WHAT SARS-CoV-2 AND COVID-19 DISEASE ARE TELLING US:

A HOLISTIC VETERINARY AND ONE HEALTH VIEW

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SYNOPSIS

This emerging disease and others that are likely to become pandemics in the future, calling for ever more vaccines and medications so long as preventive medicine remains human-centered and does not fight, under the banner of One Health, wildlife poaching, trafficking, habitat encroachment and our ever-increasing human numbers and consumption of animals wild and domesticated. At best, all the suffering, death, grieving and economic impact of this latest COVID-19 pandemic will change how we chose to live: Most especially our collective exploitation and consumption of animals that bring on such pandemics and other zoonotic diseases along with accelerating climate change and loss of biodiversity.

Our fear-based attitude toward viruses and bacteria is based on our not appreciating how these and other micro-organisms function and help sustain this living world. Parts of them are in our DNA and vital cellular content and without them in our guts we would die in a few days. They also can play an environmentally beneficial role in regulating population density, in optimizing ecological biodiversity and reducing dysbiosis.

When epidemics and pandemics break out there is always some ecological component and carrier agent coupled with the lack of immunity, for various reasons, of those humans or other species who succumb to infection, Those species and individuals who do not succumb and may show no symptoms can transmit infection to others. Some are killed by the primary infective agent, die from a secondary, often bacterial infection or become easy prey for a predator. Survivors may become infertile or abort if pregnant.

According to the U.S. Centers for Disease Control and Prevention this new Corona virus has been named "SARS-CoV-2" and the disease it causes has been named "coronavirus disease 2019" (abbreviated "COVID-19") The SARS-CoV-2 virus is a betacoronavirus, like MERS-CoV and SARS-CoV, all three of these viruses having their origins in bats. The sequences from U.S. patients are similar to the one that China initially posted, suggesting a likely single, recent emergence of this virus from an animal reservoir. Live-caught bats for sale for human consumption in one of China's open animal markets are considered the most likely source. Researchers reported evidence that a small proportion of pangolins, widely sold in China's markets, carry coronaviruses related to the strain responsible for the COVID-19 pandemic, according to a paper published March 26 in the journal *Nature*. Although international commercial trade of all eight species is strictly forbidden, pangolins are believed to be the most trafficked mammal in the world.

COVID-19 may be a recombination of two strains of coronavirus, a chimera, one from bats and the other from pangolins, that infected an animal simultaneously wherein this recombination too place.

(https://www.sciencealert.com/genome-analysis-of-the-coronavirus-suggests-two-viruses-may-have-combined). The alternative possibility of accidental or deliberate release from a laboratory has been recently discounted. The authors of a March 17 *Nature Medicine* report evaluating the virus's characteristics—including the sites on the virus that allow it to bind to human cells---and whether the virus was engineered by humans. and present what appears to be convincing evidence it was not. They also considered the possibility that the outbreak could have resulted from an inadvertent lab release of a virus under study but concluded "we do not believe that any type of laboratory-based scenario is plausible." Others question this conclusion since there have been prior accidental releases of coronaviruses from laboratories and there are two in Wuhan actively involved in coronavirus research.

Bats, a sentinel species of ecosystem health and guardian of tropical forests, are the main carriers of these kinds of viruses including Ebola to which they themselves are immune. So are most of the indigenous species who have co-evolved and co-inhabited their domains for generations of selection and survival. When people and their farmed animals encroach these last domains of the wild, they succumb to these so- called zoonotic diseases: And, when they capture and take away infective bats and other species into their own crowded and often unsanitary communities.

The classic consequence of such human encroachment is Sleeping Sickness in Africa which affected millions of people and their livestock when they invaded the domain of disease-resistant wildlife who were disease reservoirs. But there was no global spread because a fly was needed to transmit this disease and tsetse flies do not engage in international travel or trade. With COVID-19 there is no such intermediary host-vector, direct human-to-human transmission being confirmed.

Some investigators and researchers have theorized this virus is a new strain that either escaped from a laboratory or was deliberately released into the city population of Wuhan. Deliberate releases have been conducted for U.S. military biowarfare exercises, as with the San Francisco release of thought-to-be harmless bacterium *Serratia marcescens*. This bacterium subsequently colonized several hospitals, infecting and killing people. The military performed similar tests in other cities across the country over the next two decades, until Richard Nixon halted all germ warfare research in 1969.

