

# One Health, COVID-19, and a Right to Health for Human and Nonhuman Animals

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## Abstract

COVID-19 is a reminder that human, nonhuman, and environmental health are linked, and so efforts to improve human, nonhuman, and environmental health should be linked as well. But current efforts to link these issues fall short by not doing enough for humans, not doing enough for nonhumans, and focusing narrowly on health instead of expansively on health, welfare, and rights. This paper surveys the case for respecting and promoting human and nonhuman welfare, health, and rights simultaneously. It then surveys the impacts of COVID-19 on human and nonhuman populations and proposes steps that humans can take to respect and promote human and nonhuman health, welfare, and rights ethically and effectively in this context.

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## Introduction

COVID-19 makes all too apparent the many links between human and nonhuman health, welfare, and rights. While stories about the origin of COVID-19 vary, one common story is that COVID-19 originated in bats, then spread to other animals, then spread to humans at a live market in Wuhan, China.<sup>1</sup> More generally, wild animals carry an estimated 10,000 viruses that have the potential to spread to humans.<sup>2</sup> Human exploitation and extermination of animals in factory farming (that is, intensive animal farming), deforestation, the wildlife trade, and other such industries not only increase the risk that existing diseases will spread but also increase the risk that novel diseases will develop.<sup>3</sup>

As a result of these links, many people now support One Health, a policy framework that seeks to promote human, nonhuman, and environmental health simultaneously. According to this framework, since human, nonhuman, and environmental health are linked, efforts to promote human, nonhuman, and environmental health should be linked as well.<sup>4</sup> For instance, many people believe that we should reform practices such as factory farming, deforestation, and the wildlife trade to reduce the risk of disease spread.<sup>5</sup> Many people also believe that we should learn more about nonhuman health so that we can learn more about human health and improve nonhuman health so that we can improve human health.<sup>6</sup>

For all these reasons, One Health is a step in the right direction. At the same time, One Health, as standardly interpreted, is not enough to address all the risks of health threats such as pandemics. It falls short for humans, since it does not do enough to mitigate the risks that factory farming, deforestation, the wildlife trade, and other such practices impose on humanity, and it fails to recognize the connections between human health and human rights. It also falls short for nonhumans, since it treats nonhuman health as important primarily for the sake of humans rather than primarily for the sake of nonhumans, and, as with humans, it fails to recognize the connections between nonhuman health and nonhuman rights.

This paper argues that the COVID-19 pandemic illustrates the need for an expanded One Health. In particular, not only does human use of nonhumans increase the risk of health threats such as pandemics, but health threats such as pandemics also increase nonhuman suffering, both directly, via outbreaks, and indirectly, via increased exploitation and extermination of nonhuman animals. Thus, mitigating and adapting to health threats such as pandemics requires thinking about human and nonhuman health, welfare, and rights holistically and structurally, so that we can develop solutions that improve lives across species rather than improving some lives by worsening others.

We begin the paper by making the case for human and nonhuman legal rights, including a human and nonhuman legal right to health. We then survey the limits of One Health for human and nonhuman health, welfare, and rights. Next, we examine the impacts that the COVID-19 pandemic has had on captive and wild animals. Finally, we outline a series of steps that the international community can take to respect and promote human and nonhuman health, welfare, and rights simultaneously. Since our aim is to show the connections across many issues, we aim for breadth rather than depth in this paper. But we hope that this general discussion will be useful for framing and motivating next steps.

## A human and nonhuman right to health

The human right to health is enshrined in international law, arising from the International Covenant on Economic, Social and Cultural Rights (ICESCR). This treaty, adopted by the United Nations General Assembly in 1966, commits member states to granting humans a wide range of legal rights, including the rights to work, family, education, health, and an adequate standard of living.<sup>7</sup> This treaty is part of the International Bill of Human Rights, which also includes the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights.<sup>8</sup> While far from perfect, these documents together establish a strong commitment to human health, welfare, rights, and justice.

