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GLOBAL HEALTH GOVERNANCE IS AN OPEN ACCESS, PEER-REVIEWED, ONLINE JOURNAL THAT PROVIDES A PLATFORM FOR ACADEMICS AND PRACTITIONERS TO EXPLORE GLOBAL HEALTH ISSUES AND THEIR IMPLICATIONS FOR GOVERNANCE AND SECURITY AT NATIONAL AND INTERNATIONAL LEVELS.

THE JOURNAL PROVIDES INTERDISCIPLINARY ANALYSES AND A VIGOROUS EXCHANGE OF PERSPECTIVES THAT ARE ESSENTIAL TO THE UNDERSTANDING OF THE NATURE OF GLOBAL HEALTH CHALLENGES AND THE STRATEGIES AIMED AT THEIR SOLUTION. THE JOURNAL IS PARTICULARLY INTERESTED IN ADDRESSING THE POLITICAL, ECONOMIC, SOCIAL, MILITARY AND STRATEGIC ASPECTS OF GLOBAL HEALTH ISSUES.

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Ilja Richard Pavone[1]

INTRODUCTION

In the last decade, most health emergency declarations made by the World Health Organization (WHO) have been correlated to zoonoses. A study by the Royal Society B has crossed data on 142 zoonoses caused by wild animals included within the category of the most threatened species listed in the *IUCN Red List of Threatened Species*.[2] Research has highlighted that important natural reservoirs of many infectious diseases are represented by both wild animals (Non-Human Primates –NHPs and bats), and farmed animals (pigs and chicken). Against this background, poaching and the illegal trade of wild animals on one hand, and the destruction and degradation of habitats on the other hand, have been identified as major risk factors in animal transmitted diseases.

As the world has been facing a steady increase in zoonotic diseases in recent decades (SARS, MERS, Ebola, Wild Polio, and Monkeypox), the origin of COVID-19 raises the issue of how we can prevent future pandemics. Against this backdrop, this article aims to underline the impact of habitat destruction and deforestation on the way that human beings interact with ecosystems, animals, and microbes.

In particular, it highlights what went wrong under the lens of environmental governance rules in preventing the spread of the current pandemic, and it analyzes the potential role of environmental law, particularly the wildlife trade regime, in averting future disease outbreaks after the COVID-19 experience.

It will try to demonstrate that environmental law – although not adequately focused on disease prevention compared to other sectors of international law – such as health law can and must play a pivotal role in avoiding upcoming epidemics and pandemics. It illustrates that the current gaps in environmental law, particularly wildlife law, beget infectious disease outbreaks.

This article is based on the assumption that current wildlife law is not sufficiently equipped to treat infectious diseases, and must necessarily be complemented by a linkage with other regimes, such as animal law and health law. Environmental law, it is argued is weakened by a series of tenets concerning the relationship between humankind and nature. A critique of state of the art of international environmental law and zoonotic diseases leaves no doubt that a preventative approach must be adopted to address human vulnerability to infectious diseases.[3]

To this aim, I analyze the origins of SARS-CoV-2, arguing that the spillover (most likely in the wet market in Wuhan) was due strictly interrelated reasons: first, habitat destruction, deforestation and environmental degradation brings humans in direct contact with wild species otherwise relegated to tropical forests; second, the slaughtering and trading of wild species in wet markets is in complete disregard of animal welfare standards. This article argues that a global ban of wet markets is the best solution, that would also mark a shift from anthropocentrism to an ecosystemic approach in line with the One Health Approach.

THE ORIGINS OF COVID-19 AND THE LIMITS OF ENVIRONMENTAL LAW

Any disease agent that transfers from an animal source to humans is considered as zoonosis; 80% of emerging contagious diseases – such as Ebola, HIV/AIDS, SARS-CoV, MERS-CoV, COVID-19, and Monkeypox – have a zoonotic source. Among them, 70% of zoonotic diseases originate from animals that usually live in tropical rainforests and have no close contact with human beings.[4] As previously outlined, zoonotic diseases are strictly related to the encroachment of wildlife habitats.[5]

The transmission ('spillover') of a given disease can occur in a direct manner through high-risk activities such as hunting, farming, and butchering wildlife (e.g. HIV/AIDS and the 'hunter's theory'); in an indirect manner from wildlife through wet markets, or from livestock through slaughterhouses.

Long after the COVID-19 pandemic emerged, the exact origin of the coronavirus still remains a subject of intense scientific debate. In this framework, the origin intersects the issue of the plausible transmission of the novel coronavirus (SARS-CoV-2) from animal to human in the wet market of Wuhan, probably through the pangolin[6] or the raccoon dog[7] (s.c. 'intermediate host'). Bats are arguably reservoir hosts for SARS-CoV-2, whose natural cycle of infection took place in a jungle habitat and involved monkeys and mosquitoes in tropical areas of China,[8] while the intermediate host – the Chinese Pangolin – may have facilitated transfer to humans. Chinese Pangolins are nocturnal mammals that are slaughtered for their meat, which is considered a delicacy, and for their scales, which are used as traditional medicine in South-East Asia. The wild meat of pangolins is usually sold in wet markets, which could have served as a possible ground zero for the virus.

In the scientific community, most agree that COVID-19 was the result of a natural spillover in the wet market of Wuhan, which was the pandemic epicenter[9], and evidence clearly supports pangolin as an intermediate host. [10] A report in Science magazine confirms that the early epicenter of the COVID-19 pandemic was the seafood wholesale market in Wuhan.[11] In wet markets, wild animals often at risk of extinction are traded live and slaughtered on site, in full disregard of animal welfare standards. This strict contact between human beings and wild animals facilitates spillover, the process through which emerging infectious diseases that originate in wild animals are transmitted to human beings.

The already quoted work of Worobey et al. published in *Science* in 2022 clearly confirmed that most of the human infections centered around the Huanan Seafood Wholesale Market, and through its analyses, it showed that the emergence of SARS-CoV-2 occurred through the live wildlife trade in China.[12]

According to theories from political ecology, the dominant position of the natural spillover in the wet market of Wuhan (the 'apolitical ecology perspective') following the chain of natural/animal and then cultural/human does not represent, however, a full picture of the issue, but eventually tends to criminalize the Chinese culture.[13]

It could be argued that the emergence of the COVID-19 pandemic can be traced back to a certain way of how human societies relate to and alter their environment rather than to Chinese customs. Therefore, the major interactions between humans and animals, the growing contiguity of human settlements to natural reserves (including their steady decrease), and the raising of livestock in factory farms, are all factors that have drastically increased the risk of zoonotic diseases.[14] In fact, human activities that alter the human environment – as affirmed by Wallace –[15] are the source of the novel coronavirus, as well as of the rising zoonotic diseases.

To date, environmental law has not managed to provide an answer to all of these issues related to the steady spread of infectious diseases and does not address in an appropriate manner – from the point of view of disease prevention – the interrelation between emerging zoonotic diseases and habitat degradation.[16]

In fact, explicit references to health in environmental treaties are scarce, except for the UNECE Protocol on Water and Health.[17] The most important biodiversity-related international agreement is the Convention on Biological Diversity (CBD), which aims toward "the conservation of biological diversity, the sustainable use of its components and the fair and equitable participation in the benefits derived from the use of genetic resources" (Preamble).[18] Despite its significant impact on the development of biodiversity law, the CBD has never taken into consideration zoonotic diseases and their linkage with biodiversity loss.

The Secretariat of the CBD has, however, acknowledged the strict interrelation between wildlife consumption and the increase of zoonoses. The Technical Information on Biodiversity and Pandemics[19] reads as follows: "The hunting, trading, butchering and preparation of wildlife for consumption has led to a significant proportion of known zoonoses, emerging infectious diseases and pandemics such as Ebola virus disease, HIV/AIDS, Monkeypox, SARS and COVID-19" (Para. 15).

A reference to health is contained in the Cartagena Protocol on Biosafety (2000),[20] which is aimed at addressing some of the impacts of health and environment on modern biotechnology. The Protocol regulates the international transport and release of genetically modified organisms (GMOs) to protect natural biological diversity. It states in Article 1, that "In accordance with the precautionary approach [...] the objective of this Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, also taking into account *risks to human health*, and specifically focusing on transboundary movements."

The Nagoya Protocol on Access and Benefit Sharing (2010) specifically recognizes in its Preamble the relevance of the International Health Regulations (IHR, 2005) and "the importance of ensuring access to human pathogens for public health preparedness and response purposes".[21] Notably, Asrticle 8(*b*) is relevant to disease outbreaks, stipulating that Parties shall "pay due regard to cases of present or imminent emergencies that threaten or damage human, animal or plant health, as determined nationally or internationally. Parties may take into consideration the need for expeditious access to genetic resources and expeditious fair and equitable sharing of benefits arising out of the use of such genetic resources (...)".

THE GAPS OF ENVIRONMENTAL LAW

The COVID-19 pandemic shed lights on the limits of environmental law, by drawing attention to the deep disconnection between human beings, nature, and the way that we interact with the environment that surrounds us. The lack of an ecosystemic approach that recognizes the direct linkage among human health, animal health, and the protection of the environment is the main structural limit that must be reassessed.

In the next paragraphs, I analyze the gaps in wildlife law, since the illegal trade of most endangered species that can host dangerous pathogens in wet markets facilitates the spillover of zoonotic diseases. I also examine the gaps in forest law, since deforestation has led to the progressive retirement of the traditional buffer zones that keep animals and their pathogens separated from human beings.

Wildlife Law

According to most scientists, enhanced predation of wildlife is leading several threatened species to the brink of extinction.[22] With Resolution 2136/2014 on the Democratic Republic of the Congo (30 January 2014), the Security Council (SC) identified illegal poaching as a source of illegal funding for international terrorism.[23]

The two pillars of the international regime on the protection of wildlife – which should avoid the extinction of most threatened species – are represented by Multilateral Environmental Agreements (MEA): one is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Washington, 1973),[24] and the other is the Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn, 1979).[25]

The UN Framework for the Immediate Socio-economic Response to COVID-19 (April 2020)[26] has underlined the key role of these agreements in tackling the COVID-19 pandemic (Para. 28).

In this framework, the Chinese Pangolin (*Manis pentadactyla*) is protected by CITES, and the international trade of this species is prohibited under this treaty.[27]

Appendix I of CITES provides protective measures to mitigate the potential negative impacts of illegal trade on the most threatened species. Exporters must fulfill restrictive conditions to export species listed in Appendix I. First, competent national authorities must provide a grant that verifies that the export will not be detrimental to the conservation of the species in question, that the live specimens were not obtained in violation of domestic laws, and that the risk of injury, damage to health, or cruel treatment during shipment has been guaranteed. Second, an exporter must present an export permit to the customs department of the recipient country.

Finally, the importation of species listed in Appendix I is also conditional upon a finding that the import will not be detrimental to the survival of the species, that minimum standards of housing and care are satisfied, and that the specimen will not be used for "primarily commercial purposes".

However, the illegal trade of the pangolin species has not diminished, as shown by a report from the Wildlife Justice Commission issued in February 2020[28] – despite the upgrade of pangolin to Appendix I of CITES – there was a rapid growth in the industrial scale of illegal trafficking of pangolin scales in the period of 2016-2019.

In a press statement issued on 22 April 2020,[29] the United Nations Office on Drugs and Crime (UNODC) clearly affirmed that Pangolins are "the most trafficked mammal in the world, with seizures of illegal cargo originating in Africa and intended for Asian markets having increased tenfold since 2014. Between 2014 and 2018, the equivalent of 370,000 pangolins were seized globally, suggesting that millions have been trafficked and killed".[30]

Furthermore, the horseshoe bat – a virus reservoir – is not listed under CITES (and the Raccoon Dog, one of the plausible 'intermediate hosts', is not listed). CITES' listing mechanism does not take into account the potential risk of transmission of disease from animal to human beings of a given species, and the inclusion of an animal in Appendixes I, II, or III is exclusively based on its vulnerability to extinction.

The UNODC Executive Director Ghada Waly expressly stated that "Wildlife crime endangers the health of our planet – and our own health. Pangolins pose no threat to humans in their own habitat, but allowing them to be trafficked, slaughtered, and sold in illicit markets along with other wild species greatly increases the risk of transmission of viruses and other pathogens. For the sake of preserving biodiversity and preventing the next public health emergency, the illegal wildlife trade must stop".[31]

CITES, is not, however, the most appropriate legal instrument to prevent zoonoses for several reasons. First, it is not preventative because it does not address the root causes of habitat destruction or illegal trade. Second, it does not list species on health grounds or on their potential to transmit infectious diseases to human being.[32] Third, it does not consider animal welfare issues.

Currently, wildlife law has a single-species approach (special protection is afforded to species threatened with extinction) and its rules address populations (or ecosystems) to be conserved, and does not treat individual condition or suffering. Welfare issues deserve some attention only from the moment in which wild animals are caught by humans and are extracted from the wild (and this is the case of the gear entanglement of whales).[33]

There is another issue related to the structural limits of CITES, since it only applies to the import and export of endangered species and does not cover domestic trade. That is, CITES does not apply to internal trade with a transboundary dimension, and currently, does not cover the domestic Chinese trade of endangered species, meaning that it operates primarily at the borders. Trade, is defined as "export, re-export, import and introduction from the sea" (Art. 1, lect. *c*). The entire trade control system of CITES was not able to effectively prevent the domestic trafficking of pangolins and to avert the transmission of SARS-CoV-2 from animals to humans. The main issue is, therefore, a correct implementation of environmental treaties at the domestic level. In light of the business behind wet markets, it is plausible to argue that the Chinese government has not adopted incisive legislative measures aimed at fighting the illegal trade of Pangolin, but rather, has tolerated such practice.[34] The same pangolin is protected under Chinese law and, particularly, by the CITES implementation law. Article VIII of CITES explicitly states that the Parties shall "take appropriate measures to enforce the provisions of the present Convention and to prohibit trade in specimens in violation thereof"; it should also include criminal sanctions on both the trade and illegal detention/custody of species protected under CITES.

Therefore, one might assume that China has violated its treaty obligations, and here originates the core issue of the 'implementation gap' of environmental law and, in the specific case of wildlife law. The Chinese legislation, well before the disease outbreak, already envisaged that wild animals traded in wet markets should be subjected to appropriate supervision and control by local authorities concerning the respect for food safety rules.

Forest Law

Tropical rainforests are a reservoir of biological diversity and sinks for the absorption of CO2. The FAO Global Forest Resources Assessment 2020 showed that – despite legal efforts –deforestation continues globally at a rate of 10 million hectares a year.[35] Furthermore, deforestation has direct and indirect effects on human health since global warming promotes the habitat of insect disease vectors – such as mosquitos – that cause malaria, global warming, and desertification.

A survey on large-scale deforestation in West and Central Africa carried out from 2001 to 2014 highlighted that the spillover of the Ebola virus was directly related to the destruction of natural habitats and forest clearance.[36] Deforestation, particularly, plays a pivotal role in the emergence and re-emergence of infectious diseases originating from wild animals since it exposes individuals to microbes or disease vectors otherwise confined to tropical rainforests. Specifically, in tropical

areas, forest harvesting has been related to an increase in contagious diseases such as malaria, dengue fever, and yellow fever.[37]

Climate change, thus, further promotes disease spillover since it provides vulnerable conditions for diverse infectious diseases born by water, air and food.[38]

Deforestation, global warming, and contagious diseases are therefore intertwined since tropical rainforests act as both 'carbon sinks' and a barrier against microbes.

Moreover, natural environmental disasters can facilitate the spread of diseases but with a minor impact. The theory that the diffusion of contagious diseases is significantly affected by climatic cycles such as the El Niño-Southern Oscillation has been advanced by several scientists in the context of cholera outbreaks.[39]As outlined by Fidler, human history is characterized by the interaction with pathogenic microbes related to the alteration of the environment.[40]

Environmental policies to address forest depletion and deforestation are based on the creation of protected areas, restoration, and combating desertification. Actions to promote sustainable resource and habitat management are grounded on the responsibilization of local communities.

At the Earth Summit of 1992 (Rio Conference – UNCED),[41] which marked the beginning of the process of 'environmental globalism',[42] with the adoption of the two landmark conventions on biological diversity and climate change, States failed to agree on a binding treaty on tropical forests alone.

Developing countries from Latin America to South-East Asia, in particular Brazil and Malaysia, leveled strong opposition. Environmental nationalism was the reply of developing countries belonging to the s.c. 'megadiversity countries' to pressures from the industrialized world.[43]

In general, developing countries were reluctant to agree on a trade-off between economic development and the environment – that is at the core of the concept of sustainable development – imposed by developed countries unless they bestow substantial financial aid.

