

ONE HEALTH STRATEGIC PLAN FOR THE PREVENTION AND CONTROL OF ZOONOTIC DISEASES IN KENYA (2021-2025)

HARAMBEE

REPUBLIC OF KENYA
ZDU ZOONOTIC DISEASE UNIT



ONE HEALTH STRATEGIC PLAN FOR THE PREVENTION AND CONTROL OF ZOONOTIC DISEASES IN KENYA

(2021-2025)

Ministry of Agriculture, Livestock, Fisheries and Co-operatives
and
Ministry of Health

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List of Abbreviations

ACDC	Africa Centers for Disease Control
AfDB	African Development Bank
AFROHUN	Africa One Health University Network
AMR	Antimicrobial Resistance
ANAW	African Network for Animal Welfare
APHOK	Association of Public Health Officers Kenya
ARIS	Animal Resources Information System
ASAL	Arid or semi-arid land
ASTG	Agricultural Sector Transformation and Growth Strategy 2019-2029
AU-IBAR	African Union InterAfrican Bureau for Animal Resources
AWF	African Wildlife Foundation
CBD	Convention for Biological Diversity
CCM	Comitato Collaborazione Committee (medical collaboration committee)
CDC	Centers for Disease Control and Prevention
CDH	County Director of Health
CITES	Convention on International Trade in Endangered Species
COG	Council of Governors
COHUs	County One Health Units
CP3	Community Pandemic Preparedness Project
DALY	Disability-Adjusted Life Year
DHIS	District Health Information System
DMS	Directorate of Medical Services
DPT	Digital Pen Technology
DSER	Division of Disease Surveillance and Epidemic Response
DSRU	Disease Surveillance and Response Unit
DVS	Director of Veterinary Services
ECTAD	Emergency Centre for Transboundary Animal Diseases
EOC	Emergency Operation Centre
EPT	Emerging Pandemic Threats
FAO	Food and Agriculture Organization of the United Nations
FELTP	Field Epidemiology and Laboratory Training Program
GDP	Gross Domestic Product
GHSA	Global Health Security Agenda
HMIS	Health Management Information System
ICIPE	International Centre of Insect Physiology and Ecology
HPAI H5N1	Highly Pathogenic Avian Influenza H5N1
IDSR	Integrated Disease Surveillance and Response
IDU	Infectious Diseases Unit
IFAW	International Fund for Animal Welfare
IFRC	International Federation of Red Cross and Red crescent Societies
IHR	International Health Regulations of the World Health Organization
ILRI	International Livestock Research Institute
IMCAPI	International Ministerial Conferences on Avian and Pandemic Influenza
IPR	Institute of Primate Research
JEE	Joint External Evaluation
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KABS	Kenya Animal Bio surveillance System
KALRO	Kenya Agricultural and Livestock Research Organization
KEFRI	Kenya Forestry Research Institute
KEMRI	Kenya Medical Research Institute
KEPSA	Kenya Private Sector Alliance
KFS	Kenya Forestry Services
KHP	Kenya Health Policy
KHSSP	Kenya Health Sector Strategic Plan
KLWSS	Kenya Livestock and Wildlife Syndromic Surveillance system
KMA	Kenya Medical Association
KNH/IDU	Kenyatta National Hospital/ Infectious Disease Unit
KTB	Kenya Tourist Board
KU	Kenyatta University
KVA	Kenya Veterinary Association
KVP	Kenya Veterinary Policy
KWS	Kenya Wildlife Service
MALFC	Ministry of Agriculture, Livestock, Fisheries and Cooperatives
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
MOEF	Ministry of Environment and Forestry
MOH	Ministry of Health
MoI&CNG	Ministry of Interior and Coordination of National Government
MOLD	Ministry of Livestock Development
MOTW	Ministry of Tourism and Wildlife
MPHS	Ministry of Public Health and Sanitation
MPT	Mobile Phone Technology
MTP	Medium Term Plan
NAPHS	National Action Plans for Health Security

NASIC	National Antimicrobial Stewardship Interagency Committee
NCCG	Nairobi City County Government
ND1	Notifiable diseases form 1
NDMU	National Disaster Management Unit
NIT	National Influenza Taskforce
NMK	National Museums of Kenya
NOHO	National One Health Office
NPHI	National Public Health Institute
NPHL	National Public Health Laboratory
NRECC	National Rabies Elimination Coordination Committee
NZTC	National Zoonotic Disease Technical Committee
NTD	Neglected Tropical Diseases
OH	One Health
OHCEA	One Health Eastern and Central Africa
OHTC	One Health Technical Committee
OHW	One Health Workforce
OIE	Organization Internationale des Epizooties (World Organization for Animal Health
OWOH	'One World, One Health'
P&R	Preparedness and Response
PHEIC	Public Health Emergencies of International Concern
PHEIUE	Public Health Events of Initially Unknown Etiology
PZD	Priority zoonotic diseases
RRTs	Rapid Response Teams
RVF	Rift Valley Fever
SARS	Severe Acute Respiratory Syndrome
SCVOs	Sub County Veterinary Officers
SME	Subject matter experts
SOPs	Standard Operating Procedures
UHC	Universal Health Coverage
UNICEF	United Nations International Emergency Children's Fund
UoL	University of Liverpool
UoN	University of Nairobi
USAID	United States Agency for International Development
VEES	Veterinary Epidemiology and Economics Section
VERU	Veterinary Emergency Response Unit
VSF	Vétérinaires Sans Frontières
WAHIS	World Animal Health Information System
WAP	World Animal Protection
WB	World Bank
WDMMS	Wildlife Disease Management and Monitoring Strategy
WHO	World Health Organization of the United Nations
WHO-AFRO	World Health Organization Africa Region
WSU	Washington State University
WWF	World Wide Fund for Nature
ZDU	Zoonotic Disease Unit
ZTWG	Zoonoses Technical Working Group

Foreword

The burden of zoonotic diseases has increased globally over the last few decades, raising concern among governments. Zoonoses are transmitted through interactions between animals, humans and their shared environments. Zoonoses such as Brucellosis, Anthrax and Rift Valley fever lead to increased health care costs, loss of human lives, loss of income from livestock trade and loss of endangered and rare wildlife biodiversity, among many other negative impacts. The factors contributing to the increasing burden of these diseases include but not limited to human and animal population expansion, wildlife habitat degradation, international travel and trade, changing farming systems, urbanization, cultural practices, poverty and climate change.

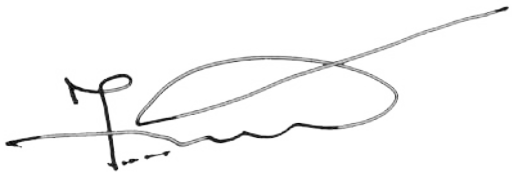
The successful prevention and control of zoonotic diseases require a One Health approach, which involves a multisectoral collaboration of the human, animal and environmental health sectors, among other stakeholders. Kenya made a firm step towards implementing the One Health approach since 2011 when the Zoonotic Disease Unit (ZDU) was established.The ZDU is a collaborative platform shared between the ministries responsible for human and animal health. It serves as Kenya's One Health office and secretariat to the Zoonoses Technical Working Group (ZTWG).

The first strategic plan for implementing One Health in Kenya (2012-2017) strengthened collaboration among multiple sectors to prevent and control zoonoses. Specific outputs were produced, such as the prioritization of zoonotic diseases in Kenya and their inclusion in the Integrated Disease Surveillance and Response (IDSR) system. This has led to better preparedness and response, and the rapid containment of the recent Rift Valley fever outbreak of 2018 is a case in point. These achievements are a good argument for further efforts to institutionalize the lessons learnt through sustainability and scaling out, within the context of devolution of public services.

Successful implementation of the One Health strategic plan for the prevention and control of zoonotic diseases in Kenya from 2021 to 2025 will contribute to a reduced burden of zoonotic diseases; enhancement of universal health coverage; food and nutritional security; enhanced conservation of wildlife biodiversity and better rural livelihoods, among other benefits. This strategic plan represents our continued commitment to strengthening collaboration between our ministries to prevent zoonotic diseases at the human-animal-environment interfaces.



Hon. Peter Munya, EGH
Cabinet Secretary
Ministry of Agriculture, Livestock, Fisheries and Co-operatives



Sen. Mutahi Kagwe, EGH
Cabinet Secretary
Ministry of Health

Acknowledgements

This One Health strategic plan for the prevention and control of zoonotic diseases in Kenya was developed through a consultative process with subject matter experts from human, environmental and animal health sectors, researchers and policy formulators at the national and county levels. The development of this plan is in line with the priorities outlined in the National Action Plan for Health Security (NAPHS). These priorities were derived from Joint External Evaluation (JEE) conducted in 2017 and Performance of Veterinary Services (PVS) conducted in 2019.

The Zoonotic Disease Unit (ZDU) coordinated this consultative process by anchoring on the existing multisectoral Zoonoses Technical Working Group (ZTWG), drawing membership from the Ministry of Agriculture, Livestock, Fisheries and Co-operatives (MALFC), Ministry of Health (MOH), Kenya Wildlife Service (KWS), universities and research organizations. The Zoonotic Disease Unit (ZDU) led the drafting process.

To prepare this national strategy, the Food and Agricultural Organization (FAO-Kenya) provided technical and financial support through the USAID Global Health Security Agenda (GHSA) initiative and the USAID P&R project. We appreciate this support. We acknowledge the institutions listed below whose representatives participated in developing and validating this strategy. A complete list of contributors and organizations has been provided in Annex 1:

- Food and Agriculture Organization (FAO)
- United States Agency for International Development (USAID)
- County Governments
- Field Epidemiology and Laboratory Training Program (FELTP)
- International Livestock Research Institute (ILRI)
- Kenya Medical Research Institute (KEMRI)
- Centers for Disease Control and Prevention-Kenya (CDC-K)
- Kenya Veterinary Association (KVA)
- Kenya Veterinary Vaccines Production Institute (KEVEVAPI)
- Kenya Wildlife Service (KWS)
- Neglected Tropical Diseases Programme
- University of Liverpool- HORN project
- University of Nairobi (UoN)
- Washington State University (WSU)
- Zoonotic Disease Unit (ZDU)



Mr. Harry Kimtai, CBS
Principal Secretary
State Department of Livestock
Ministry of Agriculture, Livestock and Fisheries
and Co-operatives



Susan Mochache, CBS
Principal Secretary
Ministry of Health

Executive Summary

The current COVID-19 pandemic has reinforced the relevance of implementing One Health principles in the global preparedness, detection and response to emerging infectious diseases. The Tripartite (WHO, FAO,OIE) fact-finding mission to identify the zoonotic origins of the SARS-CoV-2 , led to genomic and epidemiological evidence that the coronaviruses most highly related to SARS-CoV-2 may have "spilled over" from mammalian reservoirs such as bats and pangolins at the Chinese wildlife wet markets.

The recurrent Ebola outbreaks exemplify the threat from zoonotic diseases. Ebola outbreaks in Guinea, Liberia, Sierra Leone and DRC between 2014 and 2021, which led to heavy human fatalities and widespread socio- economic disruption in the four countries and beyond warrants heightened joint national and regional risk assessment and surveillance of zoonoses using one health approach.

Kenya is at high risk from zoonoses and other trans-boundary diseases due to her geographical location, growing human population, close livestock-wildlife-human interactions, and porous borders. The burden of zoonotic diseases in Kenya is estimated to cause a loss of Ksh. 618 billion annually, attributed to Brucellosis, Bovine tuberculosis and non-typhoidal Salmonella. Recurrent outbreaks of diseases such as Rift Valley fever (RFV) and Anthrax have caused significant socio-economic impacts and threatened rare and endangered wildlife species.

To mitigate the risk from zoonotic diseases, the Ministry of Health (MOH) and the Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MALF) have established joint disease surveillance and response systems within the frameworks of the World Health Organization's International Health Regulations [WHO IHR (2005)] and the World Animal Health Organization's (OIE) Terrestrial and Aquatic Animal Health Codes. Further, Kenya adopted a One Health approach in 2011 by establishing the ZDU, a collaborative office shared between the MOH and MALF. This synergistic arrangement will be strengthened and expanded within the current planning period to better integrate the wildlife and environment sectors in preventing and controlling zoonotic diseases, in line with global best practices.

The ZDU implemented the first One Health strategic plan from 2012 to 2017, which focused on establishing active collaboration at the animal-human-ecosystem interface for better prevention and control of zoonotic, emerging and re-emerging diseases. The plan led to unified efforts by MOH, MOALFC, non-governmental actors, and multiple professional disciplines towards addressing zoonotic disease outbreaks in the country. This is demonstrated by improved joint rapid response to the Rift Valley fever (RVF) and anthrax outbreaks in 2018 and 2019, respectively. Through the first strategic plan, zoonotic diseases were prioritized and evidence-based strategies, notably the rabies elimination strategy, were developed and implemented. Further, the One Health approach was incorporated in training curricular and sectoral policies. Although the ZDU was established to manage zoonotic diseases, it has played a broader coordination role and has partnered with other One Health players in other areas such as antimicrobial resistance (AMR) and food safety.

