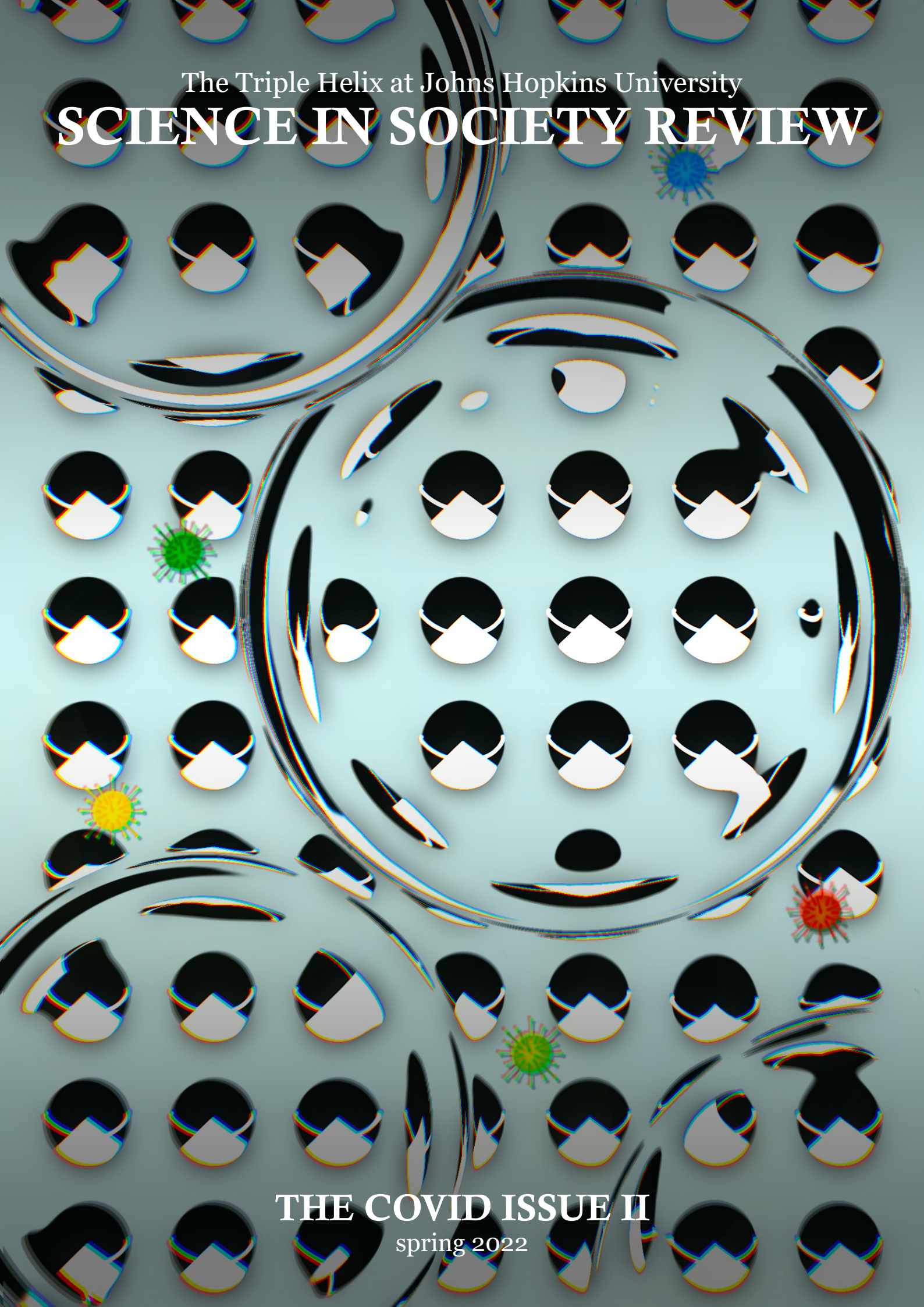

The Triple Helix at Johns Hopkins University

SCIENCE IN SOCIETY REVIEW

THE COVID ISSUE II

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About The Triple Helix

The Triple Helix is an international network of undergraduate students that focuses on the dynamic relationship between science, society, and law. We aim to promote education and critical thinking about current developments in science and the implications of these issues within a broader societal framework.

The flagship journal of the Triple Helix is the Science in Society Review, which features articles that tackle scientific issues from any interdisciplinary lens including business, law, and ethics. In addition to these publications, the Triple Helix also hosts discussions, lectures, and conferences throughout the semester, so there is always something to look forward to!

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Our Team

A Letter From the Editors

Dear Reader,

In this year's edition of Science and Society Review, we resume our exploration of the wide-reaching impacts of the COVID-19 pandemic. This continuity in our journal's theme aims to reflect both the deep complexity of human society and the shocking potency of the SARS-CoV-2 virus. Very rarely is our society united in confronting such a penetrating perturbation, capable of inducing reverberating effects through all its interconnected layers. It is both amazing and frightening to accept that a single, nanoscale virus can affect the world to such a degree, extending from our individual health to the very core of how we view each other and our institutions. The articles that follow will attempt to deconstruct and better understand the emergent behaviors and reactions of society to the pandemic while wondering whether we can take away any lessons as we build a more resilient future.

We at The Triple Helix have certainly come to discern at least one truth: it is through change that we learn about ourselves, and it is through change that we are offered the opportunity to remake ourselves. The challenging virtual format in which our writers and editors were forced to interact pushed us to reimagine a more natural and fertile environment from which future ideas can emerge. Going forward, we aim to create a comfortable and intellectual space in which The Triple Helix members can share thoughts and engage in lively conversation, bridging the critical gap between the scientific world and humanity that's becoming increasingly relevant today. This is by no means an easy task; it is one thing to analyze and disentangle the complex interactions that exist between individual agents in society, and another to construct our own microcosm. That is why we'd like to invite you to join us on this journey, which, if successful, will undoubtedly be immensely rewarding. We eagerly await your arrival.

Sincerely,

William Shao & Barbara Pejic
Editor-in-Chief and Managing Editor

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A Pandemic's Lasting Consequences on Tomorrow's Generation

Barbara Pejic

Ten-year-old Katherine Azano wrote in her diary:

> *I hate this. I'm trapped inside my house with no one to talk to. Mom's working like crazy. I haven't seen her for more than an hour in almost three days. I can't see dad since he's working at the hospital. I can't contact my friends any more... Now, if I do have a birthday, which I do NOT want to have, I will have what, like four friends standing six feet away from each other outside? Who wants that? And you know what? I bet it would rain.*[1]

On March 13th, 2020, everything we had known was abruptly taken from us.

As we all know, perhaps a little too well, the last two years have involved a whirlwind of emotion. We've had instability, unpredictability, and challenges thrown into our lives in a manner no one was prepared for. There's no denying that everyone felt the world shift, one way or another. Some of us may have felt the weight financially, and others medically or psychologically. We've talked about its burden on adults, on their employment status or relationship difficulties, but there remains one group that is often overlooked when discussing the impact of the COVID-19 pandemic: children.

Boston's NPR news station WBUR recently launched a writing contest open to children and teenagers across the country with the goal of sharing their perspectives on the global pandemic.1 This generation is being raised through their most crucial, identity-defining years during a time in which socialization is discouraged, routines are hectic, and caregivers radiate abnormal levels of stress. Several studies discussing the lasting biopsychosocial effects of the pandemic on youth have been published, but one question remains unanswered and can only be answered with time: will these setbacks fade away, or do youth require nurturing to catch up on everything they missed?