The human right to health in the ICESCR is stated in particularly strong terms. It recognizes “the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.”<sup>9</sup> It also commits member states to the pursuit of concrete steps toward this goal, including the reduction of infant mortality, the improvement of the environment, the prevention of outbreaks, and the “creation of conditions which would assure to all medical service and medical attention in the event of sickness.”<sup>10</sup> These commitments are important, since they make clear that improving public health requires a combination of individualized care and structural change that makes individualized care less necessary.

As with many modern legal rights documents, the ICESCR states that these human rights are grounded in our shared humanity. For example, the document recognizes “the inherent dignity” and “equal and inalienable rights of all members of the human family,” as well as “the obligation of States under the Charter of the United Nations to promote universal respect for, and observance of, human rights and freedoms.”<sup>11</sup> This language implies that all and only members of the species *Homo sapiens* merit legal rights and that humans merit these legal rights by virtue of their species membership. In fact, the document makes this idea explicit by stating that “these rights derive from the inherent dignity of the human person.”<sup>12</sup>

Seen from one perspective, the idea that all and only humans merit legal rights is highly progressive. In a world where humans harm, kill, and neglect one another on a regular basis, the aspiration to treat *all* humans with “inherent dignity” and “inalienable rights” is important. However, seen from another perspective, the idea that only humans merit legal rights is not nearly progressive enough. In a world where humans harm, kill, and neglect nonhuman animals on a regular basis as well (and at a much higher scale), the aspiration to treat *only* humans with “inherent dignity” and “inalienable rights” erases more than 99% of the victims of human activity, including captive and wild animals.

In part for this reason, many moral, legal, and

political theorists are now starting to challenge the assumption that only humans can have legal rights.<sup>13</sup> According to these scholars, membership in the species *Homo sapiens* is not an acceptable basis for legal rights. Species are nothing more than abstract taxonomic categories that scientists use to explain particular facts about evolution, cognition, and behavior. There is significant variation within species, significant overlap across species, and significant change in species over time. There is no good reason to hold that membership in this kind of taxonomic category can, in itself, be necessary or sufficient for possession of legal rights, including the right to health.<sup>14</sup>

Similarly, according to these scholars, membership in the species *Homo sapiens* is not acceptable as a necessary condition for legal rights. One might think that only humans can have legal rights because abstract language and reason are necessary for legal rights, and only humans have abstract language and reason. But whether or not this claim about language and reason is true, the claim about legal rights is false. For instance, humans develop the capacity for language and reason only gradually, some lose this capacity later in life, and others never develop it at all. Yet even if humans lack *legal duties* in these moments, they still have *legal rights* in these moments, because they still have relevant interests and needs.<sup>15</sup>

What these considerations reveal is that if someone has interests and needs, then they merit legal rights that protect their interests and needs. And while animal rights scholars might disagree about what it takes to have interests and needs in the relevant sense, they generally agree that consciousness, emotionality, a sense of self, or bonds of care are sufficient. This conception of legal rights includes all humans without treating membership in the species *Homo sapiens* as the basis of legal rights. Yet it also includes many nonhumans, including the billions of captive animals and the trillions of wild animals humanity kills each year, since, after all, many of these animals have relevant capacities and relationships as well.<sup>16</sup>

While there are many other views to consider, the general upshot is that there is no non-arbitrary

conception of the basis for legal rights that includes all and only humans. The species membership view includes all and only humans in an arbitrary way, and alternative views can include *all* humans or *only* humans, but not both. And while a view that includes only humans might initially seem tempting, this kind of view is ultimately incompatible with the idea of universal human rights and justice. Thus, the only acceptable kind of view about the basis for legal rights is one that includes human and nonhumans alike, since only this kind of view is both non-arbitrary and compatible with the idea of universal human rights and justice.<sup>17</sup>