Concern for deforestation and the encroachment of natural habitats was raised at UNCED due to the failure of previous global efforts. Against this background, the Tropical Forest Action Plan (TFAP, 1985) and the International Tropical Timber Organization (ITTO, 1986) had a limited impact on deforestation rates. The Statement on Forest Principles (SFP)[44] , alongside Chapter 11 of Agenda 21 devoted to deforestation (Combating Deforestation), should have served as building block for the adoption of a binding treaty on forests. Despite these initiatives, a binding treaty on forests – which should recognize the link between a loss of biodiversity and emerging diseases – is still elusive.[45]

The need to balance environmental protection, economic development, and traditional uses (such as hunting) is, however, evident from lect. (*c*) of the Preamble of the SFP: "Forestry issues and opportunities should be examined in a holistic and balanced manner within the *overall context of environment and development*, taking into consideration the multiple functions and uses of forests, *including traditional uses*, and the likely economic and social stress when these uses are constrained or restricted, as well as the potential for development that sustainable forest management can offer."

Among the core principles, it is clearly recognized that States have "in accordance with the Charter of the United Nations and the principles of international law, *the sovereign right to exploit their own resources pursuant to their own environmental policies* and have the responsibility to ensure that activities within

their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction" (Art. 1, lect. *a*).[46]

The SFP does not mention the threat of infectious diseases, although one might not consider public health among the "significant adverse impacts" subjected to environmental impact assessment (principle 8 *h*).

The Aichi Biodiversity Targets, which were promoted by the CBD, and consist of 20 specific targets to address and mitigate biodiversity loss across the globe, provide little guidance for the problems related to deforestation and emerging infectious diseases. Against this backdrop, Target Number 5 envisaged that "by 2020, the rate of loss of all natural habitats, including forests, is at least halved and, where feasible, brought close to zero, and degradation and fragmentation are significantly reduced". As highlighted in the Global Biodiversity Outlook (2020), "The recent rate of deforestation is lower than that of the previous decade, but only by about one third, and deforestation may be accelerating again in some areas. Loss, degradation and fragmentation of habitats remains high in forest and other biomes, especially in the most biodiversity-rich ecosystems in tropical regions. Wilderness areas and global wetlands continue to decline. Fragmentation of rivers remains a critical threat to freshwater biodiversity".[47]

The Glasgow Leaders' Declaration on Forests and Land Use (2022)[48] fails to mention of the relationship between deforestation and the spillover of infectious diseases. The Declaration's signatories include megadiverse countries such as Brazil, the Democratic Republic of the Congo, and Indonesia; they have committed to work collectively to halt and reverse forest loss and land degradation by 2030, while delivering sustainable development and promoting an inclusive rural transformation. This Declaration, however, recognizes the crucial role of tackling forest loss and land degradation in order to address climate change, biodiversity decline and sustainable development. In particular, States committed to "conserve forests and other terrestrial ecosystems and accelerate their restoration" (Para. 1).

After examining the root causes of zoonotic diseases, in the next paragraph, I focus my attention on the problem of wet markets and I outline possible solutions (such as a global ban).

THE PROBLEM OF WET MARKETS AND THE LACK OF A GLOBAL BAN

For centuries, human beings have exploited wildlife for food, skin, and trade. The over-exploitation of some species of wildlife has brought them to the brink of extinction. The unsustainable use of most endangered animals is damaging to their survival and has strong consequences on the environment and human health.[49] The sustainable use of biodiversity is one of the key pillars of the CBD. This principle also encompasses the sustainable use of wildlife since they are a source of sustenance for several indigenous peoples and local communities (IPLCs) and a food delicacy for local populations, especially in South-East Asia.

The principle of sustainable use of biodiversity does not question, however, meat consumption and, therefore, wet markets. As previously stated, environmental law –in addition to animal law – is grounded on the logic of the priority of human beings over animals and the fact that humans are morally superior to animals. The prohibition of such markets is, thus, an issue that is part of the margin of appreciation that each State enjoys, although there are global guidelines and standards that deal with such a topic.[50]

The key problem is related to the lack of a binding treaty that would explicitly ban the wet markets themselves or the trade, breeding, or consumption of some wild species based on public health reasons.

A global ban on the wildlife trade only for food consumption (which would allow trade for 'other uses,' such as traditional medicine, animal research, zoo animals, and pets) would be a concrete policy option.[51] This has already been indirectly envisaged in the WHO recommendations to reduce the risk of transmission of emerging pathogens from animals to humans in live animal markets or animal product markets (26 March 2020), the WHO also recommends to avoid the consumption of raw or undercooked animal products.[52]

Against this backdrop, the European Union, within the context of the negotiation of a new pandemic treaty, has supported the idea of a specific ban on wet markets and envisages incentives for countries to report new viruses or variants.[53]

A global ban of wildlife markets is not, however, without criticism, for being over-simplistic. Some scholars have argued that wildlife-oriented solutions are not enough to prevent future pandemics since they do not provide a full narrative of the problem. [54] A ban or blanket prohibition would only divert the attention away from the real issue represented by the asymmetric relationship between human beings and the environment. Second, many zoonotic diseases have spread in farm animals and not in wildlife markets, such as H1N1 influenza pandemic, North American pig farms, and mad cow disease. Third, illegal trade would be boosted, and it would imply reinforcing the verification mechanism in CITES.

Paradoxically, indirect protection can have a major impact in terms of improvement of both animal welfare and conservation; the problem lies in the fact that current wildlife law fails to provide a response to the problem of wet markets and the domestic illegal trade of wildlife.

Against this backdrop, the WHO altogether OIE and UNEP exhorted Member States to temporarily suspend the sales of wild mammals at food markets.[55] However, the WHO, in recognizing the role of wet markets in providing local communities with safe and nutritious food, has not supported the policy of a global ban but rather a simple moratorium.

The WHO, OIE, and UNEP, in applying the precautionary principle, called on "all national competent authorities to *suspend* the *trade* in live caught wild animals of mammalian species for food or breeding and *close sections of food markets selling live caught wild animals* of mammalian species *as an emergency measure* unless demonstrable effective regulations and adequate risk assessment are in place" (Recommendation 1).

These emergency measures should have a temporary nature, to allow domestic authorities to conduct a risk assessment[56] of each market "to identify critical areas and practices that contribute to the transmission of zoonotic pathogens".

These provisional rules should verify whether wild animals are illegally caught and introduced to wildlife farms and whether required food safety, hygiene and environmental standards are respected.

Recommendation 2 calls upon States to improve "standards of hygiene and sanitation in traditional food markets to reduce the risk of transmission of zoonotic diseases and person-to-person transmission of disease".

This can be particularly challenging in low- and middle-income countries and remote regions, where such markets are important in food distribution systems and are part of cultural traditions, as resources to detect and monitor infectious diseases are often scarce.

The WHO introduced the concept of *Healthy Food Markets*[57] and set the target of improving standards of hygiene and sanitation with a view of avoiding future disease outbreaks related to the lack of compliance with basic food safety requirements.

In this regard, guidelines that establish minimum hygienic requirements have already been enacted within the context of FAO: these are the General Principles for Food Hygiene contained in the Codex Alimentarius,[58] which are based on two concepts: Good Hygienic Practices (GHP) for specific foods and the Hazard Analysis Critical Control Point (HACCP) system. "Food hygiene" has been defined by the Codex as "all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain", and GHP can therefore be regarded as "all practices regarding the conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain".

However, as I have clarified in this article, the interaction between humans and wild animals creates a major risk of transmission of zoonotic diseases. Therefore, in the next paragraph I argue that a global ban of wet markets could be the more practical solution to prevent a new pandemic, although, as witnessed by the political ecology work, wet markets are only the 'peak of an iceberg', which has its roots in the encroachment of the environment and in the capitalistic society.

A GLOBAL BAN OF WET MARKETS AND THE ONE HEALTH APPROACH

The prohibition of wet markets *tout court*, although not in line with the WHO's position and highly problematic for its contrast with local traditions, is consistent with an emerging principle in international environmental law, which has not yet been codified in any treaty or convention, namely the *One Health Concept*. As is well known, it aims to reconcile human health, environmental protection, and animal welfare.[59] The One Health paradigm was developed in the aftermath of the 2003 outbreak of SARS and in due course by the diffusion of the highly pathogenic avian influenza H5N1.[60] The series of strategic goals known as the 'Manhattan Principles,' drafted by the Wildlife Conservation Society in 2004, plainly acknowledge the strict interrelation between human and animal health and the threats of zoonotic diseases to food supply and the economy.[61]

The One Health paradigm acts as a 'boundary object[62]', which is defined as a multi-interpretable concept, that is "both plastic enough to adapt to the local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites[63]."

The Global Biodiversity Outlook 5 recognizes the prevention role of One Health, stating that "the risk of future pandemics could be reduced through a more integrated, cross-sectoral and inclusive One Health approach that builds the health and resilience of people and the planet[64]."

The One Health Joint Plan of Action (2022-2026) clearly indicates that "Environmental degradation caused by human activities poses several health threats that are invariably complex and rooted in how humans interact with and use the environment."[65]

As things stand at present, however, the international action towards its codification remains primarily aspirational, relegated to the realm of doctrinal debate. The only treaty based on this principle is the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (1995) (SPS Agreement), which recognizes the right of States Parties to "to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health" (Art. 2).

UNEP, however, adopted on 7 March 2022 a resolution grounded on the One Health Concept,[66] which established for the first time animal welfare's role in sustainability.

The adoption of this resolution is a milestone since it underlines the necessity of a holistic approach to global health that recognizes the nexus among animal welfare, sustainable development an human health. Such interdependence is recognized in the Preamble, which reads as follows: "acknowledging that animal welfare can contribute to addressing environmental challenges, promoting the One Health approach and achieving the Sustainable Development Goals"; "Noting that the health and welfare of animals, sustainable development and the environment are connected to human health and well-being".[67]

As underlined by some scholars, in addition to the lack of binding norms, there is also a shortage of an adequate ethical reflection since environmental law has and continues to have an anthropocentric setting.[68]

The conflict of values among human health, animal welfare, and environmental protection raises practical dilemmas. A zoonotic disease control strategy can imply serious conflicts of interest between public health institutions, on the one hand and the agri-food industry on the other hand, and with cultural traditions such as wet markets. It is worth recalling that One Health Strategies can imply the culling of health animals and, there is thus not yet a balance of values since human health always prevails over animal welfare.

This is exactly what happened in Denmark, where the government decided to cull millions of minks, which are raised for their pelts, after a mutated version of COVID-19 was discovered in this species (it was probably transmitted to the animals by an infected operator). This event has raised a debate on the necessity to ban the fur industry.[69]

This situation has once again revealed the prevalence of the economic interests of human being (in the specific case of minks breeders) over animal welfare, and the fact that animal law does not question the human exploitation of animals. However, the existing interpretations of the One Health Concept are neither in legal documents nor in the doctrinal debate address in an appropriate manner current the moral dilemmas.[70]

CONCLUSIONS

The COVID-19 pandemic has put a spotlight on the necessity to address the biodiversity crisis along with the climate crisis, the necessity to protect animal welfare, and the need for substantial changes in global environmental policies.[71]

Although the COVID-19 pandemic cannot be considered a "food safety issue" *strictu sensu*, its origin is directly related to the food chain, the lack of respect for animal welfare standards, and environmental degradation.

Despite growing societal concerns for animals, incremental legal reforms, and new advances in moral and political philosophy, our relationship with animals remains inherently hostile by far. Whether it is CAFOs, live animal markets, or habitat destruction, we keep animals in conditions of systemic and ongoing exploitation. In countries around the world, the demand for animal meat rises as the world population increases. Animal welfare concerns are also gaining more attention as consumers perceive the links among animal health, animal welfare, and human well-being. The challenge is how to combine the unavoidable increase in food animal production while simultaneously ensuring high animal welfare standards and protecting food security.

The ongoing pandemic has put a spotlight on the interface between the health of humans and animals and the protection of the environment.

The problem is how to reach the vision behind the common target agreed upon by world governments for 2050, 'Living in Harmony with Nature', given the lack of both a strong environmental and health governance. A "solution scan" drafted by a team of scientists and zoologists[72] has advanced the proposal to reinforce the One Health Approach in its normative dimension.[73] The practical issue lies, however, in the difficulty of conciliating different moral views and adopting a shared and globally accepted definition of One Health. Furthermore, some environmentalists might criticize this approach. Formally linking human health to the encroachment of natural habitats could be considered the outcome of an anthropocentric view.

A practical solution to solve the moral dilemma of the conflicting interests between humans and animals could be to adopt as a philosophical underpinning of any future reform of environmental treaties the principle of "two factor egalitarianism" developed by VanDeVeer.[74]

Van DeVeer suggests that – with the goal of promoting overall utility – a hierarchy between the interests of humans and animals should be made. According to him, peripheral interests of humans do not prevail as a matter of principle over the basic interests of animals. Only in case of clash between basic interests those of humans shall prevail, since they are beings with more complex psychological capacities and – therefore – deserve a greater moral weight.

After having agreed on its ethical basis, future reforms could act as the fixture between the three elements of One Health (human health, environmental protection, and animal welfare).[75] A potential treaty or additional protocol to CITES based on the One Health paradigm should envisage a global ban of wet markets to avert future pandemics (although the WHO, as already underlined, did not back this option but rather recommended a moratorium). A global ban would be the outcome of the request for global animal welfare standards and would indeed reinforce both animal law and environmental law.

A wet market global ban has met strong resistance from developing countries as it contrasts with the respect for the since it contrasts with the respect of their cultural traditions, since wet markets are a consolidated tradition. Once again, there is a sharp contrast between animal welfare and cultural or religious traditions, as raised with reference to the issue of ritual slaughtering.[76]

However, a global ban could easily be achieved through an additional protocol to CITES that should fix stricter regulation of the domestic trade of endangered species. Large-scale trafficking of wildlife should be addressed at the same level as transnational organized crime, and CITES should be provided additional powers to investigate illegal trade at the domestic level, which is the main gap of this treaty.

The narrow scope of CITES – and particularly, its limited focus on the international trade of endangered species – has raised a debate on a potential amendment to address health risks.[77] One suggestion might be to draft a new appendix that would strictly regulate trade not only of endangered species but also of the species whose illegal trade might put human or animal health at risk through the transmission of zoonosis (a zoonosis protocol). An amendment to CITES could include a new Appendix listing species at a high risk of propagating zoonotic diseases aside from the level of threat or conservation status.

More generally, the most appropriate option to avert future pandemics may be inter-regime linkage ("interregime linkages", a term coined by Young to address the "interplay among distinguishable, institutional arrangements").[78] Against this

backdrop, a reinforcement not only of environmental law and health law, but also of global animal law would be helpful.[79]

Since the legal regime of the WHO is not sealed or self-contained, it must be supported by other norms of international law, such as human rights law, environmental law, humanitarian law, and trade law.[80] A theoretical division of tasks within international law – based on the concept of inter-regime linkage – might be the following: environmental law should address the root causes of zoonotic diseases, while health law and human rights law should direct in an appropriate manner the management and containment of a disease outbreak.

Radical solutions – such as the closure of all wet markets – are necessary and cannot be postponed. This does not mean, however, to divert attention away from the causes of the rapid spread of zoonotic diseases in the last quarter, which are connected to factors such as environmental degradation, habitat destruction, and deforestation, or failing to look for an appropriate answer by environmental law.

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[1] A very similar version of this paper will be part of my book entitled *Global Pandemics and International Law An Analysis in the Age of Covid-19* (London: Routledge) 2024.

[2] Johnson et al, 'Global shifts in mammalian population trends reveal key predictors of virus spillover risk', in Proceedings of the Royal Society B, 08 April 2020, https://royalsocietypublishing.org/doi/10.1098/rspb.2019.2736.

[3] Patricia L. Farnese, "The Prevention Imperative: International Health and Environmental Governance Responses to Emerging Zoonotic Diseases", *Transnational Environmental Law* (2014): 285-309.

[4] Nicolas De Sadeleer, Jacques Gofroid, "The Story behind COVID-19: Animal Diseases at the Crossroads of Wildlife, Livestock and Human Health", *European Journal of Risk Regulation*, 11 (2020): 210-227, at 221.

[5] Jones B.A et al, "Zoonosis emergence linked to agricultural intensification and environmental change", *Royal Society*, 110(21): 2013 8399-8404.

[6] Matthew C. Wong, Sara J. Javornik Cregeen, Nadim J. Ajami, Joseph F. Petrosino, "Evidence of recombination in coronaviruses implicating pangolin origins of nCoV-2019", bioRxiv (2020): 1-9; Tommy Tsan-Yuk Lam et al, "Identifying SARS-CoV-2-related coronaviruses in Malayan pangolins", *Nature* (2020): 282-285.

[7] Smriti Mallapaty, "COVID-origins study links raccoon dogs to Wuhan market: what scientists think", *Nature* (2023): 771-773.

[8] Alice Latinne, Ben Hu, Kevin J. Olival, Guangjian Zhu, Libiao Zhang, Hongying Li, Aleksei A. Chmura, Hume E. Field, Carlos Zambrana-Torrelio, Jonathan H. Epstein, Bei Li, Wei Zhang, Lin-Fa Wang, Zheng-Li Shi & Peter Daszak, "Origin and cross-species transmission of bat coronaviruses in China", *Nature communications* (2020): 1-15.

[9] Jonathan E. Pekar, Andrew Magee, Edyth Parker, Niema Moshiri, Joel O. Werheim, "The molecular epidemiology of multiple zoonotic origins of SARS-CoV-2", Science (2022): 960-966.

