Spring 5-6-2022

How Chinese Media Reports on Infectious Disease Emergence and Human Environmental Interactions

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HOW CHINESE MEDIA REPORTS ON INFECTIOUS DISEASE EMERGENCE AND HUMAN ENVIRONMENTAL INTERACTIONS

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A thesis presented in partial fulfillment of the requirements for completion
Of the Bachelor of Arts degree in International Studies
Croft Institute for International Studies
Sally McDonnell Barksdale Honors College
The University of Mississippi

University, Mississippi
May 2022

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ABSTRACT

Human activity and behavior, animal consumption and exploitation, and environmental degradation all impact the planet and those living on it. Each can contribute to the creation of favorable conditions in which pathogenic transmission can easily occur, resulting in an increase in infectious disease emergence. Through the One Health concept, an understanding of how human, animal, and environmental health are connected can help reduce these conditions in which infectious diseases can emerge and spread. However, despite being an established concept, the One Health is not widely known or implemented. Even in a country, such as China, that has a large population, substantial pollution and land use change, and a historically established practice of wildlife consumption, this concept is still in its early stages. Thus, by analyzing Chinese news media sources, it can be observed how the public reports and discusses these connections between human-environmental interaction and infectious disease emergence. After evaluating three Chinese news media sources, ranging in size and audience, it was found that the One Health concept is not reported. As for the components of the concept, the public consistently recognize the connections between animal and human health, but not environmental health. While there are a multitude of factors that explain this lack of recognition in Chinese media, the limited reporting of the interconnectedness of animals, humans, and the environment simply reveals the importance of the One Health concept in global health.

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INTRODUCTION

Human activity and behavior have significantly impacted the planet and all the forms of life that live on it. Through the increase of greenhouse gas emissions that intensify climate change and global warming, the removal of forests that degrade the ecosystem, and the consumption and exploitation of wild animals, humans are largely responsible for many of the world's health issues. From increased occurrences of heat related death and injuries and decreased lung function due to rising temperatures and pollution, human actions have not only increased rates of noncommunicable diseases, but also infectious diseases emergence and reemergence.

In order to show how these connections between human-environmental interaction and infectious disease emergence are communicated to the public, this thesis will evaluate news media sources in China and how they report and discuss these connections. First, a background section will introduce a brief history of medicine and health as well as the role of media in China. A following literature review will provide a foundation of knowledge about human-environmental interactions and infectious disease emergence, the One Health concept and its application in China, public perceptions in China about the interactions with nature and animals, and the role of media in public health. The methods section will provide an explanation of how the data was collected and analyzed for a news media analysis, in which the findings will then be provided in the results section. The discussion section will provide interpretations of the results and any new insights about human-environmental interactions and infectious disease emergence in China. Lastly, I will provide a conclusion of how the news media reports this connection in China as well as the importance of understanding the connection between human, animals, and environmental health.

BACKGROUND

History of Medicine and Health in China

Medicine and health in China dates back to over 3,000 years ago with the integration of religion, philosophy, and medicine (Hong 2004:70). The religious philosophies, Daoism and Confucianism help form medicinal practices, treatments, and prevention in ancient China. They coined various terms, such as *yin* and *yang*, referring to the two forces that maintain equilibrium in the body and the intricate connections between each part of the body (Hong 2004:79). With the combination of religious and philosophical based medicine and the basic understanding of human anatomy and physiology, the Chinese could begin diagnosing and treating illnesses (Hong 2004:80). At this time, since physicians attributed illnesses to the weather, seasons, diet, activity, and emotions, all of which disrupted the body's equilibrium, an emphasis was placed on preventative medicine; physicians wanted to treat the illness before it manifested (Hong 2004:80). Until the 1500s, traditional medicine was widely practiced, being the sole form of medicine to treat and prevent illnesses.

Yet, by the 16th century, as the Europeans arrived in China, Western treatments, procedures, and practices of medicine were introduced. The Chinese did not immediately accept or commonly use Western medicine. It was not until between the 17th and 18th centuries that the Chinese started to utilize Western medicine, but mostly out of necessity (Dong 2013:1). With the arrival of so many foreigners, the Opium Wars between 1839 and 1860, the downfall of imperial Qing dynasty in 1911, and early industrialization in major cities the country's health situation deteriorated. Epidemics of malaria, cholera, smallpox, and many other communicable diseases emerged, all of which traditional medicine practices and treatments could not adequately manage (Hong 2004:83). In order to improve the public health situation in China, the newly established

Nationalist government, led by Dr. Sun Zhong Shan (Sun Yat-sen), adopted the modern, Western style of medicine, replacing traditional medicine. In fact, in 1929 the government attempted to first suppress and then eliminate traditional medicine practices but failed due to public opposition (Hong 2004:83).

Western medicine continued in heavy usage during the Nationalist regime, but after the Chinese Civil War in 1949, a new government took control. Led by Mao Zedong, the Communist Party continued to emphasize public health improvement. Instead of concentrating solely on modern medicine, the new government recognized the value of traditional medicine and re-integrated it into healthcare (Hong 2004:84). In the 21st century, both modern and traditional medicine practices are used in healthcare. Many of the treatments used two thousand years ago, such as acupuncture and moxibustion, are still used in modern day (Hong 2004:80) Additionally, some Chinese herbs used in traditional medicines for thousands of years have also found a role in modern medicine (Dong 2013:2). Nowadays modern medicine is predominantly used, but traditional medicine is still commonly used and relied on heavily as a form of preventative medicine. This combined usage also means new healthcare approaches must navigate the spheres of modern and traditional medicine.

History of Media in China

The role of media in modern China began as the Chinese Communist Party (CCP) began reaching out to the world through communication, transportation, and trade in 1979. Up until 1979, China mostly published propaganda, but afterwards the government introduced free press. Newspapers, magazines, television, and radio stations could maintain business continuity by securing funding through the sale of advertising spots (Singh and Shirk 2011:7,1). After decades

of being “force-fed CCP propaganda,” the public had a “voracious appetite” for news about both domestic and international events (Singh and Shirk 2011:2). The number of newspapers increased rapidly from a count of 69 newspapers in 1979 to more than 2,000 newspapers and 9,000 magazines by 2005 in the country (Singh and Shirk 2011:7,8). Then with the introduction of the internet in 1993, the number of internet users skyrocketed. In 1995, China only had 61,435 internet users, and by 2017 the number rose to 765 million, the highest number of internet users in the world (Ritchie, Roser, and Ortiz-Ospina 2017).

Despite the growth in media and increase in internet users, China still ranks low in terms of freedom of press. According to the 2021 World Press Freedom Index, China ranks 177th out of 180 countries (Reporters Without Borders 2021). The CCP invests heavily into monitoring, censoring, and manufacturing the content found in media by using firewalls and blocking certain publications and websites (Singh and Shirk 2011:13). The government also jails journalists, bloggers, and activists who release news stories that expose state secrets, endanger the country, or incite social unrest (Xu 2014). Namely, the country’s greatest form of censorship is the “Great Firewall,” a combination of technological and government action that filter searches and block entire sites considered subversive (Singh and Shirk 2011:14). Thus, even after the Chinese government relaxed media and press restrictions, they still had tight control over what was released and communicated to the public.

Due to the Chinese government’s unique and central role in the release and control of news and media, the government has significant influence in what the public perceives. Given the strict control the government has over news and media, especially mainstream sources, can be regarded as a ‘mouthpiece’ of the Chinese government. These news and media sources must cater to the audience’s interests and demands, but also adhere to the central government’s

guidelines and act in accordance with the state's mission (Huang 2017). Despite the influence this strict control has in determining what is released to the public, it was found in one survey that people did prefer to use WeChat, but trusted the central government's media more, especially when it came to health-related information (Wu and Shen 2021:12). The trust in central government media has a positive effect on acceptance and compliance with health guidelines, which, when considering the COVID-19 pandemic and other major health events, can explain how the public perceives health and disease (Wu and Shen 2021:14). Thus, such trust in what central government media reports then communicates to the public the importance in recognizing and responding to these health events.

LITERATURE REVIEW

Humans have always used the land and its resources without limitation and consideration of what the effects may be. Half of the world's temperate and tropical forests have been cut down and nearly half of the ice and desert free land areas have been converted to croplands or pastures. On top of that, more than 800,000 dams obstruct the flow of 60% of the rivers in the world, all of which has ultimately altered the environment and threatened the lives of all organisms (Myersa et al. 2013:18754). The effects of human activity are undeniable, and as a result "nature is trying to tell us something" (Lustgarten 2020). As humans continue to damage and abuse the environment, not only are the environment's natural systems and animal's ability to adapt and survive at risk, but also human's health. Human activities, such as population growth, pollution, climate change, and land use change have all intensified the spread of infectious diseases, leading to outbreaks, such as SARS, Ebola, MERS, and COVID.

In observing these warnings, are humans sufficiently understanding and responding to these extreme circumstances? Within twenty years, the world has seen outbreaks of SARS, influenza, MERS, Ebola, Zika and COVID (Piret and Boivin 2021). As these infectious disease outbreaks have increased, humans have heeded these warnings, increasing their understanding and responsiveness to these outbreaks. Although the early 2000s SARS epidemic that emerged in China was not addressed properly or quickly, the faults in handling this epidemic set the stage for improvements in media released information. While the government failed to report basic information to the public, leaving them confused and ill informed, the Chinese government during the COVID-19 pandemic in 2019 utilized media, giving the public the opportunity to comprehend how this virus originated and how it spread. Thus, the use of media is essential in informing and educating the public, but it can also reveal what kind of information is communicated to the public. In China, where the population is growing, pollution is substantial, land use change is expanding, and the wildlife trade is still influential, the conditions are ideal for observing and understanding how media plays a role in linking human-environmental interactions and infectious disease emergence.

The One Health Concept and It's Components

The One Health concept, explaining the connections between animal, environmental, and human health, originated from the One Medicine concept. In 1976, Calvin Schwabe coined the One Medicine concept, which stemmed from African pastoral societies whose traditional healing practices included both human and animal health (Zinsstag 2011:149). Likewise, Schwabe combined human and veterinary medicine to conceptualize this connection between human and animal health as a way to explain the increasing number of zoonotic transmissions (Li et al.

2022:2; Keusch et al. 2009:3). However, given its clinical connotation, the One Medicine concept did not sufficiently account for the health issues that extended beyond clinical issues, such as ecology (Zinsstag 2011:150). Certain environments provide the perfect conditions for pathogens to thrive and spread. For instance, frequent and heavy rain allows mosquitoes that carry pathogens, such as the Zika virus, to thrive. Meanwhile, overcrowding, and poor sanitary conditions allow pathogens to emerge and spread.

Thus, the One Medicine concept evolved into the One Health concept, which not only explained the links between human and animal health, but also environmental health. From "bloom in trade and travel, climate change, population explosion, changing habits and lifestyle of humans, to intensive integrated animal farming," there is a myriad of factors that both directly and indirectly impact infectious disease emergence and ultimately human health (Bonilla-Aldana, Dhama, and Rodriguez-Morales 2020:234). Namely, human activity and behavior, animal consumption and exploitation, and environmental degradation all create favorable conditions in which transmission can occur and infectious diseases can emerge.