Of course, to say that humans and nonhumans alike should have legal rights is not to say that they should have all the same legal rights, or that they should all have legal rights of the same strength. For example, insofar as members of different species have different interests, needs, and vulnerabilities, they might merit different legal rights accordingly. Moreover, insofar as members of some species have stronger interests, needs, and vulnerabilities than members of other species, they might merit stronger legal rights with respect to those interests, needs, and vulnerabilities accordingly. So, there is no risk that extending legal rights to humans and nonhumans alike will collapse legally relevant distinctions among them.<sup>18</sup>

In any case, while nonhuman animals might not have an interest in, or need for, all the legal rights contained within the ICESCR, they do have an interest in, and need for, mental and physical health. For humans and nonhumans alike, mental and physical health are basic goods that facilitate the pursuit of many other goods, and achieving the highest attainable standard of mental and physical health requires a combination of individualized care and structural change.<sup>19</sup> So insofar as nonhuman animals merit legal rights at all, a right to health as described in the ICESCR is plausibly among them. It is worth asking what it might mean to respect such a legal right—and how far away humans are from doing so at present.

## The nature and limits of One Health

One Health is a policy framework that seeks to promote human, nonhuman, and environmental health simultaneously. For example, the Food and Agricultural Organization of the United Nations describes One Health as an “integrated approach” that recognizes that “the health of animals, people, plants and the environment is interconnected,” and it claims to promote One Health “in work on food security, sustainable agriculture, food safety, antimicrobial resistance (AMR), nutrition, animal and plant health, fisheries, and livelihoods.”<sup>20</sup> While One Health can improve our understanding of many practices, it will be enough for present purposes to consider three: factory farming, deforestation, and the wildlife trade.

Take factory farming first. Humans currently breed and kill more than 100 billion farmed animals (land and aquatic) annually for food.<sup>21</sup> Not only does this practice harm nonhumans, but it also harms humans in many ways. For example, many factory farms dump untreated waste in local environments, causing workers and community members to suffer from mental and physical health impacts.<sup>22</sup> Additionally, since factory farms place nonhuman animals in close proximity with one another in cramped, toxic environments, and since many factory farms also use antibiotics to prevent the spread of disease, they create the ideal conditions for antimicrobial resistant pathogens to develop and spread.<sup>23</sup>

Now, take deforestation. Humans have already cleared an estimated 40% of forested land for agriculture and other purposes, and rates of deforestation are increasing in many regions.<sup>24</sup> Not only does deforestation harm many animals—an estimated 80% of terrestrial species live in forests—but it also harms humans in many ways.<sup>25</sup> For example, deforestation can pollute the land, water, and air near forests, harming humans who rely on these natural resources for food, water, or income. It also increases the risk of zoonotic disease spread by increasing interaction between humans and nonhumans and by reducing biodiversity, which

functions as a buffer for the spread of zoonotic diseases.<sup>26</sup>

Finally, take the wildlife trade. Humans capture many wild animals—potentially trillions, if we count aquatic animals—to sell for food, medicine, and other purposes every year. This activity harms many nonhumans, who suffer during capture, transport, captivity, and interactions with humans. It also harms many humans, since it increases the risk of zoonotic disease spread, not only to new nonhuman populations but also to human populations.<sup>27</sup> Indeed, as noted in the introduction, the wildlife trade might be complicit in the COVID-19 pandemic, since the virus might have spread from a wild animal to another animal, and then spread again to humans in a live market, via the wildlife trade.

Importantly, COVID-19 is not the only disease that might have spread to humans through our treatment of other animals. The 2009 H1N1 pandemic, the 2003 SARS epidemic, and many other outbreaks seem to have resulted from practices that involve harming and killing animals in these ways as well.<sup>28</sup> Moreover, these risks are linked. For instance, since animal agriculture is a leading contributor to deforestation, it increases the risk of pandemics not only directly, via its use of antibiotics and intensive confinement, but also indirectly, via its contribution to biodiversity loss and human-nonhuman contact.<sup>29</sup> We need to think about these issues holistically and structurally to see all these links clearly.