Perhaps the first group we think of is the younger children, those under the age of 6, who have barely experienced the world outside the pandemic and don't remember much before mask-wearing and social distancing. A wide consensus among developmental psychologists is that early-childhood interactions are crucial in stimulating healthy and timely cognitive development. Growing up in a pandemic, however, renders many of those interactions no longer feasible.

The most dramatic change lies in social development. Under normal conditions, interacting with peers of a similar age develops creativity, empathy, and higher-level communication in children. Masking prevents children from developing an understanding of facial cues and expressions, which are a key aspect of successful human communication. Friendly play stimulates executive function, an umbrella term coined for a set of cognitive functions including working memory, adaptive thinking, and self-control.[2] Though this skillset may seem elementary to adults, we aren't born with it. Rather, we are born with predispositions that help us develop these skills, but engaging with the environment around us, which is difficult to do in quarantine, is vital.[3]

Since pandemic children have limited interactions with their peers, we turn to look at their relationship with their caregivers. The pandemic has burdened caregivers with several additional concerns, increasing overall stress levels, which consequently alter mood and behavior. Since children as young as infants naturally observe their caregivers as models for how to feel, they absorb much of this stress. This leads to children adopting these elevated feelings of confusion, a sense of lack of safety, and general irritation.

Despite these setbacks, the future remains optimistic. Considering that this pandemic has lasted nearly two years thus far and hopefully seems to be coming to an end (fingers crossed), we can begin nurturing these neglected areas of development. Experts studying early childhood education believe that young children are sufficiently "plastic," or adaptive to their environment, to overcome the setbacks of the pandemic and avoid experiencing a substantial delay in development.

However, adolescents, aged 13 to 19 years, are older, perhaps less plastic, and thus a more vulnerable group. Experiences at this stage in life, the final years of development, tend to be more permanent and identity-shaping. Teenagers in the COVID-19 era face high levels of exposure to biopsychosocial stressors, such as prolonged illnesses of loved ones, lack of relationships with peers, and relying on underdeveloped coping skills, all while their brain is being remodeled back to front.[4] Remodeling in the brain begins at the amygdala, the center of emotion, and ends at the prefrontal cortex, which is responsible for logical thought and reasoning. This leaves this age group with fewer cognitive tools to cope with adverse experiences, such as a global pandemic. Adolescents often rely on their already-matured amygdala to cope with things that would otherwise be the job of the prefrontal cortex, potentially causing drastic emotional responses and difficulties reasoning. For these reasons, mental health is a topic of utmost importance when discussing teenagers, which is only heightened by the pandemic.

Adolescence is a period where individuals start to develop their independence, spend more time at school, hang out with their friends, and engage in outdoor activities. At this stage in life, there tends to be a dramatic change in both quality and quantity of interpersonal relationships. Just when adolescents began to establish a sense of routine and control and grow their self-confidence, the pandemic hit and everything was abruptly stripped from them. They can no longer see their friends as they please or participate in physical activities like they're used to. A lack of autonomy and separation from caregivers often prevents the development of an independent sense of identity, which can lead to a weak sense of self, role confusion, and lack of confidence in one's own abilities. These three consequences are perhaps the most important of all, as they are the most likely to have permanent detrimental impacts on adult functioning.

Mid-pandemic, mental health is more important than ever. Quarantine has had a dramatic effect on adolescent mental health, cutting them off from many of their usual psychological support sources. Due to fewer social interactions, adolescents spend more time online, which is positively correlated with unhealthy dietary choices, lack of physical activity, and overall more illbeing.[5] Quarantined teenagers report feelings of worry, fear, and helplessness significantly more than those who were not quarantined, additionally exhibiting increased symptoms of inattention and irritability.[6,7] All of these symptoms can manifest in the form of several mood and behavioral disorders, particularly through depression and insomnia, both of which have long-term impacts on health.

The question that remains is: what now? Certain individuals likely will not be able to bounce back from such trauma. Perhaps they went through adverse childhood experiences (ACEs), such as the loss of a loved one, parental separation, or emotional, physical or sexual abuse. ACEs have been linked to chronic health problems, mental illnesses, and substance misuse in adulthood.[8] Unfortunately, some may permanently suffer the consequences of these dire past two years.

For other adolescents, perhaps redeeming what they've missed is the goal. Many will use subsequent years to catch up and fill the gaps in their development. To do so successfully, providing substantial longitudinal psychological support is key. This could involve something as simple as matching an adolescent with a confidant to talk to, whether that be a parent, friend, or a professional. In other circumstances, psychological intervention and pharmaceutical treatment may be used as appropriate. However, increasing accessibility and approachability to such resources is easier said than done.

What if we don't succeed? If we fail, we risk losing an entire generation. An entire generation of economic and technological development. An entire generation of potential and progress. If we fail, we risk propagating these psychological concerns to the next generation. At first glance, this may seem dramatic. Surely most will recover and these two years won't cause decades of setbacks. If we aren't certain, however, we must consider the implications on the future if adolescents receive insufficient support.

Firstly, employers risk hiring less qualified individuals, as the quality of education has faced a significant drop since educational institutions were made remote. Though it's understandable in such unforeseen circumstances, two years of higher education is a critical amount. Students' motivation in pursuing their interests, both academically and recreationally, has also dropped, as well as the number of opportunities to gain working

experience. Therefore, even with retaining quality of education, students risk not being as prepared for the professional world as adolescents prior to the pandemic.

Secondly, there will certainly be a higher demand for mental health professionals. With enough demand, more budgeting may be put toward psychological health resources. Considering the economic instability caused by COVID-19, perhaps this would lead to temporary decreased funding elsewhere.

Thirdly, psychological wellbeing is a determining factor in an individual's competence within society. Mental health has been shown to predict success in careers, along with overall happiness and life satisfaction.[9] An entire generation that is unsuccessful, unhappy, and unsatisfied would inevitably lead to a series of unforeseeable and potentially unsolvable consequences.

Pandemic aside, demand for mental health resources has been on a steady rise throughout the past decade or two, correlating with the rise of social media. Psychological wellbeing issues tend to peak at adolescent ages, when individuals are dealing with stressful social, emotional, and physical changes in all aspects of their lives. It's no surprise that the pandemic has brought lasting negative psychological effects, as we've all felt at one time or another. But now we must think about our future and the future of our society. The opportunity to prevent the debilitation of younger generations is right in front of us. If we act in a timely manner and prioritize the youth's psychological wellbeing, we can avoid an impending domino effect.

And, maybe then, Katherine Azano can have a birthday party inside and not have to worry about rain.

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Environmental Impacts of the COVID-19 Pandemic

Emily Song

The COVID-19 pandemic has fundamentally changed many aspects of human behavior. Many years down the line, we will still remember that pinch in the heart when someone sneezes or coughs in public or that ever-so-slightly uneasy feeling when hugging someone. However, we are not the only ones longitudinally affected by the pandemic; our environment has suffered its effects as well.