Human activity and behavior are the largest and most evident contributor to infectious disease emergence, including population growth and globalization. Currently, the global population stands at over 7 billion and within the next 35 years, the population is expected to grow to over 10 billion (Lustgarten 2020). Such a large population can have several effects on infectious disease emergence. Firstly, in order to sustain such a large population, the demands for land and resources have only intensified, resulting in a larger ecological footprint. Deforestation has increased the conversion of forests to farmland and feedstock, and greenhouse gas emissions have risen to accommodate the needs of the growing population. Secondly, large populations provide the perfect conditions in which pathogens can thrive and spread. People are closer in

proximity, providing more available hosts that allow pathogens to easily spread from person to person. Additionally, a growing population is often associated with poverty and health; less efficient sewer and sanitation systems and a high population density can easily become a breeding ground and aid the spread of pathogens (Garnett and Lewis 2007:37). Lastly, the larger the population is and the more they travel and interact, the easier it is for infectious diseases to spread. Globalization, or the movement of people, animals, goods, and other items around the globe, has increased the connectivity of the world's populations, ultimately increasing the world's "microbial traffic" (Keusch et al. 2009:86). This increased contact with other people, animals, and items from across the globe has given rise to the emergence both new and old diseases, and even allowed diseases to spread from city to city, country to country, transforming epidemics into pandemics. (Garnett and Lewis 2007:37).

As a whole, human activity and behavior have an impact on the environment, which in turn, impacts infectious disease emergence. As the world becomes more industrialized and urbanized, the amount of greenhouse gasses, such as carbon dioxide, increase and lead to global warming and climate change (Yorao and Daramola 2020:4). As a result, rising temperatures and shifting climate patterns provide the perfect conditions and habitats in which certain animals can thrive, such as mosquitos or ticks. The mosquito borne Zika virus originates in tropical areas, but in recent years has moved northward to southern Texas and Florida as the climate and temperatures change. According to the Centers for Disease Control, Zika virus was "not a nationally notifiable disease in the United States," but in 2015, 62 cases of Zika were reported due to travelers returning from infected areas. By 2016, 224 cases out of a total 5,168 cases were reported due to local mosquito-borne transmission in Florida and Texas (CDC 2021). Mosquito and other insects can now easily exist in regions they could not before, leading to an increase in

vector-borne diseases, or diseases carried by insects (Lustgarten 2020). Climate change has also brought about an increase in severe weather events. Extreme precipitation and heat events have led to outbreaks of food-borne or water-borne diseases, such as cholera (Myersa et al. 2013:18755).

Land use changes, such as deforestation, urbanization, and agriculture practices, also have a significant role in infectious disease emergence. Animals cannot adapt and survive as their habitats are cleared for pastures, cropland, or urban use, and as a result they go extinct. The background extinction rate, or normal extinction rate, is 0.1 to 1 extinctions per million-species years (E/MSY). Nowadays the extinction rate is around 100 E/MSY, meaning that the various species of birds, mammals, and amphibians are going extinct 100 to 1000 times faster than expected (Ritchie and Roser 2021). Such a rapid rate of extinction has directly contributed to the decline in biodiversity. Biodiversity is critical since the natural diversity of plants and animals results in a greater resiliency against infectious diseases (Lustgarten 2020). According to a principle of disease ecology, known as the 'dilution effect hypothesis,' a greater diversity of animals, microorganisms, or other intermediate hosts can "dilute the pool of hosts that amplify transmission" (Myersa et al. 2013:18754). For instance, populations of blue jays, house finches, American crows, and American robins all serve as natural reservoirs for West Nile Virus (Ostfeld 2010:40). Thus, mosquitoes that carry viruses from animal to animal and animal to human are less likely to find a suitable host when bird diversity is high. However, as habitat encroachment and habitat loss increase, avian diversity declines. Some populations of birds can adapt and survive, while others cannot. Consequently, mosquitoes are more likely to find a suitable host when bird diversity is low, and pathogens causing West Nile and Lyme disease can spread (Ostfeld 2010:41).

In addition to declining biodiversity, the consumption and exploitation of animals impacts infectious disease emergence. For centuries, humans have eaten meat, both raw and cooked, however both types can potentially transmit diseases, especially if the meat comes directly from wild animals. Wild animals are responsible for a large portion of the infectious diseases seen worldwide. According to the Centers for Disease Control, 60% of the known infectious diseases are zoonotic diseases and 75% of the new emerging infectious diseases are zoonotic (CDC 2021). Moreover, the poultry, animal husbandry, and other livestock industries are responsible for infectious disease emergence as well. When a large number of animals are confined in a small, single space, pathogens can easily be transmitted from animal to animal. Pathogens can also spread through ventilation units, water and feed systems, waste production, and the products themselves, which not only spreads pathogens between the animals, but also increases the likelihood those pathogens spread to humans (Liverani et al. 2013:874). In some instances, contact with other wild animals can result in transmission. For example, in 1998 Nipah virus emerged in Malaysia as a result of animal to animal and then animal to human contact. When the commercial fruit production and pig farming business intersected, so did the pig and resident fruit bat population (Epstein et al. 2006:63). Bats, who already carry more than 130 pathogenic viruses, served as reservoirs of Nipah virus. In close proximity, pigs transmitted the virus, who ultimately served as the intermediate hosts to humans (Zhou et al. 2020).

Both the consumption and exploitation of wildlife have facilitated spillover events, in which pathogens from animals are transmitted to humans, resulting in the emergence of zoonotic diseases, (Ellwanger et al. 2020). These zoonotic diseases account for 75% of emerging infectious diseases, and are responsible for outbreaks, such as HIV and Ebola (Myersa et al. 2013:18754). HIV emerged due to contact with primates found in uncommonly explored areas of

Central Africa. Likewise, the spread of Ebola is due to increased contact with wild bats. Thus, the further humans encroach into animal's habitats, the more they will interact with animals that humans do not normally interact with, ultimately facilitating the emergence of diseases.

A pertinent example of these spillover events in which contact between humans and animals increased is COVID-19. Coronavirus first emerged in the seafood wet market of Wuhan, China in late 2019. These wet markets are central to the sale of poultry, snakes, bats, and other wild animals. Given the close proximity, the flow of people and wild animals, and the potential contact with animals' bodily fluids, wet-markets serve as a prime hotspot for zoonotic transmission (Bonilla-Aldana, Dharma, and Rodriguez-Morales 2020:235). In the case of COVID-19, researchers regard bats as being the primary reservoir for the virus, especially given its similarity in gene sequence to SARS-CoV and MERS-CoV. SARS was transmitted to humans via wild animals in a wet market and MERS was transmitted to humans via camels, but for all three, COVID-19, SARS, and MERS, the primary reservoir is bats (Perlman 2020:761). In actuality, bats are hosts for the largest number of coronavirus species. Since 2019, over 200 coronaviruses have been identified in bats from all across the globe, but at least 3204 coronaviruses in bats exist and have not yet been discovered (Hernández-Aguilar et al. 2021:2). Bats are clearly a common denominator in infectious disease emergence and transmission, but it is just as important to consider understanding why there is an increase in contact between bats and humans.

Thus, the One Health concept is essential to our understanding of how infectious diseases emerge and spread. An understanding of how not only human activity and behavior and animal consumption and exploitation, but also how environmental degradation can create favorable conditions in which infectious diseases can emerge and spread (Bonilla-Aldana, Dhama, and

Rodriguez-Morales 2020:236). This understanding of the One Health concept came in at the right time, given how many diseases have emerged in the past two decades. In 2004, during the SARS outbreak in China, the One Health concept first emerged and subsequently entered international conversation as a strategic framework for reducing infectious diseases in 2008 during the avian influenza outbreak (Zinsstag 2011:150; Mackenzie and Jeggo 2019:1). Both the outbreak of SARS and avian influenza led to the realization that unknown pathogens could emerge from wild animals at any time, an early and effective international response system is necessary, and the response to outbreaks and pandemics require global cooperation and participation based on One Health principles (Mackenzie and Jeggo 2019:1). Nowadays, despite its introduction almost twenty years ago, the One Health concept is still in its early stages, mostly focusing on infectious diseases and food safety (Li et al. 2022:2).

Similarly, the One Health concept, which continues to serve as a strategic framework for reducing infectious disease risk as the "animal-human-ecosystem interfaces," is still not widely known, within and outside of China (Zinsstag 2011:150). In fact, one study found that respondents from 34 different European countries, belonging to academic and research institutions and animal health/science fields knew of the One Health concept but could not provide a complete definition (Chiesa 2021:1). Of the 171 respondents, 99 stated that they had heard of the One Health concept, but only 16 could provide a complete definition. Additionally, 129 of the 171 respondents included the 'human' component in their definition, 110 included the 'animal' component, but only 63 included the 'environmental' component to their definition of One Health (Chiesa 2021:4). This lack of inclusion of the 'environmental' component demonstrates academic, research institutions, and animal health/science workers' understanding of the traditional understanding of One Health, solely linking human and animal health.

Within these same groups, the environmental health component of the One Health concept is not as well known or perceived with unequal importance (Chiesa 2021:10). Hence, if the One Health concept is not widely known within academic, research institutions, and animal health/science fields, then the general public most likely is not aware of this concept either. Despite this lack of awareness, the One Health concept is gaining more recognition in the United States and around the globe according to the CDC, and it should continue to be considered in infectious disease reduction and control, especially given the emergence of SARS, MERS, avian flu, COVID-19 and other infectious diseases within the past twenty years (CDC 2022).

Applying One Health to China

China has the largest population in the world, a rapidly growing and developing economy and has the highest emission of greenhouse gasses in the world, responsible for 31% of the world's green gas emissions in 2020 (Ritchie and Rose 2020). As a result of the country's enormous ecological footprint, China is also home to some of "the world's most severe environmental problems," such as air pollution, biodiversity loss, desertification, deforestation, ocean pollution, habitat destruction, and more (Feng and Reiser 2011:429). China's fast developing economy, growing population, as well as cultural and social factors all contribute to the increase in infectious disease emergence.

Since the 1980s, China's economy has developed and grown exponentially, becoming more modern and wealthier, and ultimately giving rise to a huge population. With such a large population and growing economy, the demands to sustain such have increased, which have inadvertently conspired to result in a set of expanding environmental catastrophes (Harris 2006:5). Increased deforestation, urbanization, and pollution have ravaged the land. In 2016, the

Ministry of Land and Resources reported that there were 3.33 million hectares of contaminated farmland in China, leaving the land in a useless state (Wu et al. 2016:2). Likewise, China's energy consumption has increased due to population growth, which has further depleted already finite resources. China still uses coal as the country's main source of energy and continues to rank first in global coal consumption. As of 2016, coal accounted for 67% of the country's total energy consumption, contributing to 57.7% of greenhouse gas emissions globally (Wu et al. 2016:2). China's consumption of natural resources and exploitation of land have contributed to climate change and other environmental problems that directly influence human health.

