

# CROSSING SPECIES BARRIERS: THE RISING BURDEN OF ZOO NOTIC DISEASES

Authors:

1. Dr.Senthil Rajan.D

Professor & HOD, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

2. Ms.K.Sagarika

B.Pharm Final year, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

3. Ms.A.Mirudhula

B.Pharm Final year, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

4. Ms.E.Malavika

B.Pharm Final year, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

5. Ms.M.Jayasurya

B.Pharm Final year, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

Corresponding Author:

6. Mrs Sivasankari.M M.Pharm.,

Assistant Professor, Department of  
Pharmaceutics

Swamy Vivekanandha college of pharmacy

Namakkal, Tamilnadu, India

## ABSTRACT: -

Zoonotic diseases are infections that are naturally transmitted between animals and humans. They have been recognized throughout history and continue to pose significant public health challenges worldwide. The emergence and spread of zoonotic diseases are influenced by various factors such as changes in environmental conditions, urbanization, and climatic variations. Rapid urban development and increasing human–animal interactions create favorable conditions for the transmission of pathogens from animals to humans. Climate change also plays a crucial role by altering ecosystems, affecting the distribution of vectors and reservoirs of infectious agents.

The sources of zoonotic diseases include domestic animals, wildlife, and vectors such as insects. These diseases can have serious impacts on human health, animal health, and the global economy. Effective

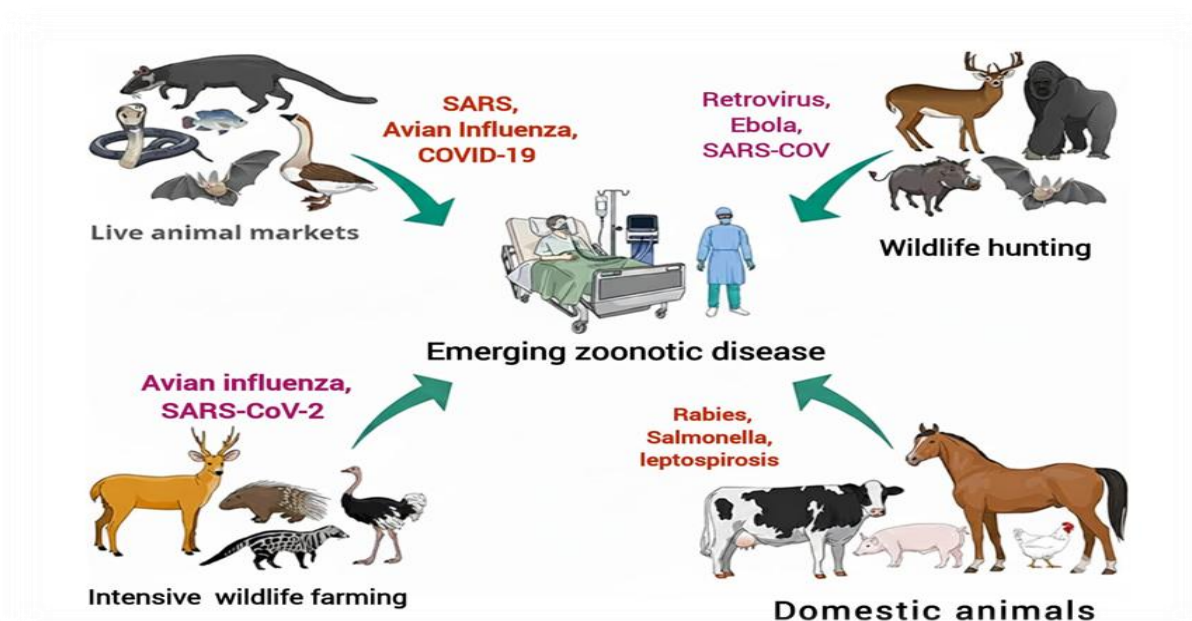
prevention and control strategies are essential to reduce the risk of transmission. These measures include maintaining proper hygiene, controlling animal reservoirs, vaccination programs, surveillance systems, and public health awareness. Treatment options depend on the type of pathogen involved and may include antimicrobial drugs, supportive care, and medical management. Understanding the history, sources, and contributing factors of zoonotic diseases is important for developing effective strategies to prevent outbreaks and protect public health.

**KEYWORDS:** Zoonotic Disease, Urbanization, Ecosystem, Vaccination program, Surveillance system, Antimicrobial drug

## **INTRODUCTION:**

The Greek words "zoon," which means animal, and "nosos," which means illness, are the origins of the term "zoonoses." Zoonosis is an infectious disease that spreads from animal species to people [1]. Numerous infectious disease-causing agents, such as bacteria, viruses, parasites, and fungi, can spread from animals to humans through a variety of methods, such as ingestion, animal bites, respiratory particle inhalation, skin/mucous membrane contact, and penetration through injured or abrasive skin. [2] There are two kinds of zoonoses: those that cause acute epidemics with high morbidity and mortality, and those that cause chronic illnesses with long-term social and economic impacts.[9] Zoonotic and vector-borne disease (ZVBD) outbreaks have become much more common in recent decades. Nowadays, 60% of all human infections and 75% of newly emerging infectious diseases are zoonotic, meaning they come from animals. Furthermore, over 80% of the world's population is at risk for vector-borne illnesses, which continue to be a danger [13]. According to a recent study, tropical regions with high wildlife biodiversity and changing agricultural land use, such as the Indian subcontinent, are more vulnerable to the introduction of zoonotic diseases [10]. Wet markets, live animal markets (LAMs), and informal markets are some of the different names for traditional food markets (TFMs). Whatever their title, they are essential to millions of people's livelihoods and supply fresh, reasonably priced food to consumers all around the world. According to estimates, zoonoses account for up to 75% of all newly developing infections over the past ten years, and 61% of all human illnesses have a zoonotic origin [3]. Humans are frequently exposed to endemic food-borne illnesses, which are caused by bacteria, parasites, and viruses that infect animals or contaminate meat, in addition to emerging zoonotic diseases, which are those that have roots in nature and are growing in frequency or geographic range [11]. Anthrax, bovine tuberculosis, brucellosis, cysticercosis, echinococcosis, leishmaniasis, rabies, and human African trypanosomiasis are among the eight illnesses that the WHO has classified as NZD. Millions of impoverished livestock keepers around the world are the most vulnerable to neglected zoonotic illnesses, which can have catastrophic effects on both animal and public health. Clinical symptoms of zoonotic diseases resemble those of typhoid, HIV/AIDS, and malaria in humans, which can result in misdiagnoses and underreporting and an underestimating of the disease burden. neglected zoonotic illnesses [4]. Additionally, rodents, which are the main hosts of both viral and non-viral zoonotic diseases (such as leptospirosis, salmonellosis, yersiniosis, pathogenic E. coli, campylobacteria's, giardiasis, and Lyme disease), are known to carry at least 85 zoonotic pathogens [5]. India's tropical environment, diverse wildlife

host species, dense population, and tighter human-animal interactions make it one of the hotspots for newly emerging zoonotic illnesses. To effectively and efficiently prevent the emergence and transmission of zoonotic diseases, multi-sectoral coordination through One Health is necessary [6]. Close human-animal interactions, abundant biodiversity, and ecological disturbances all contribute to Africa's high risk of zoonotic disease outbreaks by fostering an environment where diseases can spread from animals to people. Wildlife reservoirs are often the source of diseases like Ebola and Marburg, whose initial transmission is proved to be animal-to-human. The critical need for surveillance is highlighted by the fact that over 75% of newly emerging infectious illnesses are zoonotic and frequently associated with ecosystem changes. Climate change makes Africa even more vulnerable to these hazards, highlighting the necessity of integrated strategies for efficiently monitoring and reducing zoonotic risks. Fruit bats, which are thought to be the virus's natural reservoir, were identified as the source of the Ebola outbreak that occurred in West Africa between 2014 and 2016 [7]. For instance, human tuberculosis is thought to be the second most common cause of death after HIV/AIDS; brucellosis is one of the most prevalent zoonotic illnesses, accounting for over 500,000 cases annually; and rabies, the deadliest zoonotic disease, kills between 30,000 and 70,000 people annually [8]. One health is a cooperative multisectoral strategy that brings together doctors, veterinarians, epidemiologists, and other specialists to comprehend the ecology of each newly emerging zoonotic disease in order to combat the spread of zoonotic diseases between humans and animals [12]. In addition to causing physical harm to people and animals, natural catastrophes can also cause zoonotic illnesses to originate or become more common. Particularly, earthquakes can be regarded as a crucial stress element in the activation of latent diseases in animals and the spread of zoonotic viruses. In the days after the earthquake, outbreaks of acute respiratory, acute gastrointestinal, and vector-borne infectious diseases may occur due to community displacement or issues with infrastructure and shelter, in addition to infectious diseases like skin and soft tissue and tetanus brought on by the trauma during the earthquake [14].



Echinococcosis, foodborne trematodiasis, human African trypanosomiasis (HAT), leishmaniosis, rabies, and taeniasis/cysticercosis are among the six neglected zoonotic diseases (NZDs) included in the WHO's recent roadmap to eradicate neglected tropical diseases [15]

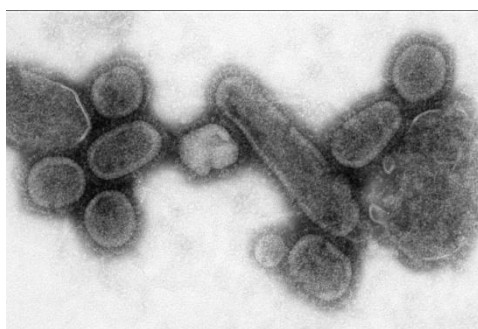
## HISTORY OF ZOOONOTIC DISEASE:

Since the 1950s, and particularly since the 1970s, the prevalence of zoonotic illnesses has increased. Global travel and trade, deforestation, industrial agricultural production, encroachment into wild animal habitats, and climate change are all contributing factors to this surge.