Part of what makes One Health powerful, then, is that it draws attention to how practices such as factory farming, deforestation, and the wildlife trade are harming humans and nonhumans simultaneously, and, as a result, it draws attention to the need for solutions that can reduce and repair harms for humans and nonhumans simultaneously. That said, standard interpretations of One Health are limited in at least three related ways.<sup>30</sup> They do not do enough for humans, they do not do enough for nonhumans, and they focus narrowly on health rather than more expansively on health, welfare, and rights. This includes human welfare and rights as well as nonhuman welfare and rights.

First, One Health, on standard interpretations, does not do enough for humans. While many people use the One Health framework to advocate for reforms to harmful practices, such as limits on antibiotic use, these reforms are not enough to solve the problem.<sup>31</sup> For example, part of how factory farming impacts global health is through antibiotic use, but another part of how it impacts global health is by producing too much waste for the planet to absorb and by contributing to the health risks involved with deforestation.<sup>32</sup> Unless we are willing to not only *reform* but also *reduce* or *replace* our use of animals for food and income, there is a limit to how much progress we can make for human health.

Second, One Health, on standard interpretations, does not do enough for nonhumans. One Health treats nonhuman animals as having only instrumental value. On this approach, humans should learn about nonhuman health to learn about human health as a result, and humans should improve nonhuman health to improve human health as a result. But humans might not have reason to learn about nonhuman health or improve nonhuman health otherwise. As a result, humans might not only neglect nonhuman health in many cases, but might also harm nonhuman health in many cases, for instance by “culling” farmed animals or wild animals when doing so appears to benefit human health.

Third, and relatedly, One Health, on standard interpretations, focuses narrowly on health rather than expansively on health, welfare, and rights. When human health is seen as merely a good to promote rather than a basic right, it might seem easier to sacrifice in many cases. Similarly, when nonhuman health is seen merely as a good to promote *for humans* rather than a basic right *for nonhumans*, it might seem *much* easier to sacrifice in many cases. In order to promote human and nonhuman health in the right kind of way, then, humans must view this project not only as a matter of promoting human health but also as a matter of respecting human and nonhuman legal rights, including a legal right to health.<sup>33</sup>

The upshot is that assessing the impacts of



global health threats such as pandemics requires assessing the impacts on human and nonhuman health, welfare, and rights together. This includes not only the impacts of outbreaks but also the impacts of related disruptions. To see how this might work, the next four sections examine some of the impacts of COVID-19 on animals. In particular, we show that COVID-19 has impacted animals not only by exposing them to zoonotic disease but also by both increasing and decreasing human neglect, exploitation, and extermination of particular animals. We need to consider all these impacts, good and bad, to know how to proceed.

### COVID-19 and farmed animals

In April 2020, reports of widespread COVID-19 infections among US slaughterhouse workers—many of whom are low-income people, people of color, or undocumented immigrants who do not have easy access to health care—began to emerge.<sup>34</sup> The conditions in meat-processing plants facilitate the rapid spread of airborne pathogens: workers typically stand close to one another during long shifts and might also share transportation and housing.<sup>35</sup> As of September 2, 2021, at least 59,148 meatpacking workers, 18,793 food-processing workers, and 13,773 farmworkers had contracted COVID-19 and at least 466 workers in those industries had died from COVID-19 in the United States alone.<sup>36</sup> There is evidence that this industry fueled significant community spread far beyond plant workers as well.<sup>37</sup>

Many other countries experienced similar problems. For instance, at least 1,000 humans associated with mink farms or mink pelting have contracted COVID-19 in Europe.<sup>38</sup> Transmission between minks and humans has also produced variants of COVID-19, some of which may be less susceptible to antibodies.<sup>39</sup> Farmers and workers have endured other hardships during this time as well. For instance, many farmers needed to “cull” farmed animals due to slaughterhouse shutdowns and reported experiencing mental health issues as a result.<sup>40</sup> Many have also experienced economic hardship, since they lost income during shutdowns, though many received compensation for

these losses.<sup>41</sup>

COVID-19 has also had profound impacts on farmed animals, some of which have been more salient for humans than others. The pandemic disrupted the transport and slaughter of animals used for food. For instance, border shutdowns in Europe created long queues of trucks transporting live animals internationally, and some animals were subjected to waiting periods of up to 18 hours.<sup>42</sup> Additionally, when farmers had to “cull” farmed animals due to temporary slaughterhouse closures, many used particularly brutal methods: for example, animals were gassed, shot, overdosed, electrocuted, beaten, suffocated, and subjected to ventilation shutdowns, among other methods.<sup>43</sup>