The One Health Strategic Plan for the Prevention and control of Zoonotic Diseases in Kenya (2021-2025) was developed through a consultative process involving a wide range of stakeholders from National and County governments, non-governmental institutions and development partners. The plan builds on achievements, challenges, lessons learnt and best practices drawn from the 2012-2017 plan. It will be implemented through close collaboration across the MOH, MALFC, the Ministry of Environment and Forestry (MOEF), Ministry of Tourism and Wildlife (MOTW) and other stakeholders, with coordination by ZDU and the Zoonoses Technical Working Group (ZTWG).

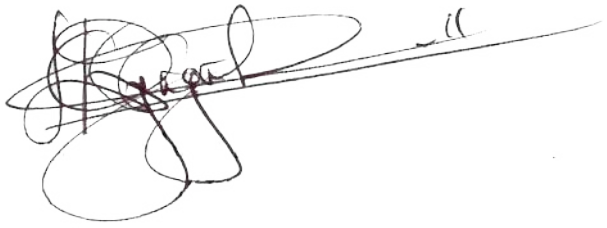
The current strategic plan conforms with the Constitution of Kenya 2010 and is aligned to sectoral, regional and global strategies and policies. The strategic plan allows domestication by County governments for their use in the fight against zoonotic diseases. The goal of the plan is to reduce the burden of zoonotic diseases in Kenya, which will be achieved through three strategic objectives, namely:

1. To strengthen implementation of the One Health approach at the national and county levels

2. To strengthen prevention, surveillance, response and control of priority zoonotic diseases in both humans and animals.

3. To promote applied research using the One Health approach

Effective implementation of this strategic plan will contribute towards Universal Health Coverage (UHC), improved livelihoods, food and nutritional security, improved biodiversity conservation and enhanced animal and human welfare. It will thus contribute to the realising the Vision 2030 and the government's "Big Four" Agenda. Potential funding sources for the implementation of the strategic plan are the National and County governments and implementing partners.



Dr. Obadiah N. Njagi, PhD, OGW
Director of Veterinary Services
State Department of Livestock
Ministry of Agriculture, Livestock and Fisheries
and Co-operatives



Dr. Patrick Amoth, EBS
Ag. Director General for Health
Ministry of Health

Glossary of Terms

Biodiversity: Biodiversity is the variability among living organisms and the ecological complexes of which they are part; this includes diversity within species, between species, and ecosystems.

DALY: The Disability-Adjusted Life Year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death

Disease Surveillance: Disease surveillance is an ongoing process that involves the systematic collection, analysis, interpretation, and dissemination of information regarding the occurrence of diseases in defined populations for public health action to reduce morbidity and mortality

Emerging Infectious Diseases: An infectious disease that has newly appeared in a population or that has been known for some time but is rapidly increasing in incidence,geographic range, or is appearing in a new species

Endangered Species: An endangered species is an animal or plant that is considered at risk of extinction

Endemic Zoonotic Diseases: Zoonotic diseases that are constantly present in the population to a greater or lesser extent, such as brucellosis and salmonellosis, are referred to as endemic

Epidemics: An epidemic is an unusual increase in the number of cases of infectious disease cases that already exist in a specific region or population. It can also refer to the appearance of a significant number of cases of an infectious disease in a region or population that is usually free from that disease.

Infectious Diseases: A disease caused by the entrance into the body of pathogenic agents or microorganisms such as bacteria, viruses, protozoa, or fungi that grow and multiply there.

One Health: An approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

Pandemics: A pandemic is an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population such as over several continents or even worldwide

Public Health Emergencies of International Concern (PHEIC): Defined in the IHR (2005) as "an extraordinary event which is determined, as provided in these regulations:

> i. To constitute a public health risk to other States through the international spread of disease; and ii. to potentially require a coordinated international response". This definition implies a situation that : is severe, unusual or unexpected; carries implications for public health beyond the affected State's national border; and may require immediate international action.

Re-emerging Infectious Diseases: Re-emerging infectious diseases are diseases that once were major health problems globally or in a particular country, and then declined dramatically, but are again becoming health problems for a significant proportion of the population.

Zoonotic Diseases: These are diseases that can be transmitted from animals to people and vice versa.


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1 Introduction

1.1 Overview

Over 60% of all human infections and over 75% of emerging and re-emerging infectious diseases are zoonotic, meaning that they can be transmitted from animals to humans and vice versa[1]. Zoonotic diseases have the potential to spread rapidly across nations to cause pandemics. Over the last several decades, it is estimated that new zoonotic diseases have emerged at an average rate of one zoonosis per year . A WHO-Africa Region (WHO-AFRO) report in 2012 indicated that 25% of the Public Health Emergencies of International Concern (PHEIC) reported from the region were zoonotic[3]. Studies further indicate that endemic zoonotic diseases account for an estimated 20% of all illnesses and deaths in the poorest countries and cause about 2.4 billion cases of human illness and 2.7 million deaths per year in lower-income countries. [4, 5]

The regional threat from zoonotic diseases was demonstrated by the Ebola outbreaks in Guinea, Liberia, Sierra Leone from 2013 to 2015 and in the Democratic Republic of Congo in 2019. [6,7] By the end of 2015, the epidemic had caused a total of 28,639 cases, 11,316 deaths and 17,300 orphaned children in the three western Africa countries. This was accompanied by widespread disruption of socio-economic activities, combined GDP losses of US$ 2.2 billion and outbreak response costs amounting to US$ 3.6 million in the three countries. The Ebola shock caused Kenya Airways over Ksh 10 billion in losses due to suspended flights to western Africa and led to reduced tourism arrivals across all African destinations.[8] The Ebola outbreak in DRC has (as of August 2019) resulted in a confirmed 2892 cases and caused 1998 deaths, translating to a case fatality rate of 67%. By October 2021, the COVID 19 pandemic in Kenya had led to 253000 cases and almost 5263 deaths with high costs in treatment and disproportionate economic impacts due to livelihood disruption, closure of businesses and reduced tourism.

Kenya is at high risk of zoonotic diseases as evidenced by constant presence and recurrent outbreaks of anthrax, Rift Valley fever (RVF), rabies, brucellosis, non-typhoidal salmonellosis and bovine tuberculosis, among other zoonoses. Zoonoses disproportionately affect poor communities causing increased household health-care costs, reduced labour productivity, loss of incomes from animal resources and increased malnutrition among other impacts.[5] They also pose a significant threat to the country's rare and endangered wildlife biodiversity.

It is against this backdrop that Kenya adopted a One Health approach that enables the MOH, MALF, MOEF, MOTW, County governments and other stakeholders to reduce the burden of zoonotic diseases and attain optimal health for humans, their animals and the environment.

1.2 Developmental Process

Development of the current strategic plan was informed by an end-evaluation of the 2012-2017 One Health strategic plan that was undertaken from January to March 2018. In October 2018, the ZDU convened a stakeholders' meeting to discuss the evaluation findings and guide the development of the new plan. In April 2019, a consultative workshop was convened to identify priorities for the new One Health strategic plan, based on the findings of the 2012 to 2017 plan, and the outputs of the Pan-Afric meeting.

Subsequently, in May 2019, a team of seven technical experts drawn from MOH, MALF, KWS and partner organizations drafted the new plan based on the stakeholders consultations. The draft was reviewed internally by technical experts from the listed ministries and later presented to a validation workshop in September 2019. Based on feedback from the validation workshop, the plan was then finalized.

2 Situational Analysis

This section highlights the context in which the One Health strategic plan will be implemented.

2.1 Country Profile

Kenya is situated on the East Coast of Africa, between latitudes 5°N and 5°S and longitudes 34°E and 43°E. Kenya borders Ethiopia (North); South Sudan (Northwest), Uganda (West), Tanzania (South) and Somalia (East). Kenya is about 587,000 km² of which 80% is arid or semi-arid land (ASAL). According to the 2019 census, the total population of Kenya is 47,564,296, with an annual population growth rate of 1.69% and an urbanization rate of 4.15%. [9, 10] The Gross Domestic Product (GDP) of Kenya is estimated at Ksh 4.8 billion in 2018 with an annual GDP growth rate of 6.3%, driven mainly by the sectors of agriculture, services and manufacturing. [11]

Agriculture accounted for 34.2 % of the total GDP, 12.1% of wage employment and 47.7% of export earnings in 2018. According to the same survey by the Kenya Bureau of Statistics, animal production contributed 4.1% to GDP, and 12% of Agricultural GDP. About 60% of the country's livestock is raised in the ASALs, employing nearly 90% of the population. [12]

Wildlife is the backbone of the tourism sector in Kenya, and tourism is a major economic driver in the country. The country is a regional hub for trade and travel, with millions of people transiting through its airports, seaports and land crossing sites annually. The tourism industry was ranked third largest in sub-Saharan Africa in 2018 growing at 5.6% per year, contributing Ksh 790 billion to the Kenyan economy and creating 1.1 million jobs. [13, 14] An estimated 8% of Kenya's landmass is covered by 65 state-protected areas, in form of national parks, reserves and sanctuaries, while a further 12% is under 160 non-state protected areas, in form of private or community conservancies [15, 16]. However, over 70% of the wildlife in Kenya is domiciled in community lands where they share scarce natural resources with humans and their domestic animals.

Kenya has made significant reforms over the last decade to build a globally competitive economy and achieve high standards of life for her citizens. In 2008, the country launched the Vision 2030, a blueprint to "*transform Kenya into a newly industrialized, middle-income country, providing a high quality of life to all its citizens in a clean and secure environment by 2030*". In 2018, Kenya launched the "Big Four Agenda" as a medium-term action plan towards the realization of the Vision 2030. The agenda has four priorities; food security, affordable housing, manufacturing and universal and affordable healthcare. Therefore, effective control and prevention of zoonotic diseases is a necessary constituent of Vision 2030, and activities to curb zoonoses will contribute to health prioritization in the Big Four agenda.

Following the enactment of the Constitution of Kenya 2010, the country has two inter-dependent levels of governance: the National Government, and 47 semi-autonomous Counties. Delivery of health care and veterinary services were devolved, in line with the 2010 constitution; by devolution, these services became the responsibility of County governments. In general, the national government focuses on policy, coordination, capacity building, standards, international agreements and related functions, while most of the implementation functions take place at the county level.

The burden of Zoonotic Diseases

Several factors place Kenya at high risk of transmission of emerging, and re-emerging zoonotic diseases. Kenya is situated astride the Equator and has a tropical climate, favoring many pathogens and vectors, in addition to its close proximity with the Congo Basin, a global hotspot of emerging pathogens. Kenya's position as a hub for tourism, trade and travel, coupled with its porous borders puts the country at risk of transmission of diseases occurring elsewhere in the world. Furthermore, human population expansion, wildlife habitat destruction, increased human-wildlife-livestock interactions, changing farming practices, poor biosecurity measures, and climate change, provide opportunities for new diseases to emerge. The numerous water bodies of the Rift Valley of Kenya serve as suitable wintering spots for migratory birds of the Eurasian flyway, increasing the risk of occurence of zoonotic influenzas in Kenya. Compounding these risks,zoonoses have historically been neglected in surveillance strategies,and the burden of zoonoses has therefore not been systematically documented.

There is growing evidence, that zoonotic diseases cause significant socio-economic impacts in Kenya. A recent study indicates that brucellosis, bovine tuberculosis and non-typhoidal Salmonella alone cost the country over Ksh 600 billion (USD 6 billion Purchasing Power Parity), corresponding to 3.9 % of the national GDP.[18] A 2006/2007 study on the socio-economic impact of the RVF outbreak indicated costs to control RVF in Kenya reached nearly Ksh 3 billion and the public health burden of of RVF was 3.4 Disability Adjusted Live Years (DALYs) per 1000 people, with per capita household costs of Ksh 11,800 for every reported human case. [19]

It is estimated that about 2000 rabies related human deaths occur annually in Kenya and these may be underestimated due to inadequacies in the current surveillance systems.[20] In Kenya, the average cost of post-exposure treatment for rabies is USD 85 per patient, and is higher when the psychological trauma and the financial hardships are fully accounted for.[19] Additionally, frequent anthrax outbreaks pose a deadly threat to domestic livestock and humans and a significant threat to rare and endangered wildlife species . For instance, outbreaks of the disease have resulted in high mortalities of herbivore species including buffalo, white and black rhinoceros, Rothschild giraffe, elands, impalas, Thompson gazelles, warthog, waterbuck and Grevy's zebras, among other wild species [21, 22, 23, 24, 25].