## ANIMAL INFECTIONS AT THE HUMAN-ANIMAL INTERFACE:

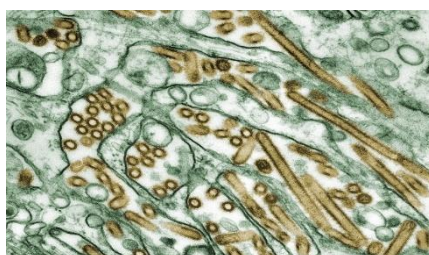
The first zoonotic infections, smallpox and measles, appeared in humans between 200 BCE and 300 CE, according to disease ecologists. Following the growth of international trade and transportation networks and the start of European colonization, the Black Death spread to Europe in the fourteenth century. Smallpox was introduced to the Americas by European settlers in the fifteenth and sixteenth century.[46]

**1. SPANISH FLU:** About 50 million people are thought to have died because of the 1918 "Spanish flu" pandemic, which was brought on by the H1N1 influenza virus [30]. Three further human IAV pandemics have since struck: the Asian flu (H2N2) in 1957, the Hong Kong flu (H3N2) in 1968, and the swine flu

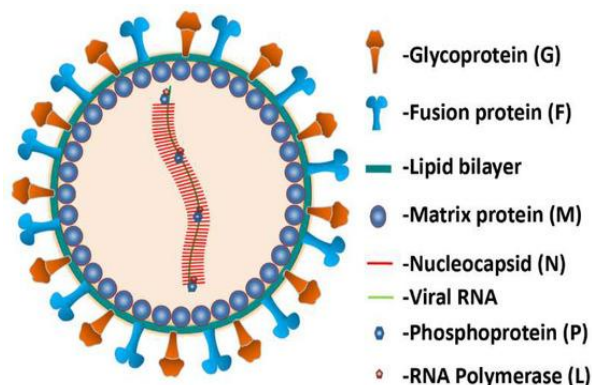


(H1N1) in 2009.[47]

**2. H5 VIRUS:** Based on serological studies using Tern/South Africa/61 (now A/tern/South Africa/61 [H5N3]) and Chicken/Scotland/59 (Smith strain) (now A/chicken/Scotland/59 [H5N1]), H5 was identified as a novel antigenic variation of influenza virus in 1966. These viruses were categorized as the Hav5 (hemagglutinin avian 5) subtype, which subsequently evolved into the H5 subtype. In 1988, the hemagglutinin (HA) gene of A/chicken/Scotland/59 was sequenced.[48]



**3. NIPAH VIRUS:** Nipah virus (Niv) is a zoonotic virus with a high case fatality rate that belongs to the Paramyxoviridae family's Henipaviral genus. In the Malaysian town of Kampung Sungai Nipah, the first known human infection occurred in 1998, sparking a fatal outbreak that persisted until 1999. The first Niv infection cluster was discovered in Perak, Malaysia, in September 1998. It was followed by two further clusters in the state of Negri Sembilan, where infections were mostly found in adult men who had come into contact with swine. Niv was identified from both afflicted individuals and the pigs in a cluster of 11 identical cases that were discovered in Singapore in March 1999 among abattoir workers who had come into touch with pigs imported from the outbreak regions of Malaysia.[49]



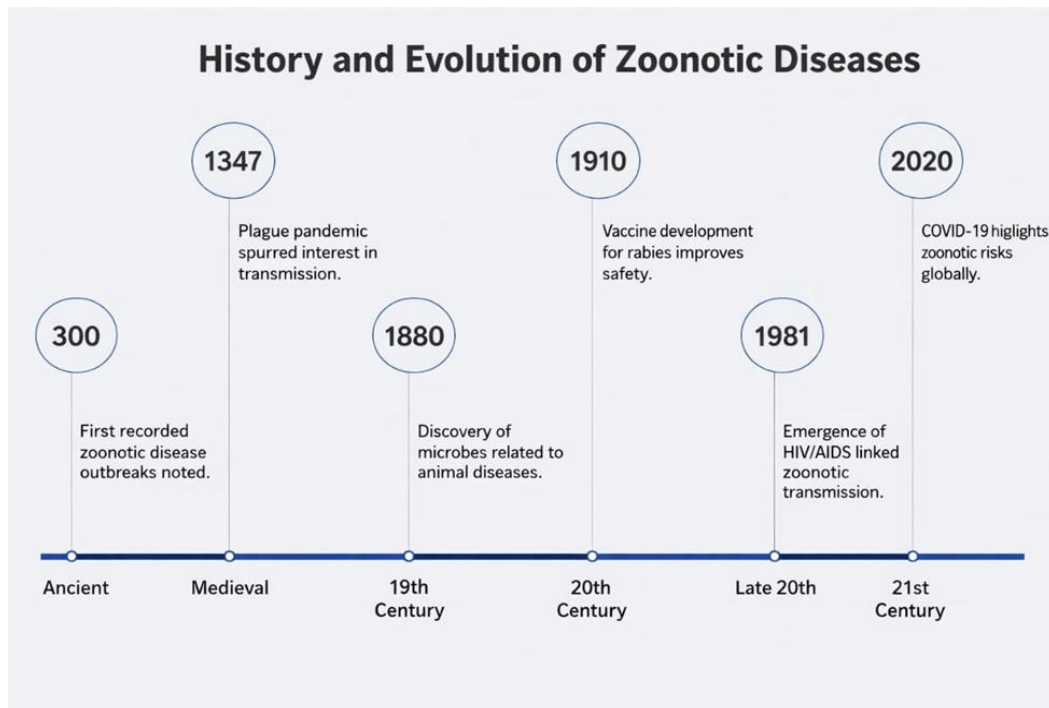
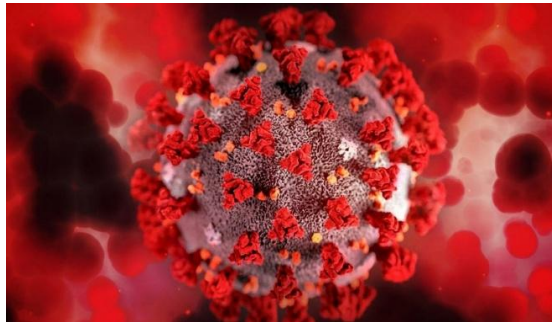
**4. WEST NILE VIRUS:** In 1937, WNV was first identified in a female patient in Uganda. However, the outbreaks in Israel in 1957 and France in the early 1960s were the first signs that its infection caused meningitis and encephalitis in humans. WNV gained notoriety in the 1990s after multiple outbreaks with severe neurological illness cases and a high death rate were documented in various regions of North Africa, Europe, and Israel. WNV was first identified in North America during a 1999 outbreak in New York City.



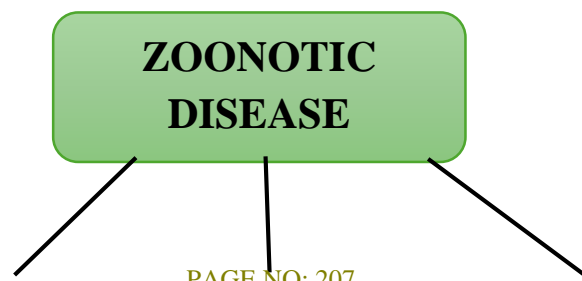
Within three years, it had quickly spread throughout most of the United States and its neighbouring nations, including Canada, Mexico, the Caribbean, and Central America.[50]

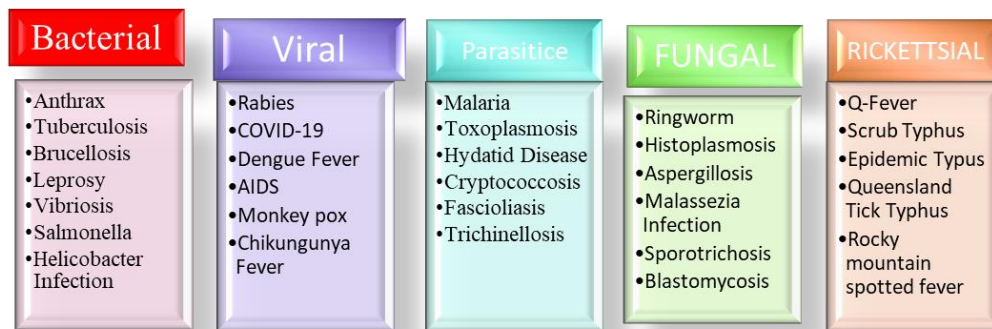
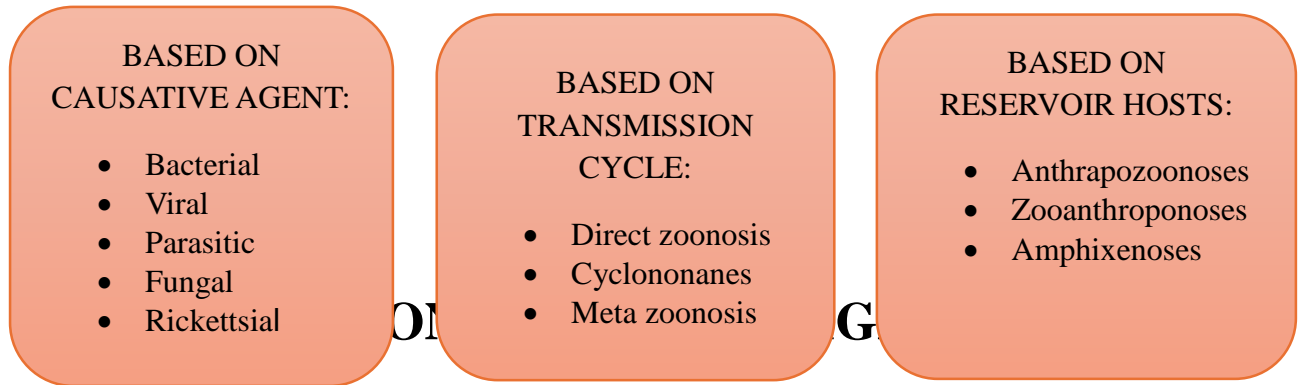
**5. CORONA VIRUS:** The study of human coronaviruses initiated in 1965, when researchers Tyrrell and Bynoe demonstrated that the B814 virus could be passaged. It was found in human embryonic tracheal organ cultures obtained from the respiratory tract of an adult with a common cold. The presence of an infectious agent was demonstrated by inoculating the medium from these cultures intranasally in human volunteers; colds were produced in a significant proportion of subjects, but Tyrrell and Bynoe were unable to grow the agent in cell culture at that time.[51] The fifth pandemic since the 1918 flu pandemic, coronavirus disease 2019 (COVID-19), is currently afflicting people worldwide. As of late December 2019, Wuhan City, China, has been the site of a cluster of unique human pneumonia cases that led to the initial report and