This pandemic has been particularly impactful for farmed animals who are vulnerable to contracting COVID-19.<sup>44</sup> For example, minks can contract, spread, and suffer and die from COVID-19, and they are particularly vulnerable in factory farms, since they are forced to live in cramped conditions and are already vulnerable to disease.<sup>45</sup> As a result, thousands of minks have died from the virus, and millions more have been “culled.”<sup>46</sup> For instance, in the largest cull of the pandemic to date, the Danish government recommended the extermination of approximately 17 million minks after discovering that a mutated COVID-19 variant was transmitted from minks back to humans.<sup>47</sup>

COVID-19 has also impacted fisheries and aquaculture.<sup>48</sup> Restaurant shutdowns decreased demand for seafood, and restrictions disrupted fishing industry supply chains. Many commercial fishing activities were reduced, and global fishing activity had decreased by 6.5% in April 2020 compared to previous years. COVID-19 restrictions have also hampered fisheries assessments, forcing scientists to postpone observation programs and management meetings. Meanwhile, the impact on aquaculture has varied by region, the fishes farmed, and characteristics of individual farms. Aquaculturists unable to sell fishes face increased feeding costs to keep fishes alive, leading some to implement growth-slowing measures to conserve supplies.<sup>49</sup>

## COVID-19 and lab animals

As of September 8, 2021, approximately 41.1% of the global population had received at least one dose of a COVID-19 vaccine.<sup>50</sup> The vaccine is an incredible accomplishment, and to the degree that animal research was necessary to accomplish this goal, we should count that as a benefit of animal research. At the same time, we can question whether animal research was, in fact, necessary to accomplish this goal. After all, nonhuman health is an unreliable model for human health, and so we can expect this research method to regularly produce false positives and negatives for both efficacy and toxicity.<sup>51</sup> In addition, the wide range of presentations of COVID-19 made the task of identifying analogous animal models particularly difficult.<sup>52</sup>

Moreover, not only is animal research potentially unreliable (as well as increasingly outdated as other methods, such as organ-on-a-chip research, become available), but it can also slow vaccine development.<sup>53</sup> In general, animal research during preclinical stages of vaccine development can take anywhere from 18 to 30 months.<sup>54</sup> As a result, the first two vaccine candidates to be approved for use in the United States “skipped” this preclinical phase entirely and instead tested vaccines on human and nonhuman animals concurrently.<sup>55</sup> The success of running these trials concurrently raises the question of whether the resources used to run animal trials might have been better spent elsewhere.

In any case, in addition to asking how much good animal research does, we also need to ask how much harm animal research does, as well as whether animal research violates rights. According to the US Centers for Disease Control and Prevention, experimental research related to COVID-19 has involved cats, dogs, ferrets, fruit bats, hamsters, tree shrews, mice, pigs, chickens, and ducks.<sup>56</sup> Researchers have also infected nonhuman primates, including rhesus and cynomolgus macaques, grivets, and common marmosets with COVID-19 to try to model human infection.<sup>57</sup> And while not all animals infected with COVID-19 become sick, many—including common marmosets, cynomolgus macaques, ferrets, grivets, hamsters, and rhesus macaques—do.<sup>58</sup>

Humans have harmed nonhumans in other ways in the course of producing COVID-19 treatments and vaccines. For instance, squalene, a boosting agent harvested from shark livers, is used in at least one major vaccine candidate.<sup>59</sup> Blood harvested from horseshoe crabs was used to test COVID-19 vaccine candidates too.<sup>60</sup> That said, determining the net effects on sharks and horseshoe crabs is difficult. For instance, drug makers have stated that squalene is harvested from sharks caught for other purposes but are not transparent about their suppliers.<sup>61</sup> They have also stated that COVID-19 will not unduly burden horseshoe crab populations, but even if so, it would still be harming horseshoe crabs.<sup>62</sup>