Coronaviruses (CoVs), are enveloped positive-sense RNA viruses with club-like spikes that project from their surface, have an unusually large RNA genome, and a unique replication strategy. Coronaviruses cause a variety of diseases in mammals and birds ranging from enteritis in cows and pigs and upper respiratory disease chickens to potentially lethal human respiratory infections. Feline coronavirus is an enveloped single-stranded RNA virus that occurs as two pathotypes: feline enteric coronavirus (FECV), defined as the "ubiquitous enteric biotype," and feline infectious peritonitis virus (FIPV), the "virulent biotype" that causes FIP in individual cats

There will always be new emerging diseases like COVID-19 and potential pandemics calling for more government funds and mass vaccinations (very profitable for investors and manufacturers) to "protect" the public so long as wildlife poaching, international wildlife trade and illegal trafficking continue, along with ever increasing human population growth and inevitable encroachments. In many countries indigenous peoples' immune systems are challenged by lack

of sanitation, contaminated drinking water, chronic malnutrition, tuberculosis, AIDS and malaria, making them highly susceptible to infection from wildlife and to have adverse reactions when given vaccinations.

Receiving influenza vaccinations may increase risk of coronavirus infection. .A study by Greg W. Wolff published in the peer-reviewed journal Vaccine, (Vaccine Volume 38, Issue 2, 10 January 2020, Pages 350-354 titled Influenza vaccination and respiratory virus interference among Department of Defense personnel during the 2017-2018 influenza season, reveals that influenza vaccination may increase the risk of infection from other respiratory viruses -- a phenomenon known as virus interference. While influenza vaccination offers protection against influenza, *natural influenza infection* may reduce the risk of non-influenza respiratory viruses by providing temporary, non-specific immunity against these viruses. On the other hand, recently published studies have described the phenomenon of vaccine-associated virus interference; that is, vaccinated individuals may be at increased risk for other respiratory viruses because they do not receive the non-specific immunity associated with natural infection. Examining non-influenza viruses specifically, the odds of both coronavirus and human metapneumovirus in vaccinated individuals were significantly higher when compared to unvaccinated individuals. Conversely, all other non-influenza respiratory viruses had decreased odds in the vaccinated population, including significantly decreased odds ratios in vaccinated people with parainfluenza, RSV, and non-influenza virus coinfections.

Environmental Factors Increasing Susceptibility

Since COVD-19 primarily attacks the lungs, millions of people, rich and poor, will be at risk in urban communities with high levels of fine particle air pollution. Some particles serve as carriers for other chemicals that are also toxic, and the combination may worsen the impact. According to the U.S. Environmental Protection Agency this pollution causes early death (both short-term and long-term exposure); cardiovascular harm (e.g., heart attacks, strokes, heart disease, congestive heart failure); respiratory harm (e.g., worsened asthma, worsened COPD, inflammation); may cause cancer and reproductive and developmental harm and cause inflammatory and degenerative changes in brain, pancreatic and other organ functions. (U.S. Environmental Protection Agency, Integrated Science Assessment for Particulate Matter, December 2009. EPA 600/R-08/139F.).

Poor air quality in urban and industrial communities creates ideal conditions for COVID-19. Air pollutants absorb and scatter UV rays, thus reducing the amount of UV radiation that reaches us and helps sterilize surfaces by killing viruses and bacteria. UV radiation from the sun is the primary germicide in the environment. More widespread application of UV light for air purification, as from drones in subways and in all institutions from hospitals and offices to apartments and retirement homes is long overdue.

Spraying disinfectants everywhere can kill birds and other wildlife and community animals, especially dogs and cats who contribute, normally, to improving public health in poor communities. Who feeds them now---from Rome’s pigeon’s to India’s cows and dogs during a total shut-down with no markets or eateries throwing out left-overs for these community animals?

High population densities in confined areas where air is recycled with little fresh-air intake to save energy in heated and air-conditioned apartments and offices are also at risk from airborne infections: Also from exposure to DNA damaging and immunosuppressing electropollution by telecommunication and other devices emitting non-ionizing radiation and electromagnetic fields of varying intensity where they live and work. 5G is of particular concern, close to microwave cooking energy, is documented to kill insects, and is now being installed in U.S. stadiums. Closing them and all crowd-containing events at this time, especially with people being exposed to these forms of electropollution, may be wisely extended.

A Brief Time-Line of the COVID-19 Pandemic

This virus, now causing a global pandemic and named COVID-19 should be renamed COVID-Li-W in honor of the young Chinese doctor Li Wenliang. On 30 December 2019 he warned fellow colleagues about a possible outbreak of an illness that resembled severe acute respiratory syndrome (SARS), later acknowledged as COVID-19, on WeChat. On 3 January 2020, Wuhan police summoned and admonished him for "making false comments on the Internet". Li, a family man, returned to work, later contracted the virus from an infected patient and died from the disease on 7 February 2020, at age 33.. His death was no doubt due in part to the stress of his being apprehended by the police and silenced by the government for spreading "false rumors."