China's influence on the environment is not only of an economic nature but also of a cultural, religious, and societal nature (Keusch et al. 2009:87). Throughout the country's long history, wild animals have been viewed as a "resource to be exploited" and "not to be protected for its intrinsic value" (Zhang et al. 2009). In fact, for thousands of years, the practice of traditional Chinese medicine (TCM) has remained a method of treating and healing illnesses. It is deeply ingrained in society due to its connections with Daoist and Confucianist philosophies, and TCM is still incorporated in the modern-day health care system. TCM uses various treatments, such as acupuncture, as well as natural herbs and animal-based products (Tang et al. 2008:1938). Animals and their body parts and organs have been used for their medicinal properties in around 13% of the treatments used in TCM. For instance, the bones, hair, teeth, and skin of a tiger have all been used for their healing qualities and for treating diseases (Still 2003:118). The consumption of wild animals as part of food culture is also deeply ingrained in Chinese society.

Due to the growing demands of wild animals for food, medicine and health, souvenirs, decoration, fashion, and pets, the wildlife trade has grown and expanded (Zhang et al. 2014). As

a result, poaching and habitat loss have increased, threatening the lives and survival of many wild animals, even driving certain populations to extinction or near extinction. Wild animals, such as pangolins, elephants, and tigers are now on the verge of extinction (Zhang et al. 2008). The wildlife trade has also increased the contact between humans and animals (Still 2003:119). Humans are more likely to come in contact with animals and their organs and bodily fluids, which could carry pathogens that may result in spillover to humans (Still 2003:120). Thus, China's enormous population, high level of demand and consumption of resources and land, and the thriving wildlife trade have all intensified infectious disease emergence. Yet, the One Health concept can help in recognizing these connections between human, animal, and environmental health in China.

Public Perceptions of One Health in China

While China does meet all the requirements for the next outbreak, do they also recognize how these issues are linked to the health of the environment, animals, and humans ? In terms of climate change and global warming specifically, one study shows that a majority of the participants from China, or around 75%, were concerned about climate change. 78% felt that the weather was becoming warmer, and 49.8% of the participants thought climate change would have a negative impact on the population's health. Additionally, a majority thought climate change would lead to increased incidences of vector-borne diseases (Tong et al. 2016). In another study, it was found that the public in China were aware of and respondent towards climate change. 93% of the respondents reported being sensitive to climate change and most believed climate change is mostly caused by human behavior (Yu et al. 2013:470).

In terms of environmental health and protection as a whole, the public have relatively positive perceptions and attitudes. In one study, administered in Shanxi Province, over 70% of the respondents considered the environmental issues that affect China to be very serious, which included water pollution, sandstorms, and damage to vegetation (Feng and Reiser 2011:432). Similarly, when asked about environmental risk, Chinese respondents of different surveys considered water pollution as the most probable with air pollution and noise pollution following but considered animal epidemics and biodiversity reduction as some of the least probable risks (Zhang et al 2013:199,200). Additionally, all the respondents from a survey administered in 2012 considered environmental pollution a severe threat to health, and 62.2% acknowledge the close ties between pollution and human health (Chen et al. 2017:355).

Yet, when it came to performing environmentally friendly behaviors, very few of the respondents in Shanxi Province reported performing public level, even household-level tasks (Feng and Reiser 2011:430). Their attitudes and perceptions in comparison to their behavior contrasted. Harris attributes this disconnect to the Chinese people's view of the natural world, stating the Chinese people saw existence of the natural world as a "benefit for the people" (Harris 2006:6). Likewise, in this survey, respondents did not strongly support the statement that humans should coexist with nature, and a small group still agrees with the statement that humans should conquer nature. Thus, a neutral and generally anthropocentric view of the natural world is common in China (Feng and Reiser 2011:432).

In terms of animal well-being and health, one survey found that 61.7% of respondents from urban areas believed that all wild animals should be protected. 52.6% thought wild animals are equal to human beings, deserving of both protection and respect, while only 9.1% thought wild animals were lower than humans. Additionally, more than 50% of these respondents

supported wildlife conservation (Zhang et al. 2008). From another survey, 55.2% of respondents stopped eating wild animals due to the food safety risk and 16.4% stopped eating wild animals because they cared about animal welfare (Li and Wang 2021:393).

Similarly, another survey found that participants from southern China had overall negative views of the use of wild animals or wild animal-by-products (Li et al. 2021:100). They also viewed rodents, domestic animals, such as poultry and swine, domestic pets, bats, and wild birds as being potential sources of pathogens that could carry and transmit diseases to humans. Of those who participated, 77.5% viewed rodents as potential sources, while only 44.2% cited bats and 37.5% cited wild birds (Li et al. 2021:98). Yet, scientists have already identified bats as the natural reservoir of severe acute respiratory syndrome (SARS) and birds as the natural reservoir for highly pathogenic avian influenza (HPAI) (Li et al. 2021:100). Additionally, more than half of the participants did not recognize the zoonotic origin of SARS, HIV/AIDS, MERS, and Ebola (Li et al. 2021:98). Thus, public attitudes towards wild animals have changed, especially in response to the SARS outbreak, but overall public knowledge of wild animals and zoonotic diseases remains poor.

Given the long list of environmental and animal consumption and exploitation issues in China that are all caused by human activity and behavior, the motive and rationality towards implementing the One Health approach is compelling. Since the early 2000s, China has been the emergence and outbreak sites of SARS, avian influenza, and now COVID, all of which originated from wild animals. Thus, the links between environmental degradation, animal consumption and exploitation, and human activity are apparent, making the One Health concept ever more essential to infectious diseases reduction and control. The One Health concept was first implemented in 2014 at an international symposium in Guangzhou, China, allowing the

country to lay down the foundation for this concept and use it in addressing health issues in China (Wu et al. 2016:6). Yet, this concept is still in its early stages in China, primarily being used with infectious disease and food safety (Li et al. 2022:2).

The One Health concept is an established concept in the academic and research world, appearing in several studies. However, there appears to be limited knowledge of this concept outside of the animal health/science and infectious disease research community, and no evidence of its implementation in infectious disease prevention and control. Likewise, this concept appears to be unknown among academics or researchers but quite foreign to most of the general public. Many within and outside of China have never heard of the One Health concept (Chiesa 2021:10). Despite this lack of awareness of the One Health concept, the public in China do still hold their own attitudes and perceptions linking environmental, animal, and human health. Even more so, the media has a significant role in influencing the public's attitudes and behavior.

The Role of Media in Public Healthcare

News media have "an obligation to inform and protect the public," especially during public safety issues (Young, Norman, and Humphreys 2021:6). Media publications of major events can circulate information to both warn and inform the public. Young, Norman, and Humphreys deduce that increased coverage of a topic results in increased public attention (Young, Norman, and Humphreys 2021:1). Their research also demonstrated that when individuals are exposed to media about an infectious disease, they are more likely to consider that infectious disease as more severe or have a higher status than those that receive less media exposure (Young, Norman, and Humphreys 2021:5). Although this study took place in Europe, its results could be applied to China, especially given the government's strong influence on

public perception through their tight control of news and media information. The importance of using media in health outbreaks and epidemics is particularly apparent during the SARS outbreak in 2003 and the COVID pandemic in 2019.

In comparing the SARS outbreak and COVID pandemic, the role of media in China was extremely different and resulted in completely different public perceptions of the disease and its causes and effects. During SARS, the first case that appeared in November of 2002 was quickly brought to official's attention and reported to health personnel by December. However, from November to March there was essentially a "virtual news blackout" (Knobler and Huang 2004). Health and government officials and the media failed to release information, while the public's anxieties, fears, and speculations rose. When news of SARS did finally reach the public, it was limited and often inaccurate. The government continued to downplay the severity and risk of the diseases, announcing to the public that the government had this disease under effective control (Knobler and Huang 2004). The government also did not share any information about the disease until April, five months after the first case appeared. The news blackout restricted the flow of information to the public, which only worsened the government's attempts to address the SARS outbreak (Knobler and Huang 2004).

However, nearly twenty years later, the Chinese government and media response to COVID-19 was polar opposite. The first case of COVID-19 appeared on December 30, 2019, and within a month after the first case, central and local governments implemented many extensive measures to control the spread and the media had a much larger role. Central and local governments implemented contract tracing and face mask and social distancing mandates while also developing test kits and researching the disease. The government also timely and adequately reported the disease's severity, mortality, and modes of transmission to the public (Liu, Chen,

and Bao 2021). The utilization of news as well as social media allowed the Chinese government to accelerate response and recovery efforts, mobilize the government, citizen, and nonprofit organization's response, and reduce public anxieties and fear (Li, Chandra, and Kapucu 2020:703). Therefore, given the links between animal, environmental, and human health, the important role of One Health in infectious disease prevention and control, and China's large ecological footprint coupled with the public's generally anthropocentric view, a newspaper media analysis from various sources would help explain how this link between human-environmental interactions and infectious disease emergence are discussed in China.

METHODS

In this thesis, I analyzed three Chinese news media sources to assess how they talk about human-environmental interactions and infectious diseases: *China Daily* (中国日报)[1], *Health Times* (健康时报)[2], and *Chinese Environment* (中国环境报)[3]. *China Daily*, owned by the Publicity Department of the Chinese Communist Party, is the most widely circulated English-language newspaper in China. It is widely distributed across the world and is found in 150 different countries, giving *China Daily* a domestic, but mostly overseas audience (He, Zhang, and Chen 2019:3). *Health Times* is a medical and health newspaper sponsored by the *People's Daily*, the official newspaper of the Central Committee of the Chinese Communist Party. Since its establishment in January 2000, medical doctors, dietitians, herbalists, psychologists, and journalists have all contributed to the coverage of mostly health stories and solutions, but also health news, advice, and policy (Liu, Dai, and Xu 2020:547,548). Lastly, *Chinese Environment*

[1] http://cn.chinadaily.com.cn/
[2] https://www.jksb.com.cn/index.htm
[3] https://www.cenews.com.cn

is a national environmental protection newspaper headed by the Ministry of Ecology and Environment. Since its establishment over thirty years ago, this newspaper provides coverage of environmental protection, policies, and reports for the general public. Each of these news sources cover different perspectives, a general, health and medicine oriented, and environmental protection focused perspective.

The coverage of these news sources also is determined by who heads the newspaper. While still government owned and operated, *China Daily* provides a more general and international focused coverage, and thus predominantly publishes content regarding global issues. More recently *China Daily* publishes topics relating to the environment, mostly being topics about air and water pollution (He, Zhang, and Chen 2019:3). Since the *Health Times* is sponsored by the *People's Dail*y, which is also run by the Chinese Communist Party, it will have more political undertones and is more likely to focus on health news related to development, politics, and economics. The *Chinese Environment,* run by the Ministry of Ecology and Environment, will focus more on publishing the party and country's policies, laws, reports, and more regarding environmental protection. However, unlike *China Daily, Health Times* and *Chinese Environment* are smaller publications with a less diverse demographic of readership. While all three news sources are directed towards the general public, those who read *Health Times* most likely have interests in or work in healthcare. Likewise, those who read *Chinese Environment* are more likely to be more environmentally conscious. Overall, these newspaper sources with diverse perspectives and coverage will provide both depth and breadth as well as assess how human, animal, and environmental health issues are reported to various audiences.