The pandemic has also impacted lab animals who were not used in COVID-19 research, with mixed results for the animals. For instance, in the spring of 2020, universities reduced on-site activity to meet social distancing requirements during the pandemic.<sup>63</sup> With fewer staff to care for lab animals, many institutions reportedly exterminated them.<sup>64</sup> Such killings occur when experiments are completed in normal times, but the pandemic led to unusually large culls. However, determining the net effects of these changes on animals is difficult, since, as with farming, it can be difficult to tell whether an earlier death is good or bad for animals who would be used, harmed, and killed for human purposes either way.

## COVID-19 and companion animals

At the start of COVID-19, companion animals were reportedly a source of stress for many humans. For instance, many humans were concerned that companion animals might be vectors for COVID-19 and that they might expose humans and nonhumans alike to COVID-19. Many other humans were concerned that they might not be able to properly care for companion animals, for instance due to illness, death, or economic hardship. At the same time, companion animals were reportedly a source of relief for many humans during a difficult time. If nothing else, the opportunity to spend more time with one’s family, including companion animals,

can make an otherwise isolating time easier to endure.

Some companion animals have benefited from the COVID-19 pandemic, while others have suffered. Fosters, adoptions, and sales of companion animals have increased during the pandemic, to the point where many shelters and rescues have struggled to keep up with the demand.<sup>65</sup> As a result, many companion animals have benefited from adoption and from spending more time with human guardians. But even in cases where animals benefit from increased interaction, there is a risk that many will experience separation anxiety when humans spend less time at home after the pandemic. There is also a risk that many will be abandoned after the pandemic, though the extent of this risk is not yet clear.<sup>66</sup>

Additionally, not all companion animals have benefited from increased interaction during the pandemic. First, while many humans ordinarily see companion animals as family, we can easily switch to seeing companion animals as “pests” during a pandemic. And even though COVID-19 appears to be rare, mild, and asymptomatic in companion animals, a fear of disease can still increase the risk of violence or abandonment.<sup>67</sup> At the start of the pandemic, fear of contracting COVID-19 led to a rise in abandonments in some countries.<sup>68</sup> In many cases, this fear also made it difficult for human guardians who contract COVID-19 to find temporary homes for their companion animals during quarantine and recovery.<sup>69</sup>

Relatedly, when humans suffer during a pandemic, companion animals can suffer as well. For instance, when humans contracted COVID-19 at the start of the pandemic, many companion animals were taken in by shelters.<sup>70</sup> The social, psychological, and economic impacts of COVID-19 can also increase risks for companion animals. For example, while many companion animals might enjoy additional affection from humans, many others might be overwhelmed by additional affection, and, of course, some might also experience additional abuse. Moreover, an economic recession can increase rates of surrender or euthanasia of companion animals as humans are no longer able

or willing to properly care for them.<sup>71</sup>

Animal rescues and shelters—along with institutions like sanctuaries—can face other problems during a pandemic too. When social and economic disruptions occur, these institutions can be particularly vulnerable because of how much they depend on donations and volunteers. With fewer donations, there will be less compensation for staff and less food and medicine for animals. And with fewer volunteers, there will be less support for staff and care for animals. As a result, as in all of the other cases discussed above, a pandemic can lead not only to increased deprivation for animals in captivity but also, as a result, to increased rates of euthanasia when no alternatives are available.