subsequent outbreak. The first symptom appeared on December 1, 2019.[52] Wuhan, in the Chinese province of Hubei, experienced an outbreak of pneumonia of unknown etiologic towards the end of December 2019. One As of January 31, 2020, the pandemic had spread significantly, infecting 9720 people in China with 213 fatalities and 106 persons in 19 other countries.[53] The term "coronavirus" refers to enveloped positive sense RNA viruses that range in diameter from 60 to 140 nm and have spike-like projections on their surface that give them a crown-like look when viewed under an electron microscope. Humans have been exposed to four corona viruses, which often cause minor respiratory illnesses: HKU1, NL63, 229E, and OC43.[54]



## CLASSIFICATION ZOOONOTIC DISEASE:





## BASED ON TRANSMISSION CYCLE:

### ✓ Direct zoonosis:

Transmission From Animal To Human Directly.

Example: Rabies, Anthrax

### ✓ Cyclononanes:

Requires more than one vertebrate host.

Example: Taenia (tape worm)

### ✓ Meta zoonosis:

Requires invertebrate vector like Mosquito, Tick etc

Example: Plague, Lyme disease

Classification based on Reservoir hosts :

## CLASSIFICATION BASED ON RESRVOIER HOST:

### ✓ Anthrapozoonoses:

These are diseases of domestic and wild animals which occur in nature independent of man. Human beings get infected from animals in unusual circumstances, through occupational contact or food .

Example: Leptospirosis, tularemia, Rift valley fever, hydatidosis, rabies.

✓ **Zoonothronoses:**

These are diseases which normally pass from human to other vertebrate animals.

Example: Tuberculosis (Human type), amoebias.

✓ **Amphixenoses:**

The agent can pass from man to animal and animal to man.

Example: Streptococcosis, non-host specific Salmonellosis, Staphylococcosis

## **SOURCES AND TRANSMISSION OF ZONOTICS DISEASE:**

origin of zoonotic parasites, such as microsporidia, Giardia intestinalis, and Cryptosporidium species [16]. Researchers have discovered links between it and a variety of social and cultural factors. Newly discovered zoonotic diseases have been spreading.[17] Sheep milk and its derivatives are now widely consumed in many communities and regions. Additionally, persons who are allergic to cow's milk use these goods.[18].

There are many different causes of zoonotic infections, but they frequently result from interactions between humans, domestic animals, and wildlife. Among are the main causes of zoonotic illnesses

a) Reservoirs for wildlife

Wildlife populations, including bats, rats, and monkeys, are the source of many zoonotic infections. These animals may harbor bacteria and viruses that can infect humans and cause illnesses including SARS, HIV, and Ebola.

b) Domestic animals:

Pets and livestock can act as middlemen in the spread of zoonotic diseases. For instance, influenza strains frequently start in pigs and domestic birds before spreading to people

c)Environmental factors:

Urbanization and deforestation are examples of environmental changes that can upset ecosystems and increase human-wildlife contact, which increases the risk of disease transmission. Transmission routes Humans can contract zoonotic diseases through a number of routes, such as: Direct contact: Disease transmission can occur by direct contact with diseased animals, their body fluids, or their tissues. Brucellosis from contact with infected livestock and rabies from dog bites are two examples. Transmission via vectors: Zoonotic infections can spread from animals to people through insects like ticks and mosquitoes. Vector-borne zoonoses include illnesses like Lyme disease and malaria. Foodborne transmission: Zoonotic illnesses can arise from eating contaminated animal products or undercooked meat. Two well-known examples are Salmonella and E. coli. Transmission by air: When sick humans or animals cough or sneeze, respiratory droplets can spread some zoonotic diseases, such as influenza and tuberculosis.[19].

**1)Water borne:**

Water is a fast-expanding global source of zoonotic diseases. Contaminated drinking or sanitation water can spread infections. Humans are particularly vulnerable to watery zoonotic infections because of our reliance on water.

**2) Fecal oral:**

Additionally, hepatitis A and E are highly prevalent viral illnesses worldwide. Hepatitis E is usually spread by drinking water tainted by feces as a result of inadequate sanitation, while hepatitis A is usually contracted by eating raw food or food contaminated by an infected handler.

**3) Borne Food:**

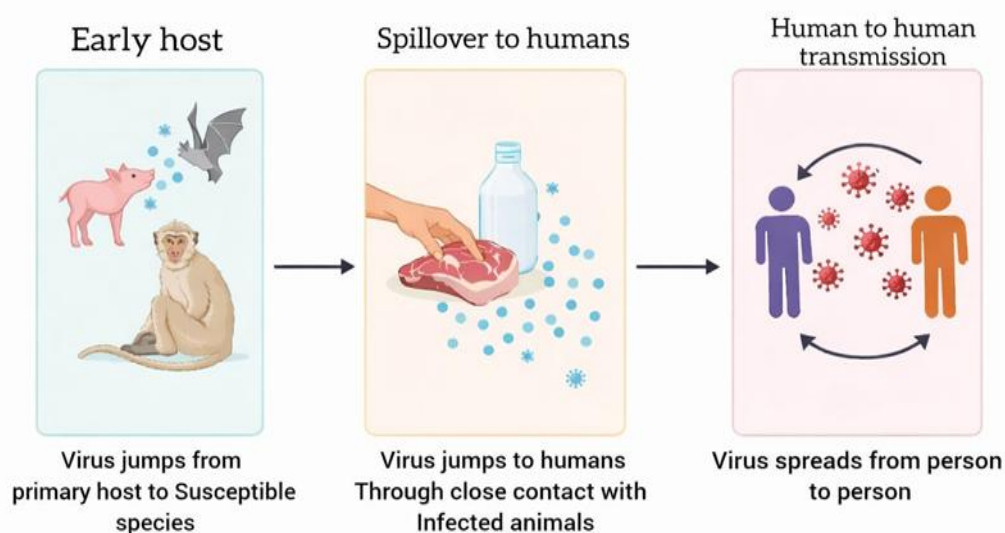
Certain zoonotic diseases may only spread through food, therefore contamination might result from unhygienic conditions and incorrect preparation. One of the most frequent causes of acute sickness is foodborne illness.

When fish or shellfish are not consumed promptly, decomposition can take place and produce toxins like Ciguatera, which can lead to fish poisoning.

**4) Vector Borne:**

A vector is another significant way that zoonotic infections spread. Due to their prevalence and need to feed on blood, mosquito-borne illnesses can spread quickly; frequently, people are unaware that they have been bitten until the illness manifests. The West Nile virus, plague, tularemia, and Ehrlichia are some of the most common illnesses brought on by vectors. Viral haemorrhagic fevers, which frequently result in complications such malaise, rashes, bruises, and bleeding, are caused by yellow fever, dengue, and Rift Valley. [20]

## Zoonotic Disease Transmission



## ROLE OF WILDELIFE LIVESTOCK AND PETS IN ZONOOSES:

"Animal rodents also constitute a reservoir of hantaviruses. The viral are shed in urine, droppings, and saliva, and humans are mainly infected aerogenic ally by breathing particulates containing the virus [21]. Increased interactions at the wildlife-human interface are largely caused by deforestation. A tick-borne flavivirus created a new disease in India in 1957 that was called after the recently cleared Kya Sanur Forest (Taylor, 1997). This disease was brought on by the clearing of forest area that was later utilized for cattle grazing. Adverse consequences for wildlife Because captive wildlife populations frequently interact with human populations, they may be perceived as disease victims. Despite the fact that cattle and wild animals rarely interact, M. Bovis transfer from domestic animals to wildlife (spillover) and subsequent spillback persisted for millennia (Bose, 2008). There have been numerous reports of tuberculosis in wild animals kept in captivity (Chakraborty et al., 1993). In wild monkeys apart from human occupation, tuberculosis is most likely non-existent (Montali et al., 2001). The current frequency of tuberculosis in wild animals kept in captivity may be due to human introduction of the disease According to Satpute et al. (2010), E. coli has been isolated from wolves (Canis lupus) and endangered captive wild tigers (Panthera tigris). Zoos in northern India have isolated various strains of Salmonella, including S. enteritidis from rodents, S. typhimurium, and a strain of Salmonella group E1 from carnivores (Sethi et al., 1980). Given the vastly varied and widely distributed wildlife populations that roam freely throughout India, the existence of zoonotic diseases in wildlife is extremely significant. 344 of the more than 2094 bird species found on the Indian subcontinent are migratory, primarily from the northern Eurasian regimesh and Ramon (Raachandran, 2005) [22]. "Emergence of Wildlife Zoonoses and Shifts in Agricultural Practices "Argentine haemorrhagic fever first appeared in east-central Argentina in the 1950s, and its spread to north-central Argentina has been closely associated with the growth of agricultural practices, particularly maize cultivation, which supports the virus's primary reservoir, the maize mouse (Calomys musculinus). Argentine hemorrhagic fever, which primarily affects adult male agricultural labourers during the harvest season, is caused by the Junin virus. Adult male agricultural labourers are the predominant victims of Argentine hemorrhagic fever, especially during the harvest season. The discovery that the simian foamy virus is a zoonotic retrovirus that infects individuals who come into close touch with fresh nonhuman primate bushmeat suggests that these zoonoses are more common, pervasive, and modern than previously thought. Human T-lymphotropic virus types 3 and 4, two novel retroviruses, have also been discovered in people who hunt, kill, or keep monkeys or apes as pets in southern Cameroon [23]. Significant progress in comprehending disease dynamics and enhancing public health outcomes has been made throughout the history of wildlife surveillance for zoonotic illnesses in the United States. It has long been known that wildlife serves as crucial sentinels for newly emerging zoonotic illnesses, offering early warning indicators of possible risks to the health of people and animals. A evaluation of monitoring systems in the United States in March 2024: Wildlife as sentinels for new zoonotic diseases [24].