[10] The Report of the WHO-China Joint Mission on the Novel Coronavirus denotes the zoonotic source of the virus. "Early cases identified in Wuhan are believed to have acquired infection from a zoonotic source as many reported visiting or working in the Huanan Wholesale Seafood Market. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19), 16-24 February 2020, at 1-40, at 10, https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf. Another report by the WHO on the origins of COVID-19 has highlighted four scenarios: direct zoonotic transmission to humans (spillover); introduction through an intermediate host followed

by spillover ("to be a likely to very likely pathway"); introduction through the (cold) food chain; introduction through a laboratory incident (a very remote possibility). WHO-convened Global Study of Origins of SARS-CoV-2. Joint WHO-China Study, 14 January-10 February 2021, Joint Report.

[11] Michael Worobey et al, "The Huanan Seafood Wholesale Market in Wuhan was the early epicenter of the COVID-19 pandemic", Science (2022): 951-959.

[12] *Supra*, footnote 9.

[13] Viktor Humpert, "A political ecology perspective on the origins of the COVID-19 pandemic", https://degrowth.org/2021/05/18/a-political-ecology-perspective-on-the-origins-of-the-covid-19-pandemic/

[14] Bryony A. Jones, et al "Zoonosis emergence linked to agricultural intensification and environmental change", Proceedings of the National Academy of Sciences of the United States of America, (2013): 8399-8404.

[15] Rob Wallace, Dead Epidemiologists: On the Origins of COVID-19, New York: Montly Review Press (2020).

[16] Patricia L. Farnese, "The Prevention Imperative: International Health and Environmental Governance Responses to Emerging Zoonotic Diseases", *Transnational Environmental Law* 3 (2) (2014): 285-309.

[17] The Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes was adopted in London on 17 June 1999 and it entered into force on 9 August 2005. According to Article 1 "The objective of this Protocol is to promote at all appropriate levels, nationally as well as in transboundary and international contexts, the protection of human health and well-being, both individual and collective, within a framework of sustainable development, through improving water management, including the protection of water ecosystems, and through preventing, controlling and reducing water-related disease."

[18] Under the CBD, conservation and sustainable use of natural resources are regarded as the main drivers of biodiversity policies. Art. 6 of the CBD ('General Measures for Conservation and Sustainable Use'), states that: "Each Contracting Party shall, in accordance with its particular conditions and capabilities: (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies." On the CBD, see Elise Morgera, Jona Razzaque (eds.), *Biodiversity and Nature Protection Law*, Edward Elgar, 2017.

[19] Note by the Executive Secretary, CBD/SBSTTA-SBI-SS/2/INF/1
2 December 2020, https://www.cbd.int/doc/c/2abd/08b3/123a81e9d2b3b9d6eb0dd9b8/sbstta-sbi-ss-02-inf-01-en.pdf

[20] The Cartagena Protocol on Biosafety to the Convention on Biological Diversity was adopted in Montreal on 29 January 2000 and it entered into force on 11 September 2003.

[21] The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity was signed on 29 October 2010 and entered into force on 12 October 2014. The scope of the Protocol is stated in the Article 3:"This Protocol shall apply to genetic resources within the scope of Article 15 of the Convention and to the benefits arising from the utilization of such resources. This Protocol shall also apply to traditional knowledge associated with genetic resources within the scope of the Convention and to the benefits arising from the utilization of such knowledge." See Claire Lajaunie, Serge Morand, "Nagoya Protocol and Infectious Diseases: Hindrance or Opportunity?", *frontiers in public health*, (2020), available at https://www.frontiersin.org/articles/10.3389/fpubh.2020.00238/full; I.R. Pavone, "Access & Benefit Sharing in the Nagoya Protocol: Implementation Progress and Gaps", *Anuário brasileiro de direito internacional*, (2018): 129-154.

[22] R Leakey and R Lewin, *The Sixth Extinction: Patterns of Life and the Future of Humankind* (New York, Doubleday 1995).

[23] In the Preamble, the SC recognized "the linkage between the illegal exploitation of natural resources, including poaching and illegal trafficking of wildlife, illicit trade in such resources, and the proliferation and trafficking of arms as one of the major factors fuelling and exacerbating conflicts in the Great Lakes region of Africa". Then, the SC urged States to adopt specific financial and travel measures, against "individuals or entities supporting armed groups in the DRC through illicit trade of natural resources, including gold or wildlife as well as wildlife products; (…)" (para. 4, lect. g). Although illegal poaching in itself was not expressly qualified as a 'threat to peace and security', its consequences on regional security were, however, taken into consideration. For further details, Anne Peters, "Novel practice of the Security Council: Wildlife poaching and trafficking as a threat to the peace", *EJIL Talk* (12 February

2014), https://www.ejiltalk.org/novel-practice-of-the-security-council-wildlife-poaching-and-trafficking-as-a-threat-to-the-peace/.

[24] In general, on CITES, Simon Lyster, *International Wildlife Law. An Analysis of International Treaties concerned with the Conservation of Wildlife* (Cambridge: Cambridge University Press, 2012).

[25] Thomas G. Kelch, *Globalization and Animal Law: Comparative Law, International Law and International Trade*
222 (2011).

[26]https://unsdg.un.org/sites/default/files/2020-04/UN-framework-for-the-immediate-socio-economic-response-to-COVID-19.pdf.

[27] The Pangolin was originally included within the Appendix II, https://cites.org/eng/app/index.php, namely "the lists of species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled".
Appendix I encompasses "all species threatened with extinction which are or may be affected by trade". Trade in Appendix I-species may be authorized only in "exceptional circumstances" (Art. II (1) CITES). Appendix II lists less endangered species, and allows under exceptional circumstances their international trade. At the 17th Meeting of COP 17 in Johannesburg in 2016, Bangladesh proposed to transfer all 8 species of Pangolins to Appendix I of CITES. https://cites.org/sites/default/files/eng/cop/17/prop/060216/E-CoP17-Prop-08.pdf. The eight species are: *Manis crassicaudata*, *Manis culionensis, Manis gigantean, Manis javanica, Manis pentadactyla, Manis temminckii, Manis tetradactyla, Manis tricuspis*. The proposal for amendment was eventually approved by a two-thirds majority as envisaged under Art. XV, Para. 1, lect *b*. Art. XV, Para. 2, lect *b*, which states that "Amendments shall be adopted by a two-thirds majority of Parties present and voting. For these purposes "Parties present and voting" means Parties present and casting an affirmative or negative vote. Parties abstaining from voting shall not be counted among the two-thirds required for adopting an amendment." Amendment to Appendices I and II of the Convention adopted by the Conference of the Parties at its 17th meeting, Johannesburg (South Africa), 24 September – 4 October 2016, https://cites.org/sites/default/files/notif/E-Notif-2016-063.pdf.

[28] https://www.prnewswire.com/in/news-releases/the-trafficking-of-pangolin-scales-must-be-tackled-as-a-transnational-organised-crime-says-new-report-from-the-wildlife-justice-commission-839709132.html.

[29] UNODC, 'Wildlife trafficking harms animals and human health: the case of Pangolins',

[30] https://www.unodc.org/unodc/press/releases/2020/April/wildlife-trafficking-harms-animals-and-human-health_-the-case-of-pangolins.html.

[31] https://www.unodc.org/documents/press/releases/Pangolins_WCR2020_press_release.pdf.

[32] Stefan Borsky, Hannah Hennighausen, Andrea Leiter, Keith Williges, "CITES and the Zoonotic Disease Content in International Wildlife Trade", Environ Resour Econ (2020): 1001-1017.

[33] The WOAH (*World Organization for Animal Health*) has approved a specific code (*Terrestrial Animal Code*) and the WTO has enacted the well-known 'Agreement on Sanitary and Phytosanitary Measures', whose goal is that "to restrict the use of unjustified sanitary and phytosanitary measures for the purpose of trade protection".

[34] On 24 February 2020, the Chinese government has announced a Decision on Completely Prohibiting the Illegal Wildlife Trade, Eliminating the Bad Habit of Indiscriminately Eating Wild Animals, and Truly Ensuring the Health and Safety of the People (the text in Chinese can be found here: https://perma.cc/5LQV-AEB5); see Amanda Whitfort, "COVID-19 and Wildlife Farming in China: Legislating to Protect Wild Animal Health and Welfare in the Wake of a Global Pandemic", *Journal of Environmental Law* (2021): 57-84.

[35] http://www.fao.org/forest-resources-assessment/2020. However, the deforestation rate diminished of 20% if compared to the previous 2010-2015 in line with the establishment of the Aichi Biodiversity Targets, even if this low reduction is strongly related to the decline in forest expansion. Positive examples of reforestation and halt to forest harvesting are represented by the case of Côte d'Ivoire and Ghana (from 2018 to 2019, the rate of forest loss was reduced by around fifty percent in both countries) and Indonesia.

[36] Jesús Olivero, John E. Fa, Raimundo Real, Ana L. Márquez, Miguel A. Farfán, J. Mario Vargas, David Gaveau, Mohammad A. Salim, Douglas Park, Jamison Suter, Shona King, Siv Aina Leendertz, Douglas Sheil, Robert Nasi, "Recent loss of closed forests is associated with Ebola virus disease outbreaks", *Scientific Reports* (2017): 1-9.

[37] https://www.nationalgeographic.com/science/article/deforestation-leading-to-more-infectious-diseases-in-humans.

[38] Asim Anwar, Sajid Anwar, Muhammad Ayub, Faisal Nawaz,Shabir Hyder, Noman Khan, Imran Malik, "Climate Change and Infectious Diseases: Evidence from Highly Vulnerable Countries" *Iranian Journal of Public Health*, 2019, 48(12): 2187–2195.

[39] Rita R. Colwell, 'Global climate and infectious disease: the cholera paradigm', *Science,* 274, 1996, 2025-2031.
[40] David P. Fidler, "Microbialpolitik: Infectious Diseases and International Relations", *American University International Law Review* (1998): 1-53, at 23.
[41] United Nations Conference on Environment and Development (UNCED). The outcome of the Conference was represented by two binding treaties (Convention on Biological Diversity, the United Nations Framework Convention on Climate Change), a declaration (the Declaration on Environment and Development, or Rio Declaration), a programme of action (Agenda 21) and a statement (The Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests). See Patricia Birnie, Alan Boyle, Catherine Redgwell, *International Law & the Environment* (Oxford: Oxford University Press), third. ed. 2008, 50-53.
[42] In this sense, Sergio Marchisio, Giovanni Cordini, Paolo Fois, *Diritto ambientale. Profili internazionali europei e comparati*, (Torino: Giappichelli), 2017.
[43] Andrew Huller, "The Politics of Amazonian Deforestation", *Journal of Latin American Studies*, (1991): pp. 197-215.
[44] The Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests. Preamble, lect. (b), "The guiding objective of these principles is to contribute to the management, conservation and sustainable development of forests and to provide for their multiple and complementary functions and uses".
[45] Jeff Tollefson, 'Why deforestation and extinctions make pandemics more likely', *Nature*, 7 August 2020.
[46] The same wording is present in Art. 3 of the Convention on Biological Diversity (CBD) "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."
[47] https://www.cbd.int/gbo/.
[48] 26th UN Climate Change Conference of the Parties (COP26) in Glasgow on 31 October - 13 November 2021.
[49] The most endangered species are included in the IUCN Red List of Threatened Species, https://www.iucnredlist.org/resources/summary-statistics.
[50] See, for instance, the WHO global strategy for food safety. Reducing public health risks associated with the sale of live wild animals of mammalian species in traditional food markets – infection prevention and control (2022).
[51] In this sense, A. Alonso Aguirre, Richard Catherina, Hailey Frye, and Louise Shelley, "Illicit Wildlife Trade, Wet Markets, and COVID-19:Preventing Future Pandemics", *World Medical and Health Policy*
[52] https://apps.who.int/iris/handle/10665/332217.
[53] https://www.euractiv.com/section/global-europe/news/eu-wants-pandemic-treaty-to-ban-wet-markets-reward-virus-detection/.
[54] Evan A. Eskew, Colin J. Carlson, "Overselling wildlife trade bans will not bolster conservation or pandemic preparedness", *The Lancet Planetary Health*, 4(6) (2020): 215-216; Roe D. & Booker F. 2019. Engaging local communities in tackling illegal wildlife trade: A synthesis of approaches and lessons for best practice. Conservation Science and Practice, 1(5):265.
[55] Reducing public health risks associated with the sale of live wild animals of mammalian species in traditional food markets. Interim guidance, 12 April 2021,
[56] Environmental risk assessment evaluates the quantitative and qualitative characteristics of the environment, in order to highlight the risk on environment and human health due to the potential presence or use of specific pollutants.
[57] WHO, A Guide to Healthy Food Markets, 2006, https://www.who.int/foodsafety/publications/capacity/healthymarket_guide.pdf.
[58] Tom Heilandt, "Codex Alimentarius: Safe, Good Food for Everyone – Everywhere", (Cinzia Caporale, Ilja Richard Pavone, Maria Pia Ragionieri, eds.), *International Food Law* (Wolter Kluwers: 2021): 91-111.
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[60] John S Mackenzie, Martyn Jeggo, "The One Health Approach—Why Is It So Important?", *Tropical Medicine and Infectious Disease*, (2019): 88-92.
[61] Wildlife Conservation Society One World-One Health: Building Interdisciplinary Bridges. Available online: http://www.oneworldonehealth.org/sept2004/owoh_sept04.html.

[62] Aline Lebeuf, "Making Sense of One Health: Cooperating at the Human-Animal-Ecosystem Health Interface", *Health and Environment Reports*, No. 7, April 2011, https://www.ifri.org/sites/default/files/atoms/files/ifrihereport7alineleboeuf.pdf.
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[64] Secretariat of the Convention on Biological Diversity (2020) Global Biodiversity Outlook 5. Montreal (2020), https://www.cbd.int/gbo/gbo5/publication/gbo-5-en.pdf.
[65] FAO, UNEP, WHO, and WOAH. 2022. One Health Joint Plan of Action (2022-2026). Working together for the health of humans, animals, plants and the environment, Rome, https://www.woah.org/app/uploads/2022/04/one-health-joint-plan-of-action-final.pdf.
[66] Resolution adopted by the United Nations Environment Assembly on 2 March 2022, "5/4. Animal welfare–environment–sustainable development nexus".
[67] On the necessity to recognize a major role of animal welfare in biodiversity law and wildlife law, see Guillaume Futhazar, "Biodiversity, Species Protection, and Animal Welfare Under International Law", in: Anne Peters (eds.) Studies in Global Animal Law (Springer Open 2020), 95-108.
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[71] United Nations Decade on Biodiversity, 'Government pandemic spending measures continue to harm biodiversity. UN Biodiversity Convention discusses biodiversity, One Health and response to COVID-19', 15 December 2020, https://www.cbd.int/doc/press/2020/pr-2020-12-15-sbstta-sbi-en.pdf.
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The solution scan started as a collaboration between the Biosecurity Research Initiative at St Catharine's College (Cambridge University) and the Conservation Evidence headed in the Department of Zoology (Cambridge University).
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CORONAVIRUS PANDEMIC: LESSONS FOR SUB-SAHARAN AFRICA

Prosper Mandela Awuni and James Mbinta

The coronavirus 2019 (COVID-19) pandemic has impacted Sub-Saharan African health systems, caused economic downturns, and put governments under intense pressure to deliver hope to their citizens. However, the unknowns of the SARS-CoV-2 virus are a concern for many experts. This paper discusses lessons from Sub-Saharan African countries and lessons from other countries regarding pandemic management. The paper identifies five lessons from Africa's management of the COVID-19 pandemic: mutation of the SARS-CoV-2 virus, COVID-19 vaccines waning over time, the threat of vaccine hesitancy in Africa, reliance on vertical health systems and lack of knowledge on political determinants of health by African leaders. Finally, drawing lessons from the current COVID-19 pandemic response from Sub-Saharan African governments and some countries could help them improve their response to the ongoing COVID-19 pandemic.

INTRODUCTION

Over three years since COVID-19 was declared a pandemic, infecting over 76 million and claiming over 6 million lives globally.[1] Also, it has been two years since the first COVID-19 vaccines were administered, and there has been a 63% reduction in mortality, meaning 19.8 million deaths have been prevented.[2] However, as the Virus began to spread rapidly and reach other parts of the world, including Europe, the severity of the situation became more apparent.