As part of efforts to mainstream zoonotic diseases into surveillance strategies, the ZDU prioritised zoonotic diseases in the country using a comprehensive set of criteria. The criteria included the severity of illness in humans, epidemic potential, socio-economic impact, prevalence or prevalence, or incidence of disease, and potential for effective intervention. Anthrax, trypanosomiasis, rabies, brucellosis, Rift Valley fever, echinococcosis, non-typhoidal salmonellosis, Q-Fever, mycobacterium species and influenza pandemics were the top ten diseases in order of rank. [26]

2.2 Surveillance of Zoonotic Diseases in Kenya

2.2.1 Surveillance in Humans

Disease surveillance in the human health sector is mainly done through the Integrated Disease Surveillance and Response System, (IDSR) and the District Health Information System 2 (DHIS 2). The IDSR is a WHO–AFRO regional surveillance and response strategy adopted by member states in 1998 to strengthen national disease surveillance systems in Africa. Disease reporting using the IDSR is health facility-based. Local health facilities report human diseases to sub-counties where data is entered into a web-based database. The data is captured using designated forms, classified and reported based on the WHO's International Statistical Classification of Diseases and Related Health Problems (ICD 10th Edition)[27]. The reporting frequency for health facilities is weekly for outbreak prone diseases, and monthly for other diseases. These reports are fed into the DHIS2 which is linked to the overall Health Management Information System (HMIS). In 2011 the Kenya IDSR strategy was revised to include more zoonotic and neglected tropical diseases.

2.2.2 Surveillance in Animals

The Directorate of Veterinary Services (DVS) is mandated to conduct surveillance for notifiable diseases in the animal health sector. Using designated Notifiable Disease (ND1) forms, Sub County Veterinary Officers (SCVOs) routinely fill and submit reports to the County Director of Veterinary Services who in turn transmits to the Veterinary Epidemiology and Economics Section (VEES) at the DVS national level. In addition, meat inspectors carry out food-borne disease surveillance at slaughterhouses and notify the DVS of suspect cases of notifiable diseases. With regard to wildlife, the Kenya Wildlife Services (KWS) undertakes opportunistic surveillance by investigating morbidity and mortality events in wildlife across the country. KWS compiles these data and reports these events to the DVS.

The types of reports submitted include monthly narrative reports, notifiable and OIE-listed disease reporting forms, radio and telephone calls and rumor logs. The sources of data include farms, slaughter houses and markets, among others.

Reporting from the field is enhanced by using electronic reporting systems that employ mobile phone technology (MPT). A Kenya Livestock and Wildlife Syndromic Surveillance system (KLWSS) packaged as a mobile application called the Kenya Animal Biosurveillance (KABS) - is currently being piloted to counties to enable web-based real-time animal disease reporting. The DVS reports notifiable diseases to 1) the OIE through the World Animal Health Information System (WAHIS) and, 2) to the African Union-InterAfrican Bureau for Animal Resources (AU-IBAR) through the Animal Resource Information System (ARIS²).

2.3 One Health Approach

Following the emergence of highly pathogenic avian influenza (HPAI H5N1) in Hong Kong in 1997, its rapid spread and pandemic potential caused the global community to realize the weakness of disjointed approaches in addressing emerging infectious diseases. In 2004, global experts formulated the 12 Manhattan Principles that called for the international community to adopt a holistic, multisectoral approach to combat threats to health under the banner 'One World, One Health (OWOH)'.[28] The call to adopt this holistic One Health approach was advocated through a series of International Ministerial Conferences on Avian and Pandemic Influenza (IMCAPI) and global congresses which the Hanoi IMCAPI Declaration unanimously adopted in 2010.

In 2008, the United Nations Food and Agriculture Organization (FAO), the World Animal Health Organization (OIE), the United Nations World Health Organization (WHO), the United Nations System Influenza Coordination (UNSIC), the United Nations International Children's Emergency Fund (UNICEF) and the World Bank (WB) jointly developed a framework for reducing risks of infectious diseases at the animal-human-ecosystem interface based on the OWOH principles.[29] In 2010, FAO, OIE and WHO established a Tripartite agreement on the One Health approach.[30] Since then, global initiatives such as the Global Health Security Agenda (GHSA) and World Bank One Health programs have assisted countries to institutionalize and operationalize the One Health approach.[31, 32]

In 2017, the heads of states and governments of the African Union (AU) established the African Union Centre for Disease Control and Prevention (ACDC) anchored on the principles of a One Health approach. The Africa CDC and the InterAfrican Bureau for Animal Resources (AU-IBAR), two AU specialized technical agencies, have jointly developed continental One Health frameworks. Similarly, the East African Community (EAC) and the Economic Community of West African States (ECOWAS) have institutionalized the One Health approach among other regional economic communities.

In 2006, Kenya formed a multi-sectoral National Influenza Taskforce (NIT), responding to the HPAI H5N1 pandemic threat originating from Southeast Asia. Though set up to address HPAI H5N1, Kenya was not affected by the pandemic at the time, and the NIT was utilized as a One Health platform to mount a rapid coordinated response to a severe Rift Valley fever (RVF) outbreak in Kenya, Somalia and Tanzania in 2006-2007. After the RVF outbreak, the NIT was re-named the Zoonoses Technical Working Group

(ZTWG), to address other emerging outbreaks of zoonoses. In 2011, the Director of Public Health and Sanitation [Ministry of Public Health and Sanitation (MOPHS)] and Director of Veterinary Services [Ministry of Livestock Development (MOLD)] signed a memorandum of understanding establishing the ZDU as a One Health Office nested between the two ministries.

The ZDU was operationalized in 2012 with support from the US Government (Biosecurity Engagement Program of the US Department of State, the Cooperative Biological Engagement Program of US Department of Defense, and the Centers for Disease Control and Prevention). The ZDU developed its first strategic plan to implement the One Health approach in Kenya (2012 to 2017). The ZDU reviewed its strategic plan in 2013 to account for the newly devolved governance system of Kenya.

In March 2017, Kenya underwent the WHO Joint External Evaluation (JEE) to assess IHR core competencies, including One Health coordination mechanisms and zoonotic diseases. The evaluation identified the establishment of ZDU as a major strength in multisectoral coordination using a One Health approach. Subsequently, Kenya has developed a National Action Plan for Health Security (NAPHS) to address gaps identified by JEE. Kenya is a permanent steering committee member of the GHSA, a global partnership that supports countries to detect, prevent and respond to health security threats using a One Health approach.

The country has also developed a National Antimicrobial Stewardship interagency committee (NASIC) to address AMR through a multisectoral One Health approach and is a member of the universities One Health network, namely One Health Central and East Africa(OHCEA) which transitioned to Africa One Health University Network (AFROHUN).

2.4 The Kenya One Health Strategic Plan 2012-2017

The Kenya One Health strategic plan 2012-2017 sought to establish active collaboration at the animal-human-ecosystem interface towards better prevention and control of zoonotic, emerging and re-emerging diseases. The plan had three objectives, namely:

1) To strengthen Kenya's capacity for zoonotic disease prevention and control;
2) To enhance collaboration between the animal health, human health and environment sectors in areas of common interest, and
3) To conduct applied research at the interface.

The key achievements, challenges and lessons learnt from the previous plan are highlighted in this section.

2.4.1 Key Achievements

The Kenya One Health strategic plan (2012-2017) unified efforts of line ministries, professional disciplines and non-governmental actors to address zoonotic, emerging and re-emerging diseases. Significant progress was realized towards institutionalizing the One Health approach such as, incorporating clear statements on One Health in the veterinary and livestock policies, and integrating of the One Health approach in medical, nursing and veterinary curricula at universities through AFROHUN. Further, One Health champions were deployed in different positions through mentorship programs for graduate interns and Field Epidemiology and Laboratory Training Programme (FELTP) fellows.

A major milestone was the prioritization of zoonotic diseases in the country. Based on this, the country's IDSR guidelines were reviewed to incorporate zoonotic diseases and evidence-based prevention and control interventions for zoonoses were formulated. Notable examples are the Rabies elimination strategy, the Kenya Livestock and Wildlife Syndromic Surveillance system (KLWSS), and Anthrax and Brucellosis studies, culminating in control strategies for the two diseases.

Through the 2012-2017 OH strategy plan, the country's preparedness and response capacity for zoonotic diseases was strengthened. This was partly achieved through the development or revision and testing of contingency plans for priority zoonotic diseases (RVF and HPAI) and Public Health Events of Initially Unknown Etiology (PHEIUE). The plan galvanized joint responses to zoonotic disease outbreaks by the ministries responsible for human and animal health.

The ZDU played a significant role in coordinating issues of One Health nature beyond zoonotic diseases. The ZDU was, for instance, designated the focal point for the Global Health Security Agenda and the unit coordinated the WHO Joint External Evaluation of the country's IHR competencies.

2.4.2 Main Challenges

The devolution of health and veterinary services under the new constitution made it necessary to establish County One Health Units (COHUs) in some piloted counties and there are efforts to cover all the 47 counties. However, the wide diversity of county administrations, high staff turnovers and the lack of a One Health devolution strategy slowed down progress in institutionalizing COHUs.

The One Health approach is new, and there is a low level of awareness of the approach among senior government officials at both national and county levels. Furthermore, the high staff turnover among senior officials requires sustained sensitization to ensure buy-in, support and institutionalization of One Health initiatives.

The ZDU did not obtain a budget line from respective ministries to implement the 2012-2017 One Health strategic plan. Notwithstanding, the ZDU attracted support to implement the One Health strategic plan from partners notably, CDC, DTRA, FAO, OIE, USAID, WHO and WSU. Sustainability of the outcomes of the previous plan in the absence of government support remains a major challenge. Furthermore, the ZDU is understaffed, and the two government staff on its payroll are inadequate for effective coordination and implementation. The absence of expertise on the environment, ecology and knowledge management in the ZDU imposes additional constraints to implement the strategy. Although the ZDU is the country's One Health office, the mandate of ZDU is confined to zoonotic diseases; as such,separate coordination mechanisms have evolved to address other One Health concerns , such as antimicrobial resistance and food safety.

2.4.3 Lessons Learnt

The (2012–2017) OHSP played a significant role in institutionalising the One Health approach in Kenya, enabling the development of evidence-based programs for prevention and control of zoonotic diseases leveraging partner support for implementation. The current strategic plan builds on past achievements while working towards making ZDU sustainable through government buy-in and support.

2.5 Institutional Framework

The One Health strategic plan for the prevention and control of zoonotic diseases will be implemented by the MOH and MALF in close collaboration with the Ministry of Environment and Forestry (MOEF) and the Ministry of Tourism and Wildlife (MOTW). The coordination of the implementation will be anchored on the existing ZTWG and ZDU as its Secretariat. The ZTWG will be transitioned to the National Zoonoses Technical Committee (NZTC), a permanent One Health coordination forum for the prevention and control of zoonotic diseases. The Director General of Health (DGH) forum to prevent and control zoonotic diseases. The Director General for Health and the Director of Veterinary Services (DVS) will alternately Chair the NZTC and provide oversight to ZDU through relevant departments under their director. At County and sub-county levels, One Health Units will work through County and sub-County Coordinating Committees to implement the plan.

Two epidemiologists jointly lead the ZDU, each seconded by respective line ministries. The unit is in the Department of Disease Surveillance, Epidemics and Response (DSER) under the Directorate of Preventive and Promotive in the DMS. In the DVS, the unit is under the Veterinary Epidemiology and Economics Section (VEES) in the Division of Disease Surveillance, Vector regulation and Zoological services.

The current strategic plan foresees stronger integration of ecosystem and environment expertise into the ZDU to enhance the impact of the One Health approach. The Directorate of Wildlife in the Ministry of Tourism and Wildlife and the KWS Veterinary Department (KWSVD) are members of the ZTWG. The KWSVD also actively participates in joint wildlife health investigations with ZDU and reports wildlife disease events to the DVS as a statutory requirement. To implement the current One Health strategic

plan, the MoU forming ZDU will be reviewed and the management structure revised, to enhance MOEF involvement. The current structure of ZDU/ZTWG and the proposed new organizational structure of ZDU/NZTC are presented below in (Figures 1 & 2).

The NZTC will provide technical guidance to line ministries and other stakeholders on the prevention and control of zoonotic diseases using a One Health approach. Its membership will include ministries and agencies responsible for human health, livestock, wildlife and environment; County governments; representatives of the private sector; semi-autonomous government agencies, non-governmental organizations, research institutions, academia, and international partners.

Management and response to zoonotic disease outbreaks, including public health events of initially unknown etiology (PHEIUE), will be coordinated by the ZDU/NZTC working closely with the Public Health Emergency Operation Centre (PHEOC), other EOCs and disaster units using the proposed management and response structure presented in Figure 3 under Appendix 2

The current One Health strategic plan will establish stronger coordination between ZDU/NZTC and other committees concerned with antimicrobial resistance and food safety. To this end, the ZDU/NZTC will play a pivotal role to establish an over-arching National Coordination Platform to addresse current and emerging One Health initiatives. Further, the ZDU will establish stronger collaborative links with local universities through AFROHUN Kenya in One Health workforce development and related capacity building activities.