## **BENEFICAL EFFECT**

### **More Resources:**

- Water
- Food

### **Decreased illness prevalence due to habitat:**

- The dilution effect

### **Decreased incidence of disease:**

- The dilution effect

### **Enhanced agro- ecology**

- Through advantageous connections.
- Dung beetles
- Tourism with wildlife

## **ADVERSE DRUG EFFECT**

### **Reduce Resources:**

- Water
- Food
- Loss of biodiversity in habitats
- The dilution effect

### **Climate shifts:**

- Destruction of habitats
- Infectious disease caused by CO2 emissions.

### **Predation Transmission of infectious diseases:**

- A decrease in productivity
- The socioeconomic burden
- Security of food
- Zoonotic illness
- Emerging infectious disease "Many nations rely heavily on livestock for their economic development."

In many nations, livestock plays a significant economic role in their development. Livestock are a major source of zoonotic germs and frequently contribute to their spread to humans due to increased contacts (such as outdoor access and high animal densities). "Zoonoses involve the mutual interactions of pathogens, humans, animals, and environment; further, some zoonotic agents like highly pathogenic A influenza virus, SARS-CoV and SARS-CoV-2 were able to spread globally and cause pandemics"[55]. Globally, livestock production has a significant impact on wildlife populations due to changes in land use and encroachment on animal habitats (Gordon, 2018). Reduced habitat, food, and water for animal populations are the results of this increasing competition with cattle, which also affects the quantity and variety of wildlife. As previously mentioned, the "dilution effect" on disease prevalence may be lost as a result of biodiversity decline; disease prevalence may rise if susceptible species take over an environment as a result of biodiversity loss. For instance, excessive grazing pressure brought on by high stocking numbers or prolonged grazing can lower

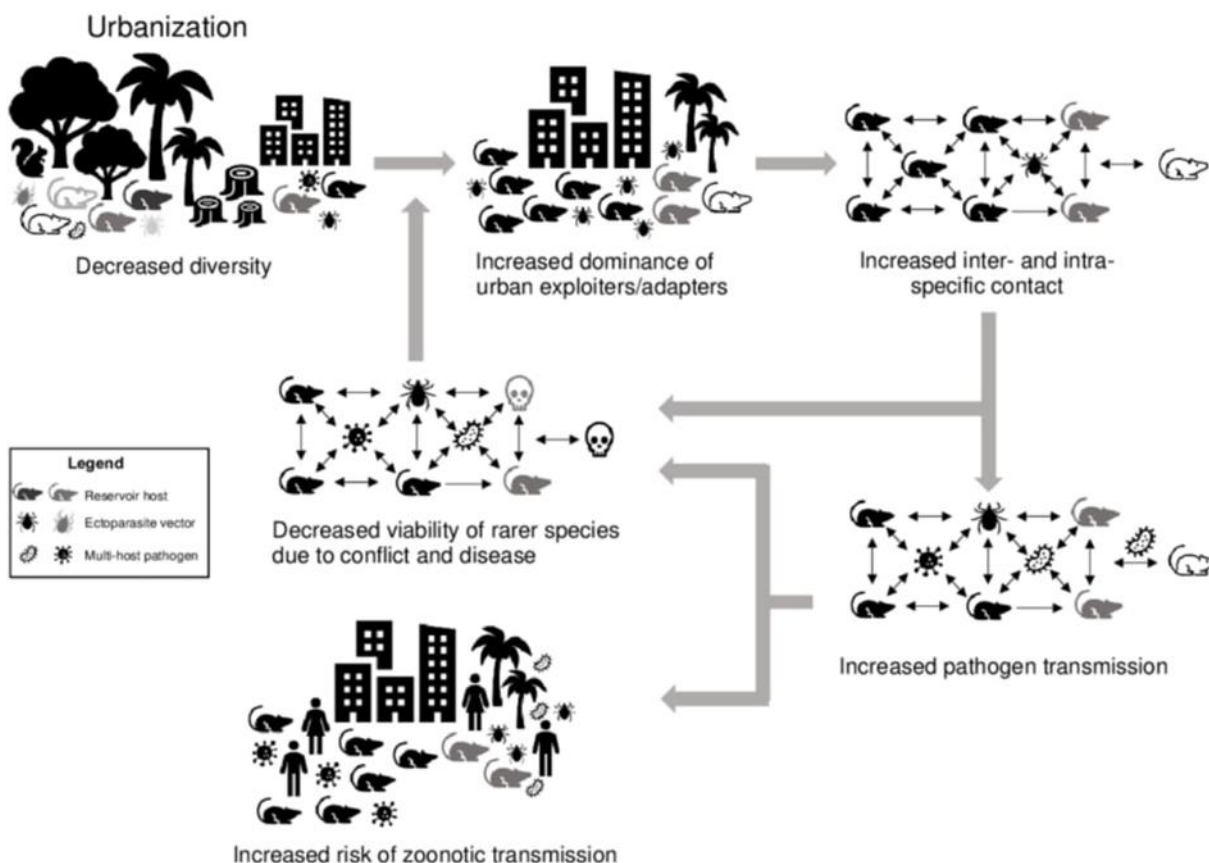
vegetation diversity and abundance, which lowers the amount of adequate habitat space and fodder available for animal species (Boone et al., 2005) [56].

## **The Impact of Human Activities Cause Zoonotic Disease:**

In addition to altering natural landscapes, human activities like urbanization, deforestation, wildlife exploitation, tourism, and global climate changes brought about by human habitation of the planet also act as catalysts for the emergence of zoonotic diseases, which raises the prevalence of zoonoses that are already known. Since emerging zoonoses account for over 60% of infectious diseases that humans encounter and have the potential to wreak global devastation, as demonstrated by the COVID-19 pandemic, it is crucial to investigate the diverse sources of these diseases [36]. Even though it seems impossible to totally prevent new infections from spreading from animals to people, if we have a better understanding of the activities that influence or drive these zoonotic transmissions, we may be able to lessen the severity of risks to the human population through faster or more effective methods of detection, early warning systems, and appropriate control or prevention policies.[37]

### **•Urbanization:**

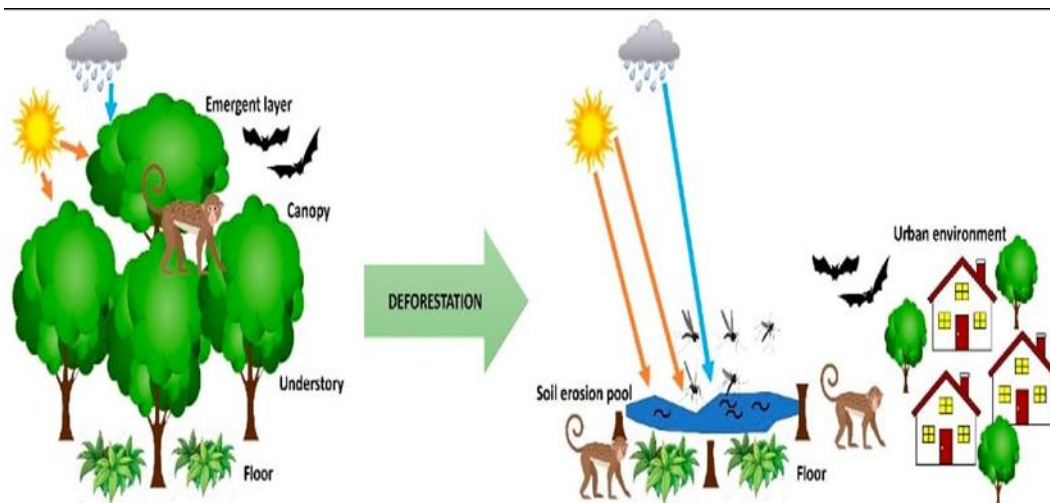
Urbanization is a complicated process that has been linked to quick changes in the environment and population shifts, both of which are elements that have been linked to the dynamics of infectious disease transmission. On the one hand, urbanization has been demonstrated to change the makeup of animal communities and increase the number of species that flourish in urban environments, which may lead to both immediate and long-term health issues as well as the advent of contagious diseases.[38] Much of Southeast Asia is fast changing due to urbanization, which also affects the frequency and intensity of interactions between humans, wildlife, and the environment as well as the structure and function of the landscape. [39] It is thought that more urban areas encourage the existence of zoonotic-infected wildlife because sick animals need more energy, thus they migrate to urban areas where there is more food, warmth, and shelter.[36]



