

The World Health Organization (WHO) estimates that 61% of all human diseases and 75% of human diseases discovered in the last decade have originated from animals. Such diseases that transfer to humans through contact with live animals, animal flesh, byproducts, or waste are called zoonoses.

PREDICT, a virus prevention program, estimated that there are more than 1.6 million unknown viral species in mammals and birds, nearly half of which may pose risk to humans. Until the outbreak in 2019, the novel coronavirus (which causes the disease COVID-19) was one of those zoonoses.



Many zoonoses emerge in or next to biodiversity hotspots like rainforests or wild animal markets. Humans are largely unfamiliar with the pathogens the animals in these spaces may harbor. Increasing human contact with wild animals increases zoonotic risk. Zoonotic diseases are frequently found after major land clearing campaigns, often to facilitate modern intensive agriculture or urban development. To see the full threat these diseases pose we must consider population resiliency and pathways of human-to-human transmission alongside the factors that increase animal-to-human transmission.

Urban Development and Inequality



While undeveloped ecosystems contain scores of potentially deadly pathogens, it is the presence of human activity which creates the threat of disease. Unsustainable development practices pushes wildlife towards human settlements. This development can take the form of logging, mining, road building, rapid urbanization, or population growth. When habitat loss occurs, animal populations decline and come into contact with humans, while the viruses that had preyed on those animals seek new hosts. It appears that species living in degraded habitats are also more likely to carry viruses that can infect humans, though scientists are unsure what drives this phenomenon. Human settlements also create optimal living conditions for common disease-vector animals like rodents and bats. Industry and building projects should avoid entering biodiverse areas whenever possible to limit initial animal-human transmission of zoonoses.

To effectively address the spread of zoonosis broader urban development strategies must be reexamined. Municipal governments struggle to improve infrastructure to accommodate the growing majority of humans living in urban areas, while often implementing policies that promote wealth inequity, lengthy food supply chains, and ecological destruction—all factors contributing to zoonosis. Only widespread changes can curb these socially and fiscally costly diseases.

Urbanization is often thought to foster improved health due to increased access to sanitation and healthcare facilities. However, it is actually associated with worse health outcomes for the poor in many countries. Cities as a whole are linked to multitudes of diseases and risk factors which make people more vulnerable to the effects of diseases like the novel coronavirus. These include: air and water pollution, mal/over nutrition, and crowding, with attendant increases in coronary disease, diabetes, cancer, and communicable disease. The poor face the worst of these effects of city life, frequently rely on jobs which do not provide sick leave, and often must resort to less safe food than their rural counterparts, increasing zoonotic risk.

Policies that label settlements of low-income residents as “illegal” or “informal” facilitate municipal abdication of public services such as water, sanitation, electricity, trash collection, and healthcare facilities. Such conditions encourage outbreaks of and fatalities from zoonoses in multiple ways. Haphazard sanitation management fosters rodent and other animal populations and increases waterborne disease. Cities refusing to collect waste and provide electricity drive up air pollution rates as households resort to burning trash or creating heat with fuel sources like coal. As air pollution compromises respiratory function and health care facilities may be inaccessible, sicknesses like COVID-19 attack victims’ lungs. New disease outbreaks are harder to detect among high rates of untreated disease.



Policies deeming such establishments as illegal also place pressures on the borders of settlements, creating overcrowded conditions where disease and bacterial resistance can spread. In such places, the recommendations we’ve seen during COVID-19 to physically distance from one another and to frequently wash hands can be next to impossible. Such policies are seen in most parts of the world where the poor are ghettoized through no choice of their own, while essentially subsidizing the lifestyles of wealthier denizens through their labor and lack of social services. Gentrification and municipal prioritization of middle-class development initiatives further push people into marginal places and encourage settlement on the outskirts of cities, in contact with new zoonotic threats. Given the nature of communicable disease and the wealthy’s reliance on the labor of the poor, health inequities result not only in the devastation of poor communities but increased risk across socioeconomic lines.

War and Occupation

People living under war and occupation face a similar, if elevated, barrage of risks as the urban poor. They frequently suffer from long-term and geographically widespread food shortages, escalating their susceptibility to disease. War also includes the potential for displacement, leading to crowding and new environmental risks. And, war and pandemic each introduce their own set of organizational impediments for humanitarian relief which may be available in the face of just one of these threats.