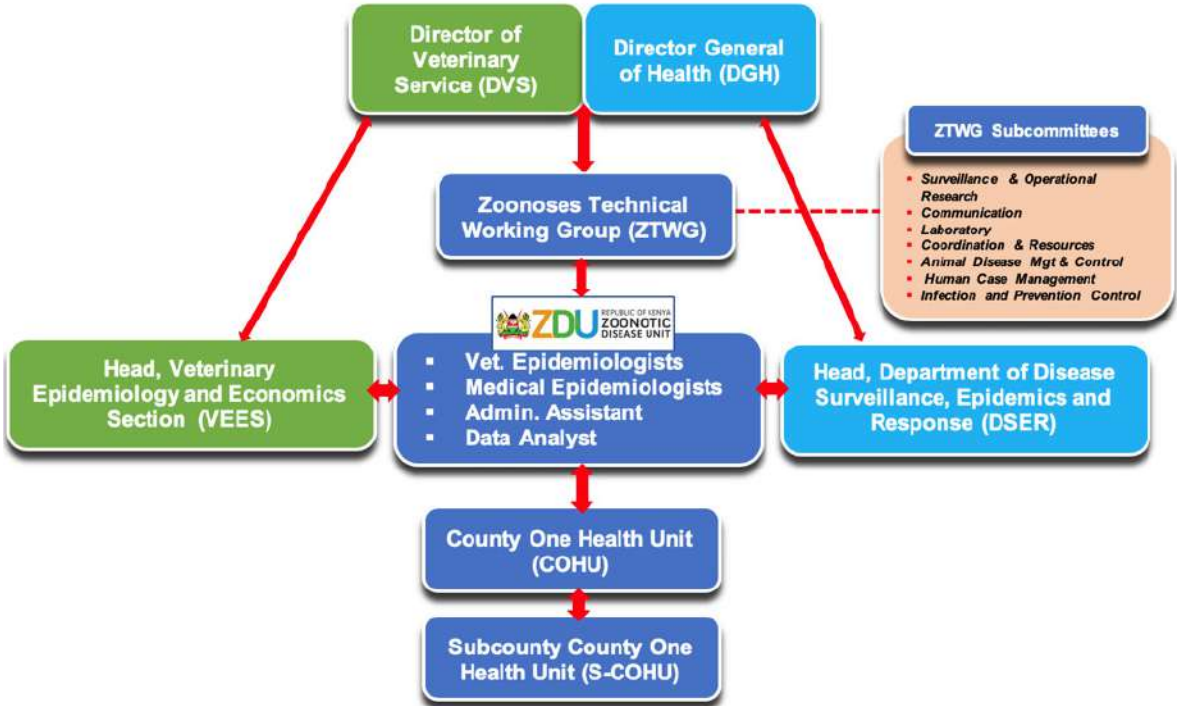


Figure 1: Current organizational structure of ZDU/ZTWG

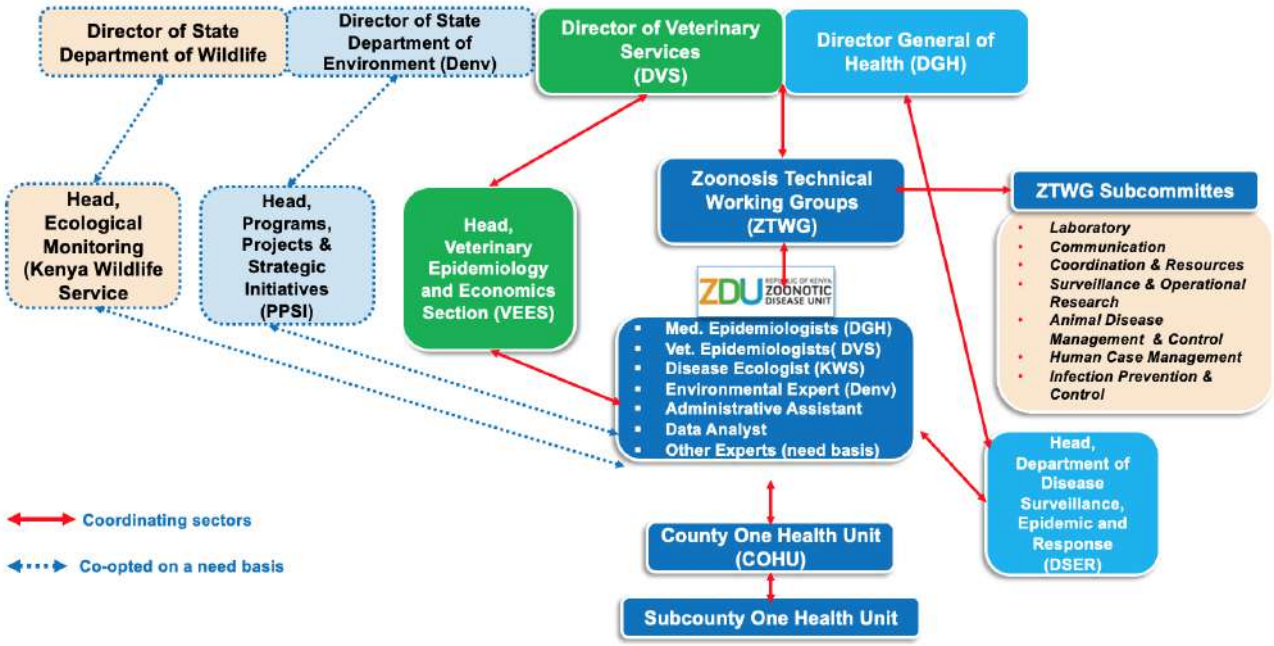


Figure 2: Proposed new organizational structure of ZDU/NZTC

2.6 Policy and Legal Frameworks

At the global level, the One Health Strategic plan (2020-2024) aligns with the Sustainable Development Goals (SDG) 2, 3 and 15, the revised WHO IHR (2005) and IDSR technical guidelines, the OIE Terrestrial and Aquatic Animal Health code, the Global Health Security Agenda (2024) and the Sendai Framework for Disaster Risk Reduction (2015-2030). The plan also aligns with the African Union Agenda 2063 and other relevant disease prevention and control strategies (such as the African Union Agenda 2063 and other relevant disease prevention and control strategies)..

At the national level, the One Health Strategic Plan (2020-2024) plan conforms with the 2010 Kenya Constitution, Vision 2030, the Big Four Agenda, as well as sectoral policies and strategies here listed: the Kenya Health Policy (2010-2030), the Kenya Health Sector Strategic and Investment Plan (2019-2023), the revised National Livestock Policy (2019), the Kenya Veterinary Policy 2015 (draft), the National Wildlife Policy 2011 (draft), the Agricultural Sector Transformation and Growth Strategy (ASTG, 2019-2029), National Action Plan for Health Security (NAPHS, 2019-2023), The National Wildlife Strategy (2030), Health strategic plan (2015-2030) and the Directorate of Veterinary Services Strategic Plan (2018-2022).

Since health and veterinary services are devolved functions, county governments will play a vital role in the prevention of zoonotic diseases using a One Health approach. The current One Health strategic plan has been developed in consultation with county stakeholders and is customizable to strategies and policies of county governments..

The plan is supported by several laws that are relevant to the prevention and control of zoonotic diseases in Kenya such as the the Animal Diseases Act (Cap 364), the Meat Control Act (Cap 356), the Public Health Act (Cap 242), Fisheries Act (Cap 378), Kenya Veterinary Vaccines Production Institute Order (1990), Kenya Medical Supplies Authority Act (2013), Medical Practitioners and Dentists Act (Cap 253); Nurses Act (Cap 257); Veterinary Surgeons and Veterinary Para-Professionals Act (Rev. 2014,2011); Medical Laboratory Technicians and Technologies Act (Rev. 2012, 1999); Food, Drug and Chemical Substances Act (Cap 254), Rabies Act (Cap 365), the Health Act (2017), Wildlife Conservation and Management Act (cap 376) and the Intergovernmental Relations Act (2012).

2.7 Stakeholder Analysis

A stakeholder analysis is essential to guide the development of a One Health strategic plan. The outputs of a stakeholder analysis feed into activities of planning, implementation and synthesis of an effective communication strategy, among others. The professionals developing this strategic plan analyzed the stakeholders in the country with respect to their roles, attitude, and implementation of the One Health approach. The analysisalso considered methods to engage various stakeholders in One Health, the key messages to be used and the champions to be targeted. Details of the stakeholders analysis are in **Table 5** under **Appendix 3**.

2.8 PESTEL and SWOT Analysis

The prevailing Political, Economic, Social, Technological, Legal and Environmental factors (PESTLE) that would impact the implementation of the One Health strategy to prevent zoonotic diseases in Kenya were analyzed. Furthermore, One Health implementation's strengths, weaknesses, opportunities, and threats (SWOT) were identified. These analyses informed the development of this strategic plan and are presented below in **(Tables 1 & 2)**

Table 1. PESTEL Analysis results for the OH strategic plan for prevention and control of zoonotic diseases in Kenya

	PESTLE Factors	Impact on OH implementation	Recommendation for OHSP
Political	Devolution of public service delivery	Inadequate coordination and divergent priorities between national and county medical and veterinary services	• Continued engagement with counties • Participation in inter-governmental relations forums
	Frequent changes in the senior leadership of ministries involved in One Health	Weakens political buy-in and slows the momentum of the One Health approach	• A sustained approach to sensitize high level ministry officials on One Health and zoonotic diseases
Political	Absence of a One Health Policy	Negatively impacts buy-in,political support and funding	• Advocate the development of a OH policy and inclusion of statements on OH in sectoral policies • Lobby relevant government ministries and stakeholders to implement a One Health policy
Economic	Competition for funding with other national priorities	Negatively impacts budgetary allocation to zoonotic disease prevention programs	• Increase collaboration with development partners • Develop resource mobilization proposals • Develop annual budgetary estimates and lobby for more budgetary allocation
Social	Cultural values and practices that hinder good animal health, production, welfare and public health	Increased zoonotic disease risks	• Capacity development and consultation with counties to use appropriate extension delivery systems,; community empowerment • Develop OH communication plan to implement information, education and behavioral change using culture-responsive information
	Low literacy levels	Hinder One Health knowledge transmission and enhance transmission of zoonotic diseases	• Use most accepted approaches for communication to various target communities • Use of appropriate information dissemination platforms

	PESTLE Factors	Impact on OH implementation	Recommendation for OHSP
Technology	Rapid development and change in ICT technologies	Inability to keep up with the required changes	Staff capacity development; continued professional development
	Use of ICT applications in OH implementation	Possibility for Improved disease surveillance, prevention and response using technology	Invest in most result-oriented and user-friendly technology in zoonotic disease prevention and control activities
Environmental	Climate change	Extreme weather pattern shifts and shocks associated with increased incidence of zoonotic disease outbreaks	• Enhance resilience, disaster preparedness and management • Streamline close collaboration with Metrological department
Environmental	Environmental degradation and Pollution	Increased incidence of diseases	Involve environmental experts and authorities in implementation of the one health strategic plan
	Increased human-wildlife interactions and conflict	Increased incidences and burden of emerging and re-emerging zoonotic diseases	• Develop and issue guidelines on Land use planning in collaboration with Environmental and Planning • Develop and disseminate guidelines on sustainable energy source
	Globalization Environmental degradation	Increased propagation and trans-boundary spread of zoonotic diseases	Collaborate with regional and global actors in addressing regional and global health agendas
Legal	Competition with other priorities in parliamentary calendar	Delay in debate and passing of veterinary medical policies and bills	Lobby the appropriate parliamentary committees
	Inadequate legislative framework	Gaps in existing laws may hinder One Health implementation	Advocate for review of laws to support implementation of one Health in prevention and control of zoonotic diseases

2.9 Consultative Approaches

This strategic plan was developed through a participatory consultative process involving a broad range of stakeholders from sectors involved with zoonotic disease prevention and control using a One Health approach. The plan builds on the lessons learnt from the previous strategic plan (2012 to 2017). This strategic plan is guided by international best practices and guidelines for the control of zoonotic diseases, in particular the FAO, OIE and WHO tripartite guidelines. It also conforms to the Kenya Constitution (2010), Vision 2030, the "Big Four" Agenda and existing sectoral polices and strategies.

Table 2. SWOT Analysis for the prevention and control of zoonotic diseases in Kenya using a One Health approach from 2021 to 2025.