- **Deforestations:**

One effect of human population growth is deforestation, which raises the danger of zoonoses. Through changes in host and vector groups, vector breeding habitat, microclimate suitability for pathogen growth, and vector–human contact rates, among other factors, vector-borne diseases—pathogens spread by biting arthropods—are especially vulnerable to forest loss and fragmentation. [40] According to others, the illness may spread more easily to non-forest areas because of forest loss [8,9]. Although the exact method is uncertain, more frequent interaction between humans and sick wild animals is probably the cause. Contact with a bat colony has been connected to the most recent outbreak in Guinea, which some have connected to the decline of forests. [41] Primates and bats are the main hosts of the Ebola virus [36]. Three distinct bat species—*Hypsignathus monstrosus*, *Myonycteris torquata*, and *Epomops franqueti*—have been identified as EVD reservoirs. [42] It's interesting to note that deforestation and the resulting new animal movements also had a significant impact on the Nipah virus (Niv), which originated from fruit bats and can spread to people. NIV has been linked to encephalitis, or brain swelling, and possibly even death. [43] Because deforestation alters wildlife communities, there is rising worry about the potential for zoonotic spillover. Between 1990 and 2016, the rise in zoonotic outbreaks—mostly in tropical regions—was partially linked to the expansion of the human population. When wildlife hosts have lost habitat space in a deforested area, it would be very beneficial to encourage their relocation to alternate wooded areas to assist lower the danger of the emergence and spread of zoonotic infections. Deforestation is causing ecological landscape

disturbances, biodiversity loss, and displaced wildlife migrations to nearby communities, all of which are linked to an increase in zoonotic infections.[36]



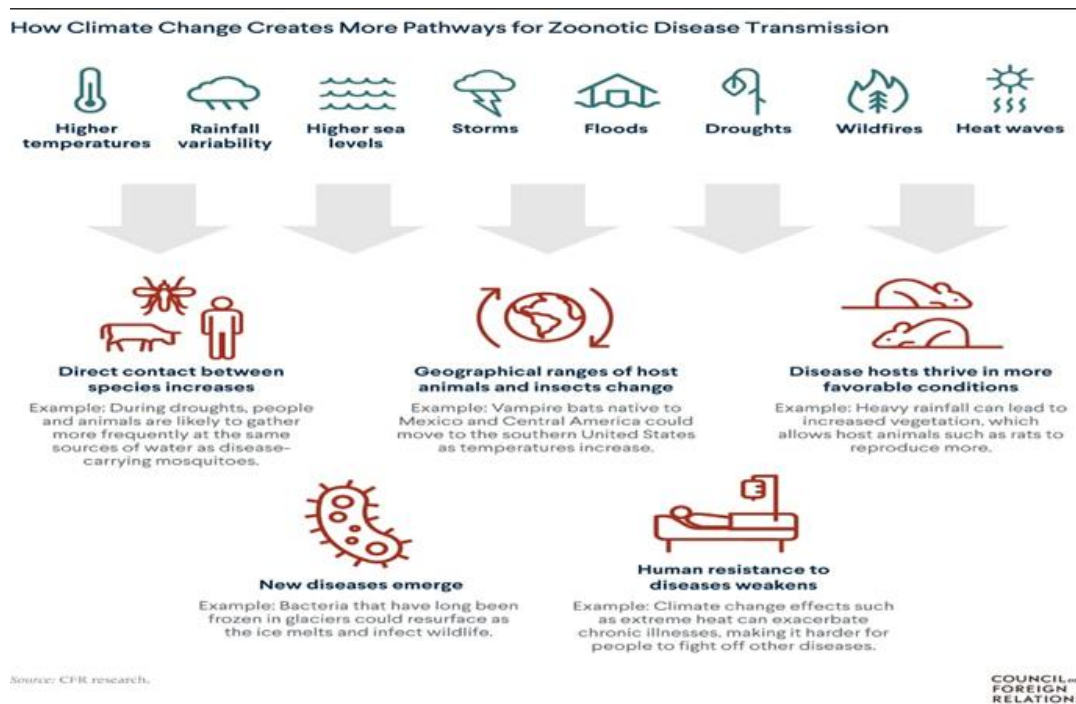
### •Tourist place:

Zoonoses are spreading as a result of humanity's advancements in travel technology. Opportunities for leisure activities that enhance human interaction with animals are also created by human discovery of new areas. It's interesting to note that when people imagine animals interacting with people, they occasionally think of everyday household pets, rodents, and birds. However, in recent years, more exotic animals—like South African lions reared on farms for commercial purposes, including tourism—have also encounter humans and raised the risk of zoonotic diseases. On these farms, direct contact and zoonotic risks with big game animals that were previously kept rather apart from human interactions have increased due to interactive tourism activities like petting the cubs and other uses of these captive lions, like killing them for trophy hunting or medical purposes. There are zoonotic risks associated with lions in zoos. Zoonotic illnesses are known to affect zookeepers and volunteers who care for them, even though the public may not be directly engaging with them. In 2015, for example, a zookeeper tending to a lion cub developed dermatophytosis as a result of the animal passing on harmful fungi to the caretaker.[44]

### •Climatic Change:

Zoonotic infections are also brought on by climate change. precipitation, humidity, and temperature are all impacted by climate change. Vectors including mosquitoes, ticks, and rodents are more prevalent because of these environmental changes. The prevalence of zoonotic illnesses has been impacted by the anomalous changes in the climate caused by these increases. The establishment of zoonotic illnesses can be impacted by changes in global temperatures, which can also change the number of vectors, transmission cycles, and species contact. The occurrence of zoonotic illnesses has been impacted by the anomalous changes in the climate caused by these increases. The establishment of zoonotic illnesses can be impacted by changes in global temperatures, which can also change the number of vectors, transmission cycles, and species contact. [45] As the world has been more aware of the risks of greater zoonotic

transmissions because to events like the COVID-19 pandemic, the significance of climate change's impact on the introduction of zoonotic illnesses has increased in recent years. It has been reported that SARS-CoV-related coronaviruses can infect wild animals, and it has been proposed that COVID-19 spread from a seafood market in Wuhan, China.[36]



## PREVENTION AND CONTROL OF ZOOONOTIC DISEASE:

Strong ties between medical and veterinary aspects are essential for the prevention and control of zoonotic infections, which represent a serious threat to public health systems [25]. Sometimes the terms "primary prevention" and "secondary prevention" are used to refer to control and prevention.[26] "Primary prevention" and "secondary prevention" are terms used to describe preventive and control. The goal of primary prevention is to keep the population healthy by stopping the spread of illness. The goal of secondary prevention is to reduce harm once an illness has already occurred. Sometimes referred to as "tertiary prevention," rehabilitation is a crucial financial component of disease control and prevention when primary and secondary prevention have failed.[27] Individuals with severe acute respiratory syndrome (SARS) and their travel history. In a few of weeks, airplane travellers carried SARS to other continents when it evolved to be effectively conveyed from animal to human. [28] The precautionary principle has been applied in numerous instances to stop or prevent the spread of diseases [29]. A number of significant actions must be taken in order to prevent and control emerging zoonoses, including identification, research, and cooperation; the creation of sophisticated structures for diagnosis and surveillance; international and interdisciplinary interventions; applied epidemiological and ecological research; education (including training and technology transfer); and information/communication [30]. In order to prevent and manage zoonotic illnesses, surveillance is essential. Early infection, afflicted persons and animals, reservoirs, vectors, and endemic regions, including "hotspots," can all be found using it. The four methods of surveillance listed below can be

used to prevent zoonoses: To find and identify pathogens, use pathogen surveillance. Serological surveillance uses immune response monitoring to find pathogens in human or animal blood. Syndrome surveillance uses data analysis based on symptoms to assess the likelihood of diseases. The presence of pathogens cannot be detected using this analysis-based surveillance. Risk surveillance is used to identify risk variables that contribute to disease transmission. The clinical characteristics and prevalence of numerous disorders cannot be ascertained using this control method.[31] The prevention and management of zoonoses are greatly aided by the one health approach. The One Health Commission defines one health as "the cooperative effort of multiple disciplines to obtain optimal health for people, animals, and our environment." An international, interdisciplinary, and cross-sectoral approach to disease surveillance, monitoring, prevention, control, and mitigation of emerging and re-emerging diseases is proposed by the "One Health" approach, which acknowledges the close connections between human, animal, and environmental health systems. [32] Particularly in environments with limited resources, the prevention and management of zoonotic illnesses place a special and frequently significant burden on public health services. Medical and veterinary health organizations have a significant interest in disease surveillance and control efforts because many zoonotic infections have a profound impact on both humans and animals. Frameworks for Zoonotic Disease Prevention, Identification, and Management.[33] Veterinarians, public health officials, and other experts must work together to prevent zoonotic infections. This include actions including early identification and monitoring, animal immunization programs, safe food preparation and handling, and public education and awareness campaigns. In order to identify and track zoonotic illnesses in both humans and animals, it entails exchanging data and resources and creating integrated surveillance systems. The pledge highlights the significance of using a One Health strategy to stop and manage the spread of zoonotic illnesses. In conclusion, multidimensional classification establishes a network of interrelated knowledge that supports surveillance, early warning, pathogen research, and policy development, offering a methodical point of reference for the prevention and control of zoonotic diseases in the future. Additionally, it encourages the three organizations to work together to enhance zoonotic disease surveillance and fund studies to gain a deeper understanding of the factors that contribute to the emergence and transmission of zoonotic diseases.[34] In conclusion, multidimensional classification establishes a networked framework of knowledge that supports surveillance, early warning, pathogen research, and policy development, offering a methodical reference for the prevention and control of zoonotic diseases in the future.[35]

S.NO	DISEASE	SYMPTOS	TREATMENT	PREVENTION
1.	Rift Valley Fever[virus] Natural Host: Cattle	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Muscle Pain</li> <li>• Headache</li> <li>• Back Pain</li> <li>• Dizziness</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine - available.</li> <li>▪ Not Specific [Supportive Care]</li> </ul>	<ul style="list-style-type: none"> <li>• Avoiding mosquito bites</li> <li>• Vaccinating the animal against</li> </ul>