In order to protect ourselves from the virus, we shield our faces with masks, and, in the case of healthcare providers, dress head-to-toe in personal protective equipment (PPE), which is often made from non-biodegradable plastic. This has generated a burgeoning amount of single-use plastic wastage, with a whopping 3.4 billion single-use facemasks disposed of daily, creating considerable stress on incineration facilities in big cities around the world.[2,7] Such incineration produces toxic pollutants and can lead to worsened air quality that correlates to higher respiratory risks, which can exacerbate the respiratory effects of the pandemic, feeding into a vicious cycle.[5,22]

To mitigate the impact of non-biodegradable plastic PPE, alternative options like biodegradable plastics and reusable masks have been proposed. However, single-use plastic, being "cost-effective" and "quick-to-produce," still seems like the ideal candidate for responding rapidly to the pandemic. In addition, cloth masks, the most popular form of reusable masks according to the Center for Disease Control and Prevention, are shown to be less effective than disposable surgical masks.[3,12,13] That being said, the burden of deciding between protecting one's own life and hurting the environment should not fall solely on the individual. Instead, authorities should take environmental factors into account when providing guidelines on which facial covering to use to simultaneously help protect the Earth and keep people safe.

Furthermore, single-use cups and food containers were the default for those in quarantine, and plastic bags made a comeback as well, amounting to a sixfold rise in plastic waste.[8,21,23] Although unlikely to be as significant as PPE waste, this is certainly a step backward in the policies and measures already in place to reduce daily plastic use. This begs the question: how far are we willing to go to trade our collective responsibility to the environment for convenience and notions of safety? The effects that these periods of "special times" will eventually have on efforts to ban single-use plastic must be taken into consideration.

In a more positive light, the immediate impact of the pandemic has not been completely devoid of benefits. With increased border closures and travel restrictions, gas emissions from traveling have been tremendously reduced.[6] For the first time since the Industrial Revolution, a pause button has been hit on human activities across the globe, leading to a 30% drop in carbon dioxide emission in urban areas.[17]

However, the reduction in emissions has not stopped the increase in atmospheric carbon levels.[19] Nor does the effect seem to be long-lived, as greenhouse emissions rushed back to pre-pandemic levels immediately after lockdown mandates were lifted.[10] The levels of greenhouse emissions are predicted to soar past original levels as people engage in "revenge travel" to make up for the time trapped inside their own homes.[11] Without systemic changes to the way we consume energy and emit greenhouse gases, merely calling a moratorium on daily life will not facilitate the drop in emissions required to mitigate climate change and prevent crossing the environmental point of no return. Hopefully, this welcome breeze amidst increasingly grim times will serve as an incentive for policy makers and investors around the world to keep the carbon beast we unleashed under control.

Humans have not been the only creatures affected by this temporary halt in travel. When we locked ourselves indoors, we left the vast outdoors open to Mother Nature. Penguins and coyotes roamed the streets of Cape Town and San Francisco, respectively, and life bounced back, from forests to oceans.[1,9] Researchers have coined the term "anthropause" to describe this special period, the implications of which are not yet fully understood.[16] One thing we can be sure of is that human activities definitively have immediate and mostly negative impacts on our ecological surroundings, and we have conclusive evidence to show that.

As vaccination rates rise across the globe and life gradually returns to normal, we can look to the nearing end of the pandemic. However, the influence that COVID-19 had on the environment will be long-lasting, if not permanent. During these unprecedented times, many lives have been upended and jobs permanently changed, especially within the agriculture sector which is heavily reliant on interaction with the environment. With higher-than-average infection rates and never-before-seen levels of unemployment, the pandemic has dealt a serious blow to the American rural agricultural communities.[20] A major reason is that agricultural incomes are inelastic, meaning that, with the same sets of assets, such as land and machinery, switching to producing other more profitable products when production falls is difficult. This, combined with the fall in exports of many food products and the fear of the virus surviving cold-chain transport, led to agriculture workers suffering disproportionately from the environmental impact of the global pandemic.[4,25]

According to a report by the Organization for Economic Co-operation and Development (OECD), COVID-19 has created long-term environmental effects that are more pronounced than its macroeconomic consequences. This is due to the pandemic's disparaging levels of influence on different fields. The highly polluting transport sector is affected more due to disruption in movement,

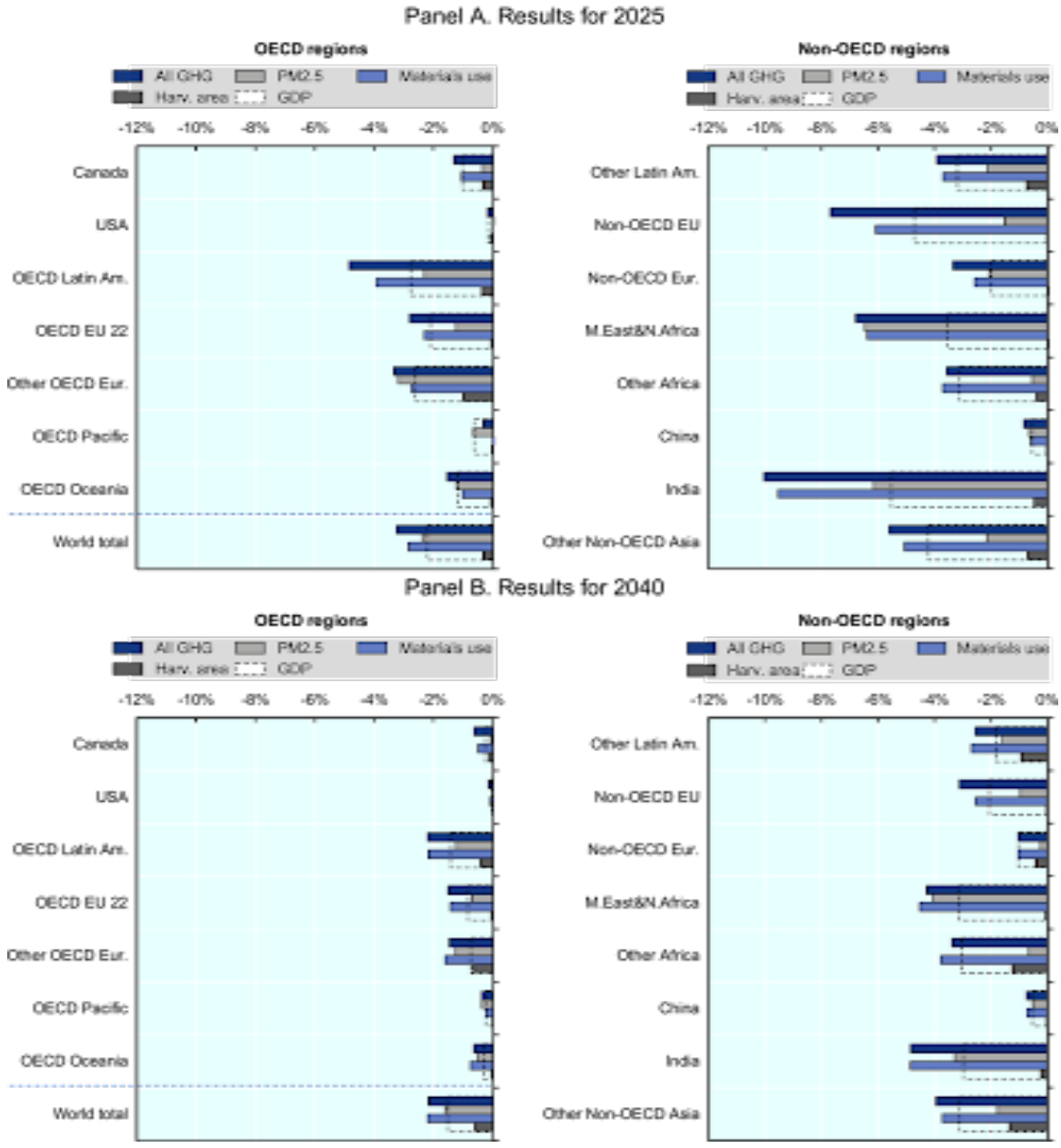

Figure 1. Deviations from the pre-COVID baseline projection (OECD, 2021)

but the less polluting service sector is affected less.[14] There are also regional differences based on how much the specific economy depends on the environment and energy system. The OECD report shows that OECD countries with more developed clean sectors are projected to suffer less of a gross domestic product (GDP) decrease compared to non-OECD countries with less developed clean sectors (Figure 1).