By March 2020, many countries had taken drastic measures, such as lockdowns and restrictions on significant activities, to slow the spread of the Virus. These measures were implemented to protect public health and prevent the pandemic from overwhelming healthcare systems. Nonetheless, the COVID-19 pandemic has had a significant humanitarian impact, including economic downturns and social disruptions.[3] Furthermore, according to the International Labor Organization (ILO), the pandemic significantly impacted global employment, with an estimated 114 million people losing their jobs in 2020.[4]

Sub-Saharan Africa has never had any coronavirus outbreak, even though there has been a previous SARS-CoV 1 with mortalities of 774 and 842 from MERS-CoV in 2003 and 2012, respectively. [5, 6] In the early stages of the COVID-19 pandemic, Africa had yet to record many cases. COVID-19 looked like it would spare Sub-Saharan Africa like SARS and MERS. Several possible reasons are cited for the lower burden of COVID-19 in Africa, including the hot climate cited as a significant factor,[7, 8] limited testing capacity,[9, 10] early restrictions[11], and demographic and undetermined innate immunity factors.[12, 13]

Also, some global health experts posited that the risk of importing infectious diseases would not be uniform across all African countries.[14] The vulnerability of some countries over others may be due to location, level of economic development, and health system capacity.[14] For example, Egypt, Algeria, and the Republic of South Africa are all at high risk of importation of infectious diseases due to their location and high levels of international travel.[14] Conversely, countries like Nigeria, Ethiopia, Sudan,

Angola, Tanzania, Ghana, and Kenya are at moderate risk of importation. Meanwhile, Gilbert and colleagues acknowledged that some African countries possessed the capacity to contain potential outbreaks.[14] Egypt, Algeria, and the Republic of South Africa had moderate to high capacity to respond to outbreaks, which can help mitigate the impact of imported diseases.[14] While countries like Nigeria, Ethiopia, Sudan, Angola, Tanzania, Ghana, and Kenya have a variable capacity to respond to outbreaks, their vulnerability to infectious diseases is influenced by weak health systems, poor infrastructure, and high poverty levels.[14] All projections on Africa have not reflected so far. The reasons for the lower COVID-19 cases and mortalities remain elusive.

Although the number of cases and mortalities in Sub-Saharan Africa has been lower than in some other regions of the world, the pandemic has significantly impacted the continent. As of January 2023, there were over 9.5 million confirmed cases and over 250,000 deaths from COVID-19 in Sub-Saharan Africa,[9]

Nonetheless, the SARS-CoV-2 virus is ongoing, with replications of different variants. Hence, the risk of importing infectious diseases can change over time and may be influenced by the emergence of new infectious agents, changes in global travel patterns, and the effectiveness of disease control measures. Therefore, it is beneficial for countries to continuously monitor their risk level and strengthen their preparedness and response capacity to minimize the impact of infectious diseases. This paper discusses the region's readiness by assessing its health systems, emergency and disaster preparedness, and political situation with lessons learned by Sub-Saharan African countries and lessons from other countries from pandemic management. In addition, lessons from the COVID-19 pandemic could help individual Sub-Saharan African countries improve their response to the ongoing COVID-19 pandemic.

SUB-SAHARAN AFRICA AND LESSONS FROM THE EBOLA EPIDEMICS

The ability to detect and contain the spread of any infectious disease lies primarily in infrastructure, data for health, logistics, laboratories, funding, commitment, and political will.[15] The Ebola epidemic in 2014 highlighted the limitations of many African healthcare systems' response to infectious disease outbreaks. For instance, "poor infrastructure, political instability, and ongoing conflict involving scores of armed militia groups" affected Sub-Saharan Africa during the Ebola epidemic.[16] Nonetheless, lessons were learned from the Ebola Epidemic to manage future outbreaks in Sub-Sahara Africa.

The impacts of political instability and militarization of most Sub-Saharan African governments over the years on health systems were of importance. Decades of war, instability, and unconstitutional rule in parts of Sub-Saharan Africa have exposed the healthcare system during the Ebola epidemic.[17-19] Liberia had decades of war, Guinea has a long-standing militarization of governments, and the Democratic Republic of Congo (DRC) has political instability, the militarization of governments, and long-standing conflicts. These resulted in the shortage of Health Care Workers and the lack of preparedness to combat the 2014 and 2019 Ebola outbreaks.[16] Also, before Ebola in Liberia, data gathered showed only 51 physicians.[20] Guinea's health system exemplified the fragile health system as physicians comprised less than 10% of all trained staff. [21] Also, qualified nurses are lacking; therefore, Nurse Aides with limited training worked during the EVD outbreak.[21]

In addition, many African healthcare systems have historically prioritized curative care over primary healthcare, which had implications for responding to the Ebola epidemic. For instance, Guinea, Liberia, and Sierra Leone lacked the necessary infrastructure, training, and resources to implement adequate preventive measures.[16]

However, some African countries took some lessons on preparedness and response to health emergencies, including the ongoing Ebola outbreak. For instance, Rwanda invested in public health infrastructure, training health workers in emergency response, and conducting regular preparedness exercises.[22] Also, Rwanda vaccinated over 3000 frontline staff against Ebola.[22] Similarly, Ethiopia adopted measures to prepare for potential Ebola outbreaks, including setting up Rapid Response Teams (RRTs) and training healthcare workers.[23] In 2019, Ethiopia reportedly had 20 well-trained RRTs at the national level and 112 regional Ebola Virus Disease (EVD) teams.[22] Thousands of healthcare workers were also trained in case management, contact identification, and infection prevention and control measures. A WHO review report indicates most Sub-Saharan African countries had improved surveillance systems, laboratory testing capacity, and infection prevention and control measures post-Ebola.[24]

While progress has been made in strengthening health systems and improving preparedness since the West Africa Ebola outbreak in 2014-2016, many countries still have significant gaps. Many countries face challenges in training and retaining frontline healthcare workers, which is critical for responding to outbreaks and providing essential health services more broadly.[23] For example, post-Ebola, RRTs were insufficiently trained in Burkina Faso and Cote d'Ivoire, while Guinea Bissau had trained only two nurses and six doctors for RRT.[23] The Gambia, Guinea Bissau, and Burkina Faso had no functional diagnostic laboratory facilities.[23]

Nonetheless, over the years, the experience of managing Ebola outbreaks in Africa may have helped to develop some of the infrastructure, systems, and protocols needed to respond to other infectious diseases, including COVID-19. For example, the Congo DRC has established a National laboratory system to tackle Ebola and other hemorrhagic fevers.[25] These testing centers positioned DRC to detect the SARS-CoV virus that causes COVID-19.[25] For instance, in the early stages of the COVID-19 pandemic, Congo was dealing with its 10th Ebola outbreak. Measures such as travelers screening, hand hygiene practices, and the creation of biosecurity units were already in place.[25] However, severe COVID-19 cases requiring ventilation are inadequate.[25] This lesson no one anticipated managing the Ebola virus disease. Nevertheless, the experience and expertise gained by the DRC in responding to Ebola outbreaks have likely contributed to their ability to respond to the COVID-19 pandemic, including their capacity for testing and early detection.

Also, lessons on the conceptualization of cross-border health security became evident post-2014 and 2019 Ebola outbreaks. Informal and formal cross-border movements of people, goods, and animals posed significant challenges to African national health systems, particularly during the Ebola outbreak.[21,26] West Africa's inland border migration is the highest globally.[26, 27] Research showed that cross-border and travel health measures could have stopped the spread of the Ebola outbreak in 2014.[28] However, porous borders existed because of an inadequate political platform for regional discussion on border issues.[29] After the Ebola outbreak, 10 West African countries (Benin, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo) reached an agreement to establish health security borders in the event of infectious disease outbreaks.[30]

Similarly, cross-border collaboration among East African Ministries of Health on epidemic preparedness was initiated.[31, 32] These measures were cited as responsible for preventing spillovers of the 2019 Ebola outbreak in Congo.[31, 32] Therefore, Ebola has given Sub-Saharan Africa a reason to be hopeful. However, while physical borders exist in Sub-Saharan Africa, they often hold little significance in the face of the social, cultural, and economic ties that bind the continent together.

The COVID-19 situation is still evolving, and the long-term impact of the pandemic remains uncertain. It will likely take continued effort and collaboration to address the impact of COVID-19 and prevent future outbreaks entirely. The Ebola outbreak highlighted weaknesses in health systems and infrastructure in the affected countries, hurting individuals' country's ability to respond effectively to the outbreak. Hopefully, Sub-Saharan African countries will build on these weaknesses to manage the many unknowns of COVID-19.

SUB-SAHARAN AFRICA AND COVID-19 PANDEMIC RESPONSE

Africa was projected to record higher mortalities from COVID-19, and these projections were based on the continent's human development index (HDI) measurement. Countries with higher HDI tend to trust their healthcare systems and government institutions more.[33] Higher HDI countries tend to have better healthcare infrastructure, more resources to invest in vaccination programs, and higher levels of education and awareness about the importance of disease prevention and other compounding HDI factors.[34] How do countries with lower HDI compare? Lower HDI countries may have lower levels of trust in their healthcare systems. As a result, they may have limited access to healthcare services, leading to lower vaccine acceptance rates or higher vaccine hesitancy.[34] This section discusses the strategies implemented in Sub-Saharan Africa to manage the COVID-19 pandemic.

Firstly, most African countries ramped up efforts to tackle the COVID-19 pandemic.[14] Several studies reported prompt responses by African governments to limit the spread of COVID-19. Implementing a continent-wide COVID-19 initiative that included logistical and human resources supply appeared to have limited the spread of COVID-19 across Africa.[35] An example is the establishment of the Africa Taskforce for Coronavirus, a move that the WHO hailed as a model for other countries. Other government measures, such as the early closure of borders to international travelers and early lockdowns,[14] appeared to have worked.[36,37] However, do border closures and travel restrictions play a role in stopping the spread of infectious diseases? Yes, and no. Recent studies showed that countries implementing border closure and travel restrictions witnessed low COVID-19 transmission rates.[38] At the same time, border closures are insufficient to reduce new infections or outbreaks of COVID-19.[38]

The speedy implementation of lockdowns is closely related to travel restrictions and border closures. Evidence exists to support lockdowns as an effective epidemiological measure to prevent fatalities from COVID-19.[39-41] In Zambia, Kenya, South Africa, and Uganda, lockdowns and quarantines resulted in low COVID-19 incidence rates, reduced fatalities, and protected health system.[42-43] Nonetheless, a size-fit approach, such as the lockdown of cities, was at odds with the economic situation of most people in Sub-Sahara Africa. [44] For example, Zambia, Kenya, South Africa, and Uganda recorded increased gender-based violence, poverty levels, unemployment, mental health problems, perceived repression from politicians and corruption, psychological stress, political repression, and abuse of power during lockdowns.[42-43]

Africa has a long history of dealing with destructive epidemics, including outbreaks of infectious diseases such as Ebola, Cholera, Lassa fever, Marburg virus, Tuberculosis, and HIV/AIDS.[45-48] Due to Africa's experience with epidemics, many public health institutions have previously and continue to develop public health programs that aim to unify communities and promote preventative action among individuals.[49, 50] Many African public health programs focus on community

engagement and empowerment.[46] Applying the unity messaging with local leaders and community organizations to promote health education and awareness and encourage individuals to protect themselves and their communities actively worked during the COVID-19 pandemic.[11] Does this suggest that African governments played a better role in reducing COVID-19 cases at the community level than other governments? Does information through communication and empowerment translate into positive behavioral practices? It would be premature to assume that Africa managed COVID-19 better than other continents because Africa had fewer cases. Nonetheless, proactive measures were implemented by most African countries.

In addition, most Sub-Saharan African countries relied on the culture of collectivism to control outbreaks. Recent studies have shown that cultural adherence to wearing masks and social distancing reduce the spread of SARS-CoV-2.[51,52] For example, a study published in 2021 found that cultural factors, such as collectivism and social norms, were significantly associated with adherence to COVID-19 prevention measures in 50 countries, including several African countries.[53] The study suggested that cultural factors may play an essential role in the effectiveness of COVID-19 prevention measures and that promoting cultural adherence to government recommendations may be vital to mitigating the spread of the Virus. Similarly, studies in Mali, Burkina Faso, Senegal, and Guinea indicate that citizens adhere to social distancing measures without the populations questioning their governments.[54]

In contrast, People in individualistic countries such as the USA, the U.K., and France did not readily comply because they could question measures that could curtail their freedoms.[52, 53, 55]. Studies in Ghana, Nigeria, Ethiopia, Malawi, and Congo DRC showed that most populations had adequate knowledge of COVID-19 and modes of transmission.[56-60] However, adherence to hand hygiene, face masking, and social distancing was not observed.[56-60] Unfortunately, the ability to follow through with some of the measures in most African countries has been suboptimal, resulting in non-compliance in the long run.[61]

Furthermore, some African countries developed good data storage and tracking systems to provide accurate and complete birth registrations and causes of death. A recent survey of 133 countries showed that 10% of Africa has a well-developed information system that enables data for health policy and action.[62] However, there are variations among countries. For instance, Ghana, Angola, Sudan, Ethiopia, South Africa, Lesotho, Eswatini, Malawi, Zambia, Kenya, Uganda, and Rwanda have well-developed systems for national health plans and policies based on data and evidence and review progress and performance.[63] In contrast, the Central African Republic, Equatorial Guinea, Gabon, and Madagascar have a nascent capacity.[63]

Another response to the COVID-19 pandemic is the earnest vaccination of citizens once COVAX vaccines were deployed to member countries. As of June 2021, most African countries had received vaccines and rolled out vaccination strategies. For instance, Liberia adopted a community-based response to COVID-19, reaching 81% vaccination coverage by the end of 2022.[64] Three other African countries, Mauritius, Seychelles, and Rwanda, reached the 70% vaccination target of completing the primary series in 2022.[64] Unfortunately, the enthusiasm that the COVAX vaccination witnessed soon fizzled out. As of November 2022, 12 countries had administered less than 50% of doses, while 24.9% of the continent's population had completed the primary series of COVID-19 vaccines.[65] Only countries with less than 10% of the populations completing primary series witnessed a significant increase in vaccinations by 4th December 2022.[65] These include Mozambique, Central African Republic (CAR), and Cameroon 13.2%, 5.7%, and 5.4% increases in vaccination rates, respectively.[65]

These gains were observed due to mass vaccination and target campaigns in Cameroon, Mozambique, and CAR, respectively.[65,66]

While many factors may contribute to the lower reported cases of COVID-19 in Africa, awareness and adherence to COVID-19 measures may be one of them. However, it is also essential to consider other factors contributing to the lower number of reported cases. For example, some researchers have suggested that the lower number of reported cases in Africa may be due to younger populations, lower levels of international travel, and pre-existing immunity to other diseases. Additionally, some cases may go undetected due to limited testing capacity in African countries. Furthermore, it is essential to note that the situation with COVID-19 in Africa is constantly evolving, and the number of reported cases may change. Therefore, individuals and communities must continue to take measures to prevent the spread of COVID-19, regardless of the reported number of cases.

LESSONS FOR SUB-SAHARAN AFRICA FROM THE COVID-19 PANDEMIC

The trajectory of this Virus is how each African country reacts, and to say that one person knows how to do this would be hubris. This primarily comes to the resilience of each country's healthcare system, working collectively to adopt lessons from pandemic management. The lessons must not be a pick of bits and pieces but adopt the rigor applied by other countries and lessons from the continent's management of the COVID-19 pandemic.

Mutation of SARS-CoV-2

From the pandemic, we understand that viruses, including the SARS-CoV-2 Virus that causes COVID-19, constantly evolve and mutate over time.[67] New variants can emerge through genetic changes in the Virus's RNA as it replicates. [68] Some variants may have different characteristics, such as increased transmissibility, increased severity of illness, or potential resistance to existing vaccines or treatments,[68] termed variants of concern (VOC) by the WHO. Many VOCs are circulating globally, alpha, beta, gamma, and delta variants;[69] however, the Omicron variant (VOC) continues to produce sub-variants, such as BA.2, BA.4, BA.5, BQ.1, BQ 1.1 and the latest XBB.1.5, the most transmissible.[67] Experts are believed to be monitoring more variants from the Omicron family. Omicron causes more infections and hospitalizations; however, the length of hospital stays and death were lower at the beginning of the pandemic.[67]

According to experts, the emergence of new variants of SARS-CoV-2 is expected; however, it is challenging to predict how these variants might evolve or when they will eventually disappear.[70, 71] Some variants may become dominant and spread widely, while others may diminish in prevalence. Therefore, Sub-Saharan African countries have not escaped this Virus because no one can predict when a new and deadly variant will emerge. Studies indicate that vaccination rates, public health measures, and population immunity influence the dynamics of variant emergence and spread.[2, 72-75] Hence, the COVID-19 Vaccination campaign must be scaled up to attain herd immunity.

Monitoring and studying new variants of SARS-CoV-2 is essential to understand their properties and potential impacts on public health. In addition, vaccination and other preventive measures, such as wearing masks, practicing good hand hygiene, and following public health guidelines, can help reduce the spread of the Virus and its variants and mitigate the impact of the ongoing COVID-19

pandemic.[74] Regular updates and adjustments to public health strategies may be necessary as new variants emerge. Therefore, providing platforms for people to rely on accurate and up-to-date information from trusted sources for the latest developments in the COVID-19 pandemic must be prioritized.