Thematic area	Strengths	Weaknesses
Zoonotic disease prevention, surveillance, response and control	•Disease surveillance structures exist at County and sub-County levels for both animal and human health. • A revised IDSR strategy that incorporates zoonotic diseases is being implemented in line with IHR (2005) • The country has comprehensively prioritized zoonotic diseases • Strategies, programs and guidelines are in place for some priority zoonotic diseases, such as for rabies elimination • Syndromic surveillance system for livestock and wildlife is being implemented through an electronic reporting platform • Regional labs and one Central Veterinary Laboratories is in place with some diagnostic capacity • The country has a good network of human diagnostic laboratories and good capacity for confirmatory diagnosis at the national reference laboratories at KEMRI and NPHL • The Disease Surveillance and Response Unit (DSRU) in the MOH produces and disseminates a weekly epidemiological bulletin on human diseases • The VEES produces and disseminates quarterly bulletins on animal diseases • Existing curriculum on One Health for training institutions at various levels • Trained human and animal health personnel • Contingency plans available • Applied epidemiology training program in place	• Weak enforcement of disease control strategies • Some priority zoonotic diseases do not have national control plans •Limited coverage of electronic reporting in animal health • Limited diagnostic capacity for zoonotic diseases in humans and wildlife •Lack of laboratories specialized in wildlife disease diagnosis and lack of validated laboratory tests for wildlife diseases • Inadequate reporting structures for wildlife disease surveillance • Absence of a structured surveillance for neglected zoonotic diseases e.g. echinococcosis, hydatidosis, q-fever, rickettsial fevers • Limited human capacity at National and County and a high turnover of surveillance officers • Weak sample referral system, especially in the animal health laboratories • Laboratories have weak capacity to diagnose zoonotic diseases • Test kits commonly used for zoonotic disease diagnosis are not validated e.g. brucellosis • Limited access to human and animal laboratory services in arid/semi-arid counties • Veterinary investigation laboratories are not adequate for the country (only seven currently) • Inadequate human health and animal health specialists • Sub-optimal involvement of private practitioners in disease reporting in both humans and animals • Challenges in reporting:- timeliness, data quality, sensitivity
	• Existence of legal and policy framework e.g. Animal Diseases Act, Public Health Act, National Livestock Policy, National Wildlife Policy • Existence of disease surveillance guidelines e.g. IDSR/IHR (2005), OIE, FAO • Existence of contingency plans for some diseases e.g. RVF, HPAI • Multiple zoonotic disease challenges e.g. anthrax	• Lack of county-specific contingency plans for outbreak response, and absence of rapid outbreak response teams • Weak institutional structures for sharing of resources between the animal and human health agencies • Culture of working in silos • Lack of intersectoral laboratory sharing policy • Lack of harmonized disease community surveillance guidelines • Lack of a National One Health policy • Inadequate human resource at national and subnational levels • Inadequate information sharing (between sectors) • Lack of integrated SOPs and guidelines for zoonotic diseases • Inadequate surveillance data feedback (between sectors and farmers/livestock keepers) • Porous borders and inadequate cross-border collaboration among neighbouring countries
One Health coordination and collaboration	• The ZDU is institutionalized in the MOH and MAL&F to coordinate zoonotic disease as a One Health platform	• Weak Involvement of the Ministry responsible for Environment in the One Health approach

Thematic area	Strengths	Weaknesses
One Health coordination and collaboration	• A Zoonotic Technical Working Group (ZTWG) is in place to provide technical guidance in prevention and control of zoonotic diseases • The country has One Health champions some of whom have been mentored by ZDU through FELTP residencies and graduate internships • ZDU promotes multisectoral collaboration • Other multisectoral collaboration efforts e.g. AMR, food safety are present in the country • One Health approach is explicitly spelt out in veterinary and livestock policies which can positively impact buy-in and support by key decision makers • Some human and animal health training institutions address One Health at pre-service level • A clear MoU defining the obligations, roles and responsibilities of each of the line ministries under the OH Platform is in place • Quarterly OHTWG and monthly ZTWG meetings are already ongoing	• Inadequate ZDU staff to effectively implement the One Health mandate • Weak county-level mechanisms for One Health coordination and collaboration • Limited Government funding for zoonotic disease prevention and control • Inconsistent monitoring and evaluation of the One Health activities • Weak linkages between ZDU and new One Health initiatives that address other thematic areas beyond zoonotic diseases (e.g AMR,) • Dependence on donor funding could hinder sustainability • Duplication of efforts with no framework to harmonize activities by different institutions • Lack of interoperable data reporting and sharing
Operational Research	• The ZTWG provides a multisectoral platform to discuss both operational research and basic research agenda using the One Health approach • An existing list of priority zoonotic diseases is available to guide the research agenda	• Weak linkage with environmental health experts limits the scope of research agenda • Weak information technology infrastructure limits the capacity for establishment of databases at national and county levels
	• The ZDU has enhanced capacity to undertake zoonotic disease outbreak investigations and associated operational research by the parent ministries. • Participating institutions are conducting relevant and reliable research related to One Health • Existence of multidisciplinary and multisectoral research experts • Political will on importance of research e.g. multi-disciplinary research funds through the National Research Fund • Availability of basic infrastructure and resources for research • Existence of rich and diverse natural resources for use in research	• Absence of a research information sharing system • Institutions conduct research in isolation • Inadequate information sharing among institutions on One Health research • Duplication of research by different institutions • Output of One Health research is not used to inform appropriate policies • National research agendas do not address One Health issues •
Zoonotic disease prevention, surveillance, response and control	• Prevention and control of zoonotic diseases including emerging pandemic threats is a priority in global health security priority and the SDGs • A national action plan for health security (NAPHS, 2019–2023) is in place to strengthen IHR (2005) core capacities that include zoonotic diseases • There are continental and regional initiatives from multiple global partners • Kenya has good information and communication technologies (enhanced mobile phone and email communication and internet accessibility) can be harnessed for improved surveillance • Devolved governance could improve funding for zoonotic disease prevention and control across the country • There is a One Health communication strategy (draft) • There is potential to expand delivery of existing curriculum on One Health to more training institutions • Establishment/strengthening of county-based veterinary investigation laboratories in all the 47 counties • Greater involvement of private practitioners in disease reporting in both humans and animals • Existence of various surveillance tools and platforms • Presence of potential donors to support disease surveillance and prevention	• Outbreaks of emerging and re-emerging zoonotic diseases such as Ebola, RVF and HPAI • Insecurity in parts of the country decreases access to essential health and veterinary services • Porous borders with neighbouring countries makes enforcement of border controls difficult, increasing the risk of incursion of zoonotic diseases • There is increasing global threat of bioterrorism • Climate change with extreme weather pattern shifts could exacerbate the emergence and spread of zoonotic diseases • Environmental degradation and pollution could increase the emergence and vulnerability to zoonotic diseases • Globalization enhances emergence and rapid spread of zoonotic diseases • Changing priorities in global health funding • International travel. • Difficulty defining the right environmental experts • Political interfering with disease control efforts. • Some cultural beliefs, practices and diets predispose communities to risks particular OH problems • insufficient or lack of compelling evidence of advantages of One Health to the policy makers • Conflicting political interests • Conflicting and/competing interests on priority setting and resource allocation • Fragmented chain of command

Thematic area	Opportunities	Threats
One Health coordination and collaboration	• Strong global technical support and advocacy for the One Health approach through FAO, OIE, WHO and World Bank among other international organizations • Presence of a vibrant private sector that provide opportunity Public-Private partnership for One Health implementation • Presence of Devolved governance as an opportunity for One Health collaboration	• The presence of devolved governance may create power struggles with the national goverment
Operational Research	• There is global interest in research on emerging and re-emerging diseases • ZDU has networks and linkages that favour research activities by international partners • Occurrence of emerging/re-emerging pandemic threats • Baseline information on One Health exists in different collaborating institutions • Existence of external funding agencies • Interest of development partners and innovation • Existence of EAC One Health forum • Existence of fora (e.g. KMA, KVA, conferences) that can be used to disseminate policy briefs	• Potential shifts in global research agenda • Many research projects are not demand driven • Lack of availability of renewable material resources • Global economic crisis • Competing priorities of the donor and local institutions • Diversity of one health group formulation • Lack of government commitment after donor withdrawal • Inadequate communication between researchers and policy makers • Customs and culture


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3 The Five-Year Strategic Plan (2021-2025)

This section presents the vision, mission, goals, core values and guiding principles of the five-year strategic plan. In addition, the detailed strategic framework, financing, and monitoring and evaluation aspects of the plan are described.

3.1 Vision, Mission and Goal

Vision:

Elimination of zoonotic disease threats to ensure well being of humans, animals and the environment in the country

Mission:

To establish and strengthen multi-sectoral collaborations through the One Health approach to effectively prevent and control zoonotic diseases at national and county levels.

Goal:

To reduce the burden of zoonotic diseases through a One Health approach.

3.2 Core Values and Guiding Principles

Core Values

The following are the core values that will guide the implementation of this strategic plan:

- Collaboration – To promote engagement, close working relationships, collaboration among stakeholders and disciplines to achieve full benefit and synergy for all.
- Adaptability – Flexibility, innovativeness and responsiveness, to meet evolving county, national, regional and international One Health requirements.
- Excellence – Promote the highest standards of performance across the One Health scope,to realize quality and continuous improvement at all levels.
- Transparency – Strive for open and interactive communications with and among members, partners, staff, and other stakeholders to create the highest level of ethics throughout its work.
- Integrity – Strive for absolute scientific confidence through all communications, resources, and programs to ensure our work's credibility and the importance and value of the One Health approach.
- Leadership – Serve with a visionary responsibility for the future, instilled with the highest level of trust to develop and implement an integrated strategy for improved health in Kenya, regionally and globally.
- Stewardship – Maintain responsible management practices, to uphold the highest standards of accountability regarding our work and the use of our funds.

Guiding Principles

The following principles will guide the implementation of this plan:

1. Prevention and control of zoonotic diseases is a public good and requires strong political and financial commitment for sustainability at national and county levels .
2. Regional and international collaboration is necessary for the control of zoonotic, emerging and re-emerging diseases.
3. Use of multi-sectoral and multi-disciplinary approach to realize technical, political and regulatory frameworks required to manage zoonotic diseases and other emerging One Health priorities.

4. Adaptation to emerging information and communication technologies for effective One Health implementation.
5. Adaptation to emerging zoonotic disease trends.
6. Community engagement in the prevention and control of zoonotic diseases.
7. Prevention is the most cost-effective way to reduce the burden of disease.
8. Respect for cultural diversity and gender inclusivity is important to overcome access barriers to health.
9. Public health policy and practice should be evidence-based.

3.3 Strategic Framework

This strategic plan will be implemented through three objectives and eleven strategies as outlined below.

Strategic Objective 1: Strengthen Implementation of One Health Approach at National and County Levels

Reducing the burden of zoonotic diseases, including emerging and re-emerging ones, requires coordination and collaboration mechanisms between ministries responsible for human, animal (livestock and wildlife) and environmental health, alongside other stakeholders. This plan will employ the four strategies outlined below to establish coordination and collaboration mechanisms at the national and county levels.

1.1: Strengthen OH Co-ordination Mechanisms at National and County Levels

This strategy will involve strengthening operations and structures of the ZDU, including enhancing the involvement of the environmental sector in ZDU; establishment and operationalization of COHU; strengthening the coordination mechanism for zoonotic disease management at national level; updating the database of ZTWG stakeholders and sensitizing the Council of Governors on the One Health approach.

1.2: Strengthen Collaborative Mechanisms for OH Initiatives

This will entail reviewing and disseminating the One Health communication strategy, strengthening linkages with regional and international platforms and coordinating the establishment of an over-arching national One Health Platform to link different OH thematic areas for synergy and coherence.

1.3: Strengthen OH Policy and Legal Frameworks

This strategy will focus on improving the policy and legislative environment for implementation of the OH approach through evidence-based advocacy with policymakers at both national and county levels.

1.4: Support Capacity Building for OH Workforce

This strategy will involve in-service training of personnel from human, animal, environmental and other relevant sectors on zoonotic diseases and One Health approach; advocating for inclusion of One Health modules in training institutions; and mentoring ZDU interns and post-graduate residents on the OH approach. This strategy will be implemented in collaboration with OHCEA/ Africa One Health University Network (AFROHUN) Kenya.

Strategic Objective: 2. Strengthen Prevention, Surveillance, Response and Control of Priority Zoonotic Diseases in both Humans and Animals

Data-driven prevention, response and control strategies are necessary to establish and reduce the burden of zoonotic diseases, which depend on strong disease surveillance systems. While medium to long-term building efforts are ongoing, there will be a need to respond to emergencies arising from outbreaks of known zoonotic diseases, and those of unknown etiology. This objective will employ the five strategies outlined below.

2.1 Strengthen Surveillance for Zoonotic Diseases at the National and County level

This strategy will involve reviewing and updating the list of priority zoonotic diseases and the associated risk maps; conducting risk assessment for priority zoonotic diseases; updating existing surveillance tools and guidelines by the different sectors; and strengthening surveillance for zoonotic diseases among other interventions.

2.2 Enhance, Prevention and Control of Priority Endemic Zoonotic Diseases

This strategy will focus on developing and updating prevention and control plans for priority endemic zoonotic diseases such as rabies, Rift Valley fever, brucellosis and anthrax.

2.3 Enhance Preparedness and Response to Zoonotic Disease Outbreaks and Public Health Events of Initially Unknown Etiology

This strategy will review and develop preparedness and response plans for zoonotic and potentially zoonotic emerging diseases and disseminate a One Health Joint Response Plan to zoonotic and potentially zoonotic emerging disease outbreaks; coordinate joint outbreak response activities; and review and develop disease-specific risk and crisis communication plans.

2.4 Support Strengthening of National, Regional and County Laboratories for Diagnosis of Priority Zoonotic Diseases

This strategy will involve conducting diagnostic laboratory needs assessment for priority zoonotic diseases, developing protocols for sample referral, and establishing and enhancing diagnostic capacity for priority zoonotic diseases.