Through such discrepancies, the pandemic has revealed how an economy that relies less on environmental factors is more resilient to shocks, such as a pandemic, potentially driving more economies to strive to reduce emissions and re-structure to become more environmentally friendly.

Though the pandemic has greatly affected our lives, it has also impacted the environment that surrounds us. From an increase in plastic waste to reduced and rebounded levels of greenhouse gas emission, this unforeseen period has brought multi-layered and multi-faceted changes to our environment in ways we never could have imagined. And such impacts will not go away with the dropping number of cases of infection but will remain with us and affect current and future generations.

In order to take action and not be bystanders as our planet is hurting, we can do our part by integrating a more sustainable lifestyle. Examples include using public transportation, buying in bulk and locally, and recycling. However, increasing industrial and policy efforts are equally crucial. Measures, such as sustainable industrialization, adoption of renewable efforts, and investment in recycling and reusing facilities, must be implemented.[15] Though many uncertainties remain on the road ahead following the COVID-19 pandemic, one thing that we can be certain of is that we do not want an environmental catastrophe to be added to the mess.

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Mental Health in a Pandemic: Reaching Patients via Telehealth Therapy

Eric Lynch

The start of the COVID-19 pandemic presented highly disruptive threats to public health. Illness and death have plagued humanity on a global scale. Beneath these pressing issues, another medical concern flew somewhat under the radar: mental health. Social distancing caused social isolation. Friendship and familial ties were weakened or even cut. Fear of contracting the virus wreaked havoc. And, for many families, grief came suddenly and harshly. Nobody was mentally prepared to take on a life-changing global pandemic and all of its subsequent issues. But, given the unique circumstances of an airborne viral outbreak, traditional mental health treatment options, such as therapy, could not fulfill their traditional roles. One of the ways that mental health practitioners adapted to these changing conditions was by using technology. Examining how technology has been used to make mental healthcare accessible during the early periods of the COVID-19 pandemic is vital in order to evaluate its effectiveness and potential for future use.

The most expansive innovation of mental health services during the pandemic has been telehealth therapy. Telehealth refers to the practice of meeting with a practitioner over the phone or via video call instead of in-person. With the current ubiquity of videoconference software, the ease and accessibility of telehealth are obvious. But this was not always the case. Before the onset of the pandemic, fewer than 20% of American clinicians offered these virtual services. Even fewer Americans, approximately 10%, had ever used telehealth services.[1] Since the onset of the pandemic, this has all changed. Most psychologists and therapists had to adapt to, or at least consider, the process of treating patients through online platforms. Not only does this help prevent the spread of COVID-19, but it also helps mental health professionals meet rising demand. 60-75% of psychologists who treat anxiety disorders or depression reported an increase in the number of patients in the early months of the pandemic.[2] Working virtually allows mental health professionals to meet with patients from anywhere, reducing concerns about commutes, lateness, and other location or travel-centered barriers.

Although the premise of telehealth sounds simple, there are several ways it can vary from practitioner to practitioner. Prior to the pandemic and still present in many practices, a large number of telehealth programs used either the "hub-and-spoke model" or the "integrated care" model. Both of these methods of therapy require the patient to arrive at a clinical location, such as a local hospital, to then join a video call with a therapist in a different location.[1] These models address the issue of the "digital divide," or the gap in access to quality technology or knowledge about how to use that technology. For technologically illiterate patients and those without a home computer or smartphone, these methods permit them to receive telehealth therapy. Additionally, the patient is surrounded by trained clinical staff, even if the therapist is not there in-person. If a patient's home is not a safe place to talk freely due to domestic violence, overbearing parents, or housing insecurity, this type of therapy can provide security. A safe environment with medical staff on hand can be especially important in a situation where a patient is suicidal or needs immediate access to medication. Since the pandemic began, many of these locations have expanded to offer direct-to-consumer intervention. Through this method, patients are able to utilize their home computers or devices to complete therapy sessions remotely. The risks of COVID-19 have made this option more accessible and thus preferable over other models. Regardless of the delivery method, once the patient is in front of the screen, telehealth therapy allows mental health treatment.

However, the main question on people's minds is: does telehealth therapy really work? After centuries, if not millennia, of seeing healthcare providers face-to-face, skepticism about virtual health interventions is understandable. But the fact is, even before the pandemic and this surge in telehealth, there has been substantial evidence proving its effectiveness. Indeed, studies have shown that telehealth therapy is equally as effective as in-person therapy.[3] This claim, from the view of patients and

practitioners, has been furthered significantly by the spike in telehealth therapy caused by the onset of the pandemic. The percentage of telehealth patients who plan to continue using telehealth in the future, even after the pandemic, has quadrupled since 2019. Also, a majority of physicians have come to view telehealth more favorably than they did prior to the pandemic, and many plan to continue to offer virtual healthcare.[4] The rising popularity of this medium, in addition to scientific studies on its effectiveness, shows that telehealth can be a viable alternative to traditional therapy, even after the spread of COVID-19 has calmed down.

Telehealth, and mental health services in general, are flawed. Although telehealth generally makes therapy more accessible, one of the barriers yet to be overcome is economic inequality. The "digital divide," where some people cannot afford quality electronic devices, remains problematic. Even the "hub-and-spoke" model, where these devices are provided at central community institutions, cannot adequately address these underserved populations because many low-income neighborhoods do not have quality community centers, including hospitals, libraries, or education centers.[5] If these places are underfunded or few exist in a particular town, then they cannot provide a safe, private, and quality place with a sufficient number of computers for virtual therapy sessions. Additionally, many of these low-income neighborhoods tend to have a greater number of minority residents, creating a racial divide in regard to accessibility to telehealth therapy. Since minority patients are disproportionately affected by the economic fallout of the pandemic and pandemic-related stress, this gap is especially concerning.[1]

Another economic concern is payment for therapy. Prior to the pandemic, many insurance companies did not cover telehealth therapy at an equal level to in-person therapy. In the early months of the pandemic, some states passed laws requiring insurance companies to treat these types of health interventions as they would in-person. Still, the majority of states did not, requiring many people to pay more for therapy simply because it is online.[1] Insurance companies may be willing to commit more resources to telehealth, but there are challenges. For example, some insurance companies intend to require practitioners to use specific softwares for their therapy sessions. This may pose a problem because some platforms have extra fees that can impose a financial burden on therapists.[5] While using trustworthy platforms is important, having insurance companies dictate such specificities may cause more harm than good. Reliable telehealth platforms remain a primary concern regarding remote patient treatment. Privacy is incredibly important, especially in a setting where patients are discussing sensitive personal information. Thankfully, HIPAA regulations outline what to look for in video conferencing software to ensure that it is reasonably safe and ethical to use. Many practitioners are aware of this issue and are careful to choose their preferred platform wisely. Data breaches, or even spying, could potentially cause major harm to clients if a video call is not secure. Some practitioners are requiring that patients provide informed consent acknowledging that they are aware that there are possible risks associated with telehealth therapy. Beyond software, securing a private location to speak freely on a video call can be difficult. For a patient, finding a room in their home where no one can overhear their conversation may be impossible. On the therapist's end, they too must ensure that they are choosing a location where no one will overhear their conversations. In-person therapy often occurs in a space that has been deliberately set up to eliminate the possibility of outsiders overhearing the conversation. In this regard, in-person therapy may be more advantageous than telehealth therapy.