President Donald Trump described the disease as the Democrats' "new hoax" at a political rally on Feb. 28, 2020 in South Carolina. As a veterinarian trained in herd health management and control of contagious diseases the first rule that I was taught is containment. If the U.S. had applied this basic principle in early February 2020, giving citizens time to get home and sequester there before a 4-6 week total shutdown of all road, air, sea and rail travel, many lives would surely have been saved as well as the escalating containment and treatment costs, equipment shortages and risk and deaths of health-care givers lacking adequate protective gear.. The lack of effective tests for COVID-19 being rapidly made available for health-care providers and individuals at home who may have contracted the COVID-19 infection along with their exposed family members and for people in high-risk confinement facilities was yet another serious flaw in pandemic prevention. Regardless of political and socio-economic concerns, containment is a basic scientific principle of epidemic and pandemic disease control.

The World Health Organization (WHO) delayed declaring there was a global pandemic until March 11th. By March 12, 2020, 1,645 people from 47 States had been infected with the virus and on March 13th Trump posted a proclamation that "the COVID-19 outbreak in the United States constitutes a national emergency, beginning March 1, 2020." (Note post-dating of this proclamation!). On April 14th 2020 Trump stopped funding the WHO, blaming them for his delayed action against the advice of his own medical and science policy advisors.

On Feb 24th 2020 China officially and permanently banned the trade and consumption of wildlife amid speculation that a novel coronavirus spread from bats to an intermediary species and then to people at a meat market. China's wildlife-farming industry is valued at an estimated $74 billion, and the wild-meat industry's estimated value is $7.1 billion, making enforcement of

any ban "untenable," said wildlife-policy researcher Zhao-Min Zhou. **(** Business Insider (2/25), Reuters (2/24)). Such a permanent ban is therefore unlikely to be either effectively enforced for long considering the money power and influence of international cartels involved in wildlife and other illegal trafficking activities. On March 30, the *Jerusalem Post* reported, that, just one month after China's "permanent shutdown" of its illegal wildlife farming industry, prohibiting the trade and consumption of wild animals, "the markets are in operation without strict oversight of illegal wildlife-trading activities."

The Trump administration's eventual response calling in part for accelerated animal-tested vaccine production will certainly profit the government -subsidized and legally protected (from adverse-reaction law suits) vaccine industry which is the antithesis of true preventive medicine from a One Health perspective.

Earlier Pandemics and Epidemics

The three major historical plagues were caused by the same bacterium (*Yersinia pestis*):

- The Plague of Justinian (peaking 541-2 CE; recurring until 750), originating from the rat flea from East Asia, is estimated to have killed 40 m. people, half the world's population, as it spread across Asia, North Africa, Arabia, and Europe. It was concentrated on Constantinople with some 5,000 deaths daily there at the peak;
- The Second Plague, deriving from the same source, commenced in 1347 and lasted three centuries. It originated with the Black Death (peaking 1347-51) which killed an estimated 138 m. people (mid-point) in Eurasia, reducing the world population (then 475 m.) by over a quarter. It culminated with the London Plague in 1665-66, which killed 100,000 (a quarter of the city's population).
- The Third Plague, bubonic and pneumonic (originating in Hunan, China in 1855, spreading to India and continuing until 1895 in Hong Kong) killed some tens of millions across Asia.

The Black Death or Great Plague was the first indicator of the potential risks of unmonitored globalization of trade and commerce in the absence of the precautionary principle. It probably originated in Central Asia or East Asia (where it continues to be endemic) from where it travelled along the Silk Road reaching Crimea by 1343. From there, it was most likely carried by fleas living on the black rats that traveled on Genoese merchant ships, spreading throughout the Mediterranean Basin, reaching the rest of Europe via the Italian Peninsula. Human to human transmission was by fleas and lice on humans. In some communities cats were blamed and persecuted and to this day black cats are still shunned by many, considered bad luck and are victimized on Halloween. This bacterial plague is estimated to have killed 30% to 60% of Europe's population and reduced the world population from an estimated 475 million to 350–375 million in the 14th century.