2.5 Strengthen Early Warning Systems for the Detection of Emerging and Re-emerging Zoonotic Diseases and Public Health Events of Initially Unknown Etiology

This strategy will entail supporting the establishment of sentinel human, wildlife and livestock surveillance sites to enhance early detection of pathogens of public health interest. It will also entail supporting community based zoonotic disease surveillance.

Strategic Objective 3: Promote Applied Research using the OH Approach

Applied research provides required evidence for interventions and policy directions with regard to zoonotic diseases prevention and control. This objective will employ the two strategies outlined below:

3.1 Develop zoonotic and emerging infectious diseases research agenda for Kenya

This will entail convening stakeholders from the different One Health sectors to discuss and agree on research priorities for zoonotic diseases in Kenya.

3.2 Conduct Applied Research to Inform Evidence-Based Strategies and Policies on Priority Zoonotic Diseases

This strategy will focus on supporting epidemiological, ecological, socioeconomic and cross-sectoral studies; reviewing literature periodically to guide updating of strategies; and promoting citizen science's application in zoonotic disease prevention and control among other interventions.

The detailed strategic framework is presented in the matrix below in (Table 3) outlining the objectives, strategies, activities, sub-activites, expected outputs, indicators, timelines, and budget for implementing the activities. The ZDU will be responsible for implementation.

Table 3. Strategic framework for implementation of One Health approach (2021 – 2025)

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
Strategic Objective 1: Strengthen implementation of One Health approach at national and county levels										
1.1 Strengthen OH coordination mechanisms at national and county levels	1.1.1: Strengthen operations and structure of the ZDU	1.1.1.1 Update optimal staff requirement for ZDU	Optimal staff requirement of ZDU established	ZDU staff establishment report	x	x				0.00
		1.1.1.2 Review and sign the MOU that establishes ZDU	MOU revised and signed	A signed MoU		x				480,000
		1.1.1.3 Advocate for deployment of staff in the ZDU	Staff deployed	Number of staff deployed against the establishment	x	x	x	x	x	0.00
		1.1.1.4 Review terms of reference (TOR) for zoonotic disease unit	TOR reviewed	Reviewed TOR available	x					
	1.1.2 Strengthen the involvement of the environmental sector in ZDU	1.1.2.1 Establish a position for a disease ecologist at ZDU and lobby the responsible ministries to deploy the officer	Disease ecologist position established and officer deployed	A deployed disease ecologist	x	x				0.00
		1.1.2.2 Establish position for an environmental officer and lobby responsible ministry to co-opt on a need basis	Environment officer position established and officer co-opted on a need basis	A co-opted environment officer	x	x				0.00
	1.1.3: Support establishment and operationalization of county One Health platform	1.1.3.1 Establish procedures to promote One Health approach at the county	Guidelines (SOPs) available	Number of SOPs	x	x				1,332,000
		1.1.3.2 Sensitize County policy makers on One Health	Sensitization meetings for County policy makers conducted	Number of sensitization meetings held	x		x			10,230,000
		1.1.3.3 Form and train County One Health Units (COHUs)	County COHUs formed and trained	TORs of COHUs Minutes/ proceedings	x	x	x			5,000,000
		1.1.3.4 Advocate for appointment of OH focal persons by Counties	County OH focal persons appointed and working	Number of focal persons appointed Number of counties with focal persons	x	x				500,000
		1.1.3.5 Sensitize the County OH focal persons	County OH focal persons sensitized	Number of focal persons sensitized	x	x	x	x		1,026,000
		1.1.3.6 Hold annual regional review meetings for COHUs	Meetings held	Number of meetings held		x	x	x	x	25,000,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
	1.1.4: Strengthen the coordination mechanism for zoonotic diseases management	1.1.4.1 Transform ZTWG to a National Zoonotic Disease Technical Committee (NZTC)	NZTC in place	Minutes of meetings	x					3,000,000
		1.1.4.2 Identify/ formally nominate members from the human, animal and environment sectors to the NZTC	Formally nominated NZTC members in place	Letters of appointment	x	x				0.00
		1.1.4.3 Form NZTC sub-committees	NZTC sub-committees formed and operational	Minutes/reports	x	x	x	x	x	3,000,000
		1.1.4.4 Hold Quarterly meetings for the NZTC	Quarterly meetings conducted	Minutes of meetings	x	x	x	x	x	5,320,000
		1,1,4,5 Hold a biennial zoonotic disease conference to involve national, county and other OH stakeholders to share best practices and experiences	Biennial zoonotic conference held	Proceedings of the conference		x		x		2, 500,000
	1.1.5 Update database of subject matter experts (SME) on priority zoonotic diseases	1.1.5.1 Request for nomination of Subject matter experts from relevant institutions	List of SME nominees in place	Number of SME nominees	x	x				0.00
		1.1.5.2 Convene a meetings of the NZTC to review and approve SME nominees	Experts database updated	A database of experts		x				2,000,000
	1.1.6 Engage COG to get support for OH approach	1.1.6.1 Develop advocacy material	Advocacy material developed	Advocacy materials		x				2,000,000
		1.1.6.2 Convene a meeting with CoG	Meetings with the CoG held	Meeting report/ minutes		x				720,000
		1.1.5.3 Convene two meetings with the relevant CECM/COs	Meeting with CECM/ Cos convened	Number of meetings Minutes of meeting			x		x	2,500,000
1.2 Establish collaborative mechanisms for OH initiatives	1.2.1 Review and disseminate OH Communication Strategy	1.2.1.1 Hold 2 workshops to review communication strategy	Communication strategy reviewed	A reviewed communication strategy Number of workshops held	x	x				2,760,000
		1.2.1.2. Disseminate strategy to stakeholders through 2 sensitization meetings and electronic platforms	Communication strategy disseminated	Number of sensitization meetings Number of platforms used			x			1,220,000
		1.2.1.3 Develop and disseminate messages to target audiences	Communication messages shared to audiences	Number of messages developed			x	x	x	1,618,000
		1.2.1.4 Update the ZDU electronic footprint (website and twitter) regularly	ZDU electronic footprint current and up-to-date	Updated electronic footprints	x	x	x	x	x	1,000,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
	1.2.2: Strengthen linkages with regional and international OH platforms	1.2.2.1 Participate in 5 cross border One Health meetings	Cross-border meetings attended	Number of cross-border meetings attended reports	x	x	x	x	x	1,120,000
		1.2.2.2 Participate in 3 regional OH platform meetings	Regional OH meetings attended	Number of regional OH meetings attended Reports	x	x	x	x	x	2,240,000
		1.2.2.3 Participate in 3 international conferences	International conferences attended	Number of international conferences attended Proceedings/ reports	x	x	x	x	x	3,360,000
	1.2.3: Coordinate the establishment of the national OH platform	1.2.3.1Identify OH thematic areas and stakeholders	One Health thematic areas and stakeholders identified	Thematic areas and stakeholders report	x	x				1,020,000
		1.2.3.2 Develop TORs and organization structure for the national OH coordination platform	TORs and Organizational structure for national OH platform developed	TORs and Organizational structure		x	x			1,020,000
		1.2.3.3Sensitize stakeholders and Counties on national One Health platform	Stakeholders and Counties sensitized on One Health platform	Number of stakeholders and Counties sensitized				x	x	2, 360,000
		1.2.4.4 Coordinate biannual meeting of the national OH platform	Biannual meetings held	Number of biannual meetings held					x	5,360,000
1.3 Strengthen OH policy and legal frameworks	1.3.1 Identify gaps in policies and legislations with regard to OH approach	1.3.1.1 Conduct a policy and legislative scan to identify gaps in existing policies and legislations	Policy and legislative scan conducted	Policy and legislative scan report		x	x			2,220,000
	1.3.2 Disseminate evidence-based policy advocacy materials to policy makers at national and county level	1.3.2.1 Prepare policy briefs	Policy briefs prepared	Number of policy briefs		x	x			1,000,000
		1.3.2.2 Convene policy dialogue through NZTC	Policy dialogue meetings convened	Number of policy dialogue meetings convened			x	x	x	1,600,000
		1.3.2.3 Prepare and publish newspaper articles	Newspaper articles prepared and published	Number of newspaper articles prepared and published			x	x	x	500,000
1.4 Support Capacity building for OH workforce	1.4.1 Develop and implement training modules on zoonotic diseases and One Health for human, animal and environmental health professionals	1.4.1.1 Conduct training needs assessment on priority zoonotic diseases and One Health	Training needs assessment conducted	Training needs assessment report	x					500,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
		1.4.1.2 Develop training modules for priority zoonotic diseases and One Health	Training modules developed	Number Training modules	x	x	x	x	x	440,000
		1.4.1.3 Conduct two trainings annually on the priority zoonotic diseases and One Health	Trainings conducted	Number of trainings conducted	x	x	x	x	x	22,016,000
	1.4.2: Advocate for inclusion of One Health modules in training institutions for animal, human and environmental health	1.4.2.1 Conduct annual advocacy meetings to promote curriculum review in training institutions to incorporate One Health modules	Annual advocacy meetings held	Number of advocacy meetings held		x	x	x	x	1,360,000
		1.4.2.2 Conduct advocacy meetings with professional regulatory bodies to accredit One Health modules as part of continuous professional development	Advocacy meeting held	Number of advocacy meetings held		x	x	x	x	1,360,000
	1.4.3 Provide mentorship to interns and post-graduate residents on the OH approach	1.4.3.1 Provide mentorship to interns and post-graduate residents	Trainees mentored on the One Health approach	Number of trainees mentored	x	x	x	x	x	1,500,000
Strategic Objective: 2. Strengthen prevention, surveillance, response and control of priority zoonotic diseases in both humans and animals										
2.1 Strengthen surveillance for zoonoses at the National and County levels	2.1.1 Review existing sector-based surveillance data collection tools to include relevant zoonotic diseases information	2.1.1.1 Review existing zoonoses data collection tools	Existing data collection tools reviewed	Number of tools reviewed Report		x	x			2,220,000
	2.1.2 Coordinate data exchange between human, animal and environmental health sectors at National and County levels	2.1.2.1 Develop guidelines on information sharing for priority zoonotic diseases at the national and county level	Guidelines on information sharing developed	Guidelines		x	x			5,220,000
		2.1.2.2 Develop data sharing agreements between the sectors	Data sharing MoUs developed and signed	Signed MoUs		x	x			500,000
		2.1.2.3 Develop a protocol for immediate notification of zoonotic diseases between multiple sectors	Protocol for immediate notification developed	A protocol for immediate notification of zoonotic diseases		x	x			500,000
		2.1.2.4 Convene biannual information sharing fora among stakeholders	Information sharing fora convened	Number of fora convened	x	x	x	x	x	4,600,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
	2.1.3: Review zoonoses surveillance guidelines	2.1.3.1 Review zoonoses surveillance guidelines and opportunities for integrated surveillance in animal, human and environmental health sectors	Surveillance guidelines in animal, human and environmental health reviewed	Reviewed surveillance guidelines	x					2,220,000
	2.1.4 Collate, analyze and share updates on zoonotic disease events in Kenya	2.1.4.1 Prepare and disseminate quarterly zoonotic disease bulletin	Quarterly zoonotic disease bulletin disseminated	Number of bulletins disseminated	x	x	x	x	x	1,000,000
		2.1.4.2 Organize public dissemination fora	Public dissemination fora on need-basis (during an outbreak)	Number of public fora organized	x	x	x	x	x	2,500,000
	2.1.5 Strengthen community-based syndromic surveillance	2.1.5.1 Develop and disseminate guidelines for community-based surveillance	Community-based surveillance guidelines developed and disseminated	Validated community-based surveillance guidelines		x				1,250, 000
		2.1.5.2 Develop lay case definitions and syndrome manuals on priority zoonotic diseases	Lay case definitions and syndromes developed	Lay case definition and syndrome manuals	x	x				4,440,000
		2.1.5.3 Disseminate case definition and syndrome manuals to	Case definitions and syndrome manuals disseminated to 15 piloted counties	Number of manuals disseminated Number of counties with manuals	x					5,220,000
		2.1.5.3 Support implementation of the community event based syndromic surveillance in zoonotic hotspots	Community event based surveillance system in place	Number of counties community event based surveillance	x	x	x			11,532,000
	2.1.6: Review and update list of priority zoonotic diseases	2.1.6.1 Identify all available tools and adopt suitable disease prioritization tool	Disease prioritization tool adopted	Adopted tool		x				1,380,000
		2.1.6.2 Conduct desk review on selected zoonotic diseases to inform prioritization at National and County	Database on zoonotic diseases available at National and County	Database on zoonotic diseases Number of zoonotic diseases reviewed		x				1,380,000
		2.1.6.3 Convene prioritization workshops to review and update priority list	Prioritization workshop convened Priority zoonoses list developed	Number of workshops Priority zoonoses list		x				1,380,000
		2.1.6.4 Disseminate zoonotic diseases priority list to stakeholders	Zoonotic disease list disseminated	1. Number of meetings held and stakeholders reached. 2. Proportion of counties to which list is disseminated		x				500,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
	2.1.7: Develop and review risk maps for priority zoonotic diseases	2.1.7.1 Develop risk maps for brucellosis, anthrax and other priority zoonotic diseases	Risk maps developed	Number of risk maps developed	x	x				2,220,000
		2.1.7.2 Review existing risk maps for rabies, RVF and other priority zoonotic diseases	Risk maps reviewed	Number of reviewed risk maps		x				1,380,000
		2.1.7.2 Develop risk profiles for priority ZDs	Risk profiles developed	Number of risk profiles	x	x				1,380,000
	2.1.8 Build capacity for risk assessment of priority zoonotic diseases	2.1.8.1 Conduct two trainings on risk assessment at national and county levels per year	Risk assessment trainings conducted	Number of risk assessment trainings conducted		x				5,152,000
		2.1.8.2 Conduct one joint risk assessment of zoonotic disease outbreaks, including public health events of initially unknown etiology (PHEIUE) per year	Joint risk assessments conducted	Number of joint risk assessments conducted			x	x	x	6,440,000
	2.1.9 Enhance surveillance at slaughter houses for neglected endemic zoonoses (Bovine TB, echinococcosis, cysticercosis)	2.1.9.1 Develop tools and training modules for surveillance of Bovine TB, echinococcosis, cysticercosis)	Tools and training modules developed	Number of tools and training modules developed		x	x	x		4,140,000
		2.1.9.2 Train slaughter-house personnel on the use of the surveillance tools for bovine TB, echinococcosis and cysticercosis	Slaughter-house personnel trained	Number of personnel trained			x	x	x	7,728,000
		2.1.9.3 Develop a reporting system and database for slaughter house surveillance	Reporting system and database developed	Reporting system and database			x	x	x	1,720,000
		2.1.9.4 Create linkages between the slaughterhouse and existing animal surveillance systems	Slaughterhouse and existing surveillance system linkage developed	Databases interoperable			x	x		1,720,000
		2.1.9.5 Advocate for inclusion of slaughter house zoonoses surveillance and reporting in curriculum of Meat Training Institute (MTI)	Advocacy meetings held	Number of advocacy meetings			x	x	x	540,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
2.2 Enhance preparedness and response to zoonoses outbreaks and public health events of initially unknown etiology	2.2.1: Develop and review contingency plans for priority zoonotic diseases	2.1.1.1 Conduct table top simulation exercises to update existing contingency plans (HPAI,RVF, PHEIUE)	1. Eight simulation exercises conducted for HPAI,RVF, PHEIUE	2. Three contingency plans updated 2. Number of contingency plans updated		x	x	x	x	17,760,000
		2.2.1.2 Conduct one field simulation exercise for HPAI	One field simulation exercise conducted	Simulation exercise report			x			2,244,000
		2.2.1.3 Develop a CP for any other emerging zoonotic disease based on risk assessment	Contingency plan developed	Number of contingency plans developed		x				1,430,000
	2.2.2 Develop, disseminate and test one health joint response plan to zoonotic disease outbreaks	2.2.2.1 Develop a One Health joint response plan for zoonotic disease outbreaks	OH joint response plan developed	One Health joint response plan			x			2,220,000
		2.2.2.2 Disseminate the plan to stakeholders	One Health joint response plan disseminated	1. Number of meetings held 2. Proportion of counties with the plan		x				250,000
		2.2.2.3 Conduct two table-top simulation exercises for joint response plan	Two joint table-top simulation exercises conducted	Number of simulation exercises conducted			x			2,769,000
	2.2.3 Coordinate joint outbreak response activities for zoonotic diseases	2.2.3.1 Conduct training for joint rapid response teams (National and County)	RRTs trained at National and Counties	Number of RRTs trained Proportion of Counties with JRRTs		x	x	x	x	5,000,000
		2.2.3.2 Develop a repository and database for all zoonotic disease outbreak and response reports	Repository for zoonotic disease outbreaks created	Zoonotic disease repository						500,000
		2.2.3.3 Conduct after action review for major zoonotic outbreaks	After action reviews conducted	Number of after action reviews conducted		x	x	x	x	2,220,000
		2.2.3.4 Participate in cross –border zoonotic disease simulation exercises	Participation in cross-border zoonoses outbreak simulation exercise	Number of cross-border simulation exercises participated in	x	x	x	x	x	200,000
	2.2.4: Review or develop disease-specific risk and crisis communication plans	2.2.4.1 Review existing disease specific (HPAI and RVF) risk and crisis communication plans	Disease specific risk and crisis communication plans reviewed	Number of plans reviewed			x			2,220,000
		2.2. 4.2 Develop risk and crisis communication plans for 4 other priority diseases	Communication plans for other zoonotic diseases developed	Number of communication plans developed			x			2,220,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
	2.2.4: Review or develop disease-specific risk and crisis communication plans	2.2.4.3 Disseminate disease-specific risk and crisis communication s plans	Risk communication plans disseminated	Number of dissemination workshops Proportion of counties with plans			x			250,000
2.3 Enhance, prevention and control of priority endemic zoonoses	2.3.1: Develop and update prevention and control plans for endemic zoonotic diseases	2.3.1.1 Finalize rabies elimination guidelines	Rabies elimination guidelines finalized	1. Number of rabies guidelines finalized	x					2,172,000
		2.3.1.2 Develop anthrax prevention and control plan	Anthrax prevention and control plan developed	Anthrax prevention and control plan	x	x				2,172,000
		2.3.1.3 Develop brucellosis prevention and control plan	Brucellosis prevention and control plan developed	Brucellosis prevention and control plan	x	x				2,172,000
		2.3.1.4 Develop prevention and control plans for 2 other priority zoonotic diseases	Prevention and control plans for other priority zoonotic diseases developed	Number of plans			x	x		4, 344, 000
		2.3.1.5Disseminate anthrax, brucellosis and other PZDs prevention and control plans and rabies elimination guidelines	Anthrax, brucellosis, and other PZDs prevention and control plans disseminated Rabies elimination guidelines disseminated	1. Number of plans disseminated 2. Number of counties with plans		x				696,000
		2.3.1.6 Train national and county technical personnel on implementation of brucellosis and anthrax prevention and control plans and rabies elimination guidelines	National and County personnel trained on anthrax, brucellosis and other PZDs plans and rabies guidelines	1. Number of counties with trained personnel 2. Number of national and county personnel trained		x				12,432,000
2.4 Support strengthening of National, regional and County laboratories for diagnosis of priority zoonotic diseases	2.4.1: Conduct diagnostic laboratory needs assessment	2.4.1.1 Conduct laboratory diagnostic capacity needs assessment for priority zoonotic diseases at national, county level and KWS diagnostic laboratory	Capacity needs assessment conducted	A capacity need assessment report		x				2,500,000
		2.4.1.2 Support trainings based on the need assessments	Trainings undertaken	Number of training conducted Number of trainees		x				2,470,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
2.4 Support strengthening of National, regional and County laboratories for diagnosis of priority zoonotic diseases	2.4.2: Develop protocols for animal health sample referral for priority zoonotic diseases	2.4.2.1 Develop protocols for specimen referral, including referrals across sectors for PZDs	Protocols developed	Number of protocols developed		x				5,130,000
		2.4.2.2 Train both human and animal health laboratory staff and frontline workers on the sample referral protocols.	Animal health laboratory and frontline workers trained	Number of staff trained		x	x	x	x	8,288,000
	2.4.3 Enhance laboratory diagnostic capacity for priority zoonoses	2.4.3.1 Establish rabies diagnostic capacity at the NPHL	Rabies diagnostic capacity established	Rabies diagnostic facility at NPHL	x					546,000
		2.4.3.2 Expand rabies diagnostic capacity to all RVILs	Rabies diagnostic capacity established in all RVILs	Number of RVILs with rabies diagnostic capacity		x	x	x	x	2,310,000
		2.4.3.3 Support establishment of confirmatory diagnostic tests for brucellosis at the NPHLS & RVILs	Brucellosis Confirmatory diagnostic capacity available at NPHLS and all RVILs	Number of RVILs with brucellosis confirmatory diagnosis Diagnostic capacity at NPHLS		x				1,638,000
		2.4.3.4 Advocate for equipping of labs according to results of laboratory needs assessment	Advocacy meetings held	Number of meetings held			x	x	x	1,500,000
		2.4.3.5 Support county labs on sample collection and basic laboratory diagnostics	Trainings carried out	Number of laboratory staffs trained			x	x	x	1, 250,000
2.5 Strengthen early warning systems for the detection of emerging and re-emerging zoonoses	2.5.1: Support establishment of sentinel wildlife and livestock surveillance sites	2.5.1.1 Identify priority zoonotic pathogens for wildlife and livestock sentinel surveillance	Priority ZDP identified	List of PZD for wildlife and livestock sentinel surveillance		x				2,260,000
		2.5.1.2 Map partners and stakeholders working in wildlife health and disease ecology	Stakeholder mapping	Database of stakeholders	x	x				300,000
		2.5.1.3 Identify and support establishment of sentinel sites with stakeholders in priority areas for targeted sentinel surveillance	Establishment of sentinel surveillance sites	Number of sites		x				2,760,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
2.5 Strengthen early warning systems for the detection of emerging and re-emerging zoonoses	2.5.1: Support establishment of sentinel wildlife and livestock surveillance sites	2.5.1.4 Support collection, collation and analysis of data from wildlife and livestock sentinel sites	Surveillance information reports	Number of reports		x				2,220,000
		2.5.1.5 Disseminate wildlife and livestock sentinel surveillance reports periodically	Wildlife surveillance reports decimated	Number of reports		x	x	x	x	200,000
Strategic objective 3: To promote applied research using the OH approach										
3.1 Develop zoonoses and emerging infectious diseases research agenda for Kenya	3.1.1: Map out stakeholders carrying out research in the human, animal and environment sectors to promote research collaborations on zoonotic diseases		Stakeholder mapping report in place	Stakeholder mapping report		x				1.000,000
	3.1.2: Convene key stakeholders meeting to identify priority research areas at the human-animal-environmental interface		Priority research agenda report	Priority research agenda report		x				1,380,000
	3.1.3: Prepare concept notes and proposals to conduct applied research in the identified areas		Concepts and proposals prepared	Number of concept notes and proposals prepared	x	x	x			0.00
3.2 Conduct applied research to inform evidence-based strategies and policies on priority zoonotic diseases	3.2.1 Conduct cross-sectional studies for baseline data on zoonotic diseases		Cross-sectional studies conducted Baseline data available	Number of diseases with baseline data Number of studies conducted		x	x			10,000,000
	3.2.2 Conduct studies in wildlife to detect zoonotic and potentially zoonotic pathogens.		Pathogen search studies done	Number of pathogen search studies		x	x	x		1,500,000
	3.2.2 Promote application of citizen science to support prevention and control of PZDs		Citizen science studies conducted	Number of citizen science studies		x	x			1,500,000
	3.2.3 Identify and map potential emerging infectious disease hotspots in the country		Potential hotspots for EIDs identified and mapped	Number of hotspot maps		x	x			1,500,000