To address these issues, government action and a greater emphasis on social justice are required. Addressing racial and economic disparities, in general, will go a long way toward equalizing accessibility to telehealth therapy. Ensuring that every neighborhood has ample technological community resources would permit everyone to have accessibility to mental health resources. Government intervention could regulate insurance companies to ensure that they cover and reimburse telehealth therapy at an affordable rate. Wide-scale change is needed to make telehealth more equitable for all groups of people.

After the COVID-19 pandemic forced American therapists to experiment with telehealth solutions, there has been a rapid change in the scale and reputation of its implementation. Still, its usage as a complete replacement for in-person healthcare will fade as the pandemic comes to a close. Predicting the niche that telehealth will occupy in healthcare is difficult. In some cases, it may be a matter of preference, allowing providers and patients to simply choose which option is more convenient and

effective for them. With the increasing ubiquity of knowledge and hardware for video calling, most therapists will likely not eliminate the option altogether. Another possibility is that telehealth will become primarily a way to consistently connect patients with unique concerns with specialists who can assist them. Being able to meet with specialists and follow up with them regularly is not always easy due to geographic barriers, so telehealth can address this. Some doctors may also opt to use telehealth as a sort of triage, allowing them to assess patients before determining whether or not they require an in-person appointment.[4] For patients with mobility issues or disabilities, telehealth may even be life-changing by making meeting with their providers exponentially easier. Determining exactly what the future holds for telehealth therapy is impossible, but it has the potential to lead society into a world where healthcare is far more accessible and equitable for all.

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Let's Get Moving: An Analysis of Increased Sedentary Behavior During the COVID-19 Pandemic

Krystal Lan

When the pandemic began, we were all instructed to "shelter in place" and isolate ourselves inside our homes while the world around us came to a halt. Instead of commuting to work or educational institutions, we logged onto meetings and classes through the newly-popular virtual meeting space, Zoom. We were instructed to only go outside for essential reasons, such as buying groceries. Gyms closed, public spaces shut down, and businesses went bankrupt. The daily routine of traveling from place to place by foot or car became the click of a button on a computer screen. As the rules and regulations confined us to our homes, we found ourselves lacking the motivation to step outside because there was simply no place to go.

Ultimately, this led to a decrease in our daily physical activity–something we had not had to worry about when walking from room to room between work meetings or classes. Even as we transition out of the pandemic, we've dug ourselves a behavioral hole and no longer wish to leave our desks, couches, and beds. We spend money on visual entertainment, such as movie and TV streaming services, and spend more time on our electronic devices than ever before. Though we have not accomplished much throughout the day, we often feel depleted and tired after many long hours of screen time. The cycle repeats, causing us to reach for our electronics and spend the night on the couch instead of making the effort to take a refreshing walk outside. As a result, prolonged sedentary behavior has led to increased physical and mental health risks in individuals of all ages.

Those of us who track screen time on our phones may have noticed that the numbers have risen substantially since the start of the pandemic. Our time spent commuting to work and listening to the news on the radio has been replaced by watching a broadcast on TV or reading articles from the New York Times. Connecting with friends and family via text and video call instead of meeting up for lunch or a shopping spree, though convenient and pandemic-safe, is also a contributing factor to increased screen time. Thus, it is clear that, as the pandemic goes on, our time spent hunched over a device is prolonged, leading to periods of extended sitting. Our "breaks" turn from chatting with a classmate or coworker to watching a YouTube video or checking social media. We no longer feel the urge to get up from our chairs because there is simply no need–our world is in the devices we use every day.

A study on adults in the United Kingdom reported that, by the first full week of lockdown, subjects exercised for an average of 57 minutes less than the baseline level, which was the typical physical activity of these subjects before the pandemic began. This is essentially a 37% reduction in weekly minutes of physical activity.[1]

A common mindset is that, by working consistently throughout the day with no breaks, we will accomplish more. We strain our eyes and necks and forget about hydrating or going outside to breathe fresh air. However, stepping away for just five minutes can immensely boost one's productivity.[2] Taking a nap, recharging by sharing a meal with family, or going on a walk can increase one's productivity even more. The benefits of decreased stress and improved mood make the decision to stand up and stretch all the more promising.

As good as it is to stand up to take a trip to the refrigerator or change scenery and move to the couch, it is even more important to engage in longer bursts of daily physical activity. Forgetting to step away from the screen leads to decreased focus and takes a toll on our sleep cycles and nutrition habits. We snack and lounge on the couch while scrolling on Instagram and watch TV on our laptops in bed.

Yes, not having to move around seems to save us time and energy. However, it leads to (and eventually perpetuates) this never-ending cycle of a declining quality of life: we lose sleep, disregard our posture, and forget about eating healthy. Contrary to what some people may

think, there are simply no health benefits to staying up late to watch a movie or play video games. Understanding the harm that these activities may be having on our minds and bodies and what we can do to flip that switch is vital. Low levels of physical activity can eventually lead to health risks, such as hormonal imbalance, worsened blood circulation, and a weaker immune system. These are also premature factors to more harmful diseases, such as type 2 diabetes, high cholesterol and blood pressure, obesity, and heart disease. Luckily, there are many things that we can do to lower our risks of developing such diseases.

So what makes exercising "good for us?" We may not be able to see how our body changes when we exercise every day but we will certainly be able to notice a change in our mood and mental health in the long term. Exercising helps release "feel-good" chemicals in our bodies which make us feel more energized and refreshed. Exercise also lowers the levels of stress-related hormones in our bodies. Though we often feel tired after a workout, we have increased blood flow in our bodies which helps us absorb more oxygen, enabling us to feel more energetic. Exercise also improves our sleep quality, aids our productivity, and makes us feel more upbeat throughout the day. Furthermore, exercising improves mental acuity, which is a measure of how sharp and healthy our minds are. With continued exercise, our short and long term memory improves, as well as our ability to focus on a task at hand and pick up new skills. Several studies have also found that exercise can reduce depression and anxiety and delay cognitive decline in older populations.[3]

For all age groups, exercise can strengthen the muscles that protect and support our joints. For older populations who may have joint pain, stiffness, and arthritis, exercise can surprisingly decrease joint pain because avoiding it will only cause the muscles to become weaker. Additionally, being physically active helps to maintain a healthy blood pressure level and improve heart strength. This means that the heart will not need to work as hard to pump blood throughout the body, thus lowering blood pressure and cholesterol levels. Ultimately, this contributes to being less prone to chronic illnesses and a higher life expectancy.

Exercise also helps our immune systems since increased blood movement within the circulatory system also increases the movement of immune cells, or white blood cells, in the bloodstream. This helps to transfer these cells to different locations in the body where viruses and bacteria may be hiding. Not only does exercise promote the movement of white blood cells, it also ensures that these immune cells do their job for up to three hours after we have finished exercising. This keeps us from getting sick by providing these immune cells with extra time to seek out unwanted intruders in our body.[4] As such, adding physical activity to our daily routines is extremely beneficial in keeping our immune systems strong to fight off diseases.