The 1918-1919 "Spanish flu" pandemic which killed at least 50 million people world-wide (many stressed and malnourished from WW1) was an H1N1 strain with genes of avian origin. The Swine influenza pandemic of 2009, originating in Mexico and killing close to a quarter

million people world-wide was a new strain of H1N1, resulted from a previous triple reassortment of bird, swine, and human flu viruses further combined with a Eurasian pig flu virus, leading to the term "swine flu". This is now a regular human flu virus and continues to circulate seasonally worldwide. Avian influenza A (H5N1) viruses are endemic in poultry in parts of the world and are infecting people sporadically, often with deadly results. In February 1957, a new influenza A (H2N2) virus emerged in East Asia, triggering a pandemic ("Asian Flu"). The estimated number of deaths was 1.1 million worldwide and 116,000 in the United States. This virus was *a reassortant* (mixed species) strain, originating from strains of avian and human influenza viruses. In the 1960s the human H2N2 strain underwent a series of minor genetic modifications, a process known as antigenic drift. These slight modifications produced periodic epidemics. After 10 years of evolution, the Asian flu virus disappeared, having been replaced through antigenic shift by a new influenza A subtype, H3N2 which gave rise to the Hong Kong flu pandemic of 1968 that killed an estimated 1 million people world-wide. COVID-19 may cause higher mortalities first time around given a larger world population and worse particulate air pollution and electro-smog. It may, like other animal-derived viral diseases, similarly circulate in the human population in the years to come along with other emerging diseases if preventive measures are ignored and reliance on costly drugs and post-pandemic vaccines, not without potentially harmful side-effects, are rushed to market.

Ebola (1976-present), a hemorrhagic virus originating from bush-meat and transmitted by tree-dwelling fruit-bats, has been confined to Central and West Africa. There have been 24 outbreaks over four decades, with over 31,000 cases and (with a fatality rate of about 50%), over 13,000 deaths. Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV) that was first identified in Saudi Arabia in 2012. Most of human cases of MERS-CoV infections have been attributed to human-to-human but current scientific evidence suggests that dromedary camels are a major reservoir host for MERS-CoV

Separate from the above, the HIV-AIDS, a virus derived from non-human primates and originating in Africa, is caused primarily by slaughtering these and other primates for food and subsequent transmission of infected individuals through human sexual contact. Since the early 1980s, it has infected 75 m. people and killed over 32 m. people (mid-points). Currently, some 38 m. are living with HIV (54% in east and southern Africa). In 1999, researchers found a strain of SIV (called SIVcpz) in a chimpanzee that was almost identical to HIV in humans. The researchers who discovered this connection concluded that it proved chimpanzees were the source of HIV-1, and that the virus had at some point crossed species from chimps to humans. The same scientists then conducted more research into how SIV could have developed in the chimps. They discovered that the chimps had hunted and eaten two smaller species of monkeys (red-capped mangabeys and greater spot-nosed monkeys). These smaller monkeys infected the chimps with two different strains of SIV. The two different SIV strains then joined together to form a third virus (SIVcpz) that could be passed on to other chimps. This is the strain that can also infect humans. HIV-2 comes from SIVsmm in sooty mangabey monkeys rather than chimpanzees.

While other primates can be infected by poliovirus strains, virologists have found no evidence of zoonotic transfer to humans. The type 2 poliovirus, an enterovirus in the Picornaviridae family, is human-specific in origin and has been largely eliminated through vaccination.

Australia's 1994 Hendra virus infections, where the contagion jumped from horses to humans, and Malaysia's 1998 Nipah virus outbreak**,** in which it moved from pigs to people, came from pathogens that originated in fruit-eating bats. Horses and pigs were merely the intermediate hosts.

The coronavirus responsible for SARS (Sudden Onset Respiratory Syndrome), according to the WHO, has reappeared four times – *three times from laboratory accidents* (Singapore and Chinese Taipei), Researchers from the University of Hong Kong examined 25 animals representing eight species in a live animal market in southern China and found the virus in all six masked palm civets they sampled, as well as in a badger and a raccoon dog. A study from Guangdong province in southern China - where the SARS outbreak first emerged in November 2002 indicated that more than 30 percent of the early SARS cases there were food handlers. This SARS epidemic infected more than 8,000 people in 26 countries and killed at least 689, the vast majority in China and Hong Kong. Chinese authorities subsequently ordered the deaths of some 10,000 civet cats by drowning and electrocution in Jan 2004 when they were identified as the primary source of SARS. The precursor virus is present in wild *Rhinolophus* bats. Civet cats and other small mammals sold as delicacies in wet markets provided a reservoir and amplifier for the virus and the opportunity for adaptation to humans.

Farmed Animals and Public Health

The number of live pigs, goats, cows and sheep transported worldwide in 2017 was 30% higher than in 2007, according to the UN's Food and Agriculture Organization .pandemics of Swine and Avian influenza generally originate from open markets and slaughtering in rural and peri-urban poor communities where centralized processing and cold storage facilities are not available and from workers exposed to infected animals inside factory farms. The overall burden of influenza in the U.S. for the 2017-2018 season was an estimated 45 million influenza illnesses, 21 million influenza-associated medical visits, 810,000 influenza-related hospitalizations, and 61,000 influenza associated deaths.