In order to find these news articles, I used Google Search and Baidu, the main search engine in China. Searches included these four keywords 新冠病毒 and 肺炎疫情 (COVID-19),

病毒 (virus), and 传染病 (infectious disease). To find all relevant articles, I combined these keywords and a site search from each of the three-newspaper sources. For example, if searching in Baidu for articles from China Daily, a search would look as such:

“新冠病毒” or "肺炎疫情" or "病毒" or "传染病" site:http://cn.chinadaily.com.cn/

In terms of deciding the relevancy of the articles, I used the following set of criteria. Firstly, all articles must be written in simplified characters since simplified characters are used in Mainland China, whereas traditional characters are used in Taiwan. Secondly, at least one keyword (新冠病毒, 肺炎疫情,病毒, 传染病) must be included either the title and/or the first paragraph. This would ensure that the article would be more directly related to COVID, infectious diseases, or viruses that would influence health. Thirdly, the articles must be published within the dates of August 1, 2019 and through July 31, 2021. During this time period, COVID-19 emerged and permeated throughout society. Thus, how the media reports infectious diseases, specifically COVID, will be especially substantial. Lastly, articles with only video will not be included.

In order to collect all of these articles, I copied and used the ‘paste special’ function to paste the unformatted text on a Word document, which would ensure no pictures, ads, special fonts, or special formatting would be included. Every single article that I copied and pasted would be placed in a separate Word document. By the end I had collected 391 articles and 391 Word documents. While I was collecting articles, I collected articles by the news source. I started with *China Daily* via Google Search, then *China Daily* via Baidu Search, *Health Times* via Baidu Search, and lastly *Chinese Environment* via Baidu Search and then Google Search. While the other two of the three news sources had articles from both Baidu and Google, *Health Times* only had articles from Baidu. After searching by news source and search engine, I kept individual folders on the computer of all the articles from *China Daily* using Google Search,

China Daily using Baidu Search, *Health Times* and Baidu, *Chinese Environment* and Baidu and Google. I chose to additionally separate the news sources by search engine due to the fact that there were many duplicates. At times, both Baidu and Google generated the exact same article.

As I collected these articles, I would quickly read over them, looking for keywords or phrases, such as climate change or animals as host or means of transmission, that related to humans, animals, or the environment. Specifically, these keywords and phrases related infectious diseases with direct and indirect contact with animals and the environment. In the early stages of designing this research project, I had already compiled 11 words relating to infectious diseases and human, animal, and environmental health, including human activity, climate change, global warming, environment, deforestation, biodiversity, urbanization, habitat destruction, wildlife, wildlife trade, and One Health. Using these words and phrases describing these words guided this stage of quick keyword/phrase searching, which constitutes the preliminary state of data analyzing.

I kept a list of each article on the Excel file by news source. Within each new source, I gave each article a number, starting from 1, that would correlate with the same Word document found in the files. During this stage, I also started to preliminarily organize the articles I had collected, marking them ‘yes’ or ‘no.’ If the article explicitly stated a word or conceptualized the word in a phrase and related it to the variables I mentioned earlier, I marked it as ‘yes’ on the Excel file, meaning the article did connect infectious diseases to human, animal, or environmental health. For instance, in many of the articles, globalization in relations with COVID and other infectious diseases was not explicitly stated, but the phrase ‘imported cases’ or ‘overseas cases’ conceptually described globalization in terms of infectious disease emergence. If the article did not state any of these words or describe the words conceptually,

then I marked that article ‘no’ on the Excel file. I continued with this process for all 391 articles from the three news sources. Throughout this preliminary stage, as I would read through the articles, I noticed more words or ways of describing the connections between infectious diseases and human, animal, and environmental health. Thus, I added on words, such as temperature, globalization, and livestock, to the list. I followed the same process of marking the articles as ‘yes’ or ‘no’ for these three words.

In the second stage of data analysis, I re-read articles only marked as ‘yes, ’ they did mention one of the 14 words and connect it to infectious diseases. While reading through these articles more in depth, I marked which words and how many were mentioned in each article in the same Excel file. I ended up with 14 columns representing each word and marked with another ‘yes’ to indicate that the article did mention this word or conceptualization of the word. Some articles mentioned not a single word, some only mentioned one, and some articles mentioned multiple words in one article.

At this point, I added 5 more words/phrases to the list of 14. These words and phrases continued to appear in the articles themselves as well as in the literature review, including population growth, food culture, co-exist with animals, co-exist with the environment, and connections between animals, environment, and humans. In addition to adding words/phrases, I revised the definitions of these words/phrases. When describing wildlife in everyday life, it is described as the wild animals that live in a region. But in this research, I altered the definition of wildlife to describe it as the source or means of transmitting infectious diseases.

In the third stage of data analyzing, I re-read all of the articles to ensure that I had properly marked each appropriate article as well as looking for 19 words/phrases. These 19 words/phrases now served as codes for this research, in which I would use to further organize the

data and find relationships. These codes, consisting of a list of 19 variables, are listed in Table 1, which defines the keywords/phrases in the context of this research project. In the end, I collected 391 articles in total, covering four main categories, human, animal, environment, and coexistence. Within each of the 4 categories, the 19 variables, or subcategories, are divided in their respective categories. These categories and subcategories will help to determine which topics the news sources choose to report and connect to infectious disease emergence, predominantly but not limited to COVID-19.

Table 1: Variables and Their Definitions (related to this research)

Human	
Globalization (全球化)	Movement of people, animals, goods, and other things around globe
Human Activity (人类活动)	The impact on environment due to human activity and behaviors
Population growth (人口增加)	The increase in the size and density of population over time
Animal	
Food Culture (饮食文化)	The consumption of wild animals
Livestock (人类活动)	The infectious diseases originating in animals or spreading due to poor livestock management practices
Wildlife (野生动物)	Wild animals as source or means of transmitting infectious diseases
Wildlife Trade (野生动物贸易)	The trade of wild animals as spreading infectious disease and increasing human-animal contact
Environment	

Biodiversity (生物多样性)	A decline in biodiversity
Climate Change (气候变化)	The change in climate patterns and increase in severity of weather events
Deforestation (森林砍伐)	The removal of trees
Environment (环境)	the natural world, as a whole or in a particular geographical area, especially as affected by human activity
Global Warming (全球暖化)	The rise in global temperature
Habitat Destruction (栖息地破坏)	The destruction and/or encroachment of organisms' habitat
Temperature(温度)	A rise in temperature
Urbanization (城市化)	The degradation of land to establish urban and suburban development
Coexistence	
Coexist with Animals	Living in harmony with animals
Coexist with Environment	Living in harmony with environment
Coexist with both Animals and the Environment	Living in harmony with both animals and the environment
One Health (同一健康)	The connection between human, animal, and environmental health

RESULTS

A total number of 391 articles were collected, and as shown in Table 2, the number of articles collected from each news source and the number of articles that related at least one subcategory to the infectious diseases varied greatly. It should also be noted that some articles mentioned more than one category and will therefore be counted in more than category. Of those 391 articles, 245 articles came from *China Daily*, 111 from *Health Times*, and 35 articles from

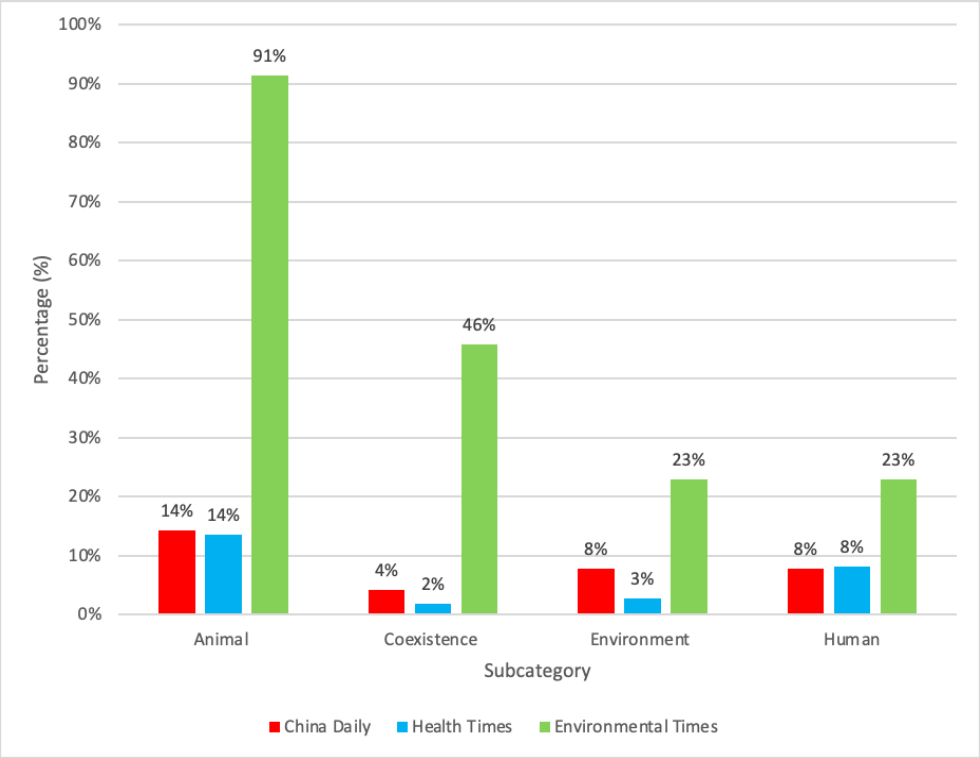
Chinese Environment. Additionally, the category of animals has the greatest number of articles. The human category follows second, environment third, and the coexistence category falling last with the lowest number of articles at 28.

Table 2: Summary of News Sources and Articles

News Source	Animal	Coexistence	Environment	Human	Articles
China Daily	35	10	19	19	245
Health Times	15	2	3	9	111
Chinese Environment	32	16	8	8	35
Total	82	28	30	36	391

Given the different total number of articles collected from each news source, Figure 3 presents the total percentages of the articles collected within each category for each news source. It should be noted that since there is more than one variable or subcategory within a single category, that all percentages were calculated from the total number of articles mentioning at least one subcategory out of the total number of articles collected from the respective news source. Given this, Figure 3 shows that *Chinese Environment* not only has the highest percentage of articles among the three news sources, but also among the four categories. 91% of the articles from *Chinese Environment* mentioned animals, 46% mentioned coexistence, and 23% for both the environment and human categories.

