation that could be garnered from the world’s collective experiences with the COVID-19 pandemic, it is that virtually every country struggled mightily in curbing hospitalizations and deaths using non-pharmaceutical interventions (NPIs). Countries with the most robust health systems (e.g., in Europe and North America) were among the world’s worst performers. The best performers (e.g., East Asia and island nations) acted early and hard, often with draconian lockdowns, aggressive testing/tracing/quarantine, and travel bans.

Yet, overall, there remains little scientific consensus on the extent to which these measures effectively curbed viral spread. Experts projected that complete inaction would have resulted in over 50% of countries’ populations infected, with deaths among 0.1-0.6 of the global population, concentrated in the elderly, immunocompromised, and socioeconomically disadvantaged groups.⁴ Most countries never quite got to those staggering levels, but absent a vaccine, would eventually have had devastating case and death rates. It turned out that for most liberal democracies, NPIs had two modest, but important, impacts on disease epidemiology: NPIs helped “flatten the curve” for a short while to prevent hospitals from becoming overwhelmed, and also bought some time to develop and rollout vaccines. But NPIs came with a high cost to liberty, privacy, mental health, and the economy.

Education. At the initial height of the pandemic in April 2020, UNESCO estimated that nearly 90% of the world's students were impacted by school closures, including nearly 80 million in the US.⁵ Half the world's students were still affected as of March 2021. The UN's Universal Declaration of Human Rights (art. 26) recognizes a right to education, yet governments were ill-prepared to support adequate virtual learning.⁶ Particularly poor children lacked reliable internet access or lived in crowded homes un conducive to learning. Hundreds of millions of children are estimated to have fallen below literacy standards, perpetuating cycles of poverty and gender inequities especially in lower income communities. In the US, the Constitution requires that all children have equal access to education regardless of race, religion, sex, income, or citizenship status. Yet even in a wealthy country like the US, inequities were palpable, with the severest learning losses in reading and mathematics reported among schools that primarily serve students of color.⁷ Educational achievement gaps, moreover, could be generational, with countless children still missing from schools amidst the COVID-19 pandemic.⁸

Where shifting educational environments may be necessary to protect teachers, students, and families during an outbreak, strategies implemented during COVID-19 brought enormous harms, largely shouldered by the already disadvantaged. This past September saw children returning to in-person learning. In the US, at least, jurisdictions varied widely in how safe school settings would be. In many geographic areas (particularly the northeast and west coast), teachers were vaccinated, and children masked. But in the South and mid-west, often poorer and rural children returned to school without basic public health mitigation measures.

Economies. The abrupt shock of COVID-19 and related lockdowns brought the economic world to a virtual halt, causing the global economy to shrink in 2020 by a projected 5.2% – representing the deepest recession since the Great Depression.⁹ Millions of people lost employment and income, depleted their savings, and still struggled to pay rent and other bills. In higher-income countries, governments globally spent \$11.5 trillion by September 2020 to support to businesses, individuals, and families; poorer countries that lacked this capacity relied on donors and international lenders like the International Monetary Fund to provide a lifeline to vulnerable populations, but little help arrived.¹⁰

Still, the pandemic revealed that prioritizing health over the economy is a false dichotomy; there is synergy between public health and economic stability. While long-term economic impacts remain unknown, countries that implemented stronger infection control measures earlier experienced fewer COVID-19 cases and deaths and appear to be recovering stronger economically.¹¹ The public will decline to engage in shopping, travel, and leisure if they remain fearful of contracting a dangerous pathogen. In evaluating this tradeoff, the most important consideration is whether, and to what extent, business closures lowered SARS-CoV-2 hospitalizations and deaths.

Better evidentiary understanding of the positive (and negative) effects of shutdowns is crucial. As COVID-19 shutdowns brought demonstrable harms to individuals, families, and businesses, determining the least restrictive mechanisms to keep populations safe from viral spread while

avoiding the worst economic harms should be studied thoroughly in the aftermath of the pandemic.

Healthcare. As COVID-19 overwhelmed health systems, countries redirected resources, personnel, and finances toward fighting the pandemic. Among 105 countries surveyed by the WHO, 90% reported non-COVID health service disruptions, with substantial losses in low- and middle-income countries in fighting conditions like malaria, AIDS, and tuberculosis, and childhood immunization campaigns.¹² Among even the wealthiest countries, substantial disruptions were reported in noncommunicable disease and mental health services, as well as maternal and newborn care, with the greatest burdens borne by economic and racial minorities, who often lacked capacity to receive quality virtual health services. And as with previous pandemics, COVID-19 exacerbated risk factors for suicide, such as economic stress, social isolation, and loss of mental health services.¹³ Overall, what we have seen with COVID-19, and many other health crises, is that as many, or more, deaths are attributable to diseases other than the epidemic disease. For COVID-19, the excess deaths reported will persevere as the outcomes of delayed diagnoses and treatments manifest over the coming years.

Sadly, as long as healthcare systems remain underfunded, understaffed, and underprepared, shifts in healthcare delivery during emergencies may be unavoidable to maximize scarce resources and personnel. But even when healthcare must be rationed, it should not result in the major inequities that we have seen during COVID-19. Looking forward, we must assure that even the most marginalized populations are enabled reap the benefits of telehealth innovations to assure continuous, equitable access to care.