Richer communities and countries like the U.S. where pork and poultry products are dietary staples pay the environmental and public health costs of these zoonotic diseases, antibiotic-resistant strains of E. coli, Salmonella and other bacteria being an escalating problem with inhumane factory farming production systems at home and World Bank- supported operations abroad that rely on multiple veterinary vaccinations and feeding animals antibiotics and other drugs to boost productivity and control diseases under the inhumane, stressful and disease-promoting conditions under which they are raised.(Nitrate pollution of drinking water from animal wastes/manure fertilizer is a related, escalating public health issue).

According to the Centers for Disease Control and Prevention report *Antibiotic Resistance: Threats in the United States 2019.* more than 2.8 million antibiotic-resistant infections occur in the U.S. each year, and more than 35,000 people die as a result. New research from the Centers

for Disease Control and Prevention (CDC), found that Hepatitis E is an "emerging foodborne pathogen," that is transmitted to humans through raw or undercooked pork. The CDC states: Zoonotic diseases are very common, both in the United States and around the world. Scientists estimate that more than 6 out of every 10 known infectious diseases in people can be spread from animals, and 3 out of every 4 new or emerging infectious diseases in people come from animals.

Avian Influenza, also known as fowl plague, is caused by Influenzavirus A, which is in the family Orthomyxoviridae. Influenza A viruses are further classified by their surface glycoproteins, hemagglutinin (H or HA) and neuraminidase (N or NA). Sixteen H (H1 to H16) subtypes and nine N (N1 to N9) subtypes of influenza A have been identified. Between 2014 and 2016 more than 50 million birds (egg laying hens, chickens raised for meat, turkeys and others) were killed across more than a dozen states in an effort to contain a bird flu outbreak. This did as much as three billion dollars' worth of damage to the U.S. economy, and APHIS (Animal & Plant Health Inspection Service) spent over $900 million cleaning up the mess it describes as" the most serious animal health disease incident in history."

APHIS also states: "However, it is worth acknowledging that there are AI viruses circulating in poultry that are of significant concern to public health, such as H5N13, H5N6, and the Asian lineage H7N9. The majority of these infections have been detected in Asia, though there have been human cases identified around the world. While human infections remain relatively uncommon due to an apparently high species-specific transmission barrier, mortality rates can be high." The method of cutting off ventilation to kill ("depopulate") the birds via heat-suffocation is neither humane nor acceptable.

Over-fishing for human consumption and to feed farmed animals is one factor in the demise of the oceans. As a One-Health advocating veterinarian I appeal to all consumers and governments to consider the impossibility of preventing such pandemics and other animal-food-borne epidemics and regional outbreaks of disease because of the enormous scale of factory farm animal production systems---billions of poultry and pigs world-wide that are the primary source of various strains of influenza virus and antibiotic-resistant strains of bacteria. This problem is so serious in poultry that their carcasses are washed in bleach, the U.K. refusing to accept America's chlorine-treated chicken under current trade negotiations (along with America's hormone-treated beef).

The U.S. has tried to sterilize such produce using radioactive isotopes but this move was temporarily blocked by health-food and safety experts because such radiation produces radiolytic-breakdown products, the safety of which to consumers has been questioned. Such concerns were validated by the death of cats in Australia after being fed imported canned cat food that was, under import-regulations, subjected to irradiation. For details visit https://truthaboutpetfood.com/was-irradiated-pet-food-the-cause-of-cat-deaths-in-australia/

As of December 31, 2015, the FDA reportedly received approximately 5,200 complaints of illnesses associated with consumption of chicken, duck, or sweet potato jerky treats, many of which were imported from China. The reports involved more than 6,200 dogs, 26 cats, three people, and include more than 1,140 canine deaths from acquired Fanconi syndrome, a normally rare kidney disease typically seen primarily in certain breeds as a hereditary condition.

Regardless of clear labelling of being subjected to radiation on many such treats, the FDA did not publicly report any connection between food irradiation and this companion animal food-related epidemic.