So what can we do if we want to start exercising? If one has been sedentary for a long time, progressing slowly from a five-minute walk to a ten and eventually a twenty-minute walk is already a large accomplishment. Taking a bit of time out of our days to clear our minds has proven to be more beneficial to our productivity than avoiding breaks and time away from our screens. As one progresses their workout routine, it can be beneficial to up the tempo by introducing moderate-level cardio activity like biking or jogging and strength-based body-weight exercises. Fitness classes, whether in-person, streamed live, or pre-recorded, are a great method to keep us motivated and on-par with the movements. However, we must remember that committing to an active lifestyle takes willpower and consistency. Additionally, we should drink lots of fluids before and after physical exercise to replenish the water lost through sweat and eat a balanced diet to optimize the effects of our exercise.

Ultimately, failing to exercise regularly can have detrimental effects on our health, both in the short and long term. Thus, it is imperative to remember to exercise regularly to improve our mood, physical health, and overall bodily functions. It never hurts to take a brisk walk before, during, or after a long day of work to keep our minds refreshed.

As the pandemic comes to an end, we are slowly transitioning back to how life was before these drastic changes. We go back to school and work in-person, grab lunch with friends, and make regular trips to the grocery store. We spend our commute in the car listening to podcasts and travel long distances to see family. And as gyms

reopen, we start to exercise more and attend fitness classes again. We also resume typical outdoor activities, such as walking, running, biking, swimming, and hiking. We start to experience improvements in our mood and sleep schedule and we no longer feel the urge to sit endlessly in front of the television. We make better nutrition choices and encourage others to do the same. All of these effects come naturally from regular exercise and it's only a matter of time before daily exercise becomes a habit. After all, it is never too late to be active and live a healthy lifestyle!

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How the Vaccine Policies of U.S. Universities Affect International Students

Pan Hao Harrison

Attending college in a global pandemic is hard; attending college in a global pandemic as an international student is even harder. For students overseas who are coming to study in the United States, navigating through the realm of information about COVID-19 is especially tedious. While many schools understandably decide to implement measures to limit viral spread and protect vulnerable people in their communities, their specific approaches vary significantly, falling into a few different brackets. The first group includes those that mandate their students to receive WHO-approved COVID-19 vaccines. Among these institutions are schools such as Johns Hopkins University, that require students to be inoculated with FDA-approved vaccines (a considerably smaller pool of vaccines than the WHO-approved list). Importantly, this may subject students to undergo a revaccination process if their original vaccine is not accepted by the school officials. A group of schools that diverge significantly from the path of vaccine mandates do not require students to be vaccinated, but rather provide incentives—such as exemption from masking requirements—for students who decide to do so.

These complicated—and often rapidly evolving—policies make it hard for international students to know what to expect or how to prepare. However, the morality of these measures in the context of a university's diverse population goes deeper than personal feelings and inconvenience. Moral principles "should ideally be one of those uncontroversially taken to have some relevance for policy making."[4] Two broadly-accepted principles are the harm principle, which is the idea that people's liberties should only be limited in a way to prevent harm to others, and the fairness principle, which is the idea that good policies should try to avoid free-riding and encourage shared burdens.

The Incentive Method

A group of schools incentivize COVID-19 vaccines rather than mandating them. These incentives can take a few forms: a monetary prize drawn from a lottery, a non-recurring payment, or exemption from the university's mask mandate. For example, the policy of Santa Fe College rewards students and employees who are fully vaccinated with a one-time financial payment of $60.[9] Dickinson State University exempts students from its masking requirements, given that they can prove that they are fully vaccinated.[2]

One hallmark of the incentive method is that it may be the least intrusive method possible to achieve public health objectives. This may be helpful to persuade some people who resist mandatory vaccination, not because of personal beliefs or skepticism towards vaccines' safety, but rather because they feel that their bodily autonomy is being violated. As opposed to compulsory vaccination, which unavoidably contains provisions that punishes anti-vaccination behaviors and restricts freedom of anti-vaxxers, this method rewards good behavior and therefore encourages civic responsibility. Another benefit is that this policy is likely to boost the vaccination rate regardless of the contextual circumstances. Bambery et al. supports this policy and, after suggesting that mandatory measures are only "necessary for countries without robust immunization programs capable of achieving sufficient vaccination uptake through voluntary initiatives," argues that incentivization should be vastly explored as a useful alternative approach.[1]

No matter what public health guidelines a school provides, their sole purpose is to allow the community, especially the vulnerable, to maximize the benefits of herd immunity while minimizing the inconveniences that often come with coercive measures. Incentivization is especially appealing because it claims that both ends can be met simultaneously. There are, however, a few problems with the incentive method. These intrinsic problems hinder its application as a standalone remedy.

The first problem with the incentive method concerns its efficacy. From a public health standpoint, a substantial number of people must

be vaccinated in order to slow the transmission of COVID-19. It is possible that the threshold could be even higher to achieve herd immunity as new and more contagious variants emerge. The World Health Organization (WHO) estimates that 70 to 90 percent of the general population must gain immunity for COVID-19 to stop being transmissive.[5,6] This threshold will be difficult to be met solely by the method of incentivization. As a result, herd immunity cannot be established because the virus can still transmit in the community and vulnerable people are thus not protected. Therefore, the incentive method only goes so far in a public health emergency setting, as there are always enough people this method cannot persuade who will substantially impede this method's efficacy.

Though the incentive policy is unlikely to achieve herd immunity on its own, the underlying principle that Bambery et al. put forth when suggesting incentivization be explored is explained through an analogous case that they raise by comparing pathogens with toxic chemicals:

> *Johnny is a seven-year-old boy. He finds a bottle of toxic bleach in the laundry. He does not understand the danger presented by the chemical. His mother discovers the bottle in his school bag. She forcibly removes it from him—he resists because he wants to show his friends the bright blue bottle with the skull and crossbones . . . But the lethal risk presented by the toxic chemical warrants removing it from Johnny's possession, even against his will. That is what parents ought to do. And if they don't, a third party is justified in taking this dangerous chemical away from him.*[1]

In this case, the authors base their grounds on a risk calculation that non-vaccinators pose to others, regardless of whether or not the damages are purposefully done. Bambery et al. suggest here that mandatory vaccination is justified because the harm principle is violated; they then suggest that incentivization should be "explored as a legitimate coercive alternative."[1] However, since the method of incentivization is unable to achieve herd immunity, the risks that infectious diseases pose to the vulnerable still exist; and these vulnerable people are the exact population public health policies vow to protect. Though the argument by Bambery et al. for mandatory vaccination may be logical, their support for incentivization falls apart if the harm principle is applied. Therefore, it is difficult to argue for incentivization as a viable standalone policy based on the harm principle.