Strategy	Activities	Sub-activities	Outputs	Indicators	Timeframe					Budget (Ksh)
					2021	2022	2023	2024	2025	
3.2 Conduct applied research to inform evidence-based strategies and policies on priority zoonotic diseases	3.2.4 Conduct linked studies on transmission dynamics of priority zoonotic diseases at the animal-human interphase		Linked studies conducted	Number of linked studies conducted			x	x	x	1,500,000
	3.2.5 Conduct operational research studies to support and evaluate implementation of anthrax, brucellosis and rabies strategies		Studied conducted	Number of studies conducted		x	x	x		1,500,000
	3.2.6 Carry out biennial review of literature to update burden, prevention and control measures for priority zoonoses		Literature review report	Number of literature review reports			x		x	1,380,000
	3.2.7 Conduct socio-economic impact studies to inform policies on zoonotic disease prevention and control and the One Health approach		Socio-economic impact studies conducted	Number of studies conducted		x	x	x		1,500,000
	3.2.8 Promote ecological studies to understand drivers of zoonoses emergence and re-emergence	3.1.6.1 Establish an expert working group with environmental sector subject matter experts	Expert working group established	An expert working group			x			1,380,000
		3.1.6.2 Conduct one study per year on ecological drivers of disease emergence and disseminate findings	Studies conducted	Number of studies conducted		x	x	x	x	1,500,000
	3.2.9 Prepare and submit scientific publications and reports for journals, books and conference proceedings		Scientific publications and reports submitted	Number of scientific publications and reports submitted		x	x	x	x	240,000
	3.2.11:Create a repository for scientific publications and reports on zoonotic diseases in Kenya		Repository created	Number of articles	x	x				300,000

3.4 Financing the Strategic Plan

The strategic plan for the prevention and control of zoonotic diseases using a one Health approach will cost Ksh 313,577,000 as shown in the breakdown below (Table 4). These financial resources are expected to come from the government of Kenya, county governments, other governmental agencies and implementing partners. The ZDU will develop a resource mobilization strategy for implementing this strategic plan.