Travel and Migration. Despite WHO recommendations against border closures after declaring COVID-19 a global emergency under the International Health Regulations (IHR), almost every nation went against this advice and closed their borders to all outside nations.¹⁴ These decisions devastated trade, travel, and tourism. Students and workers abroad lost educational or income opportunities. Travel bans kept families apart, and in some cases, prevented persons from getting home or fleeing danger. Many times, border closures were overbroad, senseless, and grounded in politics, xenophobia, or discrimination, such as the Trump administration's policy to expel migrants, separate children from families, and require others to remain in Mexico, often in crowded and unsafe conditions, while awaiting a court hearing.¹⁵

Travel restrictions make sense if they can keep a nation safe from a dangerous epidemic, but there is scant evidence that closing borders can curb an already spreading epidemic or pandemic, while causing enormous disruptions to international or even domestic travel.¹⁶ It is true that some countries, especially island nations like Australia and New Zealand fared well with travel restrictions, while travel bans paired with aggressive internal measures seemed to succeed, especially in east Asia, such as in China and Viet Nam.¹⁷ But overall, travel restrictions were an abysmal failure, likely not worth the huge tradeoffs.¹⁸

As COVID-19 vaccination rates are increasing in high income countries, governments are considering or implementing “vaccine passports”, where only persons who can show digital or other proof of vaccination status receive travel privileges, as well as access to certain food, retail, or entertainment services.¹⁹ Vaccine passports could encourage vaccination and help ease restrictions in a safe manner. If vaccines are plentiful, then the case is strong for proof of vaccination systems. But globally there exists cavernous inequalities in access to COVID-19 vaccines. Vaccine passports for international travel could leave lower-income countries even further behind.

Social Engagement. Restrictions on social gatherings, implemented by nearly all countries during COVID-19, demonstrated some effectiveness in reducing viral spread from one person to the next.²⁰ But these interventions also came with costs. In the US, the Supreme Court struck down public gathering restrictions as applied to houses of worship, in line with trends of recognizing strong First Amendment freedoms including religion, speech, and assembly. Social distancing ordinances have also been a near death sentence for persons experiencing domestic abuse, substance misuse, homelessness or unsafe housing, and food insecurity.²¹ Others experiencing social isolation, including vulnerable groups like the elderly, have suffered excruciating blows to their mental health and quality of life.

Tradeoffs like these are hard to measure, but the crucial point is that there are ways to ameliorate harms while still keeping in place effective public health measures. By providing a social safety net, and social/mental health support services, some of the emotional hardships of isolation can be reduced.

Medical Countermeasures. The development and approval of SARS-CoV-2 vaccines in less than a year was an unprecedented human achievement. While the virus baffled most public health systems, science offered an astoundingly effective tool. Yet the whole process of vaccine trials and regulatory approval raised questions on the safety and ethics standards for hurrying new vaccines to the markets. Both China and Russia approved vaccines before large scale, phase 3 testing even began. Russia’s vaccine had only been tested on 76 volunteers from the country’s military when it was approved in August 2020 – sparking criticism from scientists around the world on issues of scientific integrity and informed consent.²² Even today, the WHO hasn’t yet granted Sputnik V their emergency use listing. At the same time, Chinese vaccines have been shown to be far less effective than the mRNA technologies widely used in high-income countries.

In the UK, the US and Europe, vaccines were only approved under stringent protocols requiring phase three clinical trials, yet leadership from all these jurisdictions temporarily paused vaccine deployment (AstraZeneca in the UK and Europe,²³ and Johnson & Johnson in the US²⁴) after a miniscule number of severe blood clots were reported. When the US paused the Johnson and Johnson vaccine, vaccination rates of all three US-approved vaccines began to fall sharply, and took some time to recover.²⁵ Actions to ensure vaccine safety thus slow vaccination rates both by restricting market availability and arousing public safety concerns. But failing to take

seriously reported safety issues could create public distrust, too. For a virus that continues to take thousands of lives each passing day, how much risk should we be willing to accept when it comes to vaccines?

Post-COVID-19, it is important that protocols for emergency countermeasure development and approval are re-examined. While the benefits of rapid vaccine development during COVID-19 have been undeniable, are there ways to better mitigate the risks and protect against harms? How can we best assure the public that approval decisions are based on sound science, and not politics? Plans for prioritizing vaccine distribution to vulnerable and marginalized populations – both nationally and globally – should also be crafted well ahead of the next pandemic.

For now, the world remains deeply unprepared for epidemic threats, and risk tradeoff decisions will remain key facets of the current COVID-19 pandemic and its aftermath. No one knows when the next pandemic will strike or what the pathogen will be (e.g., influenza, Ebola, or a coronavirus), but we do know that it will occur one day in the future. We face a choice. Do we return to the predictable cycle of complacency followed by panic? Or will we learn from COVID-19, and prepare—using effective, less-intrusive, and equitable measures to prevent, detect, and respond? That level of preparedness needs to take place both nationally and through sound global financing and governance, including through a strengthened World Health Organization.

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