In a similar vein, belligerent sanctions, such as the current “maximum-pressure” U.S. sanctions on Iran, limit the capacity for national and international response to a disease outbreak. COVID-19’s devastation of Iran reflects the weakened economy’s diminished ability to fight disease. Even more pointedly, it exposes the effects that fears of litigation have on suppliers and shipping companies who choose to halt the passage of live-saving imports, notwithstanding unreliable and imprecise sanctions exemptions for humanitarian goods.



In occupation, the elevated risk to public health can provide justification for occupiers’ human rights violations and create new potentials for ethnic cleansing. Israel’s response to COVID-19 includes: introducing tracking measures for residents, which—though covertly in place before the outbreak—may increase within the Palestinian population after the pandemic recedes; selectively quarantining Palestinians in the West Bank; raiding and destroying Palestinian medical facilities and emergency food provisions, and failing their legal responsibility under the Fourth Geneva Convention to provide for the health of Gazans. Gazans remain trapped in one of the most population-dense areas on earth without enough resources for a fraction of their people. Systemic water and electricity shortages take on new urgency, as Gazans are told by the World Health Organization to wash their hands and hospitals try to ensure a steady supply of power to the few respirators they have.

Long histories of racist and colonial health policies also make colonized and disadvantaged communities skeptical of health advice and healthcare facilities run by the state or coming from the West. Suspicions that the 2019 coronavirus (and earlier, Ebola) were manufactured by the West to increase pharmaceutical profits or curb population growth distract from health advice and from the very real pathways of disease racialization. Healthcare access and quality is heavily determined along racial lines in many countries, such as the United States which has seen much higher rates of deaths from COVID-19 in Black and Latino residents than white residents where such statistics are available.

Intensive Animal Agriculture

Urban development is also linked to an increased demand for animal products and longer food supply chains. From the 1960s, the global demand for animal products has quadrupled. Contact with meat and animal byproducts is a significant factor in the spread of zoonoses. In addition, the appetite or need for wild animal consumption widens the pool of potential pathogens.

Meat markets place large numbers of people and animals together with little protection from viruses jumping from animal to human. Wet markets where animals are slaughtered and sold in the same location have come under particular scrutiny, as the novel coronavirus is thought to have likely originated in a wet market in Wuhan, China. In many regions, wet markets have limited sanitation infrastructure, including access to sufficient drainage and refrigeration, creating good conditions for viral spread.





Some politicians have called on China to eliminate wet markets in light of COVID-19. However, wholesale bans on wet markets or on specific wet market practices or locations may drive trade underground and away from regulation. Wet markets also serve a crucial function in the lives of many small-scale farmers and low-income shoppers looking for nutritious, local foods. According to a 2012 study based on data from the China Health and Nutrition Survey, the availability of wet markets correlated with an increase in Chinese children's nutritional intake. Given these benefits, the Chinese government has taken a different approach by reoutfitting wet markets to make conditions safer, as well as banning the consumption of some species. Unclear definitions surrounding medicinal exemptions in the sale and consumption of wild animals is an ongoing problem.

Some traditional livestock practices which could be helpful are nevertheless often maligned as dangerous. Such charges often have colonial origins and are used to support the "development" of rural areas and peoples. Delia Grace, an epidemiologist with the International Livestock Research Institute, characterizes such accusations as a "matter of concern" rather than a "matter of evidence." Many traditional practices carry their own disease prevention methods, such as boiling fresh milk shortly before consumption or fermenting meat for long periods of time. As "development" campaigns succeed and as more people move to cities, these agriculture methods are replaced with intensive animal agriculture. The hollowing out of rural life decreases food sovereignty and accelerates the rate of urbanization, while jeopardizing national food security in times of pandemic and international trade disruption.

It is not only wild animals and informal markets which pose risks, but intensive urbanization and industrialized farming. Industrial livestock production is a leading cause of ecological disruption as lands are cleared for grazing and crops are grown to feed livestock rather than local communities, shaking loose zoonoses from uncultivated ecosystems. Farmed animals can also harbor new zoonoses. One reason is the tendency of zoonoses to enter the human population through an intermediate carrier: an animal which catches the disease from a different species and passes it to humans.

The turn to big agriculture has also led to intensive use of antibiotics and antivirals to augment animal growth and to keep animals from falling sick, as opposed to treating illness. These non-therapeutic uses have led to livestock receiving around 70% of all medically important antibiotics and antivirals manufactured. These practices have created powerful antibiotic-resistant bacteria which enter our environment and food. The profitability of these industries has generated large lobbying operations which have prevented legislation aimed at the health of the consumers, factory-farm workers, and the general public (such as curbing antibiotic/antiviral use and preventing the sale of animals who can no longer stand unassisted). Overuse of antibiotics and antivirals may increase the drug resistance of pathogens originating or carried by livestock and reduce treatment options for humans who catch new diseases. Antibiotic resistance also jeopardizes food security during disease outbreaks within livestock populations.