Figure 3: Total Percentage by Category



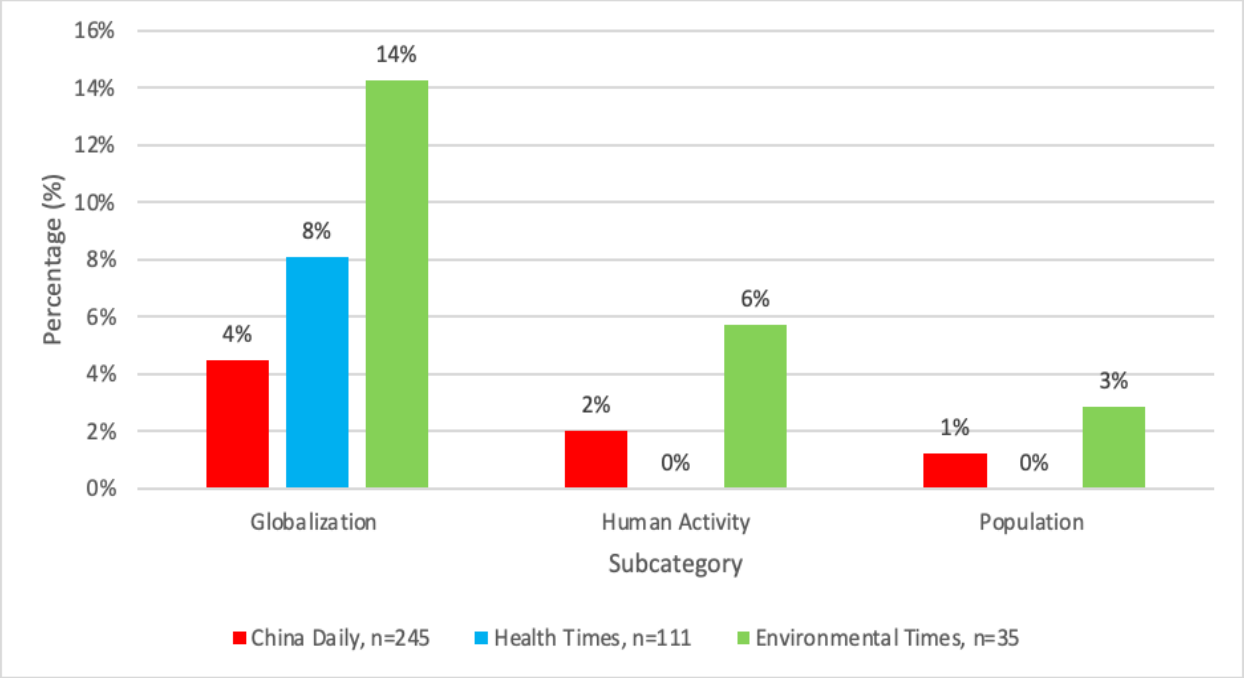
Similar to the results shown in Figure 2, Figure 3 shows that the category of animals appears the most frequently, which includes articles that mentioned wildlife, wildlife trade, livestock, and/or food culture. Articles under the category of humans appear the second most frequent, mentioning human activity, globalization, and/or urbanization. At third most frequent is the articles that mention the category of environment, including variables such as environment, temperature, climate change, global warming, deforestation, urbanization, and/or habitat. Lastly, articles within the category of coexistence appear the least, this includes coexisting with animals, coexisting with the environment, coexisting with both animals and the environment, and One Health.

Looking more in depth, Figures 4 through 7 display the percentages of the subcategories mentioned in the articles from each news source. Along with these figures, representative examples of quotes from the articles displaying these categories will be included. Each quote

will also be provided with an English-language translation followed by the original Chinese text in parentheses.

Figure 4 shows the percentage of articles that mention the subcategories related to humans. Of the three subcategories, globalization not only has the highest percentage among all the articles categorized as relating to humans, but also among each of the three news sources. 14% of the articles from *Chinese Environment*, 8% of the articles from *Health Times*, and 4% from *China Daily* mention globalization. Most of these news sources blame the numerous 'imported cases" and "overseas cases" for contributing to the rise in COVID cases.

Figure 4: Percentage of Articles Related to Humans



One article in particular, titled "7 new local cases in Beijing Li Lanjuan: Food traceability must be strengthened (北京新增 7 例本土病例 李兰娟：一定要强化食品溯源)," directly relates globalization or the movement of goods and products around the globe with infectious diseases. Chinese epidemiologist, Li Lanjuan, stated that "the flow of people in the wholesale market is very large, and the goods and personnel in the market come from all directions, which

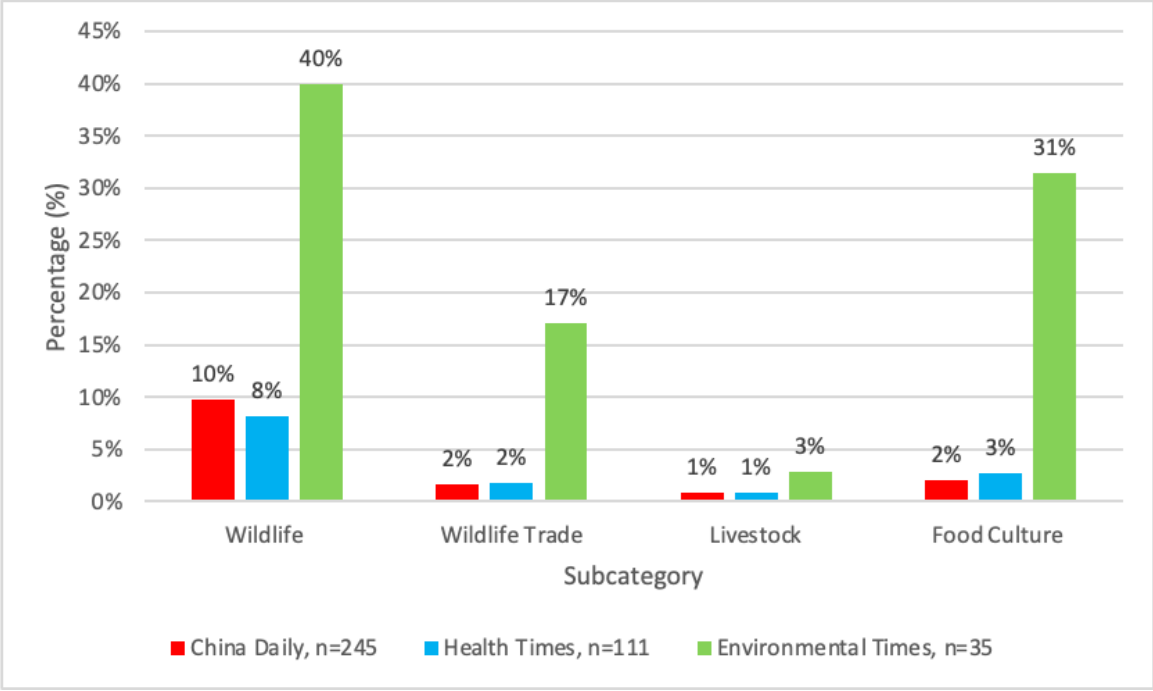
is more likely to bring and spread viruses (批发市场人流量非常大，市场上的东西和人员都来自四面八方，比较容易带来和传播病毒)" (Zhang 2020). Despite this connection between globalization and infectious diseases, the words and phrases relating to globalization were not found in the titles, but rather at the end or in the middle of a very long article. Rather this article emphasized the dangers of contaminated food and importance of food traceability in such an interconnected world.

While globalization has the highest percentage, the subcategory of human activity follows second. Articles mentioning human activity included the phrase, such as "the contact of these viruses to humans has increased substantially (这些病毒与人类的接触面大幅增加)," most frequently (Zhang 2020). The subcategory population has the lowest percentage between all collected articles mentioning the category of humans. Population also has the lowest percentage among the three news sources. Only 3% of the articles from *Chinese Environment* and 1% of articles from *China Daily* mention the population. Of the few articles that did mention population, they simply connected infectious disease emergence with an "increase in population density (人口密集程度增加)", and "a large scale population (超大规模人口社会)" (She 2020; Wu 2020). These short phrases about population growth and density are all only found in the middle of articles. On another note, *Chinese Environment* has the highest percentage of articles from each subcategory among the three news sources, while *Health Times* has the lowest percentage from each subcategory.

Figure 5 presents the percentage of the articles mentioning the subcategory animals from each news source. Among wildlife, wildlife trade, livestock, and food culture, wildlife has the highest percentage with 40% of the articles from *Chinese Environment*, 10% from *China Daily*, and 8% from *Health Times* mentioning wildlife and relating it to infectious diseases. Many of the

articles reported wildlife as the natural reservoir, source, or host (天然/自然宿主) for the COVID-19 virus and attributed the virus as being transmitted from animals to humans, rather than being created in a laboratory environment. One article titled "Strengthen legal responsibility to protect wild animals (强化法律责任 保护野生动物)," does not focus directly on COVID, but rather the how the protection of wild animals would maintain public health. The article mentions that over 70% of emerging infectious diseases originate from animals (超过 70%的新发传染病来源于动物), but also states that wild animals are not to only be blamed for causing disease and death (野生动物宿主并不一定致病致死). In fact, human consumption of wild animals and degradation of their habitats are only increasing the conditions in which viruses originating in animals could spill over to humans (由于人类食用野生动物或侵蚀野生动物栖息地，使得这些病毒与人类的接触面大幅增加，为病毒从野生动物向人类传播创造了条件) (Zhang 2020).

Figure 5: Percentage of Articles Related to Animals



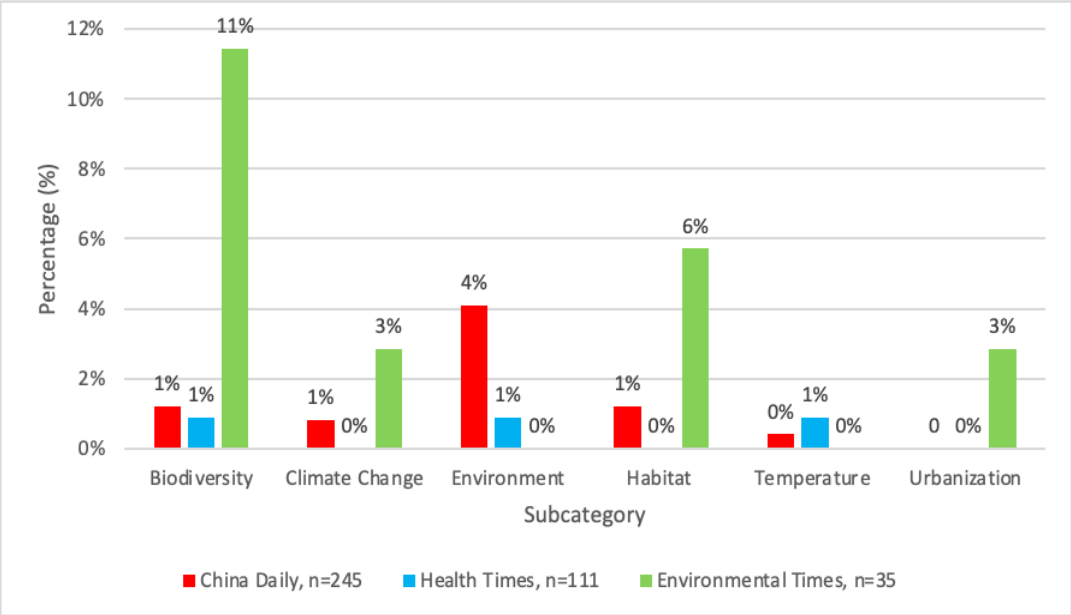
Despite wildlife having the highest percentage of articles, wildlife trade has one of the lower percentages. These articles did mention wildlife trade and relate it to infectious diseases, naming the wildlife trade as one the "important reasons for the frequent occurrence of various viruses," and that the coronavirus epidemic "may be related to the trade of wild animals. A couple articles even advocated for the ban of wild animals, such as the *Environmental Times* article titled, "Make up Your Mind, Say Goodbye to the Wildlife Trade (痛下决心，告别野生动物交易)." This article not only advocates for the ban of wild animals, but also "the complete ban of the trade of live poultry and on-site slaughtered meat" (全面禁止活禽交易，全面禁止现场宰杀肉类交易了) (Xu 2020).