Vaccine Effectiveness

Scientific research must be prioritized in Sub-Saharan Africa in evaluating the effectiveness of COVID-19 vaccines. Several studies have shown the effectiveness of the COVID-19 vaccine warning over time with SARS-CoV-2 infection, mortality, and hospitalizations.[73, 76-81] The Studies were carried out on the Pfizer–BioNTech, Moderna, Oxford–AstraZeneca, and Johnson & Johnson vaccines. At a baseline of 92% effectiveness of each vaccine against hospitalizations and 91% for mortality saw a reduction to 79% and 86% for hospitalizations and mortality, respectively.[76] For people with a primary series of vaccination, effectiveness reduced from 83% against the SARS-CoV-2 Virus that causes infections to 62% by 112-139 days.[76]

Based on these findings, developed countries have actively embarked on booster doses. However, although there are limited studies on the effectiveness of booster doses, their effectiveness wanes over time.[80, 82-87] In support of this, Wu and colleagues' systematic review revealed that the effectiveness of booster doses 70% at baseline against infections and 89% for hospitalizations reduced to 43% and 89%, respectively. Notably, the Omicron variant originating in Sub-Saharan Africa had lower vaccine effectiveness for primary series and booster doses of vaccines.

However, many African countries are struggling to achieve primary vaccine series. Also, many Sub-Saharan African countries do not have adequate scientists and laboratory capacity. [88] To evaluate waning vaccine effectiveness and detect emerging variants over time due to the changing patterns of the SARS-CoV-2, investment in scientific research must be included in national health budgets. Also, the Africa CDC has shown its capacity with its research output;[88] hence, the African Union must invest resources in the Africa CDC vaccine effectiveness program. Similarly, academic institutions, NGOs, and Ministries of Health must not work in isolation of the CDC; instead, there should be a solid partnership to ensure that evidence-based programs are implemented effectively against the SARS-CoV-2 infections. For example, such partnerships in South Africa have produced studies[79, 89, 90] that evaluated the effectiveness of primary series and booster doses of the COVID-19 vaccines.

The threat of vaccine hesitance

The pandemic has shown that vaccine hesitancy threatens public health in Sub-Saharan Africa. With the virus' capability to mutate, speed is a top priority if African countries aim to reach herd immunity and prevent future outbreaks on the continent. The continent is the least affected by COVID-19; however, low vaccine acceptance and uptake levels can result in prolonged outbreaks, increased morbidity and mortality, and hinder progress towards achieving herd immunity.

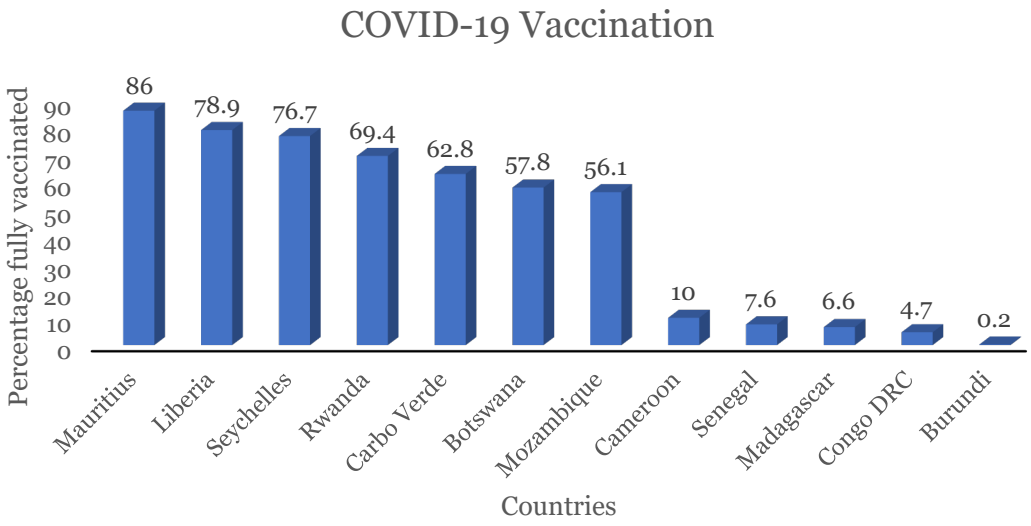
Although there have been inroads in vaccination in some Sub-Saharan African countries, evidence shows that vaccine hesitance persists in most African countries. For example, vaccine hesitance is still rising in South Africa at 52.1%, Nigeria at 28.1%, Ghana at 42.0%, and Kenya at 31.2%.[91] In 2022, Ghana, South Africa, and Kenya witnessed an increase in vaccine hesitancy of 21.1% ,13.8%, and 8.5%, respectively.[91] People vaccinated against SARS-CoV are also reluctant (12.1%) to receive a booster

dose.[91] This means that, as countries' COVID-19 vaccination programs are delayed, citizens pay less attention to information regarding COVID-19 and vaccine mandates.

It has been nearly three years since the availability and administration of COVID-19 vaccines; however, the number of people on complete primary series is 49.9% in Africa.[9] When addressing vaccine hesitancy, it is crucial to understand why people may be hesitant or skeptical about getting vaccinated. This may include issues related to trust in the government or healthcare system, misinformation or rumors about the safety and efficacy of the vaccine, or cultural or religious beliefs that may conflict with vaccination.

An Afrobarometer study in West Africa showed that 6 out of 10 people were COVID-19 vaccine-hesitant.[92] Similar studies in Mozambique, Rwanda, Sierra Leone, Uganda, Cameroon, and Burkina Faso showed that vaccine safety, effectiveness, and side effects were significant concerns.[93,94] These concerns strengthened when reports of Deep Vein Thrombosis (DVT) and some notable deaths were linked to AstraZeneca and Johnson and Johnson vaccines.[95-100] Also, the subsequent suspension of AstraZeneca and Johnston and Johnston,[101, 102], and the South African report on the effectiveness of the vaccines,[103] increased hesitancy. The vaccination rates of African countries have been summarized in **Figure 1** below, showing the countries that achieved the WHO 70% target and the least vaccinated countries as of December 4th, 2022.[65]

Figure 1: COVID-19 Vaccine Uptake in Africa December 4th 2022



Recently, ongoing research in vaccinology continues to push the boundaries of what is possible, with the potential for new vaccines against emerging infectious diseases and the development of more effective vaccines against existing diseases.[104] Furthermore, studies have shown that all vaccines have the same level of protection.[105] Similarly, DVT has no direct association with the AstraZeneca vaccine.[106] Making the side effects of vaccines public shows that global health has become more transparent and would hide nothing from the public. Therefore, vaccine-hesitant people are not worried about vaccines; instead, people are hoping for an excuse when they are already highly vaccine-hesitant and searching for confirmation bias.

Also, the COVID-19 pandemic showed the deep distrust of Africans against foreign health governments, donor agencies, and pharmaceutical companies. For example, in the USA, France, and the U.K., during the Ebola outbreak, without

consent, collected over 250,000 blood specimens were. However, these countries cited national security for failing to surrender information.[107, 108] Also, a French scientist's statements rekindled some Africans' impression of the assumed "Guinea Pig" experiment on the African black race at the peak of the coronavirus pandemic.[109] The comments received widespread denunciation; the damage caused could have increased hesitation. Similarly, issues on colonialism and the history of medical and vaccine investigation in Sub-Saharan Africa underpin vaccine hesitation.[110] For example, 40% of the vaccine refusers and delayers cited mistrust of pharmaceutical companies and foreign and local governments in Ghana.[111] Similar findings were observed in 15 African Countries.[112]

Similarly, misinformation and conspiracy theories about vaccines have taken root in African society and have stifled COVID-19 management. Conspiracies such as the belief that the vaccine was a trick to produce biological weapons,[113, 114], have taken root in most countries. The WHO recognized this trend and coined "infodemics" for Africa's misinformation and conspiracy theories. In Sub-Saharan Africa, some believed that the vaccine was a means to control the population, cause infertility, change DNA, and bioweapon.[115-119] conspiracies about the deliberate engineering of the Virus as a pretext to distribute a vaccine with microchips embedded to depopulate the world,[120] make a few people rich,[121] a ploy by Bill Gates to introduce 5G to control people globally[122] and disrupt world economies in favor of the USA and China.[123] According to Lazarus and colleagues, about 38.6% of people did not care about information on COVID-19 and vaccine mandates.

However, there are case studies in Africa that the rest of the continent can learn from. According to an Afrobarometer study, Mauritians were also vaccine-hesitant; however, nine in 10 people were willing to vaccinate, achieving a 92.2% total vaccination rate.[9] The government created the "beSafeMoris" smartphone app, which provides information on COVID-19 and vaccines and is constantly updated.[124] Another African country, Seychelles, overcame vaccine hesitancy to become the world's most vaccinated country in 2021. Seychelles created a vaccine tracker website to update citizens on the progress of vaccine development and the safe vaccines available to citizens.[125] The availability of such technologies reduces misinformation and conspiracy theories and creates positive attitudes toward vaccines.

The Vietnamese who adopted the community empowerment and engagement program from Sub-Saharan Africa realized increased vaccination rates and reduced spread.[126] By December 2021, Vietnam had vaccinated 57.8% of people,[126] but through collaboration with universities to provide effective communication and propaganda pictures that changed perceptions and behaviors of citizens on vaccination[126]. By March 2022, 80% of complete primary series and 60% of booster doses were received.[127] All this was achieved within five months.

As the pandemic has plunged most economies in Africa into recession, studies among 27 African countries show that countries that started early vaccinations yielded the most health and economic benefits.[128] Fortunately, most African countries started vaccination programs before late 2021; hence, continuous vaccination and upscaling of the COVID-19 vaccines by Sub-Saharan African governments must continue to realize the benefits of the vaccination.

Addressing vaccine hesitancy requires a concerted effort from Sub-Saharan African governments, healthcare professionals, and the wider community to promote vaccine acceptance and uptake. Also, African governments and health professionals must not forget so soon how mistrust played a large part in thwarting the effort to control the Ebola Virus Epidemic in West Africa and Congo DRC in 2014 and 2019, respectively.[129-131] By working together and prioritizing vaccination, governments can

ensure that the benefits of vaccination are realized and that progress is made toward ending the COVID-19 pandemic.

SINGLE DISEASE PROGRAMS/ VERTICAL HEALTHCARE SYSTEMS

The challenge brought to the forefront is the Single Disease Programs (SDPs) or vertical healthcare system in many Sub-Saharan African countries. A vertical healthcare system is organized around a specific disease or health issue, often relying on external funding and technical assistance to support programs focused on that particular issue.[132] This approach can address specific health concerns like HIV/AIDS or malaria. However, it can also result in a lack of investment in broader health systems and infrastructure called Primary Health Care.[133]

The WHO warned that 80 million children were at risk of missing out on essential vaccines due to the COVID-19 pandemic.[134] In 2020, Tanja Ducomble and Etienne Gignoux from Medecins sans Frontieres called on Sub-Saharan African countries to draw lessons from the Measles outbreak in Congo DRC during the Ebola outbreak to prepare for COVID-19.[135] Unfortunately, of the 25 million children who missed vaccinations in 2021, more than 60% live in ten countries, of which six are in Sub-Saharan Africa.[134] Since the COVID-19 pandemic, 151 events and 131 outbreaks have emerged in Africa.[136] Significant disease outbreaks include Measles, Poliomyelitis, Dengue Fever, Cholera, Murburg, and Meningitis. In addition, the re-emergence of Mpox on the continent, with 1472 cases summarized in **Figure 2**,[136], points to the verticality of health systems in most African countries.