		<ul style="list-style-type: none"> <li>• Weight Loss</li> <li>• Loss Of Sight</li> <li>• Confusion</li> <li>• Liver Problems</li> <li>• Meninge</li> <li>• Eye Infection</li> </ul>		disease.
2.	Influenza/Flu[virus] Natural host: Cattle, Pigs, Aquatic Birds	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Runny Nose</li> <li>• Sore Throat</li> <li>• Muscle Pain</li> <li>• Headache</li> <li>• Coughing</li> <li>• Fatigue</li> <li>• Diarrhea</li> <li>• Vomiting</li> <li>• Tiredness (Extreme)</li> <li>• Pneumonia</li> <li>• Acute Respiratory Distress Syndrome Meningitis</li> <li>• Encephalitis</li> <li>• Asthma</li> <li>• Cardiovascular Diseases</li> <li>• Sepsis</li> <li>• Lysis Of Cells.</li> </ul>	<u>HEMOTHERAPY:</u> <ul style="list-style-type: none"> <li>▪ Oseltamivir</li> <li>▪ Baloxavir</li> <li>▪ Zanamivir</li> <li>▪ Supportive Care.</li> <li>▪ Vaccine-available</li> </ul>	<ul style="list-style-type: none"> <li>• Hand washing</li> <li>• Flu vaccine</li> <li>• Social Distance</li> <li>• Cover your nose and mouth while sneezing</li> </ul>
3.	Salmonellosis [Bacteriae] Natural host: Contaminated food	<ul style="list-style-type: none"> <li>• Food Poisoning</li> <li>• Diarrhea</li> <li>• Fever</li> <li>• Abdominal Cramps</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-available</li> </ul> <u>HEMOTHERAPY:</u> <ul style="list-style-type: none"> <li>▪ Ciprofloxacin</li> <li>▪ Ceftriaxone</li> </ul>	<ul style="list-style-type: none"> <li>• Proper Washing</li> <li>• Preparation of food</li> <li>• Vaccine</li> </ul>

		<ul style="list-style-type: none"> <li>• Vomiting</li> <li>• Enteritis</li> <li>• Typhoid Fever</li> <li>• Irritable Bowel Syndrome</li> <li>• Inflammatory Bowel Disease</li> <li>• Chills</li> <li>• Headache</li> <li>• Stomachache</li> <li>• Nausea.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trimethoprim</li> <li>▪ Sulfamethoxazole</li> <li>▪ Azithromycin,</li> <li>▪ Supportive Care.</li> </ul>	<ul style="list-style-type: none"> <li>• Food Hygiene.</li> </ul>
4.	<p>Monkeypox [Orthopox virus] Natural host: Small animals</p>	<ul style="list-style-type: none"> <li>• Rash</li> <li>• Blisters</li> <li>• Fever</li> <li>• Swollen Lymph Nodes</li> <li>• Muscle Aches</li> <li>• Sore Throat</li> <li>• Pneumonia</li> <li>• Sepsis</li> <li>• Encephalitis</li> <li>• Loss Of Vision</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-available</li> </ul> <p><u>HEMOTHERAPY:</u></p> <ul style="list-style-type: none"> <li>▪ Tecovirimat</li> <li>▪ Cidofovir</li> <li>▪ Vaccinia Immune Globulin Supportive Care.</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccine</li> <li>• Hand Washing</li> <li>• Social Distancing</li> <li>• Covering Rashes</li> <li>• Avoiding Contact with Infected Person</li> <li>• Don't Scratch or Pop the Rash</li> <li>• Keep Rash Clean and Dry</li> <li>• Wear Mask</li> <li>• Eat Healthy</li> </ul>

				and Drink a Lot of Water.
5.	Nipah virus Natural host: Fruit bats, Pigs	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Cough</li> <li>• Headache</li> <li>• Shortness of Breath</li> <li>• Confusion</li> <li>• Dizziness</li> <li>• Drowsiness</li> <li>• Encephalitis</li> <li>• Seizures.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-Not Available.</li> <li>▪ Not Specific (Supportive Care)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoiding Exposure to Bats and Sick Pigs and Things Partially Contaminated by Them.</li> </ul>
6.	Menangle parabular virus. Natural host: Fruit bats, Pigs	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Chills</li> <li>• Rigors</li> <li>• Sweats</li> <li>• Malaise</li> <li>• Headache</li> <li>• Red Spotted Rash.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-Not Available.</li> <li>▪ Not Specific (Supportive Care)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid Contact with Infected Animals</li> <li>• Standard Hygiene and Sanitation Practice Must Also Be Followed.</li> </ul>
7.	Marburg virus disease Natural host: Fruit bats	<ul style="list-style-type: none"> <li>• Headache</li> <li>• Fever</li> <li>• Chills</li> <li>• Fatigue</li> <li>• Nausea</li> <li>• Vomiting</li> <li>• Diarrhea</li> <li>• Maculop Apular Rash</li> <li>• Abdominal Pain</li> <li>• Conjuncti Vitis</li> <li>• Malaise</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine Is Not Available.</li> <li>▪ Not Specific (Supportive Care)</li> </ul>	<p>Sterilization Disinfection Avoiding Contact with Infected Persons Person Who Died of It</p>

		<ul style="list-style-type: none"> <li>• Dyspnea</li> <li>• Edema</li> </ul>		
8.	Human monocytic ehrlichiosis Natural host: White tailed deer, goat, dogs, racoons, coyotes	<ul style="list-style-type: none"> <li>• Malaise</li> <li>• Low Back Pain</li> <li>• Gastro intestinal Symptoms</li> <li>• Fever</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine Not Available</li> <li>▪ Tetracycline (Doxycycline)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid tick bites clothing</li> <li>• Repellants usage</li> <li>• Avoid tick Prevalent area.</li> </ul>
9.	Anaplasmosis Natural host: Sheep	<ul style="list-style-type: none"> <li>• Jaundice</li> <li>• Weight Loss</li> <li>• Diarrhea</li> <li>• Paleness Of the Skin</li> <li>• Aggressive Behavior</li> <li>• High Fever</li> <li>• Low Wbc Cells</li> <li>• Low Platelets</li> <li>• Elevated</li> <li>• Liver Enzyme</li> <li>• Anemia</li> <li>• Blood In the Urine</li> <li>• Anorexia</li> <li>• Paleness Of the Eyes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-not Available</li> </ul> <p><u>HEMOTHERAPY:</u></p> <ul style="list-style-type: none"> <li>▪ Tetracycline</li> <li>▪ Imidocarb</li> <li>▪ Doxycycline</li> <li>▪ Amoxicillin</li> <li>▪ Cefuroxime</li> <li>▪ Rifampin</li> </ul>	<ul style="list-style-type: none"> <li>• Tick control testing for disease in ruminants and humans, improved sanitation</li> <li>• repellent usage.</li> </ul>
10.	Ebola virus disease Natural host: Fruit bats	<ul style="list-style-type: none"> <li>• Feeling Tired</li> <li>• Headache</li> <li>• Muscle And Joint Pain</li> <li>• Eye Pain and Vision Problems</li> <li>• Weight Gain</li> <li>• Belly Pain</li> <li>• Loss Of Appetite</li> <li>• Hair Loss</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-Available</li> <li>▪ Monoclonal Antibody</li> <li>▪ Treatment: Inmazeb &amp; Ebanga And Intravenous (Iv) Fluids (If required)</li> </ul>	<ul style="list-style-type: none"> <li>• ERVEBO Vaccine</li> <li>• Use Protective Equipment</li> <li>• Avoid Contact with Anything That May Have</li> </ul>

		<ul style="list-style-type: none"> <li>• Skin Problems</li> <li>• Trouble</li> <li>• Sleeping</li> <li>• Memory Loss</li> <li>• Hearing Loss</li> <li>• Depression</li> <li>• Anxiety</li> </ul>		<p>Touched Infected Body Fluids, And Body of Someone Who Died from Ebola</p> <ul style="list-style-type: none"> <li>• Monitor Yourself For 21 Days</li> <li>• Bush Meat</li> <li>• Use Boiled Water and Food</li> </ul>
11.	Canine Parvovirus	<ul style="list-style-type: none"> <li>• Vomiting</li> <li>• Diarrhea [Often Bloody]</li> <li>• Lethargy</li> <li>• Dehydration</li> </ul>	<ul style="list-style-type: none"> <li>▪ Antiviral Therapy</li> <li>▪ Supportive Care</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination</li> <li>• Hygiene</li> <li>• Early diagnosis</li> </ul>
12	Staphylococcus pseudintermedius infection	<ul style="list-style-type: none"> <li>• Skin Lesions</li> <li>• Itching</li> <li>• Redness</li> <li>• Pus Formation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Antibiotics</li> </ul>	<ul style="list-style-type: none"> <li>• Proper hygiene</li> <li>• Wound care</li> <li>• Regular veterinary checkups</li> </ul>
13	Toxocariasis	<ul style="list-style-type: none"> <li>• Abdominal Pain</li> <li>• Diarrhea</li> <li>• Weight Loss [In Animals]</li> <li>• Can Be Asymptomatic</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deworming [Anthelmintic Drug]</li> </ul>	<ul style="list-style-type: none"> <li>• Regular Deworming Programs</li> <li>• Proper Disposal Of Feces</li> </ul>
14	Flea Infestation	<ul style="list-style-type: none"> <li>• Itching, Hair Loss, Skin Irritation, Allergic Reaction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Topical Ectoparasite Medication</li> </ul>	<ul style="list-style-type: none"> <li>• Regular grooming, flea control</li> </ul>