However, incentives, in whatever forms they exist, can be helpful to persuade some people to get vaccinated, therefore somewhat improving the outlook of the pandemic. Also, incentives may help universities achieve the public health objective faster, thereby reducing the harm that COVID-19 can potentially cause. However, a deeper problem concerns the fairness of the policy. A pioneer who introduces this principle into the conversation of vaccination is Alberto Giubilini, who argues that non-medical exemptions should not be given by making two analogous cases, one about taxation and another about the government's militaristic protection:

> *[P]eople are normally not exempted from paying their share of taxes just because they do not ethically approve of some ways in which their government spends public money, such as in the case of pacifists, or because they are afraid that it would be unsafe to spend public money in certain ways, for example, in case someone thought that some military operations would trigger reactions from terrorists in one's own country. These exemptions would simply be unfair, given that, for instance, even pacifists benefit from the public good of national security preserved through military forces.*[4]

The key point that Giubilini aims to make in these cases is that, because herd immunity is a public good similar to social benefits or government's militaristic protection, health policy should be made to avoid free-riding and encourage shared burdens—also known as the fairness principle. As such, incentivization is not a fair policy. Incentivization does not address the problem of free-riding, as there are always people who will enjoy the benefits while bearing no burden in a school setting. Second, incentivization clearly does not encourage an equal sharing of burden. The people who will be swayed by financial incentives are likely the same group of people who earn less money and already suffer more due to COVID-19 than people of higher socioeconomic status. It is morally unfair for them to bear the burden of achieving herd immunity while people who are significantly less affected by COVID-19 bear little-to-no burden.

Mandating WHO/FDA-Approved Vaccines

Some schools, such as Johns Hopkins University, not only mandate COVID-19 vaccines, but also require them to be WHO/FDA-approved.[8]

One of the biggest problems with such policies concerns the harm principle and its limitations. Professor Jessica Flanigan at the University of Richmond is a prolific author in bioethics and one of the leading voices in support of the harm principle. She justifies coercive measures based on the harm principle.[3] But even Flanigan must introduce some limitations to her justification, which she does by providing four conditions that must be met in order for mandatory measures to be justified:

> *(1) Vaccination prevents a contagious illness.*
> *(2) Those who are exposed to the illness do not make themselves liable to the risks.*
> *(3) Vaccination is potentially effective at limiting contagion.*
> *(4) Vaccination does not limit rights of self-defense or defense of others.*[3]

In cases where the harm is well-defined, the condition of the fourth principle means that mandatory vaccination is only justified if the vaccination does not harm the people vaccinated. However, what if the harm is not well-defined or unclear? In other words, are mandatory measures still justified when the harms of vaccination are unknown?

Even Johns Hopkins University admits that "there are no controlled studies on revaccination yet"[8] even though it insists that its students be revaccinated at the time this article was written. Where harm is unclear or undefined, coercive measures cannot be justified. Thus, because the safety of being revaccinated with vaccines made by a different manufacturer is not yet clear, vaccine mandates forcing students to do as such is unjustified.

Another major problem regarding this policy concerns its fairness. The fairness principle argues that public policies should be made to avoid free-riding and that the equal sharing of burden is as important as achieving the public policy objective itself. In a university setting, many international students who come to study abroad during a roaring pandemic have their vaccine choices limited to the ones available in their home countries, which may not be approved by the WHO, let alone the FDA. Given the context, is mandating WHO/FDA-approved vaccines a fair policy?

This depends on whether or not international students are considered free-riders. Free-riding individuals are those who do not contribute or do not contribute enough toward a shared resource or public good. In terms of public health in a university setting, free-riding applies to members of the institution who enjoy herd immunity without paying their fair share, unless vaccination threatens their health so that their rights of self-defense are violated. The counter argument provided by Johns Hopkins University to justify its policy is that "some vaccines not authorized by the FDA may be less effective against the delta variant."[7] Even though non-WHO/FDA-approved vaccines are potentially less effective than the ones that are, are international students who have already been vaccinated with an unapproved vaccine free-riders?

In Giubilini's taxation analogy, he states that the analogy between vaccination policies and taxation is valid "because it shows that when we need to ensure that important public goods are preserved or realized, as is the case with taxation, the appropriate goal to pursue is not only the realization or preservation of such public goods but also that everybody makes their fair contribution to them."[4] Following the analogy, different people with different financial capabilities pay different amounts when it comes to taxes. The system is not unfair just because a wealthier person pays more taxes than a poor person. Fairness cannot be judged by the specific amount of contribution but must be put into context . First, one's individual ability and willingness to contribute must be considered. If one has the willingness to contribute but contributes less because the person is less capable, he or she is not a free-rider.
In higher education institutions, international students who have the resources but refuse vaccinations should be considered free-riders because they have the ability but lack willingness. These students, therefore, should be subject to mandatory measures or punishment as a last resort. However, students who are vaccinated but not with WHO/FDA-approved vaccines have the willingness but lack the ability to be vaccinated with the approved vaccines. Thus, international students vaccinated with non-WHO/FDA-approved vaccines cannot be considered free-riders.

One of the main objectives of vaccine mandates is to

eliminate free-riding. However, mandating WHO/FDA-approved vaccines unfairly punishes students who are not free-riders, making such a policy unjust. Does this policy encourage an equal sharing of burdens?

By coercing already-vaccinated international students to undergo revaccination efforts, school officials are placing more burdens onto the shoulders of international students than they do onto domestic students. Therefore, by limiting the pool of COVID-19 vaccinations to the ones approved by WHO/FDA only, a gap in burden between international and domestic students is created and an unequal sharing of burden is established.

Schools mandate WHO/FDA-approved vaccines because they believe that these selective vaccines are more effective. This may be true. However, mandating a selective pool of vaccines, which poses unique burdens for international students, fails to establish itself as a fair policy.

What's Right & What's Next?

Both incentivization and WHO/FDA-approved vaccines mandates may be defective or unfair, and on some occasions even both. However, a more well-rounded approach can be established by tracing their limitations.

WHO/FDA-approved vaccine mandates are problematic because they limit vaccine choices for international students. Both the harm and fairness principles are, therefore, violated. The part of the policy that makes it harmful and unfair is its requirement that only WHO/FDA-approved vaccines are accepted, given that those vaccines are not necessarily readily available in all countries. However, this policy is effective at limiting COVID-19 transmission because herd immunity is established.

Incentivization, on its own, is not viable because of its inability to achieve herd immunity and maintain fairness, as such a policy allows for a gap in burden. However, this approach is versatile. To utilize the benefits of incentivization while avoiding its disadvantages, incentivization must be applied in a way that creates an equal sharing of burden. This can be achieved by combining incentivization with vaccine mandates. Since everyone is mandated to get vaccinated, an equal sharing of burden is formed. Incentivization can serve to convince people to get their shots faster and achieve herd immunity more quickly instead of simply persuading more people. By reaching the critical threshold faster, the damages caused by COVID-19 can be reduced and the vulnerable population in university communities can be safeguarded.

A potential solution utilizing this combined policy requires students to be vaccinated with any vaccine that is approved by the FDA or similar entity to guarantee safety and effectiveness. Incentives can be used to expedite achieving herd immunity and encourage civic responsibility. Furthermore, by decreasing the amount of incentive as time passes, people are persuaded to get vaccinated early. Admittedly, some vaccines are less effective than the ones approved by the WHO/FDA so this strategy may not be as good at curbing the spread of COVID-19 as mandating only WHO/FDA-approved vaccines, like the policy executed by Johns Hopkins University. However, effectiveness should not be achieved at the expense of unfair treatment and harm. These facets are deeply interrelated and equally important when considering public health policies at universities.

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The Lasting Impact of the Pandemic on Museums and Art Investment Businesses

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COVID-19 suddenly entered our lives, causing an unpleasant impact on daily life and businesses. The impact of the pandemic varied across industries, and museums and art investment companies faced some of the most severe effects. The COVID-19 pandemic has greatly affected the plans and policies of museums and art investment businesses. These changes have also produced controversies, such as the decision of the Baltimore Museum of Art to sell artwork.