Figure 2: Monkey pox cases in Africa 2022–2023

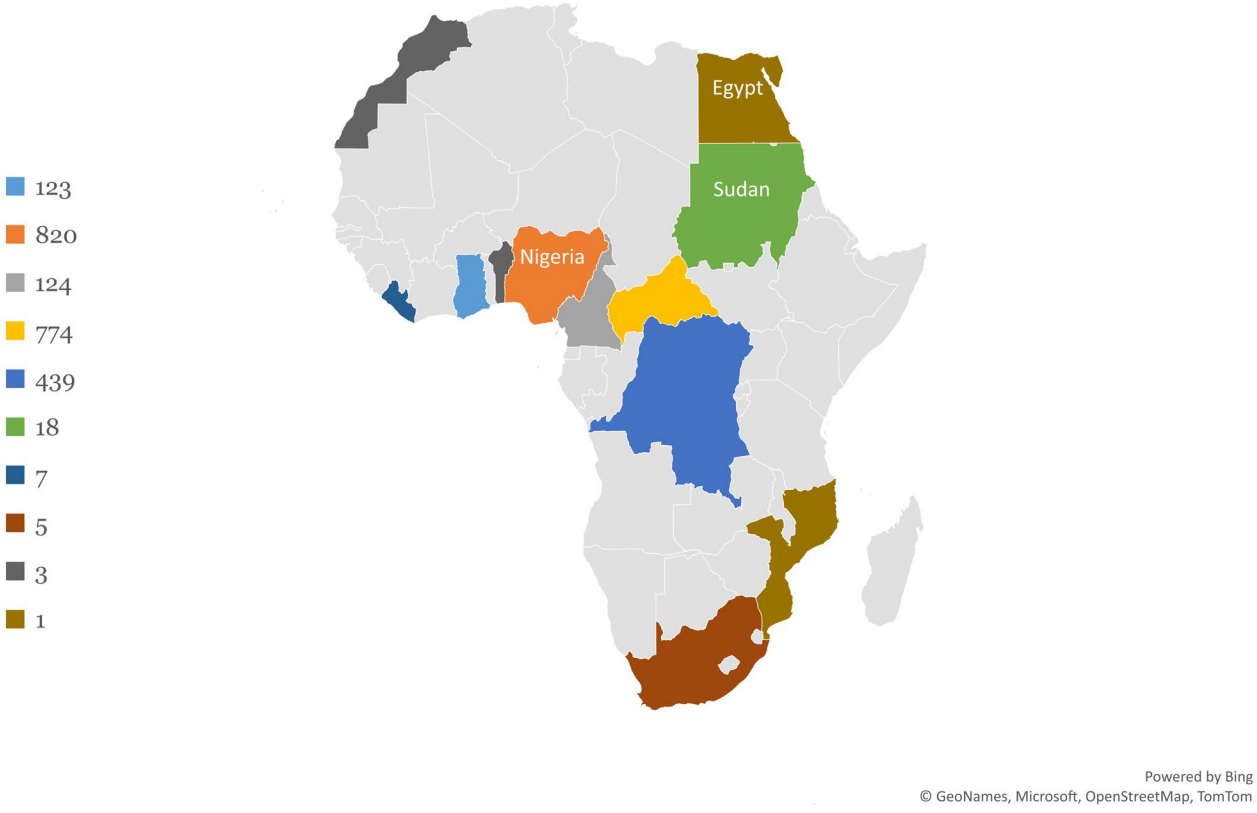


Figure 3: Cholera outbreaks October 2021 – March 2023

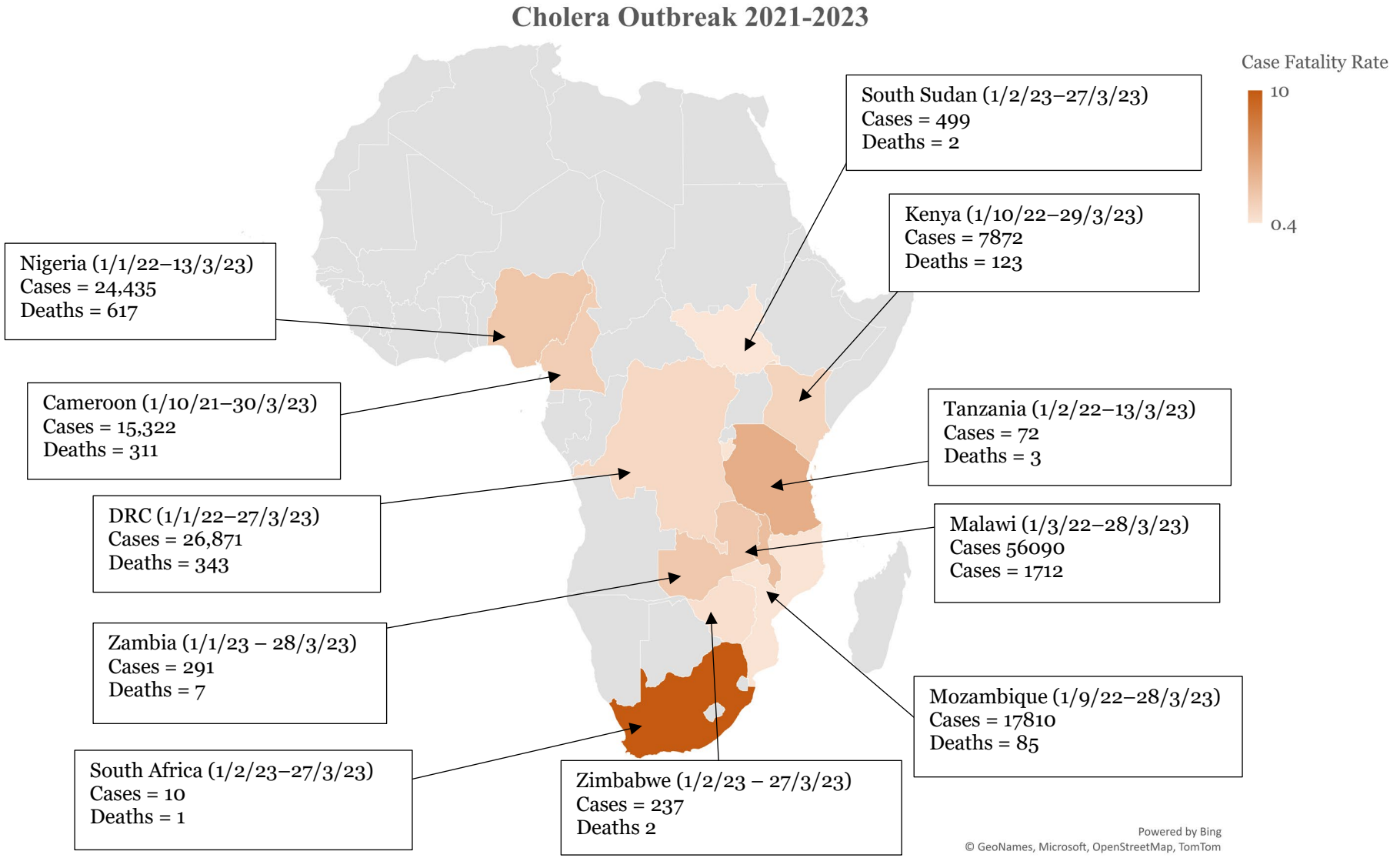
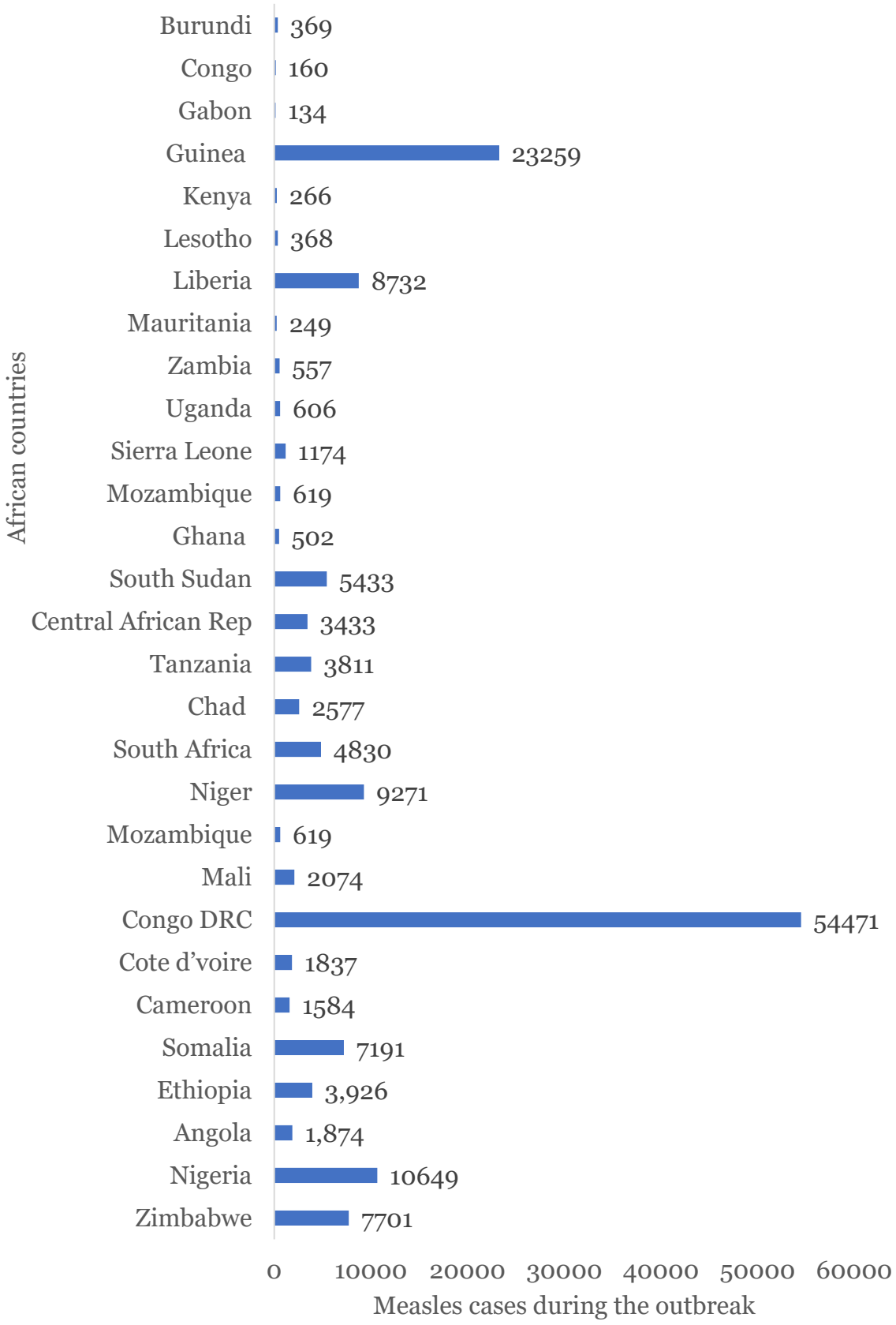


Figure 4: Measles outbreaks recorded in Sub-Saharan Africa



In January 2023, 26000 cases and 660 deaths from Cholera were recorded in 10 African countries.[137] As of 30th March 2023, 13 countries reported cholera cases, with 9547 new cases and deaths peaking from 660 to 3250.[137] The cases of cholera outbreaks and fatality rates between 2021-2023 are summarized in **figure 3**.[137] Meningitis a vaccine-preventable disease outbreak were reported in Togo, Niger, and Nigeria with a case fatality rate of 9.8%.[136] Other vaccine-preventable diseases Poliomyelitis was recorded in 10 African countries, while 46 Sub-Saharan African countries have recorded Measles outbreaks with an exponential increase of 400%.[138] For instance, once hailed for success in childhood vaccine-preventable disease programs139, Ghana recorded an outbreak of Polio and Measles during the pandemic.

There had been a decline in childhood vaccine coverage by 38.8% for Measles and Rubella and 53.1% for Pentavalent vaccines.[132,139] A shortage of childhood vaccines in Ghana has spurred the measles outbreak in northern Ghana.[139] **Figure 4** is a selection of Sub-Saharan African countries with measles outbreaks recorded during the COVID-19 outbreak. The data summaries are based on the data reported to the WHO data observatory. The COVID-19 pandemic has highlighted existing health system weaknesses and disparities in many African countries, including healthcare infrastructure, human resources, and funding challenges, which may have impacted their readiness and capacity to respond effectively to other VPDs.

Sub-Saharan Africa relies heavily on SDP funding so much that African countries struggled to mobilize resources for healthcare providers during the COVID-19 pandemic. In 2010, a Lancet study revealed the over-dependence of developing countries on Development Assistance for Health (DAH) but investing 43% less in their budgets on health.[140] Development Assistance for Health funds 40% of 8 African countries' health budgets and another 30% of many African countries.[141] Similarly, IDA goes to 74 countries, of which 39 are African countries benefiting.[142] IDA has averaged $29 billion in the last three years, and 70% has gone to Sub-Saharan African governments.[142] For example, between 2000 and 2019, developing countries, including Sub-Saharan African countries, received $42 billion for TB, HIV/AIDS, and Malaria.[143] During the COVID-19 pandemic, the World Bank donated $100 million to the Africa CDC and other Sub-Saharan African countries.[142] Without donor funding, the COVID-19 narrative in Sub-Saharan Africa would have been different.

Ultimately, addressing the challenges facing healthcare systems in Sub-Saharan Africa will require sustained investment and collaboration at the continent, regional, and country levels. The COVID-19 pandemic has underscored the importance of building robust and resilient health systems that respond effectively to various health threats. There is an opportunity for countries to leverage the lessons learned from the pandemic to drive progress toward this goal.

POLITICAL DETERMINANTS OF HEALTH

The COVID-19 pandemic has highlighted the significant impact of political determinants of health on individuals and communities. Political determinants of health refer to the policies, systems, and structures that shape the distribution of power and resources in society, which affects people's access to healthcare, social services, and other resources that influence health outcomes.[144, 145]

In 2001, heads of state met in Abuja, Nigeria committed to allocate 15% of national budgets to health.[146] This was called the Abuja Declaration on HIV/AIDS, tuberculosis, and other infectious diseases.[146] Also, after the West Africa Ebola

outbreak in 2016, the Assembly of Heads of State and Government of the Africa Centers recognized the need to prioritize pandemic preparedness. Therefore, the African Center for Disease Control and Prevention (Africa CDC) was founded with the mandate to help member states five priority areas: Surveillance and Disease Intelligence, Laboratory Systems and Networks, Emergency Preparedness and Response, National Public Health Institutes and Research, Disease Control, and Prevention.[147]

However, during the COVID-19 outbreak, most countries had not implemented the Abuja declaration and the Africa CDC target areas. In mid-April 2020, about 41 African countries had just over 2,000 ventilators and 5,000 intensive care beds across 43 countries.[148] According to the WHO, most countries did not have Personal Protective Equipment (PPEs), and there was no coordination among the regional and provincial governments for contact tracing and treating the sick. Though most countries have established national laboratories, only Ghana, Kenya, and Nigeria have expanded laboratories to ensure COVID-19 testing is decentralized for effective case detection.[148]

Furthermore, the COVID-19 pandemic has increased our understanding of how diseases can transcend borders quickly. However, the implementation of policies on cross-border collaboration to combat infectious disease outbreaks is limited. By 2019, the only functioning cross-border collaboration was the East Africa Public Health Laboratory Networking Project (EAPHLN), which includes Angola, Burundi, the Central African Republic, the Republic of the Congo, the Democratic Republic of the Congo, Rwanda, South Sudan, Uganda, the United Republic of Tanzania, and Zambia ministries health[149, 150] formed after the 2019 Ebola outbreak. Nonetheless, the EAPHLN and Regional Coordinating Center (RCC) played an essential role in the COVID-19 pandemic in the sub-region.[151] However, among the countries, disparities exist in policy planning, implementation and harmonization, laboratory capacities, human resources sharing, information sharing and joint research, and surveillance systems to engage in cross-border collaboration. For example, for RCC, apart from Ethiopia, Kenya, Uganda, South Africa, and Zambia, all other countries lack developed indicator-based surveillance (IBS) systems, Event-Based Surveillance (EBS), and Laboratory Information Management Systems (LIMS).[151] Almost all countries, including the Africa CDC, depend on the World Bank and partners for funding.

African countries can draw some lessons from Asian countries that implement cross-border collaborations without depending on donor funding. For instance, Singapore, Malaysia, China, Japan, and South Koreans relied on the Joint Declaration by ASEAN and ASEAN +3 leaders of SARS 2003,[152, 153] to foster cross-border collaboration on contact tracing, information, and data sharing. [154] Though these are developed countries, there is no direct correlation between a country's wealth and its prioritization of health.[155] This means that some countries with high per capita income may not necessarily spend more of their budget on healthcare. For instance, Rwanda, a developing country, prevented the spillover of the 2019 Ebola outbreak in DR Congo through collaboration between the various ministries of health.[156]

The WHO report also highlights the importance of investing in healthcare to achieve sustainable economic growth and development. In other words, while wealth alone does not necessarily lead to increased spending on healthcare, investing in healthcare can contribute to economic growth and development in the long term. The Abuja Declaration remains relevant today, and African governments must fulfill their commitments to allocate at least 15% of their national budgets to the health sector. In addition, the COVID-19 pandemic draws the African government's attention to

prioritizing healthcare funding and building resilient and sustainable health systems that respond effectively to future health crises.

Also, the pandemic has shown that when the government structures function appropriately, there is a sense of trust in leaders and solidarity among citizens. According to an Afrobarometer study, Mauritians were COVID-19 vaccine-hesitant.[157] However, nine in 10 people were willing to vaccinate to achieve a 92.2% total vaccination rate because more than half of Mauritians trusted the government's response.[157] Furthermore, although some citizens perceived that funds for COVID-19 were lost to corrupt practices, this was not among the ten main reasons for vaccine hesitancy.[157] A similar study cited the good governance for successful vaccination amid vaccination hesitation in Seychelles.[125] The good governance indicators include political stability, the rule of law, government effectiveness, regulatory quality, voice, accountability of governments to the people, and control of corruption.[125] Mauritius and Seychelles are considered countries with good governance and were projected to beat vaccine hesitance. Ultimately, both countries were the Sub-Saharan African countries to meet the WHO's ambitious target of 70% vaccine by mid-year 2022.[158]

Another example is the Vietnamese government's transparent handling of COVID-19. All positive cases traced and contacted were published, increasing citizens' confidence in the system.[159] However, Vietnam faced its crisis period, resulting in a rise in cases. The cause of the crisis includes inadequate information and data on new variants, an insufficient supply of vaccines, low vaccinations, complacency on earlier successes, and a shortage of health equipment.[160] Nonetheless, the Vietnamese government's collaboration with public health and research institutions increased disease surveillance knowledge and built institutional capacity.[127] One birdrock of Vietnam's response was its animal health department's capacity to monitor and vaccinate domestic animals and cull them if possible. [127] A focus on one health and zoonotic disease must always include animal health, which is often neglected.[127] Countries in Sub-Saharan Africa could begin prioritizing animal health or veterinary medicine in the fight against infectious diseases.

The COVID-19 pandemic shows how political determinants of health can also affect the recruitment and retention of healthcare workers. Globally, the health workforce has been depleting, with developed nations in Europe and North America heavily affected. About 180,000 healthcare workers died from COVID-19 between 2020-2021.[161] Also, about 20% of nurses in the USA have left the profession due to burnout and exhaustion.[162]

The indirect impact of the pandemic on Sub-Saharan Africa is the depletion of the health workforce through brain drain. Wealthy nations have resorted to fast-track recruitment of nurses to fill gaps. Around 1,000 nurses from Africa and other developing countries arrive in the USA each month.[162] This gradually leaves significant gaps in the healthcare system in many African countries. More nurses and doctors have left Zambia, Ghana, Nigeria, and Kenya. [163] For instance, five of the top 20 countries of foreign-trained or born doctors and nurses of origin are Nigeria, Ghana, Kenya, Zimbabwe, and South Africa.[163] The hardest hit by the health worker shortage in Africa including Rwanda, Comoros, Zambia, and Zimbabwe.[161]

Between 2020 and 2022, the U.K. has created an easy route for healthcare workers with reduced visa application fees.[164] Also, Canada has eased language requirements for internationally trained.[162] In addition, countries that were not destination countries for foreign-trained health workers have started recruiting due to the impact of the pandemic. For example, Germany recruits foreign-trained doctors into physician assistants' roles, while Japan provides residency for aged care workers.[162]

In 2010, the WHO member states enacted the Global Code of Practice on the International Recruitment of Health Personnel to solve the brain drain.[165] This was partly due to the mass exodus of Nurses and doctors from Sub-Saharan Africa to wealthy countries, especially the USA, Canada, Australia, and New Zealand. U.K. Many African governments have invested significant money in training doctors, nurses, and other healthcare professionals, only to see them leave for higher-paying jobs in countries like the United States and Britain.[166] However, wealthy nations have not adhered to the code. The code states that though one has the right to migrate, wealthy nations must recruit nurses via a bilateral agreement with the workers' country of origin Ministry of Health.[165] Also, the recruiting country will have provided initiatives to support the source country, and workers must learn and return to help their country of origin to help with the new skills learned.[165] However, for years, this has not been the case.

If this cycle continues, this will not only lead to a shortage of healthcare professionals in African countries but also represent a loss of valuable human capital and investment. The lack of healthcare professionals can lead to inadequate healthcare provision, negatively affecting the economy, education, and overall development. The mistakes of the 2014 Ebola outbreak must be avoided. For example, before the EVD in Liberia, data gathered showed only 51 physicians,[20] Guinea's physicians comprised less than 10% of all trained staff,[21] and lack of qualified nurses during the EVD outbreak.[21]

Sub-Saharan African countries must implement policies, laws, regulations, governance structures, workforce Diversity and Equity, and improve working conditions and pay to address the brain drain. Also, African countries must fully implement the Global Code of Practice on the International Recruitment of Health Personnel. With the many unknowns about the SARS-CoV-2 virus and vaccine hesitancy, Africa needs its skilled workforce to end the current outbreaks and prepare for future outbreaks.

Finally, the political determinants of health can indeed impact vaccine wastage, which refers to the unused or discarded doses not administered to eligible individuals. Vaccine wastage and expired doses can occur for various reasons, such as storage and transportation issues, inadequate monitoring of vaccine stock, and logistical challenges in administering vaccines. Vaccine wastage has been reported in 46 countries.[65] In Senegal, Algeria, Madagascar, Congo, and Benin have recorded higher expired vaccine doses.[65] Therefore, countries must have proper systems to manage vaccine distribution and ensure that doses are used before expiration.