### COVID-19 and wild animals

In some respects, the COVID-19 pandemic has had the same effects on wild animals as companion animals, but in other respects, it has had the opposite effects. For instance, whereas social distancing might lead to increased interaction with many companion animals, it might lead to decreased interaction with many wild animals. This can be good for humans in some ways but bad for us in other ways. When there are fewer cars on the road, we benefit not only from less air, light, and noise pollution, but also from fewer vehicle collisions with nonhumans.<sup>72</sup> At the same time, when humans depend on, say, wildlife tourism for income, they might experience economic hardship during social distancing.<sup>73</sup>

The impact of the COVID-19 pandemic on wild animals has been similarly mixed. On one hand, many wild animals have benefited from the social and economic changes produced by the pandemic. Insofar as humans were social distancing, wild animals were able to explore cities, roads, canals, and other spaces more, prompting the media to publish (in some cases overblown) stories about wild animals “reclaiming” these spaces. This can be good for animals, as bees, birds, whales, and many others benefit from a quieter planet.<sup>74</sup> And of course, given that tens of millions of animals are killed in vehicle collisions every year, animals stand



to benefit from fewer vehicles on the road as well.<sup>75</sup>

On the other hand, many other wild animals have been harmed by the social and economic changes produced by the COVID-19 pandemic. For instance, the pandemic led to a substantial increase in single-use plastics.<sup>76</sup> Humans have relied more on plastic bags for shopping, delivery, and take-out, and we have also relied more on personal protective equipment such as face masks. While some of these changes have reduced the spread of COVID-19, they have also increased plastic pollution, as well as other kinds of pollution that can harm wild animals. For instance, when humans throw away face masks without cutting the ear loops, nonhuman animals can easily get tangled up in the loops and suffer or die.

Reduced tourism has also had mixed effects on wild animals. US wildlife agencies have reported increases in hunting and trapping licenses since the pandemic began.<sup>77</sup> Raja Ampat, a popular Indonesian dive site, is a good example of these mixed effects. Shark, manta ray, and sea turtle populations have increased, likely in response to fewer dive boats in the area.<sup>78</sup> However, fees from tourists, which fund conservation law enforcement, have also decreased.<sup>79</sup> Meanwhile, poaching has intensified in areas where communities rely on international tourism for income and conservation, and animals who rely on food from tourists, such as Thai macaques, have faced possible starvation without their usual food sources.<sup>80</sup>

Of course, many wild animals are also vulnerable to zoonotic diseases. So, during a pandemic, many wild animals are not only at risk of contracting the relevant disease but also at risk of being seen as “pests” and treated accordingly.<sup>81</sup> While humans tend to be responsible for zoonotic disease spread, we also tend to blame nonhumans rather than ourselves for the resulting outbreaks. For instance, bats are important not only intrinsically but also instrumentally, because of their contributions to ecosystems.<sup>82</sup> But since many humans see bats as a possible origin of COVID-19, there is a risk that violence against bats will increase or that support for bats will decrease in the wake of the pandemic.

## Lessons for the future

The COVID-19 pandemic has highlighted the myriad ways in which human and nonhuman animal health, welfare, and rights are linked. The virus might have come from the wildlife trade, which brings humans and nonhumans into close contact. And as of September 8, 2021, the virus has infected more than 221 million humans and killed over 4.5 million humans.<sup>83</sup> In one sense, then, the pandemic underscores the importance of nonhuman health because of its impact on human health. If we want to reduce the frequency and intensity of future pandemics, then we should either regulate or abolish the wildlife trade, which might have led to this pandemic, as well as factory farming and deforestation, which can easily lead to others.

But if human and nonhuman animals alike deserve a right to health, then the COVID-19 pandemic underscores a broader set of lessons as well. Nonhumans matter for health threats such as pandemics not only because our exploitation and extermination of nonhumans via factory farming, deforestation, and the wildlife trade contributes to these threats, but also because these threats contribute to nonhuman suffering and death. Moreover, health threats harm nonhumans not only directly, by increasing the risk of outbreaks, but also indirectly, by increasing the risk that humans will harm nonhumans in the search for food, medicine, or income, as well as because humans are either unable or unwilling to care for nonhumans during crises.