Among the three news sources, 17% of the articles from *Chinese Environment*, and 2% from both *Health Times* and *China Daily* mention wildlife trade, substantially lower than the articles that mentioned wildlife. Throughout each article, words and phrases related to animals, especially wildlife, were found throughout. Overall, *Chinese Environment* has the highest percentage of articles that mentioned each subcategory among the three news sources, while *Health Times* has the lowest percentage from each subcategory.

Figure 6 presents the percentage of the articles mentioning the environment from each of the three news sources. Of the 8 subcategories, biodiversity has the highest percentage, 11% of the articles from *Chinese Environment*, 1% from *China Daily*, and 1% from *Health Times.* Each of these news sources acknowledges that "maintaining biodiversity is fundamental" (维持生物多样性才是根本) (Li 2020). One article even explains how biodiversity impacts infectious diseases emergence, writing "that the diversity of wild animals greatly dilutes the probability of viruses infecting humans (野生动物的多样性大大稀释了病毒感染人类的概率) (Lin 2020). In the absence of a diverse ecosystem, the easier it will be for a pathogen to find an animal host.

The subcategory biodiversity has the highest percentage of articles that mention wildlife and relate it to infectious diseases. Despite the high percentage from *Chinese Environment*, both *Health Times* and *China Daily* have significantly lower percentages in comparison.

Figure 6: Percentage of Articles Related to the Environment



*No articles for global warming and deforestation were found

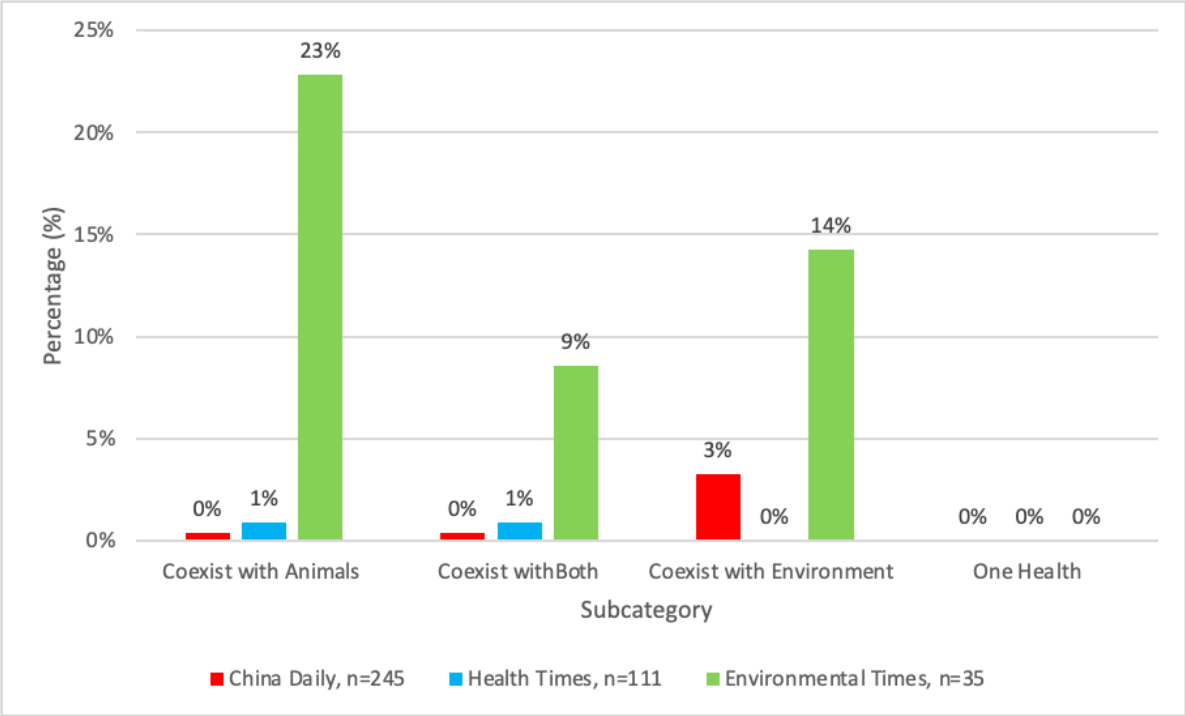
In general, *Chinese Environment* has the highest percentage of articles mentioning one or more of the subcategories, while *Health Times* has the lowest percentage of articles. The articles collected from *Health Times* only mention three out of the eight subcategories, including biodiversity, environment, and temperature. As a whole, there are not many articles reporting the environment related subcategories. Biodiversity is the only subcategory to be mentioned in all three news sources. A majority of the subcategories are only mentioned in one or two of the news sources. Two subcategories, specifically deforestation and global warming, were not mentioned in a single article from any of the three news sources.

However, there is one article from *China Daily*, titled "The Era of American Dominance is Over (美国主导的时代已经终结), that summarizes the effects of human activity on the

environment and infectious disease emergence. This article written by Jeffrey Sachs and translated to China, discusses how infectious disease outbreaks have affect countries, and now, in the face of COVID all countries must cooperate. One country is not better than the other because everyone has a role in infectious disease emergence. Humans are responsible for contributing to the large-scale deforestation (大规模的森林砍伐), destruction of terrestrial and marine wildlife habitat (陆地和海洋野生动物栖息地的大规模破坏), biodiversity collapse (生物多样性的崩溃), and massive emissions of greenhouse gasses (温室气体大量排放). Now humans and organisms are pushed into new ecological environments, increasing their contact, ultimately giving pathogens a pathway to infect animals and then humans (Sachs 2020).

Figure 7 presents the percentage of the articles mentioning coexistence from each of the three news sources. Of the 4 subcategories, coexistence with animals has the highest percentage. 23% of the articles from *Chinese Environment*, 1% from *Health Times*, and 0% from *China Daily* mention the coexistence with animals in association with infectious diseases, encouraging the public to "to really understanding nature, wild animals, and microorganisms (真正地认识自然、认识野生动物和微生物)" as well as "form a relationship between humans and wildlife (人和野生动物的关系)" (Lin 2020, Liu 2020). The coexistence with the environment subcategory follows second with 14% of articles from *Chinese Environment*, 3% from *China Daily*, and 0% from *Health Times*. The most common phrases describing coexistence with the environment are "relationship between humans and nature (人和野生动物的关系)" or "man and nature living in harmony (人和自然要和谐相处)" (穿越寒暑 2020; Zhao 2020).

Figure 7: Percentage of Articles Related to the Coexistence



The subcategory coexistence with both animals and the environment followed third with 9% of articles from *Chinese Environment s*, 1% from *Health Times*, and 0% from *China Daily*. In one article from *Chinese Environment*, titled ““To stop the virus, why should we fast from wild animals? (阻击病毒，为何要禁食野生动物?),” the ban of the wildlife trade and decreased consumption of wild animals is encouraged. At the end of the article, the public is urged to “ respect nature (尊重自然),” “protect nature (保护自然),” and “make protecting wild animals philosophy for all of us (让保护野生动物成为我们每个人的理念)” (She 2020). This is a common theme with all of the subcategories, any mention of coexistence with animals, with the environment, or with both is included near the end.

Of the three news sources, *Chinese Environment* has the highest percentage of articles that mention coexistence. 23% mention coexistence with animals, 14% mention coexistence with the environment, and 9% mention coexistence with both animals and the environment.

Meanwhile, *Health Times* has the lowest percentage of articles that mention coexistence. *Health Times* only mentions two out of the four subcategories, coexistence with animals and coexistence with both, and neither of the percentages are very high. Additionally, not a single article from any of the three sources mention the One Health concept.

DISCUSSION

Based on the data, a variety of Chinese news sources relate infectious diseases with human behavior and actions, animals, and the environment. All three news sources, including a general, medicine and health, and environmental protection focused news source, relate infectious disease to a majority of categories and subcategories. This demonstrates some level of understanding by journalists and media produces about how animal and/or environmental health is connected to infectious diseases and human health. Of the three news sources, *Chinese Environment* has the highest percentage of articles collected that reported at least one variable and related it to infectious diseases. *Chinese Environment* also has the highest percentage of articles that reported at least one variable and related it to infectious diseases. In contrast, *Health Times* has the lowest number of articles collected that reported at least one variable and related it to infectious diseases despite being a health and medicine focused news source.

As for *China Daily*, this source has the greatest number of articles collected and reported the most variables, 15 out of 19 variables, which as an international and more general news source, is expected to provide a breadth of topics. Such a news source would also want to cover and reach as much of the public as it can, both domestically and internationally. Thus, by reading the *China Daily*, the public would be exposed to this breadth of topics, giving them the opportunity to learn, understand, and form their own perceptions and attitudes. On other hand,

both *Chinese Environment* and *Health Times* are smaller publications that are not as internationally distributed. They are both directed towards the general public, but predominately reach those living in China, perhaps even a subgroup of Chinese public, such as healthcare workers and environmental conscious individuals. In addition, *Health Times* is not known for their performance in bridging the gaps between the public and health reporter. These gaps in basic knowledge and understanding of health issues, health programs, and concepts exist as a result of health reporters' inability to report health stories that are credible and informational, but also easy to understand (Liu, Dai, and Xu 2020:547). This performance is also apparent based on the results from this research. *Health Times* consistently has the lowest percentage of articles reporting any of the subcategories and relating it to infectious diseases. Additionally, even though *Chinese Environment* reported the most in relating infectious diseases with human, animal, and environmental health as well as their connections, it cannot reach, inform, or influence as much of the public as an international, mainstream news source, like that of *China Daily* (关于我们 2022).

As a whole, only 20% of the articles collected related infectious diseases to at least one of the variables. This low number of articles shows that this issue connecting animal, environmental, and human is not widely reported. Many news sources do not frequently publish or report to the public how infectious diseases are related to the environment, animals, or human activity and how they are connected. However, since these media sources are all government owned and run, the public is more likely to trust and believe the information that these news sources publish, especially in comparison to social media-based news sources (Wu and Shen 2021:12).

Humans

Of the three news sources, human activity and behavior is the second most frequently reported category. Within this category, globalization has the highest percentage of articles. In the twenty-first century, globalization is increasingly becoming a more important and more widely talked about topic, not just in China but worldwide. As humans, animals, goods, and more are transported from city to city and from country to country, the potential that pathogens can also be transported increases. Increased connectivity between people, animals, and goods all across the global has given rise to increased "microbial traffic" and allowing outbreaks to become epidemics and potentially into pandemics, ultimately affecting human health (Keusch et al. 2009:86; Garnett and Lewis 2007:37).