The vaccines are temperature; hence, African countries can adopt the Singapore approach. Realizing the temperature-sensitive nature of COVID-19 vaccines, Singapore actively worked to ensure the safe and efficient transportation of COVID-19 vaccines throughout the country.[154] Singapore partnered with its national airline Airlines and logistics forwarding company DHL to create a "cold chain" system for transporting vaccines.[154] Through these measures, Singapore became the first country in Asia to receive the Pfizer-BioNTech and Moderna vaccines.[154] Singapore's efforts to ensure the safe and timely delivery of COVID-19 vaccines are an essential part of its strategy to combat the pandemic and protect its population.

Understanding and addressing the political determinants of health are critical to promoting health equity, addressing health disparities, and ensuring an effective response to public health emergencies like the COVID-19 pandemic. It requires a comprehensive approach that includes evidence-based policies, equitable access to healthcare, addressing social and economic determinants of health, promoting health literacy, and addressing misinformation. Also, health authorities must advocate for

policies that prioritize public health and well-being and ensure that decision-making processes are inclusive and considerate of communities' diverse needs and perspectives.

CONCLUSION

The COVID-19 pandemic will be with us for a long time because of the ongoing nature of the Virus. To be prepared for the unknowns, Sub-Saharan African countries must take clues from their response to the pandemic so far and lessons from other countries.

Firstly, African countries can prioritize building strong health system governance and leadership structures capable of guiding and coordinating overall healthcare delivery rather than solely focusing on vertical programs. This includes developing national health policies and plans, establishing effective regulatory frameworks, and ensuring coordination and collaboration among health programs. Second, African countries can prioritize mobilizing domestic resources for health through increased investments in healthcare, improved health financing mechanisms, and better utilization of existing resources. This can reduce dependence on external funding and provide sustainable funding for healthcare services. African countries can invest in strengthening health information systems to improve data collection, analysis, and use for decision-making.

Secondly, Sub-Saharan African governments must be educated or reminded about the political determinants of health. African governments are responsible for upholding their constitutions and the international human rights treaties they have ratified, including guaranteeing the right to health for all individuals within their borders. The right to health is a fundamental human right recognized by various international human rights instruments, including the Universal Declaration of Human Rights, the International Covenant on Economic, Social, and Cultural Rights, and the African Charter on Human and Peoples' Rights. This right obliges governments to ensure all individuals can access adequate healthcare services and facilities without discrimination. Therefore, African governments must fulfill their obligations under national and international human rights law by guaranteeing the right to health for all individuals within their borders. This would involve ensuring universal access to healthcare services and facilities, prioritizing healthcare funding, and addressing the systemic inequalities that often lead to disparities in access to healthcare services.

Thirdly, increasing COVID-19 vaccine uptake in African countries is crucial to mitigate the pandemic's impact and protect their populations' health and well-being. African countries need to ensure that COVID-19 vaccines are accessible and available to all segments of their populations. This includes reaching remote and underserved areas and populations through mobile vaccination clinics, outreach programs, and door-to-door campaigns. Efficient distribution and logistics systems should be in place to ensure that vaccines are delivered promptly and equitably across the country. In addition, African countries should establish robust monitoring and evaluation mechanisms to track COVID-19 vaccine uptake and identify gaps or challenges. This data can inform targeted interventions and strategies to improve vaccine coverage and address barriers to vaccination. Also, African countries may consider implementing vaccine mandates, such as requiring COVID-19 vaccination for certain high-risk groups, such as healthcare workers or travelers, to increase vaccine uptake. However, this should be done in a manner that respects human rights, ethics, and cultural sensitivities and considers local contexts and legal frameworks.

In addition, preparing against different variants of COVID-19 requires a proactive and multifaceted approach that includes surveillance and monitoring, testing and diagnosis, vaccination strategies, public health measures, health system readiness, risk communication and community engagement, and collaboration and coordination. African countries should establish robust systems for surveillance and monitoring of COVID-19 variants. This includes genomic sequencing to identify and track different variants circulating in the population. Regular monitoring of variant prevalence and distribution can help inform public health strategies and interventions, such as targeted testing, contact tracing, and vaccination campaigns.

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THE POLITICS OF SOFT POWER EXTREMES: EXPLAINING BRAZIL AND INDIA'S LACKLUSTER POLICY RESPONSE TO COVID-19

Eduardo J, Gómez and Maya Neumann

In this article, we examine how two emerging economies, Brazil and India, initially responded to the COVID-19 pandemic. Historically, to build their international reputation and soft power influence in health, both countries implement effective prevention and treatment programs in response to global pandemics, such as HIV/AIDS. However, this did not occur in response to COVID-19. Why? Building on the global health diplomacy and soft power literature, we introduce a new concept, soft power extremes, to explain Brazil and India's delayed and lackluster policy response to COVID-19. Soft power extremes emerge when presidents either prioritize building their international reputation in health at the expense of meeting domestic healthcare needs, or conversely, when they are apathetic towards international reputation building through policy innovations. At the same time, we argue that the absence of a strong state-civil societal partnership in response to COVID-19 in both countries facilitated the emergence of these soft power extremes, in turn revealing the importance of combining a focus on elite-centered foreign health policymaking with analysis of governance and social accountability.

INTRODUCTION

Not too long ago, many would have claimed that emerging economies, such as the BRICS (Brazil, Russia, India, China, and South Africa), were shining stars when it came to responding to public health challenges. For example, in 2003, Brazil won the Bill & Melinda Gates Foundation's *Gates Award for Global Health* for having the best policy response to HIV/AIDS – dubbed a 'model' for other developing nations [1]. Despite an initial lagged response, China also successfully overcame the SARS-1 pandemic in 2004. Singapore (an established, wealthy economy), India, and several African nations, such as Botswana, have also been acknowledged for their innovative and timely policy response to public health challenges. But when it came to the COVID 19 pandemic, some of these emerging economies did not respond as well.

Among the emerging economies, Brazil and India stand out as good examples. Ironically, these are nations that have had historically strong public health systems, particularly Brazil, in response to infectious diseases. While India has trailed Brazil in developing a historically strong federal response to health epidemics and establishing an effective universal health care system (on India's healthcare challenges, see Jean DrèzeJean Drèze and Amartya Sen. 2013. *An Uncertain Glory: India and its Contradictions*, 2014), in recent years these governments have worked closely with the international community to combat global pandemics, such as HIV/AIDS [2]. Both nations were also fully committed to building their international reputations in health, mainly through the introduction of progressive prevention and treatment programs in response to HIV/AIDS (ibid). However, this kind of response did not occur when the COVID-19

pandemic emerged. Why?[2]. Both nations were also fully committed to building their international reputations in health, mainly through the introduction of progressive prevention and treatment programs in response to HIV/AIDS (ibid). However, this kind of response did not occur when the COVID-19 pandemic emerged. Why?

In this article, we argue that this paradox can be attributed to what we call presidential *soft power extremes* and the political, institutional, and social contexts that facilitate this process. Here, soft power extremes are defined as presidential over- or under-commitments in their international reputation-building interests in response to health pandemics. These extremes can be either very high, i.e., presidents obsessed with primarily building their international reputation-building in health above all else, or they can be very low, i.e., those presidents that are apathetic towards such reputation-building endeavors. However, as the cases of Brazil and India illustrate, especially at the beginning stages of a pandemic, both extremes can lead to presidential inaction on critical domestic COVID-19 policy needs.

Indeed, with respect to very low soft power extremes, and as seen during Brazil's initial response to COVID-19, presidents may retreat from engaging the international health community while being apathetic towards building their nation's international reputation in health through the timely introduction of COVID-19 policies. Alternatively, in India, very high soft power extremes may exhibit a prime ministerial leader that is incessantly worried about building their international reputation in health during the initial stages of a pandemic, so much so that they distort scientific information, e.g., concealing the true severity of COVID-19, in order to support their global reputation of having contained the pandemic, while neglecting ongoing domestic COVID 19 policy needs; here, politicians' geopolitical interests overcome domestic healthcare needs.

But why did these soft power extremes emerge in the first place? In the case of Brazil, recent transitions to a more conservative isolationist government contributed to a radical shift in presidential foreign policy interests in the environment and health, especially with respect to providing technical assistance to other countries in response to COVID-19 and the absence of presidential leadership in initiating and being fully committed to international cooperation in vaccine production; these interests dovetailed and were built upon similar policies focused on increased state sovereignty and self-sufficiency. While in India, the government's historic commitment to building its international image as an effective and lucrative developmental state continued and shaped the government's immediate priorities in response to COVID-19.

Broader social contexts were also important and facilitated the emergence of these soft power extremes. In fact, it seems that these extremes were facilitated by weak state-civil societal relationships and a lack of federal government accountability to society. In contrast, and as Gómez (2018) has argued elsewhere, when positive soft power geopolitical incentives align with strong state-civil societal partnerships and public accountability, an effective central government response to public health challenges can emerge. Nevertheless, in the context of COVID-19 in India and Brazil, it seems that the absence of strong state-societal relationships can make the policy consequences of soft power extremes all the more problematic. In both cases, these contexts obstructed the need to create an effective public health bureaucracy, to build consensus and coordination between federal and state policy-makers, while ensuring the timely distribution of vaccines early on in response to the pandemic.

METHODOLOGY

This article employed a qualitative methodological approach to research. The data used in this study relied on an analysis of primary and secondary document analysis. Primary analysis entailed documents, such as articles, journals, and policy reports published by authors in Brazil and India, as well as articles in the Portuguese language from Brazil. Secondary documents entailed articles written by experts from other countries in the English language. When retrieving documents, we used Google and Google Scholar online search engines. As Table 1 illustrates, keyword search terms were used, such as "Brazil and health and foreign policy" "Foreign Policy," "Soft power in India foreign policy," and "Brazil soft power." Documents were also obtained based on one of the author's knowledge about the literature and the case of Brazil. The authors then conducted an in-depth analysis of the Brazil and India case studies and used the documentary data to analyze and support their empirical claims. The research for this article began in the spring 2022 and ended in the summer 2022.

Table 1: Keyword Search Terms via Google and Google Scholar

Country	Key words
Brazil	"Brazil, Bolsonaro, foreign policy" "Brazil, health, foreign policy" "Brazil soft power"
India	"Civil society response to COVID-19 India" "Soft Power in Indian Foreign Policy" "Indian Soft Power"

Source: Authors' calculations

SOFT POWER IN THE CONTEXT OF COVID-19

In recent years, scholars have explored the different forms of power relations that exist between nations and their implications for international cooperation in health. While realist scholars in international relations (IR) theory have emphasized how financial and military resources empower states that seek to advance their interests within a perceived international anarchical society, constructivist IR scholars have instead emphasized the importance of normative and ideological beliefs and multilateral cooperation through international institutions. In a COVID-19 context of increased geopolitical polarization and a decline in multilateral negotiations, soft power can and should reemerge as a guiding global health diplomacy (GHD) principle, with the global south taking an important international leadership position in this regard [3].

Soft power is a relatively new concept in GHD studies. Several GHD scholars have shown how a nation's track record in establishing much needed healthcare policies, as well as providing direct assistance to countries in need, can bolster a government's international reputation, leadership, and foreign policy–at times non-health–influence [4, 5]. Here, power resides in a nation's ability to become a popular example of how best to

tackle a global healthcare issue, essentially leading by doing, building international support along the way. In response to international criticisms, others have also argued how nations strive to develop their international reputation in health through domestic health policy innovations[2].

Nations have varied in their interests and utilization of soft power in global health. For India, as one of the largest democracies in the world[6], the government utilizes soft power extensively to gain sway on the world stage. India has taken a more defensive rather than offensive approach in utilizing its soft power unlike many leading world hegemons. It has prioritized image building over the creation of lasting international influence in its efforts towards building soft power and Indian foreign policy makers regard this tool as a means to increase attractiveness towards foreign investors[7]. Many have perceived India's usage of soft power as disappointing in terms of the promise it held for the nation. India learned the hard way that soft power is ineffective if they do not have the hard power to back it[7]. While soft power has changed the world's perception of it for the better, it is clear that the improvements have only been shallow in terms of the benefits it had promised to provide.

Historically, Brazil's government has also been committed to using soft power in global health. Brazil's rise to prominence in foreign affairs is found to be a combination of its desire to achieve autonomy as well as to establish a significant role in international politics[8]. The country has a longstanding history of utilizing soft power in its foreign policy objectives. Since the early twentieth century under the nation's foreign minister Jose Paranhos, combining soft power objectives with material ones has been a leading imperative of the country's foreign agenda[9]. Due to its foreign advisors' agendas, soft power has established itself as a trend in Brazil's global interactions. Obtaining such symbolic resources have been found to improve relations with rising global powers such as the United States and boost its global standing[9].

Despite Brazil's hopes for soft power as a tool towards resolving global issues, it has displayed incapability in being properly implemented within the country. Many international policy-makers and international relations theorists believe that soft power ultimately fails to measure up to the robust nature of hard power capacities [8]. Soft power is unable to effectively compensate for Brazil's vulnerabilities within its military and economic resources. The weakness in soft power's effectiveness ultimately exposed the misguided imperatives and implementation methods of Brazil's foreign policy-makers. As the Brazilian government prioritized soft power techniques such as diplomacy, consensus-building initiatives and persuasion over military objectives, they revealed the country's traditional non-interventionist stance and erased the influence of hard power [8]. To compensate for Brazil's lack of military and economic power, its country's policy-makers have utilized soft power to increase their legitimacy in hopes of eventually building upon their hard power as well.

Recently, however, Brazil's government has not been as committed to striving for greater soft power in global health diplomacy. With the arrival of the Jair Bolsonaro administration (2019-2022), the government was not committed to working with other countries on key global issues, such as the environment, allegedly seeking to resist any foreign interference in the government's environmental policies[10].With the arrival of the Jair Bolsonaro administration (20198-20222), the government was not committed to working with other countries on key global issues, such as the environment, allegedly seeking to resist any foreign interference in the government's environmental policies[10].

As discussed shortly, the emergence of the COVID-19 pandemic unmasked Bolsonaro's reluctance to work with the international community in response, while breaking away from Brazil's rich tradition of providing foreign aid in health in response to pandemics, a key component to establishing the government's soft power in health.

The COVID-19 pandemic has nevertheless revealed some challenges with the existing soft power in global health diplomacy literature. First, this literature fails to consider the ramifications associated with polar extremes in political leaders' soft power interests. That is, as seen in India, what happens when political leaders strive to bolster their international reputation in health at all expenses, overlooking domestic healthcare needs? Alternatively, what happens when political leaders break away from foreign policy tradition and are apathetic about building their government's international reputation in health, as seen in Brazil? To our knowledge, the existing soft power in GHD literature does not address these critical issues.

Second, what are the specific political, institutional and civil societal contexts that both facilitate and encourage the rise of these soft power extremes? Does the foreign policy agenda-setting autonomy and power of presidents allow for this to occur? Do weak state-civil societal relationships matter? To our knowledge, the soft power and GHD literature has not addressed these issues. In the next section, we address these questions by conducting a comparative case study analysis of Brazil and India.

BRAZIL

Brazil's position on global health politics and diplomacy changed dramatically with the arrival of President Jair Bolsonaro. The previous presidential administrations, particularly the Luiz Inácio Lula de Silva administration (aka, Lula), were unwaveringly committed to engaging and working with the international community in the areas of public health. Lula was committed to working with the United Nations (UNN), the World Health Organization, and other countries (primarily from the Global South) on combating the HIV/AIDS pandemic, both through the sharing of knowledge and technical assistance. Other scholars account for Lula's commitment to not only engaging in these activities but also firmly establishing his government's international reputation in health, as a government focused on health as a human right, while having the capacity to deliver on health policy promises[2]. For the most part, the subsequent Dilma Rousseff presidential administration followed the same path, though to a lesser extent with respect to foreign policy in health [11]Both administrations nevertheless seemed to follow the government's longstanding tradition of working with the international community and establishing its reputation in global health policy[2].

However, this situation soon began to change. With the arrival of the conservative Michel Temer administration following Dilma's impeachment, Brazil's foreign policy operations in critical regions, such as Africa, began to decline, signaled by the closure of embassies due to resource constraints[12]. This decline in foreign policy activities worsened with the election of President Jair Bolsonaro in 2018. Much like former President Donald Trump in the United States, Bolsonaro campaigned as a political outsider, committed to clearing the government of graft, eradicating crime, and above all, rejuvenating the economy. Shortly after becoming President, Bolsonaro's administration established a clean break from prior governments' commitment to international cooperation and diplomacy. This break became evident when the Ministry of Foreign Affairs, led by

Ernesto Araújo, got rid of the ministry's subdivision working on climate change, which had previously worked with the UN on this topic[13].This break became evident when the Ministry of Foreign Affairs, led by Ernesto Araújo, got rid of the ministry's subdivision working on climate change, which had previously worked with the UNN on this topic[13]. While Bolsonaro administration agreed to remain a part of the 2015 Paris Agreement, the environment minister, Ricardo Salles, made it clear that international interference in Brazil's territory or natural resources would not be tolerated [13]. Furthermore, despite recent commitments to addressing Brazil's environmental challenges, Bolsonaro did not attend the UN Climate Change conference in Glasgow, Scotland, in 2021, in turn questioning his commitment to the issue[14].