Even so, meat and poultry producers who use ionized radiation to kill pathogens in product now have expanded options, thanks to two rules published by the U.S. Food and Drug Administration. https://www.foodsafetynews.com/2012/12/fda-expands-irradiation-uses-for-meat-and-poultry/

Protecting Wildlife from Cruel Exploitation

There are degrees of inhumanity and cruel treatment of animals for which we unwittingly pay the price. Civet cats are held in small cages in Ethiopia and have their anal glands routinely scraped out to "harvest" musk for the perfume industry while in Indonesia these caged animals are force-fed coffee beans that are collected in their feces and sold as gourmet "fermented" beans called Kopluwak. Such practices reflect the depravity that surfaces where there is no empathy and the lure of money. This is exemplified especially by China's bear-bile farms where bears, constantly confined in cramped cages, have abdominal cannulas collecting their bile for sale as medicine. One of the alleged cures from traditional Chinese medicine that the government recommends for treating severe and critical cases of COVID-19 is an injection of Tan Re Qing, which contains bear bile, National Geographic reported.

David Rivard, a member of ISON (INTERPOL's Special Operations Network on Trafficking, and Airline Ambassadors Counter-Trafficking Director) sent me this statement: "Generally, it would be that many people think of different types of trafficking (threats) as nouns. Human Trafficking, Drug Trafficking, Animal Trafficking etc. But the prime criminals are the *networks* of transnational criminal operations (and even global criminal syndicates). Local smugglers of people, drugs and wildlife do not make much more than subsistence money and many times they are even forced to smuggle. The real profiteers are the transnational criminal syndicates….. They establish "off shore" banking accounts, commonly known as tax havens. They influence politicians and national laws to keep their industry alive, and establish local cultures of criminality where they operate through extortion, kidnapping, forced labor (human trafficking) and murder…. They strip their local areas of all that is of value with an impunity that is evidenced by the bold atrocities they commit. This "Off Shored" money never makes it back into the national treasuries. Federal governments must then suffer the consequences of not having enough money to pay for even basic infrastructures, and most the infrastructure money is supplied by the U.S. taxpayer through our USAID Program, where it usually goes to law enforcement, and even these monies must go through a national gauntlet of political corruption and local law enforcement criminal capture".

While this reality may make one despair, all countries should be severely sanctioned economically for engaging in wildlife trafficking and for having open markets selling wild-caught animals. And there must be a redoubling of wild habitat protection from human encroachment with population control through voluntary and ready access to family planning, smaller families and communities needing fewer livestock to sustain their needs.

The still legal traffic and trade in wildlife calls for greater vigilance and health-monitoring as per the April 2020 report that hundreds of horses in Thailand have died as biting midges spread African horse sickness, which some scientists suspect arrived in zebras imported from Africa. Without controls, the virus could even travel via wind-borne midges across seas to herds on island nations, gradually working its way to Australia, which has more than 1 million racing, sport, and feral horses. The nation is "engaging with other countries to develop a regional response to this outbreak," says Australia's Chief Veterinary Officer Mark Schipp. (. Science (tiered subscription model) (4/16)

Conclusions

International trade in animals, dead and alive, for human consumption should be curtailed as a public health service and for national security and within-nations should be terminated to help reduce a major industry's contribution to the Climate and Extinction crises (as well as rural poverty), and decline in public health. It may seem racist to say this coronavirus came from China and the last influenza pandemic from Mexico. But it is speciesist to claim that animals were created for our own use and that we can kill and consume them and otherwise exploit them as our needs and wants dictate.

Hopefully this global health crisis is catalyzing international collaboration in prevention and treatment. We may yet see the emergence of a United Environmental Nations that unshackles public health from politics, nationalism, isolationism and prioritizing the economy over the health and security of the people and links public health with environmental and animal health. Above all, humans should keep out of wildlife habitat where such diseases emerge and to which we have no immunity; and for consumers in industrial countries to support producers of organically certified foods to sustain a healthful vegetarian/vegan diet with minimal or zero consumption of eggs, dairy, meat including sea foods.

The American Public Health Association's September 2007, Vol 97, No. 9, p 1546 editorial by philosopher David Benatar in the *American Journal of Public Health* observed: "It is curious, therefore, that changing the way humans treat animals—most basically, ceasing to eat them or, at the very least, radically limiting the quantity of them that are eaten—is largely off the radar as a significant preventive measure."

The British Veterinary Association's initiative promoting the benefits of sustainable consumption of farmed animal produce to help reduce climate change is also applicable to reducing zoonotic diseases embraces the concept of "less and better" farmed animal produce for animal welfare, One Health and sustainability reasons. "Eating "less and better" sees some citizens reduce consumption of animal derived products, whilst maintaining proportional spend on high animal health and welfare products." ((BVA Position on UK sustainable animal agriculture - British Veterinary ...https://www.bva.co.uk/...policies/Policies/Farm_animals/BVA-Position-on-UK-Sustain.).