Thus, if humans want to mitigate and adapt to the impacts of health threats such as pandemics in an effective and inclusive manner, then we need to address all of these impacts. That is, we need to reduce our use of animals as part of our mitigation efforts and increase our support for animals as part of our adaptation efforts. And insofar as we do this work, we need to address not only the direct harms that pandemics can impose on animals, such as the harm of illness, but also the indirect harms that pandemics can impose on animals, including the harm of increased exploitation or extermination. This requires promoting human and nonhuman health, welfare, and rights simultaneously, including but not limited to the right to health.

This discussion makes it clear that addressing the harms of pandemics is not a simple matter of restoring the status quo that existed prior to COVID-19. After all, this status quo was massively and unnecessarily harmful for humans and nonhumans alike. And while many humans and nonhumans suffered more during the pandemic, many also likely suffered less, either because they received more affection (as with some companion animals) or less abuse (as with many other captive or wild animals). Therefore, learning the right lessons from this pandemic requires creating a new status quo by attempting to mitigate the negative impacts while building on the positive impacts of this disruption.

Since it would take much more space to fully explore the implications of this discussion, we will close by noting six implications here. First, and generally, humans should extend a legal right to health to humans and nonhumans alike. Following the ICESCR, this legal right to health would ideally commit states to recognizing “the right of everyone to the enjoyment of the highest attainable standard of physical and mental health” and to taking concrete steps toward this goal. And while different concrete steps will make sense for different species, as a general matter they should reflect the reality that promoting public health requires a combination of individualized care and structural change that makes individualized care less necessary.

Second, and relatedly, humans should revise and expand policy frameworks such as One Health to consider human and nonhuman health, welfare, and rights (including the right to health) holistically and structurally. We should consider these issues holistically so that we can improve human and nonhuman lives simultaneously, rather than, say, improve human lives by worsening nonhuman lives unnecessarily. And we should think about these issues structurally so that we can track how our basic social, political, and economic systems reinforce the status quo and how changing them can disrupt the status quo, for instance by transitioning from animal-based food systems to humane, healthful, and sustainable plant-based alternatives.

Third, and as a result, humans should research

our impacts on human and nonhuman populations and should include human and nonhuman health, welfare, and rights considerations in impact assessments. Many people are increasing their support for academic research in nonhuman health and welfare for this reason. Additionally, some cities, such as Mexico City and New York City, have created animal welfare offices so that humans can be empowered to represent the interests of nonhumans in policy discussions.<sup>84</sup> While states can and should do much more to increase representation for other animals, even these first steps can have a major impact on health and environmental policy.

Fourth, insofar as humans include nonhumans in impact assessments, humans should also include nonhumans in policy decisions regarding education, employment, and social services. As states build more healthful and sustainable food, energy, and transportation systems, they can work to build more humane food, energy, and transportation systems too, and they can expand opportunities for doing that work. This can include expanded opportunities for veterinary education and employment, so that humans have more opportunity to care for wild animals in addition to particular kinds of captive animals. The more states invest in such work, the more they can improve the lives of humans and nonhumans as a result.<sup>85</sup>

Fifth, and relatedly, humans should include animals in decisions about infrastructure. In the same way that states can transition to more humane, healthful, and sustainable food, energy, and transportation systems, at the same time, they can also transition to more humane, healthful, and sustainable lived environments. For instance, insofar as states require building materials to be energy efficient, they can also require that building materials be animal friendly, such as by reducing collisions with birds. And to the extent that states expand urban parks for beautification and clean air and water, they can also install habitats, feeding stations, and water stations for the nonhuman animals they expect to reside in these spaces.<sup>86</sup>

Finally, and in general, humans should stop punishing nonhuman animals for human-caused problems. At present, humans kill captive and wild

animals alike for a wide range of reasons, including but not limited to food, medicine, income, and disease containment. This approach is incompatible with nonhuman health, welfare, and rights. Before humans can support nonhumans in achieving the “highest attainable standard of physical and mental health,” we must first support them in achieving at least a *minimal* standard of physical and mental health, such as by not killing them unnecessarily and by not using them in such high numbers that killing them during a disruption is seen as necessary.

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