Changing animal rearing practices may disproportionately raise the cost of life for the urban poor. However, viral outbreaks also hit the poor the hardest, in terms of work hours lost and price raises when entire livestock populations must be culled.



Indeed, coronavirus may push hundreds of millions of people into poverty if wealthy countries do not take action. Low-wage farm workers also bear particularly high risk of infection. Subsidizing the transition back to localized forms of protein, reducing the consumption of non-local meat and animal by-products, and ensuring the health of animals who come in contact with workers would do the most to limit disease passed to humans from domesticated animals.

Migration, Travel and Trade

The trade of animals is a key focus point in examining zoonoses. Animals circumnavigate the globe because of the value-chains their products fall into. Global capitalism drives the movement of animal products across environmental conditions and increases the rates of infectious disease. For example, the first cases of avian flu came from Tibetan chickens taken over 1500km across China.

Localized food systems reduce the risk of outbreaks and transmission. This is one reason wet markets, farmers markets, and the like must not be demonized as unhygienic, but be protected. Staving off the increase of supermarkets, particularly foreign-owned chains which tend to import more food, reduces the potential for diseased food to spread to many locations at once. Reducing the global food trade would also lesson agricultural inequities and makes communities more resilient in the face of pandemic. Currently, entire nations are at risk of food insecurity when global trade halts.



Human migration from rural to urban areas also poses some increased risks for zoonoses. Pathogens can be brought to cities from interaction with rural livestock or from livestock transported into the city. Urban disease also poses threats. When a sufficient percentage of the population is immune to a disease, its spread among the vulnerable population is cut short (a phenomenon called herd immunity). When migrants move to cities, they may hold less immunity to particular diseases, jeopardizing their own health and the balance of herd immunity. The disease risks of migration increase as movement and trade patterns complexify, and individuals potentially spread disease to rural areas. While human movement is a fundamental right, greater social and economic support should be given to rural areas to make non-urban life viable, prosperous and healthy.

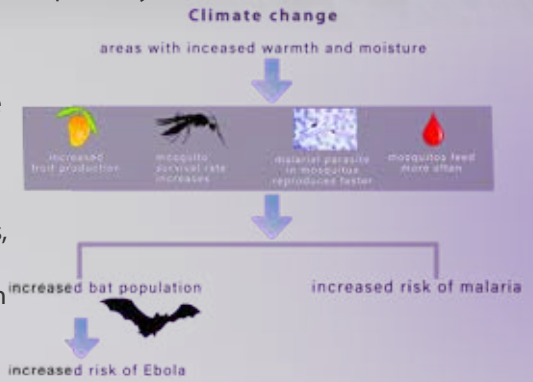
Global increases in travel and migration are unavoidable outcomes of colonialism, war, inequality, and increasingly, climate change. Such travels must not be hindered. Scrutiny should however be placed on the far-reaching exchanges of goods for a host of zoonotic reasons. Unnecessary travel accelerates the spread of disease. Global trade is associated with wealth inequities and subsequent health inequities. Long-distance trade increases climate change, which brings its own set of zoonotic factors. And crucially, the habitat destruction zoonoses thrives on is often driven by wealthy countries' demand for poorer countries' natural resources. Localizing trade will reduce these zoonotic factors.

Climate Change

Climate change poses long-term threats from the spread of zoonoses and other disease. While some areas may become too hot or arid for certain diseases, the increase in warmth and moisture in other areas will accelerate sickness. Many diseases thrive in warmer weather and flood conditions, including malaria, dengue fever, West Nile virus, cholera and Lyme disease. Weather impacts these diseases in complex ways.