A majority of the articles mentioning globalization came from *Chinese Environment*, while *China Daily* had the fewest. As an international focused news source, globalization and how it influences infectious disease emergence and human health would seem to be a highly discussed topic. Moreover, the subcategory of human activity has low percentages, the lowest percentages within the category of human activity and behavior and the lowest among the three news sources. Given China's large ecological footprint due to its massive population, population growth as a contributor of increased infectious disease emergence would seem to be reported more frequently. However, given the article's connection with COVID-19, the emergence and spread of COVID is not usually associated with globalization or population growth, but rather animals. In fact, a majority of the articles from the three news sources that mentioned animals, reported them as a source of the virus. Whereas globalization is a means of spreading a virus, not a source of a virus.

Animals

Animal consumption and exploitation and behavior is the most frequently reported category with the greatest percentage of articles reporting infectious diseases and at least one other variable comes from *Environmental Times.* As a news source directed towards publishing the party and country's policies, laws, reports, and more regarding environmental protection, *Environmental Times* is expected to frequently report on topics related to environmental health. An increase or decrease in the emergence of infectious diseases are often associated with environmental and animal factors (Bonilla-Aldana, Dharma, and Rodriguez-Morales 2020:234). A healthy environment can provide the perfect habit for animals to thrive, while a desecrated environment inhibits an animal's ability to thrive and even survive.

Among all three news sources, the subcategory food culture also has high percentages. The consumption of wild animals is deeply ingrained in China due to its long history and cultural significance (Zhang et al. 2009). Whether wild animals are consumed either for food, fashion, or for medicinal purposes, China is responsible for consuming and trading around 8,000 tons of wild meat (Li and Wang 2021:389). Given the influence wildlife consumption has in Chinese society and the connection wildlife has with both COVID and other zoonotic diseases, news sources of all types will report about how society's wild animal consumption culture influences infectious disease emergence and ultimately human health

Overall, this focus on animal health also exists for the other two news sources, *Health Daily* and *China Daily*, which is especially comprehensible given that COVID is a zoonotic disease and that "75% of emerging infectious diseases are zoonotic diseases" (Myersa et al. 2013:18754). However, animals in this context are seen more as the source of the virus. Humans exploiting and consuming animals are not commonly associated with facilitating this

transmission between animals and humans. The public in China have always had neutral, but generally anthropocentric views of the natural world, despite the fact that many in China report having positive attitudes towards the well-being and conservation of wildlife (Feng and Reiser 2011:432). This could explain the low percentages of articles mentioning wildlife trade as a contributor to infectious disease emergence.

Both the subcategories wildlife and food culture have higher percentages than wildlife trade. These low percentages could be due to the long history and influence of Traditional Chinese Medicine or due to lack of enforcement of the wildlife protection laws. In 1988, the Chinese government implemented laws that protected 300 species of wild animals, and in 2020, during the COVID epidemic, the government implemented laws banning the wildlife trade (Zhang et al. 2008; Zhang and Yin 2014:390). However, when asked to detail what made people give up wild animal consumption, 55% of participants of a study admitted to stopping in response to the potential food safety risks, while only 1.7% gave up consuming wild animals due to the wildlife protection laws (Li and Wang 2021:393). Thus, given the seemingly less than effective form of informing and reducing wild animal consumption and given how historically and culturally important TCM is in society, news source reporting about wildlife trade and its connections with infectious diseases will be limited. Some of the news sources will willingly share and some of the public will easily understand, but overall, there will still be gaps in understanding these connections between animal, environmental, and human health.

Environment

The third most frequently reported category is the environment, with biodiversity as the main subcategory being reported. An ecosystem with a high level of biodiversity of plants and

animals is able to resist pathogens, limiting new or old infectious disease emergence (Lustgarten 2020). Since biodiversity has such an integral role in infectious disease emergence, this is the only subcategory that all three news sources mentioned. In fact, the other five subcategories only had at most two news sources mentioning those subcategories. Two subcategories, in particular deforestation and global warming, are not mentioned by any news source, which is unexpected.

Deforestation, urbanization, and habitat degradation all lead to declining biodiversity, which impacts infectious disease emergence and human health (Wu et al. 2016). This failure to connect all the environmental factors to infectious disease emergence does coincide with public attitudes and behavior in China. Although, the Chinese public seems to have positive perceptions and attitudes towards environmental health and protection. They acknowledge and understand the seriousness of the environmental issues that affect China and human health (Feng and Reiser 2011:432; Chen et al. 2017:355). The government also seems to attribute importance in maintaining biodiversity by implementing ecological projects and increasing public participation on biodiversity (Li et al. 2022:4). Yet, these divergences between public knowledge and official monitoring data related to environmental conditions are frequent (Chen et al. 2017:348).

The low percentages within these subcategories could be due to lack of information and/or access to accurate information about how environmental issues and declining biodiversity lead to risks and influence infectious disease emergence. In fact, in one survey, some respondents did not consider animal epidemics and biodiversity reduction as a probable risk (Zhang et al 2013:199,200). Another reason for the low percentages could be due to the difference in attitudes and behavior. Despite the public's positive perceptions and attitudes towards environmental health and protection, it was found in a study that very few people actually performed environmentally friendly behaviors (Feng and Reiser 2011:430). Similar to

the wildlife category, the public's attitudes and perceptions towards the environment contrasted with their behavior, further supporting the idea that many in China still have a generally anthropocentric view of the natural world.

Coexistence

The least frequently mentioned topic among all three news sources is coexistence. Considering this category was the last of four to be added, any articles from this category were initially unanticipated, but the results from this category follow the same patterns found in other categories. Coexistence with animals has the highest percentage, with coexistence with the environment following second, and coexistence with both animals and the environment third.

As mentioned earlier, wild animals and their usage in consumption and production are deeply established in Chinese society, both historically and culturally. Additionally, despite the seemingly less than effective wildlife protection laws and historically short-term effective wildlife trade bans, the implementation of both demonstrates an understanding in the relationship between humans and animals as well as how that relationship impacts infectious diseases emergence (Li and Wang 2021:393; Koh, Li, and Lee 2021:2). Lastly, COVID itself has a relationship with animals. Many researchers and scientists contribute wild animals, a bat, pangolin, or other animals, as being the source of the virus (Ciotti et al. 2019:220) Thus, acknowledgment of the relationship between humans, animals, and infectious diseases emergence inherently forms.

As for the following subcategories, coexistence with both the environment and coexistence with both follow similar patterns found in another study investigating One Health perceptions and experiences in Europe. When asked to define One Health, the participants

mostly mentioned the links between human and animal health and not environmental health, suggesting human, animal, and environmental health did not have equal importance (Chiesa et al. 2021:10). It can also be suggested that human and animal health are often connected, and not environmental health, due to more research and a better understanding of human and animal health and zoonotic diseases.

Lastly, the category One Health did not have a single news source. Perhaps, the One Health concept is simply not well known among the general public and not frequently published in mainstream news or media. Even among the academic, scientific, and health care community, the One Health concept is not widely known. In fact, the earlier mentioned study also found that a majority of the respondents from 34 different European countries, who all worked in academic and scientific research, ministries, NGOS, and healthcare field, stated they knew of One Health, but could not provide a definition of One Health (Chiesa et al. 2021:4). Therefore, if academics, scientists, NGO and ministry workers do not know the One Health concept, then the general public surely will not know either, which can be greatly attributed to the lack of media reporting.

Overall, this pattern of only recognizing the connections between animal and human health, and not environmental health, is clearly consistent throughout this research. China's large ecological footprint, extensive wildlife trade, established practice of Traditional Chinese Medicine (TCM), and generally anthropocentric view of nature further supports the recognition of the connections between animal and human health. However, this pattern does not entirely coincide with the historical religious and societal structures in China. In Daoism, the balance between humans and the environment is emphasized, which is most notably seen in TCM through the concept of *yin* and *yang*. *Yin* and *yang* are opposite forces, such as positive and negative or dark and cold, and the maintenance of equilibrium between these opposite forces is

essential for good health (Hong 2004:79). Moreover, Confucianism, another dominant belief system in China, places great importance on harmony, harmony between man and the natural world (Li 2003:1). Given that the two largest beliefs systems in China emphasize this relationship between man and nature, yet the public does not fully recognize all of the connections in One Health could be attributed to the dissonance between ancient traditions that value humans and nature and the modern drive to develop as a nation. Perhaps, the One Health concept can re-introduce the environmental aspect and its influence on health into the modern world view.

CONCLUSION

China is home to some of "the world's most severe environmental problems" (Feng and Reiser 2011:429). It is responsible for over half of the global greenhouse gas emissions and continues to consume an astounding amount of wild animal meat, which in turn, accounts for over one quarter of the wildlife trade in Asia (Wu et al. 2016:2; Li and Wang 2021:389). For several years, as China modernized, the country has not had a harmonious relationship with nature and animals, but as new and old infectious diseases emerge the need to implement the One Health concept grows. Yet, given the results shown in this research, the very elements that make up the One Health concept, including humans, animals, and the environment, are not reported or communicated to the public in China, much less the concept in its entirety. In China, historically and culturally established habits and medical practices, such Traditional Chinese Medicine, animal meat consumption, and the wildlife trade limit the extensiveness of news media coverage and results in an unequal focus on animals and infectious diseases. These issues in the lack of coverage and unequal understanding go beyond China. The connections between

animal and human health, and not environmental health, are further emphasized by the very nature of COVID-19 itself, a zoonotic disease, and the already well-known One Medicine concept.

Overall, the greater understanding that animal health influences human health more than environmental health reveals what the public finds important and influential to human health. Animals have a clear and direct effect on human health, while the role of the environment and human activity on health is less obvious. Cutting down trees and releasing pollutants into the ecosystem that disturb habitats and threaten animal diversity, which ultimately increases infectious disease emergence does not provide a clear, direct pathway. This limited understanding of the interconnectedness of animals, humans, and the environment communicates the importance of One Health. Anything and anyone have a part, a responsibility, in influencing health and managing the factors that threaten health. This is a part of global health, to not only understand the sources and means of transmission, but also the responsibility that various factors have in determining and improving health for all. The One Health concept simply shows what and who is included and what is required for optimal health in not just humans, but also for the environment and animals.

BIBLIOGRAPHY

Scholarly References

Centers for Disease Control and Prevention. 2021. "Zika Cases in the United States." *Centers for Disease Control and Prevention.*

Bonilla-Aldana, D. Katterine, Kuldeep Dhama, and Alfonsa J. Rodríguez-Morales. 2020. "Revisiting the One Health Approach in the Context of COVID-19: A Look into the Ecology of This Emerging Disease." *Advances in Animal and Veterinary Sciences* 8(3):234-237.

Ciotti, Marco et al. 2019. "COVID-19 Outbreak: An Overview." *Chemotherapy* 64:215–23.

Chen, Yi et al. 2017. "Public Perception and Responses to Environmental Pollution and Health Risks: Evaluation and Implication from a National Survey in China." *Journal of Risk Research* 20(3): 347–65.

Chiesa, Francesco et al. 2021. "A Survey on One Health Perception and Experiences in Europe and Neighboring Areas." *Frontiers in Public Health* 9:1–15.