COVID-19 has certainly provided significant changes in our society with regards to science. It has caused psychological changes in many, including being cautious of visiting popular public facilities, especially museums. After the invention of vaccines and frequent usage of high-quality masks, science is now assisting our society's return to normality. Some of the major institutions that were affected by these changes were museum and art investment companies, as they are heavily reliant on public activities and visitors. Since public activities suddenly declined, these institutions started to implement actions to minimize the drawbacks of the pandemic.

Figure 1. Textiles displayed at the Indian Heritage Center, Singapore [2]

The pandemic has caused two major impacts on museums and art investment businesses: economic and social impacts. Since the pandemic made the government initiate social distancing and other policies that discouraged people from gathering at public facilities, museums experienced a dramatic decline in their regular number of visitors. Similar to other industries, art investment companies, such as Artsy, rapidly began using online offices.[1] Since art investment companies don't need their visitors to visit in-person, active use

of online offices minimized significant damage to their finances.

However, the nature of museums as a walk-through public facility made them heavily dependent on physical visits and the income from tickets, which made their economic hardship significantly worse than those of art investment companies. Furthermore, many museums started to receive fewer external donations. External donations to museums were generally made by major corporations to promote their brand and social authority. This also applied to art investment companies, which often announced these corporations as major sponsors of auctions. The social perception of museums as public educators and art investment companies as a source of public donations through charity auctions made corporations assume that their donations would also promote their position. However, since COVID-19 prevented visitors from actually observing the brands of providers of funds, the marketing effects of donations lessened.[2] This caused corporations to withdraw their donations, especially as their own economic situations worsened due to the pandemic. The sudden termination of two major sources of income caused the profits and budgets of museums and art investment companies to dramatically decline. Despite the different natures of museums and art investment companies, they shared this similarly. Though museums are public facilities that prioritize the preservation of artifacts, art investment companies prioritize profit. Even though their purposes are significantly different, the economic impact of the pandemic on each was surprisingly similar.

The pandemic also impacted museums and art investment companies differently. As mentioned previously, the pandemic caused the number of visitors to museums to significantly decline, which caused economic hardship. Although people still attended museums through virtual tours, the number of in-person visits to museums declined. The pandemic stole the most essential element of museums—the ability of visitors to see the artifacts for themselves. Even though museums initiated virtual tours, the social interaction aspect could not be easily replicated in virtual media, which caused the total number of visitors to significantly decline.[3] The public quickly lost interest in virtual tours of museums since they could only see the artifacts on their screens, much like searchable Google images. The tendency of people not to visit public facilities to avoid contracting COVID-19 from other visitors caused the number of museum visitors to dramatically drop.

However, the social impact was more complex for the art investment industry. Art investment businesses could still maintain their primary focus during the pandemic: communication between clients and intermediators. Investment companies didn't interact with every client in-person even before the pandemic due to the geographical challenges and other obstacles.[4] For instance, Artsy, an online artwork market that manages over 4,000 galleries, already used Zoom and other online platforms to communicate with the clients and identify their personal interests, which made the users experience less change and fewer obstacles to invest in artworks during the pandemic. This was especially significant since many art investment companies, such as Christie's, were forced to close their major regular auctions due to the pandemic.[5] In fact, the total number of users actually increased steadily for art investment companies. The unique nature of using works of art to earn profits and network with others with similar interests piqued the interest of large-scale investors. Moreover, the pandemic forced people to stay indoors, which heightened users' interests in interior design and ownership of artworks. Unfortunately, these beneficial impacts of COVID-19 were not shared by museums, which previously required people to physically visit the facility and view the artifacts. Furthermore, investment in artwork required minimal physical interaction with other people since the technologies that calculate the price of artworks, such as carbon dating, were developed prior to the pandemic. In contrast to the remarkable decline in the number of visitors to museums, art investment companies received a unique increase in popularity due to the pandemic.

The unprecedented pandemic left museums and art investment companies suddenly facing major changes. However, workers soon began to minimize the damage and maximize

the benefits, especially in museums where the impact of the pandemic was significantly worse. The responses to these challenges can be divided into scientific ones and financial ones. Scientific responses mainly involved the introduction of virtual tours of museums[6,7] and long-term preservation of artifacts. Since museums and art investment companies couldn't leave their artworks without any caregivers, they began to use various technologies to preserve their art. The most common technology implemented was the usage of light and dark, specifically placing the artworks in a dark room without any exposure to light for long periods of time. This technique was an important response to the pandemic since the majority of artifacts are made of paint, clay, glass, and other materials that are extremely vulnerable to exposure to light, heat, and water. For instance, colors of paints and glass fade away when a piece of art is exposed to direct light for too long and clay cracks when long exposure to light makes the atmosphere too dry. Managers began to only expose artworks to light when a visitor or client requested. Similar to a wine cellar, the curators and preservators calculated an optimal condition for the material of each artwork and controlled the conditions of each container accordingly.[8]

Figure 2. Museum-goer wears a mask while browsing art. [1]

Additionally, virtual tours and masks were major scientific responses. Following the guidelines from the CDC and the WHO, museums and art investment companies converted to virtual platforms to minimize unnecessary contact with other people during the height of the pandemic. When new variants of COVID-19 with lower levels of severity, such as Omicron, became the dominant form of the virus, workers were able to return to their offices if they wore KN94 masks.[9] Museums and art investment companies also conducted health screens of clients and visitors and checked vaccination statuses. Currently, museums and artwork investment companies allow guests if they are fully vaccinated.[10] Even if visitors had COVID-19, they could still enter museums and art investment companies if a certain length of time passed since their recovery, since the WHO concluded that recovery from the virus provides strong immunity. These preventative measures against the pandemic enabled museums and art investment companies to resume in-person exhibitions and meetings to some extent.

In order to speed up their recovery from economic hardships, museums and art investment companies also focused on balancing their budgets, bringing in more visitors, and

motivating their external donors to resume donating. One example of a financial response was a marketing strategy implemented for vaccinated visitors by American museums. Vaccinated visitors received a discount in their entrance fees or membership fees, which enabled museums and art investment companies to host more visitors than they could at the start of the pandemic. Another response was an increase in the number of temporary exhibitions. Some museums and art investment companies hosted movable exhibitions and temporary auctions and traveled to various regions instead of waiting for users to visit them. This also enabled them to appeal specifically to the locals of each region they visited, which further accelerated the financial recovery of museums and art investment companies. However, some of these methods were met with criticism, such as when some local museums attempted to sell some of their works of art at auctions. The American Alliance of Museums amended their policies to allow museums to use their profits from auctions for additional administrative costs,[11,12] such as creating virtual programs. In response to this change, the Baltimore Museum of Art announced their plan to sell their art to balance their budget.[13] However, Martin Gammon,[14] an advisor to museums and private clients' collections, criticized this action for "abandoning the public trust of the museum to preserve the artworks for the next generations." Yet, this serves as a reminder that museums are still institutions that are heavily dependent on a budget. Critics underestimate the financial problems of museums to a degree that could be relieved by irregular donations.[15] Following this conflict, the Baltimore Museum of Art canceled their plan to sell their artworks. However, art investment companies continued to increase their incomes through selling artworks but did not receive criticism from reporters, since selling artworks was their role even before the start of the pandemic. In contrast, museums are perceived as public educators that safeguard the stories of people.

Even though they share a major focus, museums and art investment companies were affected differently by the pandemic. The nature of museums as public facilities and art investment companies as private businesses caused variation in how they were impacted by the pandemic. Designating museums solely as public educators worsened the effect that they experienced due to the pandemic.

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