Continuing to consume animals as a basic food-source, marketing ever more vaccines and having ever more children, the rich and poor alike will be subject to the indiscriminate justice of natural law until we all abide in greater harmony with other species as well as with each other. We will then need fewer guns, chemicals and other and bioweapons when our appetites and numbers are under more effective self-control. Alternatively, with deteriorating natural controls of health-sustaining biodiversity, plagues and pestilences of Biblical proportions will be the legacy of our collective failure in planetary stewardship that surviving generations will inherit.

COVID-19 can be seen as a wake-up call. Richard Horton, the editor-in-chief of The Lancet, in declaring the response to the coronavirus "the greatest global science policy failure in a generation", writes, "If COVID-19 eventually imbues human beings with some humility, it's possible that we will, after all, be receptive to the lessons of this lethal pandemic." "But," he warns, "perhaps we will sink back into our culture of complacent exceptionalism and await the next plague that will surely arrive. To go by recent history, that moment will come sooner than we think."

Albert Schweitzer, MD, summed it up with prescience decades ago when he opined "We must fight against the spirit of unconscious cruelty with which we treat the animals. Animals suffer as much as we do. True humanity does not allow us to impose such sufferings on them. It is our duty to make the whole world recognize it. Until we extend our circle of compassion to all living things, humanity will not find peace."

POSTSCRIPT

Companion Animal Concerns

According to a release to veterinarians from the AVMA which I received on Feb 20th 2020, " at this time, experts have not expressed concern about transmission to or from animals. Multiple international health organizations have indicated that pets and other domestic animals are not considered at risk for contracting COVID-19 or transmitting the virus that causes the disease".

But I would caution that COVID-19 could mutate, and like the Swine flu infecting people that was passed on to their cats, be passed on from infected humans to domestic animals. There were news reports Feb 26/2020 of a Pomeranian dog in Hong Kong testing positive for COVID-19 which he got from his infected owner. The old dog was taken into quarantine for observation and eventually died from unrelated causes, probably the stress of isolation/separation. In March 2020 the Hong Kong government has urged people not to abandon their pets and to stop kissing them after a second dog tested positive for coronavirus, but stressed that the animal had not shown any symptoms of the disease. A German shepherd living was sent for quarantine along with another mixed-breed dog from the same residence on Thursday after their owner was confirmed as being infected, the Agriculture, Fisheries and Conservation Department (AFCD) said in a statement. Though the shepherd tested positive for the virus, no such result was obtained from the mixed-breed dog, and "neither dog has shown any signs of disease," the AFCD said, adding it will continue to monitor both dogs and conduct repeated tests on the animals.

Belgium's Public Health, Food Chain Safety and Environment authority announced March 27,2020 that a domestic cat tested positive for COVID-19.. About a week after its owner got sick with COVID-19, after returning from a trip to Northern Italy the cat developed diarrhea, vomiting and respiratory issues. (https://www.livescience.com/cat-infected-covid-19-from-owner.html).

Cats can be infected with the coronavirus that causes COVID-19 and spread it to other cats, but dogs are not really susceptible to the infection, according to researchers in China. The team, at Harbin Veterinary Research Institute in China, also concludes that chickens, pigs, and ducks are not likely to catch the virus. (Nature News, April 1.2020 Coronavirus can infect cats-dogs, not so much. https://www.nature.com/articles/d41586-020-00984-8). Chinese scientists investigated the susceptibility of ferrets and other species that have close contact with humans to SARS-CoV-2. They found in laboratory exposure tests that SARS-CoV-2 replicates poorly in dogs, pigs, chickens, and ducks, but ferrets and cats are susceptible to infection. Cats are susceptible to airborne infection and can infect each other with extensive lung damage evident in young cats. Ferrets develop milder upper respiratory infections from which they are likely to recover. (Jianzhong Shi et al Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS–coronavirus 2 *Science* 08 Apr 2020: eabb7015 DOI: 10.1126/science.abb7015).

These disturbing findings mean that domestic cats should be quarantined and tested if exposed to infected people and precautions taken at this time when cats develop early signs of sickness involving the upper respiratory system. It has not been determined if cats with COVID-19 can infect people. Cats are sold and killed for food in Chinese markets, a practice which should be prohibited in view of these findings. The Chinese government's declaration in early April 2020 prohibiting the same fate for dogs in these markets because they are "companion animals" is a face-saving public relations action. A similar prohibition should be applied to cats and all live animals wild and domesticated in these widespread markets that are normative in a culture which must change for the common good.

China is not alone in being responsible for animal welfare and the public health consequences of the many diseases transmitted to consumers from the animals they consume. The cruel transportation, handling and slaughter of 500,000 pigs daily in the U.S.is a call to conscience and common sense.