Destoumieux-Garzón, Delphine et al. 2018. "The One Health Concept:10 Years Old and a Long Road Ahead." *Frontiers in Veterinary Science* 5:1-13.

Dong, Jincheng. 2013. "The Relationship Between Traditional Chinese Medicine and Modern Medicine." *Evidence-Based Complementary and Alternative Medicine* 1-10.

Ellwanger, Joel Henrique et al. 2020. "Beyond Diversity Loss and Climate Change: Impacts of Amazon Deforestation on Infectious Diseases and Public Health." *An Acad Bras Cienc* 92(1):1-33.

Epstein, Jonathan H. et al. 2006. "Nipah Virus: Impact, Origins, and Causes of Emergence." *Current Infectious Disease Reports* 8:59–65.

Feng, Wang and Anna Reiser. 2011. “Factors Influencing Private and Public Environmental Protection Behaviors: Results from a Survey of Residents in Shaanxi, China.” *Journal of Environmental Management* 92(3):429-436.

Garnett, Geoffrey P., and James J.C. Lewis. 2007. "The Impact of Population Growth on the Epidemiology and Evolution of Infectious Diseases." *HIV, Resurgent Infections and Population Change in Africa* 27-40.

Harris, Paul G. 2006. “Environmental Perspectives and Behavior in China.” *Environment and Behavior* 38(1):5-21.

He, Yingfei, Guoliang Zhang, and Lijuan Chen (2019), “Analysis of News Coverage of Haze in China in the Context of Sustainable Development: The Case of China Daily.” *Sustainability* 12 (1): 2-15.

Hernández-Aguilar, Itandehui et al. 2021. “Coronavirus in Bats: A Review for the Americas.” *Viruses* 13:1-14.

Huang, Li. 2017. “Functions and Roles of Social Media in Media Transformation in China: A Case Study of “CCTV News.” Telematics and Information 34(3):774-785.

Knobler, Stacy and Huang, Yanzhong. 2004. “The SARS Epidemic and Its Aftermath in China: A Political Perspective.” Pp. 116-132 in *Learning from SARS: Preparing for the Next Disease Outbreak.* Washington D.C.: National Academies Press.

Hong, Francis F. 2004. “History of Medicine in China When Medicine Took an Alternative Path.” *McGill Journal of Medicine* 8:79-84.

Keusch, Gerald T., Marguerite Pappioanou, and Mila C. Gonzales. 2009. “Drivers of Zoonotic Diseases.” Pp. 77-114 in *Sustaining Global Surveillance and Response to Emerging Zoonotic Diseases.* Washington D.C.: National Academies Press.

Li, Hongying et al. 2021. “Knowledge, Attitude, and Practice Regarding Zoonotic Risk in Wildlife Trade in Southern China.” *EcoHealth Alliance* 18:95–106.

Li, Qianlin et al. 2022. “Towards One Health: Reflections and Practices on the Different Fields of One Health in China.” *Biosafety and Health* 4(1):23-29.

Li, Tianchen. 2003. “Confucian Ethics and the Environment.” *Cultural Mandala: The Bulletin of the Centre for East-West Cultural and Economic Studies*.” 6(1):1-6).

Li, Zhenyi and Huashu Wang. 2021. “Consumer Behavior and Wild Animal Consumption in China.” *Chinese Economy* 54(6):389-401.

Liu, Ning, Zhuo Chen, and Guoxian Bao. 2021. “Role of Media Coverage in Mitigating COVID-19 Transmission: Evidence from China.” *Technological Forecasting and Social Change*. 163.

Liu, Shiyu, Lingjie Dai, and Jing Xu. 2020. “Tell Health Stories Comprehensively and Accurately: A Case Study of Health Edition of People’s Daily.” *International Journal of Nursing Sciences* 7(1):46-51.

Liverani, Marco et al. 2013. “Understanding and Managing Zoonotic Risk in the New Livestock Industries.” *Environmental Health Perspectives* 121(8)873-877.

Lustgarten, Abrahm. 2020. “How Climate Change in Contributing to Skyrocketing Rates of Infectious Disease.” *ProRepublica,* May 7, 2020.

Mackenzie, John S., and Martyn Jeggo. 2019. “The One Health Approach – Why Is It So Important?” *Tropical Medicine and Infectious Diseases* 4(2):1-4.

Myresa, Samuel et al. 2013. “Human Health Impacts of Ecosystem Alteration.” *Perspective* 110(47):18754-18760.

Ostfeld, R.S. 2010. “Biodiversity Loss and the Rise of Zoonotic Pathogens.” *Clinical Microbiology and Infectious Diseases* 15(1):40-43.

Perlman, Stanley. 2020. “Another Decade, Another Coronavirus.” *The New England Journal of Medicine* 382(8):760-762.

Pin Koh, Lian, Yuhan Li, and Janic Ser Huay Lee. 2021. “The Value of China’s Ban on Wildlife Trade and Consumption.” *Nature Sustainability* 4:2-4.

Piret, Jocelyn and Guy Boivin. 2021. “Pandemics Throughout History.” *Frontiers in Microbiology* 11(632736):1-16.

Reporters Without Borders. 2020. “2020 World Press Freedom Index.” *Reporters Without Borders.*

Ritchie, Hannah and Max Roser. 2020. “CO2 and Greenhouse Gas Emissions.” *Our World in Data*.

Ritchie, Hannah and Max Roser. 2017. “Extinctions.” *Our World in Data.*

Ritchie, Hannah and Max Roser. 2017. “Internet.” *Our World in Data.*

Seghal, R.N.M. 2010. “Deforestation and Avian Infectious Diseases.” *Journal of Experimental Biology* 213(6)955-996.

Singh, Gunjan and Susan L. Shirk. 2014. “Changing Media, Changing China.” *Oxford University Press,* New York, 2011.

Still, J. 2003. “Use of Animal Products in Traditional Chinese Medicine: Environmental Impact and Health Hazards.” *Occasional Paper* 11:118–122.

Tatem, A.J., D.J. Rogers, and S.I. Hay. 2006. “Global Transport Networks and Infectious Disease Spread.” *Advances in Par*asitology 62:293-343.

Tang, Jin-Ling, Bao-Yan Liu, and Kan-Wen Ma. 2008. “Traditional Chinese Medicine.” *The Lancet*, *372*(9654):1938-1940.

Tong, Michael Xiaoliang et al. 2016. "Perceptions of capacity for infectious disease control and prevention to meet the challenges of dengue fever in the face of climate change: A survey among CDC staff in Guangdong Province, China.” *Environmental Research* 148:295-302.

Wu, Jianyong et al. 2016. “One Health in China.” *Infection Ecology and Epidemiology* 6(1):1-8.

Wu, Yi and Fei Shen. 2021. “Exploring the Impacts of Media Use and Media Trust on Health Behaviors During the COVID-19 Pandemic in China.” *Journal of Health Psychology* 1-17.

Yoroa, Kelvin O. and Michael O. Daramola. 2020. “CO2 Emission Sources, Greenhouse Gases, and the Global Warming Effect.” Pp. 3-28 in *Advances in Carbon Capture*. Sawston, United Kingdom: Woodhead Publishing.

Young, Meredith E., Geoffrey R. Norman, and Karin R. Humphreys. 2021. “Medicine in the Popular Press: The Influences of the Media on Perceptions of Disease.” *Frontiers in Public Health* 9(609949):1-15.

Zinsstag, J. et al. 2011. “From “One Medicine” to “One Health” and Systematic Approaches to Health and Well-being.” *Preventative Veterinary Medicine* 101(3-4):148-156.

Zhang, Lei et al. 2013. “Public Perceptions of Environmental Risk in China.” *Journal of Risk Research* 16(2):195-209.

Zhang, Li et al. 2014. “Wildlife Consumption and Conservation Awareness in China: A Long Way to Go.” *Biodiversity and Conservation* 23:2371–2381.

Zhang, Li, Ning Hua, and Shan Sun. 2008. “Wildlife Trade, Consumption, and Conservation Awareness in Southwest China.” *Biodiversity and Conservation* 17:1493–1516.

Zhou, Mingzhu et al. 2020. “Culture, Eating Behavior, and Infectious Disease Control and Prevention.” *Journal of Ethnic Food* 7(40):1-7.

Primary Sources Quoted

Anonymous. 2020. “穿越寒暑无问西东——写在新冠疫情构成“国际关注的突发公共卫生事件”半年之际” *China Daily*. July 31, 2020. (http://cn.chinadaily.com.cn/a/202007/31/WS5f237c99a310a859d09db3e2.html).

Anonymous. 2022. “关于我们” *China Environment*. Feb 2, 2022. (https://www.cenews.com.cn/news.html?aid=227269).

Li, Ning. 2020. “不食野味不能是因为“害怕.” *Health Times*. March 6, 2020. (https://www.jksb.com.cn/index.phpa=show&c=index&catid=248&id=160234&m=content).

Lin, Yan. 2020a. “枪响之后没有赢家.” *Environmental Times*. February 13, 2020. (https://www.cenews.com.cn/art/rw/mj/202002/t20200213_928212.html).

(------.) 2020b. “枪响之后没有赢家.” *Environmental Times*.February 13, 2020. (https://www.cenews.com.cn/art/rw/mj/202002/t20200213_928212.html).

Liu, Yang. 2020. “惊蛰之敬.” *China Daily*. March 2, 2020. (https://www.cenews.com.cn/newpos/sh/yj/202003/t20200302_931274.html).

Sachs, Jeffrey. 2020. “美国主导的时代已经终结.” *China Daily*. June 6, 2020. (https://cn.chinadaily.com.cn/a/202006/10/WS5ee0c00ca31027ab2a8cf7c2.html).

She, Huimin. 2020a. “阻击病毒，为何要禁食野生动物.” *China Daily*. March 4, 2020 (https://www.cenews.com.cn/opinion/202003/t20200304_931722.html).

(------.) 2020b.“阻击病毒，为何要禁食野生动物.” *China Daily*. March 4, 2020 (https://www.cenews.com.cn/opinion/202003/t20200304_931722.html).

Shi, Weiyan and Qian Liang. 2020. “我国进入全面禁食野生动物时代.” *Environmental Times*. March 4, 2020. (https://www.cenews.com.cn/newpos/xf/202003/t20200304_931596.html).

Wu Yanpeng. 2020. “《抗击新冠肺炎疫情的中国实践》报告全文.” *China Daily*. April 21, 2020. (https://cn.chinadaily.com.cn/a/202004/21/WS5e9e45afa310c00b73c786ed.html).

Xu, Kun. 2020. “痛下决心，告别野生动物交易.” *China Daily*. January 26, 2020. (https://cn.chinadaily.com.cn/a/202001/26/WS5e2d418aa3107bb6b579b9d5.html).

Zhang, Jing. 2020. “强化法律责任 保护野生动物.” *Environmental Times*. February 20, 2020. (https://www.cenews.com.cn/opinion/rdjd/202002/t20200220_929393.html).

Zhao, Cheng et al. 2020. “风雨无阻向前进——写在全国疫情防控阻击战取得重大战略成果之际.” *China Daily*. May 17, 2020. (http://cn.chinadaily.com.cn/a/202005/17/WS5ec1d979a310eec9c72b980a.html).