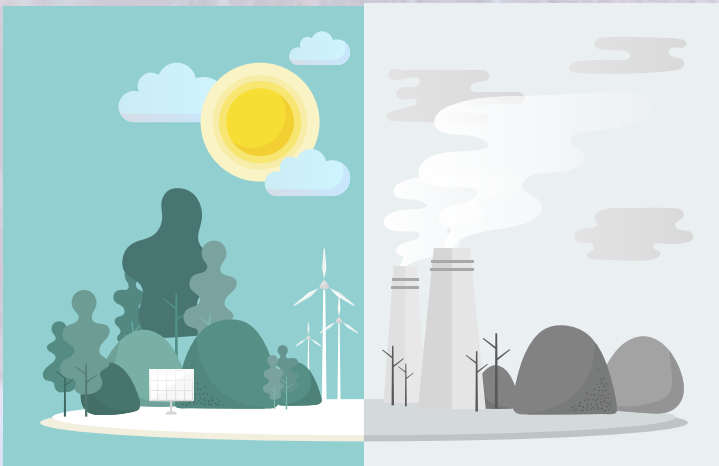
For example, warmth brings increased fruit production which is anticipated to increase the bat population carrying Ebola.

As another example, warm, wet weather increases the reproduction rate of the parasite which causes malaria in mosquitos, the survival rate of mosquitos and of the frequency with which mosquitos feed on blood.



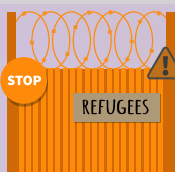
Ecological changes will also disrupt relationships between wild animals, potentially leading to higher numbers of pathogen-carrying species. Increased food and housing pressures from drought and flood may increase the intensity of animal agriculture, lead efforts to find new food sources which may carry zoonoses, and encourage further incursion into natural habitats. Regional abilities to react to disease outbreak may also be compromised by climate associated food insecurity and poverty.

Yet another threat from our warming planet may emerge from the ice. Already, outbreaks of disease have occurred where corpses of diseased animals and humans are uncovered by melting ice. Mass graves hold victims from recent 18th-20th century outbreaks, including Spanish flu, smallpox, and bubonic plague. And the dangers go deeper. The low temperatures of permafrost and tundra soil are conducive to long viral and bacterial life. Scientists have recovered live bacteria strains from millions of years ago. Some bacteria show antibiotic resistance despite never being exposed to man-made antibiotics. Artic animals losing their habitats may also constitute another set of disease-vectors. Even partial ice melt brings large risks as it has made mining, shipping and drilling in the Arctic Ocean accessible and profitable, driving more people into the region and turning up more earth. While the artic threat is hard to quantify, and other threats remain more pressing for now, this form of disease is one more reminder of the urgency of our fight against climate change.



Political Implications of COVID-19

One of the responses seen during COVID-19 is joy over the environmental effects of the global shutdown, where emissions have decreased and wildlife has returned to urban environments. Such emotions should drive a new vision of what is possible when industry stops its ecological devastation. A pandemic like this one can expose the gaps and inequalities in our food, economic, and health care systems, and perhaps can open the eyes of the powerful to the problems effecting the politically disempowered, as the pandemic jumps between poor and rich bodies.