				treatments, clean environment
15	Leishmaniasis	<ul style="list-style-type: none"> <li>• Skin Ulcers</li> <li>• Weight Loss</li> <li>• Fever</li> <li>• Enlarged Spleen</li> </ul>	<ul style="list-style-type: none"> <li>▪ Gene Therapy [Emerging]</li> <li>▪ Antiparasitic Drug</li> </ul>	<ul style="list-style-type: none"> <li>• Vector Control [Sandflies]</li> <li>• Protective Measure</li> <li>• Early detection</li> </ul>
16	Drug resistance Zoonotic infections	<ul style="list-style-type: none"> <li>• Persistent Infection, Poor Response To Treatment</li> </ul>	<ul style="list-style-type: none"> <li>▪ New-Generation Antibiotic</li> <li>▪ Targeting Resistant's Strains</li> </ul>	<ul style="list-style-type: none"> <li>• Rational Drug Use</li> <li>• Antimicrobial Stewardship</li> <li>• Early Intervention</li> </ul>
17	Corona virus	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Cough</li> <li>• Myalgia</li> <li>• Dry Cough</li> <li>• Shortness Of Breath</li> <li>• Loss Of Taste or Smell</li> <li>• Sore Throat</li> <li>• Diarrhea.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vaccine-available like Covaxin, Covishield</li> <li>▪ Complete bed rest</li> <li>▪ Water electrolyte balance.</li> <li>▪ Fever &amp; pain: <ul style="list-style-type: none"> <li>○ Paracetamol</li> </ul> </li> <li>▪ Antiviral drugs: Remdesivir (for hospitalized patients)</li> <li>▪ Steroids: Dexamethasone (for severe</li> </ul>	<ul style="list-style-type: none"> <li>• Using face masks</li> <li>• To cover coughs and sneeze with tissues</li> <li>• To wash hands regularly with soap or disinfection with hand sanitizer containing at least 60% alcohol</li> <li>• To avoid contact with infected people</li> <li>• To maintain an</li> </ul>

			cases to reduce inflammation) <ul style="list-style-type: none"> <li>▪ Oxygen therapy</li> </ul>	appropriate distance from people <ul style="list-style-type: none"> <li>• To refrain from touching eyes, nose, and mouth with unwashed hands</li> </ul>
18	Leptospirosis	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Muscle Pain</li> <li>• Vomiting</li> <li>• Jaundice</li> <li>• Chills</li> <li>• Kidney And Liver Dysfunction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Penicillin</li> <li>▪ Ceftriaxone</li> <li>▪ Amoxicillin</li> <li>▪ Doxycycline</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid Contact with Contaminated Water or Soil</li> <li>• Maintain Proper Sanitation</li> <li>• Use Protective Clothing</li> </ul>

Some of the zoonotics disease, symptoms, treatment, and Prevention are discussed above Table.

[57, 58, 59, 60]

### **Conclusion:**

- Zoonotic diseases remain a major global health concern affecting both humans and animals.
- Their occurrence is influenced by factors such as urbanization, climate change, and human–animal interactions.
- These diseases originate from various sources including domestic animals, wildlife, and vectors.
- They have significant impacts on public health, economy, and food security.
- Rapid environmental changes further increase the risk of disease spread and outbreaks.
- Effective prevention and control measures like hygiene, vaccination, and surveillance are essential.
- Proper treatment is available, but antimicrobial resistance is an emerging challenge.

- Overall, a coordinated and integrated approach is necessary to reduce the burden of zoonotic diseases.

## REFERENCE:

- 1.Zoonotic Diseases: Etiology, Impact, and Control Md Tanvir Rahman 1,\*, Md Abdus Sobur 1, Md Saiful Islam 1, Samina Ievy 1, Md Jannat Hossain 1, Mohamed E El Zowalaty 2,3, AMM Taufiquer Rahman 4, Hossam M Ashour 5,6
- 2.Zoonotic diseases of fish and their prevention and control Mina Ziaratia, Mohammad Jalil Zorriehzahrab, Fatemeh Hassantabar , Zibandeh Mehrabid , Manish Dhawane,f , Khan Sharung ,Talha Bin Emranh andShokoofeh Shamsik, Kuldeep Dhamai , Wanpen Chaicump
- 3.Zoonotic Diseases: Etiology, Impact, and Control Md. Tanvir Rahman1, \*, Md. Abdus Sobur1, Md. Saiful Islam1, Samina Ievy1, Md. Jannat Hossain1, Mohamed E. El Zowalaty2,3, AMM Taufiquer Rahman4 and Hossam M. Ashour5,6, \*
- 4.Neglected zoonotic diseases in Nigeria: role of the public health veterinarian Nusrat Elelu 1,&, Julius Olaniyi Aiyedun 1, Ibraheem Ghali Mohammed 1, Oladapo Oyedeji Oludairo 1, Ismail Ayoade Odetokun 1, Kaltume Mamman Mohammed 1, James Olaniyi Bale 1, Saka Nuru 1
- 5.Interactions between zoonotic pathogens and infectious disease spread: Why understanding mechanisms and modelling matters more than ever Author links open overlay panelNaizhe Li a 1, Sunxiao Ruan a b 1, Huaiyu Tian a b
- 6.Enhancing Global Health Security in Sub-Saharan Africa: The case for integrated One Health surveillance against zoonotic diseases and environmental threats☆Author links open overlay panel Pierre Gashema a b c, Placide Sesonga a b d, Patrick Gad Iradukunda c e, Richard Muvunyi f, Jean Claude Mugisha a b, Jerome Ndayisenga a b, Tumusime Musafiri a g, Richard Habimana, Radjabu Bigirimana a , Alice Kabanda a b, Misbah Gashegu a I,Noel Gahamanyi a i, Jonathan Izudi j, Emmanuel Edwar Siddig a b, Jean Claude Semuto Ngabonziza a i k, Ayman Ahmed a b i, Tafadzwa Dzinamarira l, Leon Mutesa a b m, Claude Mambo Muvunyi a i
- 7.Enhancing Global Health Security in Sub-Saharan Africa: The case for integrated One Health surveillance against zoonotic diseases and environmental threats☆Author links open overlay panelPierre Gashema a b c, Placide Sesonga a b d, Patrick Gad Iradukunda.
- 8.Prioritizing zoonotic diseases utilizing the One Health approach: Jordan's experience Author links open overlay panelKhalid A. Kheirallah
- 9.Animal care professionals' practice towards zoonotic disease management and infection control practice in selected districts of Wolaita zone, Southern EthiopiaAuthor links open overlay panelHaben Fesseha, Tasew Kefelegn, Mesfin Mathews.
- 10.Drivers of zoonotic disease risk in the Indian subcontinent: A scoping review Author links open overlay panelAnna Durrance-Bagale a, James W. Rudge a b, Nanda Bahadur Singh c d, Steven R. Belmain e, Natasha Howard a f

11. A systematic mapping review of links between handling wild meat and zoonotic diseases Author links open overlay panel Luke Tumelty , Lauren Coad a c, Sagan Friant d e, Joseph Mbane f, Cedric Thibaut Kamogne f, Caleb Yengo Tata g A
12. **One Health Approach to Address Zoonotic Diseases** Divya Aggarwal <sup>1</sup>, Anandhi Ramachandran <sup>1,✉</sup>
13. Unpacking the risks of zoonotic and vector-borne pathogen transmission to humans in the context of environmental change Author links open overlay panel Raquel L. Carvalho , Diego Anjos , Clément Harmange , Adriano Pinter <sup>5</sup>, Christina Faust , Daniel Streicker <sup>2 6</sup>, Camila Lorenz , Paula R. Prist jean paul
14. Natural disasters and the rise of zoonotic diseases: A case of post-earthquake disseminated cryptococcosis in a dog Author links open overlay panel Ezgi Sababoglu Baytaroglu a, Volkan Ipek b, Halil Ibrahim Gokce c, Leyla Elif Ozgu Ayozger b, Berkay Olguner c
15. The global burden of neglected zoonotic diseases: Current state of evidence Author links open overlay panel Carlotta Di Bari a b c, Narmada Venkateswaran a d, Christina Fastl a b, Sarah Gabriël c, Delia Grace a e f, Arie H. Havelaar a g, Ben Huntington a h i, Grace T. Patterson a j, Jonathan Rushton a h, Niko Speybroeck k, Paul Torgerson a l, David M. Pigott a d, Brecht Devleesschauwer
16. Pet chinchillas (*Chinchilla lanigera*): Source of zoonotic *Giardia intestinalis*, *Cryptosporidium ubiquitum* and microsporidia of the genera *Encephalitozoon* and *Enterocytozoon* Author links open overlay panel Veronika Zikmundová a b <sup>1</sup>, Veronika Horáková c <sup>1</sup>, Lenka Tůmová a b, Břetislav Koudela a c, Nikola Holubová a, Bohumil Sak a, Michael Rost b, Kristina Beranová b, Martin Kváč ab
17. "Microbial traffic" and newly emerging viral, bacterial spread of newly identified zoonotic illnesses has been linked to a wide range of social and cultural
18. Which have been unearthed by researchers Zoonotic risks of pathogens from sheep and their milk borne transmission Author links open overlay panel René van den Brom a, Aarieke de Jong b, Erik van Engelen c, Annet Heuvelink c, Piet Vellema a
19. Emerging Zoonotic Diseases: Origins, Transmission, and Strategies for Prevention Ariel Jaitovich\* Department of Biological Sciences, University of Birmingham, Birmingham, UK
20. Epidemiology of Zoonotic Diseases in the United States: A Comprehensive Review Adekunle Sanyaolu<sup>1\*</sup>, Chuku Okorie<sup>2</sup>, Nasima Mehraban<sup>3</sup>, Oladapo Ayodele<sup>3</sup>, Sarah K Sinthy Tshitenge<sup>3</sup>, Rochelle Knox<sup>3</sup>, Elda Mullaj<sup>3</sup>, Aaron Nandzo<sup>3</sup>, Ayman El-Samman<sup>3</sup>, Steven Neshewat<sup>3</sup> and Vivek<sup>3</sup>
21. Wildlife as Source of Zoonotic Infection Hilde Kruse \*,✉, Anne-Mette Kirkemo \*, Kjell Handeland
22. Role of India's wildlife in the emergence and re-emergence of zoonotic pathogens, risk factors and public health implications Author links open overlay panel B.B. Singh a, A.A. Gajadhar b
23. Wildlife, Exotic Pets, and Emerging Zoonoses <sup>1</sup> Bruno B Chomel \*,✉, Albino Belotto †, François-Xavier Meslin
24. World Journal of Advanced Research and Reviews 21(3):768-776 DOI:10.30574/wjarr.2024.21.3.0773 Authors: Olumuyiwa Tolulope Ojeyinka Toritsemogba Tosanbami Omaghomi University of North Carolina at Chapel Hill