In late March 2020, the Bronx zoo had several tigers become ill after exposure to one keeper who was infected and asymptomatic while attending to the animals. Tests verified COVID-19 in one of the tigers and all made a full recovery.

U.S. veterinary diagnostics firm Idexx has tested more than 3,500 samples from dogs, cats and horses for infection with SARS-CoV-2, the virus that causes COVID-19, and none of the tests have been positive. The findings support experts' assertions that pets are unlikely to catch or transmit the disease, but the virus could become attached to animals' fur, and the CDC says people should avoid kissing pets and should wash their hands after touching pets. **Full Story:** Today (3/24)

. How people respond in the face of an anthropogenic plague will determine the quality of life on Earth for generations to come. The reported public panic and hysteria in some parts of China killing cats and dogs for fear they may be infective and in Peru resulting in the mass killing of bats--- which the government sought to stop, pointing out how bats benefit us in killing insects that can transmit diseases to us,--- is one indicator of how we need to evolve into a more intelligent life form.

Feline Coronavirus (FCoV) is a common viral, but highly contagious intestinal (enteric) infection in cats. It can be asymptomatic, but may cause a few problems, like diarrhea in most infected cats. In some cats, however, the intestinal form of FCoV mutates and turns into feline infectious peritonitis (FIP), a disease that is generally fatal. Two forms of FIP may occur, effusive (wet) and non-effusive (dry). Feline Coronavirus (FCoV) is not the same Coronavirus identified first in Wuhan (2019 Novel Coronavirus). The Feline Coronavirus (FCoV) is not a threat to humans, it can only affect cats.

ADDENDUM

COVID & BIOSECURITY

Biotechnology, Commentaries, Health April 14, 2020

COVID-19: A wake-up call for biosafety (slightly abridged)

by Jonathan Matthews of GMWatch

Like many of our readers, we may be sheltering-in-place, but please don't think we're taking our eye off the ball. Although other issues may not seem so important at the moment, the COVID-19 virus will subside one day, yet we will still be facing huge threats such as the so-called "extinction crisis" (the collapse of biodiversity) and the failure to take biosafety seriously. Interestingly, the pandemic is making many people more alert to exactly these kinds of issues.

Take, for instance, biosafety. While some experts have stated that COVID-19 has not been deliberately genetically engineered and released as a bioweapon, the possibility that it emerged from a research laboratory has not been ruled out. Rutgers University's Prof Richard Ebright, a biosecurity expert who has been speaking out on biosafety issues for nearly a biosecurity expert who has been speaking out on biosafety issues for nearly 20 years, thinks that the COVID-19 pandemic could have started as an accidental release from a lab, such as one of the two known to have been studying bat coronaviruses in Wuhan, China, where the new coronavirus first emerged.

And Stuart Newman, professor of cell biology and anatomy at New York Medical College in Valhalla, New York, editor-in-chief of the journal Biological Theory, and co-author of Biotech Juggernaut, adds crucial historical context that shows exploring whether COVID-19 could have been genetically engineered should not be dismissed as a subject fit only for conspiracy theorists from a research laboratory has not been ruled out.

He points out that the genetic engineering of coronaviruses has been going on for a long time. According to Newman, "Even most biologists are not aware that virologists have been experimentally recombining

and genetically modifying coronaviruses for more than a decade to study their mechanisms of pathogenicity."Newman points to papers on engineering coronaviruses that go back a full 20 years.

Others are flagging up how the proliferation of genetic engineering technologies like CRISPR could threaten us with pandemics that are even more deadly than COVID-19. The current pandemic has also fueled interest in the work of Toby Ord, Senior Research Fellow at Oxford's Future of Humanity Institute. In his just published book The Precipice, Ord warns that global pandemics triggered by research on viruses pose one of the two biggest existential threats that humanity faces. He points to the fact that even the highest biosafety level (BSL-4) labs, working on live pathogens that are known to threaten global harm, have a poor track record for biosecurity. This includes research involving strains of these pathogens that are deliberately designed to pose even more danger – for example, through enhanced transmissibility. "With current BSL-4 labs," Ord writes, "an escape of a pandemic pathogen is only a matter of time."

In fact, coronaviruses, Prof Ebright points out, are known to have been studied in much lower biosafety level (BSL-2) labs. This includes the bat coronaviruses studied at labs in and around Wuhan. "As a result," Ebright says, "bat coronaviruses at Wuhan [Center for Disease Control] and Wuhan Institute of Virology routinely were collected and studied at BSL-2, which provides only minimal protections against infection of lab workers."

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