In addition, there was no sense that Bolsonaro was committed to international cooperation in health and maintaining the government's international reputation in global health diplomacy. To our knowledge, essentially no effort was made by the Bolsonaro administration, or even the Ministries of Foreign Affairs and Health, to engage the international community in global health by providing technical assistance to other countries (as Lula had done in response to HIV/AIDS) and/or leading by policy example, a soft-power high point of the Lula administration. Worse still, Bolsonaro criticized the work of the WHO and threatened to leave the organization, while presidents in Latin America also criticized his approach to the crisis[15].

The arrival of COVID-19 in Brazil reaffirmed Bolsonaro's isolationist stance. Shortly after the virus emerged, Bolsonaro claimed that it was simply the flu, nothing serious, and that it did not require social distancing and economic closure. During this period some also claimed that Boslonaro was not interested in adopting the WHO's public health recommendations [16]. It was as if Bolsonaro simply did not care about the WHO or the international community's pressures for a stronger domestic policy response.

Nevertheless, it is important to highlight that the government, through the federal ANVISA regulatory agency, was committed to cooperating with China in the co-development of late-stage vaccine trials (which ANVISA approved[17]) with China's *Sinovac* biotech company, while China was committed to helping supply ingredients after these trials despite technical (non-political) delays [18]. These trials were co-conducted with the São Paulo state-owned *Butantan Institute*, and according to the Brazilian ambassador to China, Paulo Estivallet de Mesquita, Brazil was committed to cooperating with China and learning from each other (Yuwei, 2021).) with China's *Sinovac* biotech company, while China was committed to helping supply ingredients after these trials despite technical (non-political) delays [18]. These trials were co-conducted with the São Paulo state-owned *Butantan Institute*, and according to the Brazilian ambassador to China, Paulo Estivallet de Mesquita, Brazilthe Ministry of Foreign Affairs was committed to this cooperating with Chinaon and learning from each other[19].The Brazilian government was also fully committed to allowing for the export of raw materials from *Sinovac* to produce the *CoronaVac* vaccine [18, 20], even when Bolsonaro had been mistrustful of China[20]. While the Ministry of Health (MoH) allowed for these initial cooperative agreements (also with the UK's *AstraZeneca* and the public *Biomanguinhos* production facility in the state of Rio), it is important to note that the impetus for cooperating with China appeared to derive from the state government of São Paulo[21]. The governor of São Paulo at the time was João Doria, a political rival to Boslonaro. While this rivalry did not seem to harm the technical transfer agreement with China, Bolsonaro appeared to delay the official approval of the vaccine as a political tactic against Doria (ibid)The Brazilian government was also fully

committed to allowing for the export of raw materials from *Sinovac* to produce the *CoronaVac* vaccine [18, 20], even when the Bolsonaro administration had beenwas mistrustful viewed as critical of China for benefiting economically from the virus[20]. While the Ministry of Health (MoH) allowed for these initial cooperative agreements (also with the UK's *AstraZeneca* and the public *Biomanguinhos* production facility in the state of Rio), it is important to note that the impetus for cooperating with China appeared to derive from the state government of São Paulo[21]. The governor of São Paulo at the time was João Doria, a political rival to Boslonaro. While this rivalry did not seem to harm the technical transfer agreement with China, Bolsonaro appeared to delay the official approval of the vaccine as a political tactic against to discredit Doria[21].

Bolsonaro's allowance of Brazil's cooperation with China and other countries is nevertheless questionable. For instance, in response to São Paulo's vaccine rollout, Bolsonaro appeared resistant to a state-mandated *CoronaVac* vaccine, in turn contributing to a national anti-vaccination movement[22], while the federal regulatory agency, *Anvisa*, headed by one of Bolsonaro's allies, briefly paused the vaccine rollout of *CoronaVac* due to an unverified "adverse, serious event"[20]. Many questioned *Anvisa's* decision, arguing that it was not based on scientific grounds[20]. While Bolsonaro eventually changed his mind on a national vaccine rollout, researchers note that his change of heart occurred after the emergence of his political rival, Lula, and his interest in running for presidential office as well as his critical views of Bolsonaro's handling of the pandemic[23]. If Bolsonaro had been truly committed to bolstering Brazil's soft power diplomacy in cooperation for vaccine production, why did he behave in this manner?Bolsonaro's allowance of Brazil's cooperation with China and other countries is nevertheless questionable. For instance, in response to São Paulo's vaccine rollout, Bolsonaro appeared resistant to a state-mandated *CoronaVac* vaccine, in turn contributing to a national anti-vaccination movement[22], while the federal regulatory agency, *Anvisa*, headed by one of Bolsonaro's allies, briefly paused the vaccine rollout of *CoronaVac* due to an unverified "adverse, serious event"[20]. Many questioned *Anvisa's* decision, arguing that it was not based on scientific grounds[20]. While Bolsonaro eventually changed his mind on a national vaccine rollout, researchers note that his change of heart occurred afterattribute this to the emergence of his political rival, Lula, and his interest in running for presidential office as well as his critical views of Bolsonaro's handling of the pandemic[23]. If Bolsonaro had been truly committed to bolstering Brazil's soft power diplomacy in cooperation for vaccine production, why did he behave in this manner?

This calls into question Bolsonaro's commitment to vaccine procurement, rollout, and his interest in international soft-power cooperation. Instead, it seems that the initial impetus and idea behind Brazil's cooperative agreements stemmed from the MoH and its health officials, reinforced by state-led requests and needs for technical assistance. It is important to note that the MoH had a long tradition of engaging in international cooperation agreements in vaccination and technical assistance, a policy legacy that predated COVID-19 and Bolsonaro. It therefore seems that Brazil's international cooperation with China and other countries stemmed mainly from the MoH and its historic policy legacies and did not exhibit any new efforts by Bolsonaro to engage in soft power strategies.

Social Context and Government Accountability

The broader social context also facilitated Bolsonaro's isolationist geopolitical approach to COVID-19. Unlike prior administrations, the president and the Ministry of Health (MoH) were not firmly committed to working closely with civil society in response to the pandemic. It is important to keep in mind that this decision broke from precedent: that is, in response to the last major global pandemic, HIV/AIDS, the government viewed civil society as an important partner in creating AIDS prevention policies. Specifically, under the Fernando H. Cardoso and Lula presidential administrations, with the support of international organizations, such as the World Bank, working closely with AIDS activists was seen as vital for raising awareness and implementing prevention programs; Cardoso and Lula were wholeheartedly committed to these endeavors; and they were very concerned about establishing their soft power in global health through a strong national policy response[2]. However, in response to COVID-19 under the Bolsonaro administration, this strong state-civil societal partnership with the government was absent. Why?

In large part Bolsonaro's reluctance to work with civil society appeared to reflect his style of governance and political interests. The product of Brazil's military structure, it seems that he operated in a highly centralized, autonomous manner, seeking to appoint health ministers and officials that aligned with his preferences rather than the recommendation of public health scientists and civil society. Following the resignation of his health Minister, Nelson Teich, after the firing of his predecessor, Luiz Mandetta (due to differences in opinion over COVID-19), the next minister, Eduardo Pazzuelo, was an active Army general and had no experience in public health[24]. The decision to appoint Pazzuelo revealed Bolsonaro's lack of concern over the scientific community and activists' pressures for a more experienced, credible health minister.

Furthermore, it could very well be that Bolsonaro also had a lack of trust in society. This may be due to the fact that progressive health activists were closely aligned with the previous leftist governments of Lula and Dilma Rousseff. We must keep in mind that Bolsonaro campaigned on and sustained his position against what he perceived to be a corrupt and inefficient leftist government. He also had a history of intolerance and delegitimizing leftist political opponents[25].He also had a history of intolerancequestioning and delegitimizing leftist political opponents[25]. In many ways similar to Trump, Bolsonaro marketed himself as a political outsider, committed to ridding the government of corruption, fighting crime, and strengthening the economy. Any association with illegitimate opposition leftist views and their ties to supportive civil societal actors essentially went against his political views and interests. In the absence of government support, civil society nevertheless did its part in establishing its own public safety guidelines while successfully lobbying the government to provide an Emergency Assistance program in the amount of R$600 a month for the poor and unemployed due to COVID-19[25].

In this context, when it comes to creating policies in response to COVID-19, Bolsonaro had essentially no accountability to civil society. Having full control over foreign policy in health, Bolsonaro was able to easily dismantle Brazil's historic track record of soft power in global health and engender a more isolationist response to the pandemic. And yet it seems that this negative soft power extreme had severe domestic policy consequences. Being apathetic towards maintaining Brazil's historic soft power in global health and civil societal needs, when combined with his disbelief in the severity of

the pandemic generated few incentives for Bolsonaro to scale-up his domestic policy response. In fact, some have argued that his government enacted an *intentional* institutional propagation of COVID-19 through a variety of strategies, from obstructing state-level policies to denying workers the right to stay home from what the government deemed essential work[26]. Clearly this is not indicative of a government that is genuinely concerned about society's healthcare needs.

INDIA

Long before the rise of COVID-19 and the pandemic in 2020, India was one of the largest medication and drug suppliers in the global market. During the first wave of the pandemic, India led the global equitable distribution and accessibility of the COVID-19 vaccine. Engaging in what was referred to as *Vaccine Maitri*, with *Maitri* translating to 'friendship' in Hindi, India's vast vaccine manufacturers pursued the diplomatic effort of providing the *Covaxin* and *Covishield* vaccines, both approved and produced in India, to a host of countries in need throughout the world[27]. Countries receiving these vaccines from India included countries such as Bangladesh, Sri Lanka, Myanmar, Nepal, Afghanistan, Guatemala, Bhutan, Paraguay, Fiji, Mozambique, and a host of Caribbean nations[27]. What's more, in addition to donating the *Covishield* vaccine to UN peacekeepers, India donated 18.1 million *Covishield* vaccines to several countries through the global COVAX facility[27]. India also lobbied the World Trade Organization (WTO) to temporarily eliminate the patent rights to vaccine production to ensure equitable global access[27]. In addition to vaccine access, India helped other countries by sending several teams of military doctors to countries such as Maldives, Nepal, and Kuwait [28]. India's military medical staff also provided online medical training to neighboring SAARC (South Asian Association for Regional Cooperation) countries[28].

The effort to provide vaccines to other countries, especially within its region, reflected the Prime Minister Narendra Modi government's "Neighborhood First" principle in foreign diplomacy[28]. This principle prioritizes helping nations within India's region in a non-reciprocal manner, viewing strong partnerships and friendships with its neighbors as the key to India's destiny[28]. Because of this, Modi's government has emphasized the importance of cooperating with and helping its neighbors[28]. Unfortunately, however, it appears that these global diplomatic efforts came at the expense of India's own people at the beginning of the COVID-19 pandemic[29].

Indeed, Modi was ultimately a complacent leader domestically when it came to the pandemic despite his promotion of nationalist strength on the world stage. Modi rode off of his internet fame and utilized his notability to expose an image of India of greatness and power across social media platforms. It was one of his main imperatives at the peak of the pandemic in 2020 to foster a positive representation of how India had been dealing with covid-19[30]. Many of these inspiring stories were exaggerations of how well the state of the country truly was during the pandemic. While India was experiencing "tens of thousands of COVID-19 deaths in 2020", Modi's administration downplayed the extent of the negative impact and amount of death rates to the public[30]. Modi claimed in January of 2021 that India had "saved humanity from a big disaster by containing corona efficiently" but this was in the wake of a rising death toll[30]. The diversion of his attention towards media concealment rather than investing in healthcare infrastructure would come to harm Modi's popularity in the next couple of years to come. While the death count

from COVID-19 continued to rise and surpass two hundred thousand in May of 2021, the Modi administration continued to undercount and "expend energy on censorship"[30].

When it came down to it, India did not have the necessary medical equipment and support to address the widespread COVID cases that were erupting across the country. These conditions worsened to the point that citizens of India began begging for help on social media[30]. The country lacked sufficient hospital resources to meet the rising demands of a pandemic world.

By April 2021, India had roughly more than 350,000 COVID cases daily on average[31]. This ironically contrasted India's role as one of the world's largest vaccine producers. Due to the second wave, India had to stop its exports of vaccines[27] to other countries in Asia and the Middle East and instead accept aid from other countries like the US. This change in roles from being the provider to the dependent negatively impacted India's image[31]. Even though the first wave of COVID-19 did not harm Modi's autocratic populist regime, the second wave slowly began eroding his middle-class base of support. This led Modi and his right-hand man Amit Shah to disappear from the public scene that they had dominated for so many years in the media[31].

Covid-19 changed the identity politics that India had placed so much emphasis upon. The victory of State Chief Ministers Mamata Bannerjee and Pinarayi Vijayan are prime examples of this shift[31]. They were both reelected due to their prioritization of social welfare programs and managing the pandemic through public health policy. Both of which were imperatives Modi failed to take as he chose to falsely project nationalist strength through the media despite India's rise in COVID-19 cases. The victories of Bannerjee and Vijayan prove how governance efficiency and its results are what's truly important in politics, not the Hindu nationalist mottos that have run politicians' popularity for the past decade. The Hindu nationalism and middle-class trend has been losing traction since post-Covid and may be reaching its end[31].

As Modi's regime has favored electoral interest over the safety and health of India's citizens, he incurred a huge death toll and spread of disease throughout his country. This choice reflects those of other right-wing populists such as Donald Trump and Jair Bolsonaro of Brazil [32]. Modi claimed the credit alongside these men for defeating COVID-19 in early 2021 when it was just the beginning of the second wave. He lifted almost all of the public gathering restrictions to hold key state elections in his battleground state of Bengal [32]. Modi also allowed the Hindu pilgrimage and festival of Kumbh Mela to proceed with few COVID-19 protocols, both events of which became a critical spreader of the virus.

Ultimately, India's government pursued a soft power extreme in its approach to dealing with the COVID-19 pandemic. Instead of taking government accountability for the rising death tolls and rise in infections, Modi's regime decided to falsely bolster their international image and protect their nationalist sentiments. Modi was more concerned with international reputation-building in health rather than investing in government and medical infrastructure for the public.

Social Context and Government Accountability

Another consequence of the pandemic was how it revealed India's slide away from its status as a democracy[32]. In April 2021, Freedom House denounced India's status as a free nation to a partly free nation. Throughout the pandemic, Modi's regime has ignored providing his people with a multitude of civil liberties, such as free speech and press, to

suppress the truth of his inefficiency in dealing with the effects of COVID-19. Modi and his government struck down hard on his people for speaking out against him and hunted down his opponents[32]. They consisted of but were not limited to climate activists, civil society leaders, nongovernmental organizations, writers, artists, Bollywood directors and actors, as well as the press.

Inevitably, the lack of society holding the PM and parliament accountable allowed governmental and infrastructural inefficiencies to fester, resulting in more COVID-19 cases and deaths for India, both of which could have been preventable. India has held a fraught relationship with its activists since Modi's government's harsh response to the Gujarat riots in 2005. While civil society played a huge role in countering COVID-19 from unofficial upstart initiatives, in totality, activists were unable to hold Modi's regime accountable[33]. Modi's government tends to neglect migrant worker issues, and there is a lack of accountability. There also exists no robust domestic infrastructure to support workers. Instead of working alongside activists in health policy and strengthening the country's welfare, Modi's government prioritizes "portraying an image of control" at home and internationally[34]. These initiatives posed the Indian government and activists as adversaries rather than collaborators, and this dynamic ultimately spelled for the bleak COVID-19 statistics that plagued India since the virus's outbreak.

CONCLUSION

In response to COVID-19, the emerging economies of Brazil and India did not demonstrate an early and effective domestic policy response. This is surprising, considering the long history that both nations had in positively responding to previous global health challenges, such as HIV/AIDS. In contrast, both nations exhibited weak initial policy responses to COVID-19. Why? We have argued that the concept of *soft power extremes* can help to answer this question. Soft power extremes emerge when presidents either over-commit to building their international reputation in health (as seen in India), or under-commit to doing so by being apathetic towards international policy criticisms and reputation-building through policy innovations (as seen in Brazil). Unfortunately, both extremes not only generated a lackluster policy response to COVID-19 but they also failed to consider civil society's immediate healthcare needs. To our knowledge, however, the global health diplomacy literature has neglected to address this type of extreme soft power variation in presidential foreign policy goals in health. For the most part, this literature has concentrated on governments using foreign medical aid and/or innovative domestic policy responses to global health challenges as a means to bolster their international reputation in health and influence international policymaking.

Nevertheless, we have argued that presidential soft power interests were insufficient for explaining Brazil and India's weak policy response to COVID-19. The government's relationship with civil society and accountability also mattered. Unfortunately, in both countries, presidents had a weak relationship with civil societal actors and did not strive to include them in the COVID-19 policymaking process. In the case of Brazil especially, this was a dramatic shift away from the government's historic tradition of working closely with civil societal actors to devise early and effective preventive policy responses to public health threats, such as HIV/AIDS. In this context, political leaders in Brazil and India were unresponsive to civil society's needs and did not feel accountable to society for their policy ideas. We have argued that this social context

both facilitated and encouraged these leaders to engage in extreme soft power interests to the detriment of population health.

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