25. Zoonotic Diseases and Their Impact on Public Health: Prevention and Control Strategies Ayesha Tariq\*1 , Ieman Tariq1 , Firasat Hussain\*1 , Faisal Siddique1 , Rais Ahmed1 , Kanza Sadiq2 , Moazzam Ali Shah3 , Majida Maqbool3 , Ali Haider4 and Muhammad Touseef5.
26. General Principles for Treatment, Prevention and Control of Zoonotic Diseases Ayesha Humayun1 , Adnan Hassan Tahir1 , Talha Humayun2 , Arsalan Khan3 , Zia ud Din Sindhu4 , Rana Fasiel Naeem1 , Saima Somal1 and Muhammad Arif Zafar1\*
27. Review on Principles of Zoonoses Prevention, Control and Eradication
28. Zoonotic viral diseases and the frontier of early diagnosis, control and prevention J. L. HEENEY
29. The Precautionary Principle in Zoonotic Disease Control Open Access J van Herten , B Bovenkerk
30. Control and Prevention of Emerging Zoonoses Bruno B. Chomel
31. “Zoonotic Diseases: Etiology, Impact, and Control Md Tanvir Rahman 1,\* , Md Abdus Sobur 1, Md Saiful Islam 1, Samina Ievy 1, Md Jannat Hossain 1, Mohamed E El Zowalaty 2,3, AMM Taufiqur Rahman 4, Hossam M Ashour
32. Zoonoses and One Health: A Review of the Literature Satish Bidaisee 1,2,\* , Calum N L Macpherson
33. Frameworks for Preventing, Detecting, and Controlling Zoonotic Diseases Miriam L Shiferaw , Jeffrey B Doty , Giorgi Maghlakelidze , Juliette Morgan , Ekaterine Khmaladze , Otari Parkadze , Marina Donduashvili , Emile Okitolonda Wemakoy , Jean-Jacques Muyembe , Leopold Mulumba , Jean Malekani , Joelle Kabamba , Theresa Kanter , Linda Lucy Boulanger , Abraham Haile , Abyot Bekele , Meseret Bekele , Kasahun Tafese , Andrea A McCollum , Mary G Reynolds
34. Zoonotic diseases (zoonoses): definitions, classifications, hazards, and prevention strategies Author links open overlay panel Jianshun Guo, Ningyi Jin
35. Zoonotic diseases: understanding the risks and mitigating the threats Ibrahim Elsohaby 1,2,3,✉, Luca Villa
36. The Impact of Human Activities on Zoonotic Infection Transmissions Michelle Marie Esposito 1,2,3,\* ,†, Sara Turku 1,3, Leora Lehrfield 1,3,†, Ayat Shoman 1
37. Implications of human activities for (re)emerging infectious diseases, including COVID-19 Nundu Sabiti Sabin 1,2,3, Akintije Simba Calliope 1,2,3, Shirley Victoria Simpson 1,2,3, Hiroaki Arima 1,2, Hiromu Ito 1, Takayuki Nishimura 4,5, Taro Yamamoto 1,2,3,✉
38. Urbanization prolongs hantavirus epidemics in cities Huaiyu Tian a,1,2, Shixiong Hu b,1, Bernard Cazelles c,d,1, Gerardo Chowell e,1, Lidong Gao b,2, Marko Laine f, Yapin Li g, Huisuo Yang g, Yidan Li a, Qiqi Yang a, Xin Tong a,h, Ru Huang h, Ottar N Bjornstad i,j, Hong Xiao h,2, Nils Chr Stenseth k,
39. Rats and the city: Implications of urbanization on zoonotic disease risk in Southeast Asia Kim R. Blasdel Serge Morand <https://orcid.org/0000-0003-3986-7659>, Susan G. W. Laurance <https://orcid.org/0000-0002-2831-2933>, and Cadhla Firth
40. Amazon deforestation drives malaria transmission, and malaria burden reduces forest clearing 1. Andrew J MacDonald, Erin A Mordecai
41. Recent loss of closed forests is associated with Ebola virus disease outbreaks

- Jesús Olivero 1,✉, Julia E Fa 2,3,✉, Raimundo Real 1, Ana L Márquez 1, Miguel A Farfán 1, J Mario Vargas 1, David Gaveau 3, Mohammad A Salim 3, Douglas Park 4, Jamison Suter 5, Shona King 4, Siv Aina Leendertz 6,7, Douglas Sheil 8, Robert Nasi
42. Mapping the zoonotic niche of Ebola virus disease in Africa David M Pigott 1,†, Nick Golding 1,†, Adrian Mylne 1, Zhi Huang 1, Andrew J Henry 1, Daniel J Weiss 1, Oliver J Brady 1, Moritz UG Kraemer 1, David L Smith 1,2, Catherine L Moyes 1, Samir Bhatt 1, Peter W Gething 1, Peter W Horby 3, Isaac I Bogoch 4,5, John S Brownstein 6,7, Sumiko R Mekaru 8, Andrew J Tatem 9,10,13, Kamran Khan 4,11, Simon I Hay
43. Nipah virus: Impact, origins, and causes of emergence Jonathan H Epstein 1,✉, Hume E Field, Stephen Luby, Juliet RC Pulliam, Peter Daszak
44. African Lions and Zoonotic Diseases: Implications for Commercial Lion Farms in South Africa Jennah Green 1, Catherine Jakins 2, Eyob Asfaw 1, Nicholas Bruschi 1, Abbie Parker 1, Louise de Waal 2, Neil D’Cruze
45. Effect of climatic changes on the prevalence of zoonotic diseases ✦Authors:Neelam Sachan ✦V. P. Singh ✦Historical Literature Related to Zoonoses and Pandemics Barbara Canavan, Independent Scholar1]
46. Historical Literature Related to Zoonoses and Pandemics Barbara Canavan, Independent Scholar1
47. A brief history of bird flu Samantha J Lycett 1,, Florian Duchatel 1, Paul Digard 1
48. Highly pathogenic avian influenza H5N1: history, current situation, and outlook Florian Krammer 1,2,3,4, ✉, Enikö Hermann 4, Angela L Rasmussen 5,6,7
49. Evolution of Nipah Virus Infection: Past, Present, and Future Considerations Naomi Hauser1, Alexis C. Gushiken2, Shivakumar Narayanan2, Shyam Kottilil2 and Joel V. Chua2, \* history article
- 50.. Introduction to West Nile Virus Shazeed-Ul Karim, Fengwei Bai
51. History and Recent Advances in Coronavirus Discover Jeffrey S. Kahn, MD, PhD,\* and Kenneth McIntosh, MD†
52. COVID-19: The first documented coronavirus pandemic in history Author links open overlay panel Yen-Chin Liu a 1, Rei-Lin Kuo a b c d 1, Shin-Ru Shih a b c e f
53. Coronavirus disease 2019: What we know? Feng He, Yu Deng, Weina Li
54. A Review of Coronavirus Disease-2019 (COVID-19) Tanu Singhal1 Received: 23 February 2020 /Accepted: 25 February 2020 /Published online: 13 March 2020# Dr. K C Chaudhuri Foundation 2020
55. Animal board invited review: Risks of zoonotic disease emergence at the interface of wildlife and livestock systems Author links open overlay panel François Meurens a b 1, Charlotte Dunoyer c 1, Christine Fourichon a 1, Volker Gerds d 1, Nadia Haddad e 1, Jeroen Kortekaas f 1, Marta Lewandowska g h 1, Elodie Monchatre-Leroy i 1, Artur Summerfield g 1, Paul J. Wichgers Schreur f 1, Wim H.M. van der Poel f 1, Jianzhong Zhu j k 1
56. Wildlife–livestock interactions in animal production systems: what are the biosecurity and health implications? Open Access Ferran Jori , Marta Hernandez-Jover , Ioannis Magouras , Salome Dürr , Victoria J Brookes

57. Abdul Basit<sup>1</sup>, Ushbah Yasin<sup>2</sup>, Hammad Ahmed Hashmi<sup>3</sup>, Ayesha Kiran<sup>4</sup>, Haris Ali<sup>5</sup>, Baby Yasmeen Keerio<sup>6</sup>, Maaz Anjum Rana<sup>7</sup>, Muhammad Tauseef Ahmad<sup>8</sup>, Kausar Zeb<sup>9</sup>, Hammad Riaz
58. Status of Chemical Antibiotics Against Bacterial Zoonosis Shahid Ahmad<sup>1</sup>, Muhammad Rizwan<sup>1</sup>, Sajid Mahmood<sup>2</sup>, Usman Ashraf<sup>1</sup>, Khalil Anwar<sup>1</sup>, Mukhtar Ahmed<sup>1</sup>, Muhammad Aqib Ali<sup>1</sup>, Aqsa Ghafoor<sup>3</sup>, Ibtisham Elahi<sup>3</sup> and Warda Qamar<sup>4\*</sup>
59. Zoonotic Diseases: Causes, Symptoms, Diagnosis, Treatment and Influence of Climate Corresponding Author: Sripathi Chandragupthan, D.A.V. School, Adambakkam, Chennai, India, 600088.