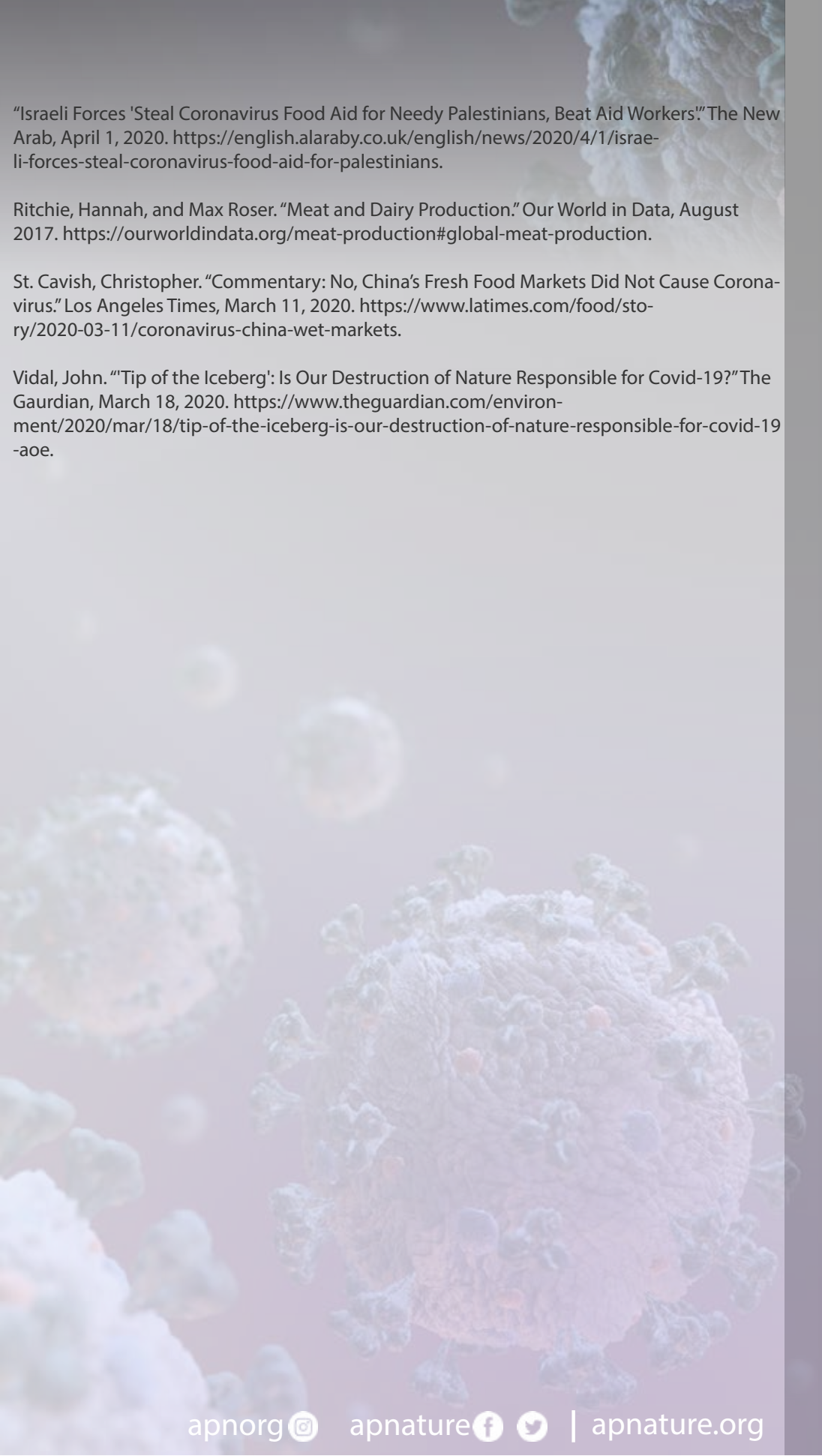
The positive environmental impacts of COVID-19 have led some people to characterize “humans as the virus” on the earth. This emergent rhetoric supports the aforementioned worries of some who believe the virus was generated for population control. We cannot see our strained resources, high rates of pollution, or increased disease risk primarily as a symptom of population growth or movement and not as that of bad economic policy. Western environmental conservationism has long stoked fears of overpopulation and sought to curtail birthrates in poor countries, while strands of the environmental movement have promoted limiting migration in order to protect local ecosystems. These ideas are swiftly bleeding into right-wing politics which link ecological threats and threats to a white majority. Presidents like Hungary’s János Áder have branded their fight against climate change as an effort to slow migration, while in France, the National Rally’s spokesman has declared, “borders are the environment’s greatest ally.” Most dramatically, the recent mass shootings in the U.S. and New Zealand (two countries with histories of racialized land-based nationalisms), have been accompanied by manifestos linking ecological change to an increased non-white population. The links of the novel coronavirus to human movement, resource consumption, and climate change should put civil society on alert for emerging anti-migrant and eugenicist policies. In pointing out the ecological and disease-related dangers of capitalist globalization, civil society groups must ensure that their rhetoric centers on the drivers of resource exploitation or they will risk contributing to forms of eco-nationalism which target those who suffer most from and are least responsible for ecological threats.

Zoonosis has many drivers. It is difficult to combat because its factors like urbanization, trade, habitat loss, and unsustainable animal consumption feed into one another. Picking out some factors and excluding others can be dangerous. A reading of this study which chooses to focus on the dangers of urban migration over wealth inequality or on the consumption of wild animals over the resource extraction pushing workers into the rainforest would do more to increase xenophobia and racism than combat zoonosis. COVID-19 has led to a spike in hate crimes against Asians across Europe and the U.S., alongside racialized theories of what eating habits the virus originated from. We are still waiting to see how these and other attitudes will impact public policy going forward. It is likely that authoritarian governments will utilize the coronavirus crisis to implement laws that would not pass public scrutiny without the excuse of public health. It is important that civil society groups refocus public attention onto the key factors which heighten the impact of disease–wealth inequality, habitat destruction, and long-distance trade–while protecting civil rights.

APN’s mission of fostering sustainable local food production is more relevant than ever before, and should serve as a regional and global inspiration in this difficult time.

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