Table 4. Summary budget for implementation of the strategic plan

Strategic Objective	Budget (Ksh)
Strategic Objective 1: Strengthen implementation of One Health approach at national and county levels	
1.1 Strengthen OH coordination mechanisms at national and county levels	79716000
1.2 Establish collaborative mechanisms for OH initiatives	22,378,000
1.3 Strengthen OH policy and legal frameworks	3,454,000
1.4 Support Capacity building for OH workforce	25,396,000
Subtotal	130,944,000
Strategic Objective: 2. Strengthen prevention, surveillance, response and control of priority zoonotic diseases in both humans and animals	
2.1 Strengthen surveillance for zoonotic diseases at the National and County levels	69,274,000
2.2 Enhance preparedness and response to zoonotic disease outbreaks and public health events of initially unknown etiology	39,039,000
2.3 Enhance, prevention and control of priority endemic zoonotic diseases	24,268,000
2.4 Support strengthening of National, regional and County laboratories for diagnosis of priority zoonotic diseases	24,672,000
2.5 Strengthen early warning systems for the detection of emerging and re-emerging zoonotic diseases	7,740,000
Subtotal	164,993,000
Strategic objective 3: To promote applied research using the OH approach	
3.1 Develop zoonotic and emerging infectious diseases research agenda for Kenya	2,340,000
3.2 Conduct applied research to inform evidence-based strategies and policies on priority zoonotic diseases	15,300,000
Subtotal	17,640,000
GRAND TOTAL	**348,577,000**

3.5 Monitoring and Evaluation

The ZDU/ZDTWG will develop a monitoring and Evaluation (M&E) plan for this strategic plan. Monitoring will focus on routine and continuous tracking of zoonotic disease prevention and control activities including efficiency and effectiveness. Evaluation will provide a periodic assessment of how well ZDU and its stakeholders meet their objectives. The mid-term evaluation will inform any changes that may be necessary to put implementation back on track and end-evaluation will document learning from the implementation of the strategic plan to inform the next steps.



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Appendix 1. List of contributors

List of contributors to the development of the One Health strategic plan for the prevention and control of zoonotic diseases in Kenya from 2021-2025

	Name	Organization
1.	Aggrey Lugendo	MOH-Kakamega County
2.	Ahmed Arale	CORE group
3.	Ahmed Ogwel	World Bank
4.	Allan Azegele	DVS
5.	Alessandro Guarino	CCM
6.	Allan Ogendo	MOALFC
7.	Andrew Kitua	USAID P&R
8.	Andrew Thaiyah	USAID
9.	Angela Mukami	ZDU
10.	Athman Mwatondo	ZDU
11.	Augusta Kivunzya	Kitui County
12.	Benard Bett	ILRI
13.	Caroline Nasimiyu	ZDU
14.	Charles Kibui	MOH
15.	Daniel Lang'at	MOH
16.	David Mutonga	USAID P&R
17.	David Soti	MOH-Africa CDC
18.	Davis Ikiror	VSF Suisse
19.	David Mwangangi	DVS
20.	Dennis Okundi	MALFC
21.	Edward Kiema	COG
22.	Emily Mudoga	WAP
23.	Emmanuel Okunga	DSRU-EOC
24.	Eric Fevre	UoL/ILRI
25.	Eric Osoro	WSU
26.	Erick Maitha	MOH-Kilifi county
27.	Evans M. Tenge	FAO
28.	Francis Gakuya	KWS
29.	Getrude Kusa	NCCG- Food safety
30.	Githui Kaba	Nakuru County
31.	Harry Oyas	Deputy Director DVS
32.	Hesbon Awando	DVS
33.	Isaac Lekolool	KWS
34.	Isaac Ngere	WSU
35.	Jack Omolo	ZDU
36.	Jane Githuku	FELTP
37.	Jane Lwoyero	OIE
38.	Jeremiah Akumu	VSF German
39.	John Mwita	MOTW
40.	Julius Kimitei	MOH/ZDU
41.	Kelvin Momanyi	WAP
42.	Konongoi Limbaso	KEMRI
43.	Lian Thomas	ILRI/UoL
44.	Lisa Kramer	USAID
45.	Lydia Njaramba	Nyeri County
46.	Malega S.K	Kilifi County
47.	Mark Nanyingi	University of Liverpool/UoN/FAO-ECTAD

48.	Mark Obonyo	FAO- ECTAD
49.	Martin Mboloi	Makueni County
50.	Mathew Mutiiria	ZDU
51.	Matthew Muturi	ZDU
52.	Michael Otieno	NCC
53.	Michael O. Mitoko	Nairobi County
54.	Moses Olum	KALRO
55.	Mwatha Stephen	NTD-MOH
56.	Nazaria Wanja Nyaga	KVA
57.	Omolo Jada	ZDU
58.	Peninah Munyua	CDC
59.	Peter Kinyanjui	NHPL
60.	Peter M.Wamai	CDH-NYERI
61.	Philip Ngene	MOH-DSRU
62.	Rinah Siawa	FAO-ECTAD
63.	Robert Miheso Mulembani	DVS-BUSIA
64.	Romona Ndayi	DVS
65.	Ruth Njoroge	ZDU
66.	Samuel Kadivane	Nairobi County
67.	Solomon Njenga	KNH/ IDU
68.	Stella Kiambi	FAO ECTAD
69.	Stephen Manen'gene	MOTW
70.	Susan Mubichi	KEPSA
71.	Susan Scribner	USAID P&R
72.	Thomas Manga	DVS
73.	Thomas Manyibe Nyariki	USAID P&R and FAO ECTAD
74.	Thumbi Mwangi	WSU-KEMRI
75.	Titus Kaitho	KWS
76.	Titus Wanjala	Consultant USAID P&R
77.	U.S Adano	Intra Health
78.	Victor Okoth	Afya Ugavi
79.	Wande Alimi	Africa CDC
80.	Zelalem Tedesse	FAO- ECTAD

Appendix 2. Management and Response Structure for Zoonotic Diseases

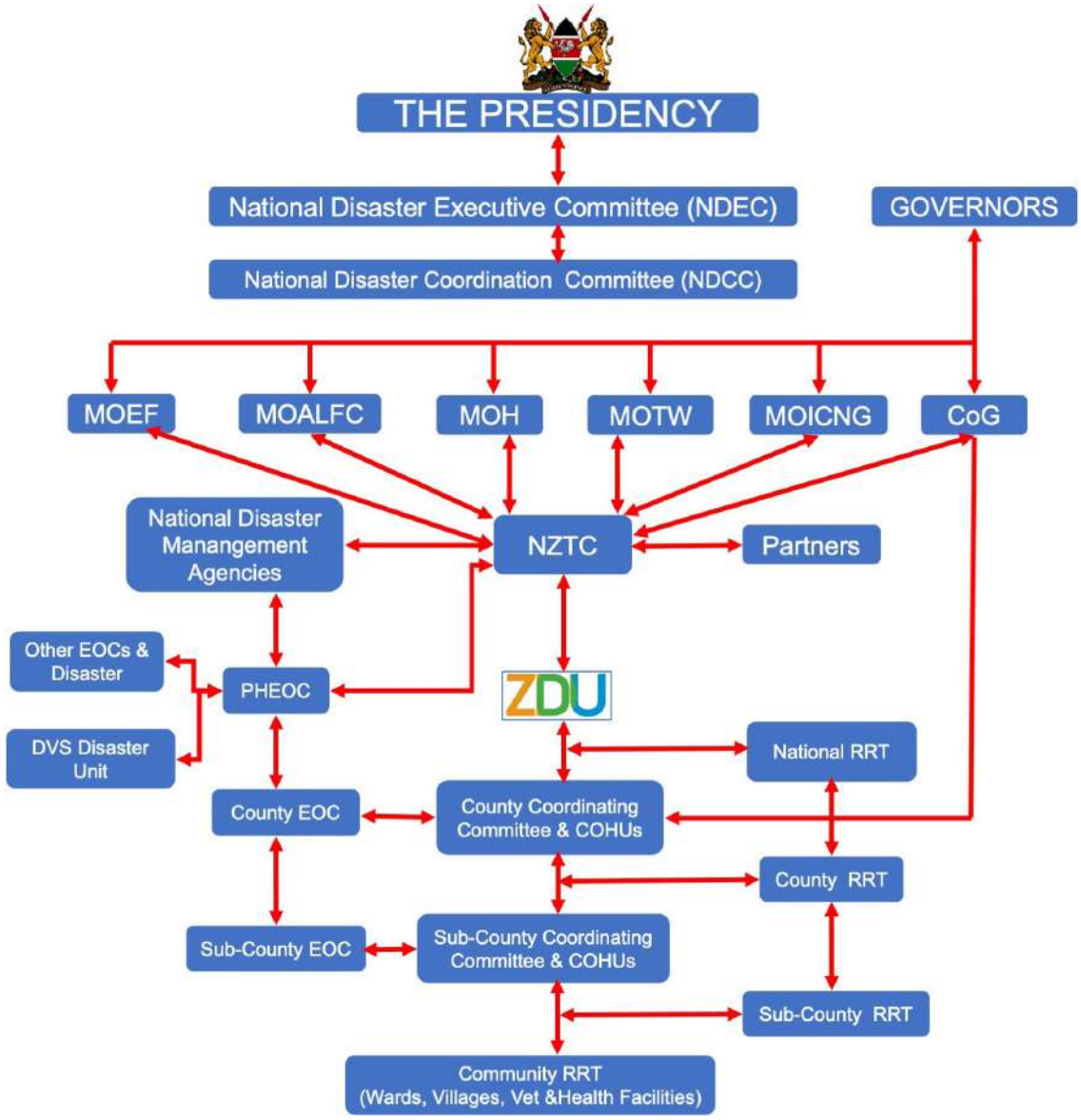


Figure 3: Proposed management and response structure for zoonotic diseases and PHEIUE.

The various offices and entities on the coordination structure are defined as follows;

1. **The Presidency**
   The office of the presidency
2. **National Disaster Executive Committee (NDEC)**
   The Cabinet secretaries' committee
3. **National Disaster Coordinating Committee (NDCC)**
   These are the Principal Secretaries
4. **Environment**
   This will be the Ministry responsible for environment currently, Ministry of Environment and Forestry (MOEF)
5. **Livestock**
   The Ministry responsible for agriculture, livestock, fisheries, irrigation and research, currently the Ministry of Agriculture, Livestock, Fisheries and Cooperatives(MALF)
6. **Interior**
   This will be the Ministry responsible for interior and coordination of National government (MoICNG)
7. **Health**
   This will be the Ministry responsible for human health, currently Ministry of Health (MOH)
8. **Wildlife**
   This will be the Ministry responsible for Wildlife, currently Ministry of Tourism and Wildlife (MOTW)
9. **Governors**
   These are the 47 governors representing counties within the Republic of Kenya
10. **Council of Governors**

This is the official county platform for consultation, information sharing, capacity building, performance management, and dispute resolution

11. **National disaster management agencies**
    a. National Disaster Operations Centre (NDOC) i.e. the National coordinating agency
    b. National Disaster Management Unit (NDMU) i.e. safety, security and incidence command
    c. National Youth Service (NYS)
    d. Kenya Wildlife Service (KWS)
    e. Kenya Forest Service (KFS)
    f. National Police Service (NPS)
    g. Kenya Defense Forces (KDF)
    h. Government Chemist
    i. Radiation Protection Board (RPB)
    j. Kenya Nuclear Energy Board (KNEB)
    k. Emergency and Disaster Risk Management (EDRM)
    l. Public Universities and research agencies

12. **Partners – public and private actors**
    a. Kenya Red Cross Society (KRCS)
    b. St. John Ambulance
    c. UN Agencies
    d. Kenya Private Sector Alliance (KEPSA)
    e. Bilateral partners
    f. OHCEA/AFROHUN KENYA
    g. Other relevant NGOs

13. **National One Health Technical Committee (NOHTC)**
    The NOHTC comprises technical teams such as Ministries responsible for Human health, Animal health, Environment and other line ministries under One Health approach.

14. Director of Veterinary Service Disaster Unit (DVSDU)
The DVSDU coordinates emergencies in the animal health sector

15. Public Health Emergency Operation Centre (PHEOC)
The PHEOC coordinates emergencies in the human health sector

16. Other Relevant Emergency Operations Centers (OREOCs)
The OREOCs coordinates emergencies within other line ministries/sectors

17. National Rapid Response Teams (NRRT)
The NRRT is a multi-sectoral team that responds to emergencies at the national Level

18. County Coordinating Committee (CCC) and Emergency Operations Centre (CEOCs)
The CCC manages emergencies using the CEOCs as the operational organ

19. Sub-County Coordinating Committee (SCCC) and Emergency Operations Centre (CEOCs)
The SCCC manages emergencies using the CEOCs as the operational organ

20. County Rapid Response Teams (CRRTs)
The CRRTs responds to emergencies at the county level

21. Sub-County Rapid Response Teams (SCRRTs)
The SCRRTs responds to emergencies at sub-county level

22. Community Rapid Response Teams (CoRRTs)
The CoRRTs responds to emergencies at wards, village and local health facility levels.

Appendix 3. Detailed Stakeholder Analysis

Table 5: Stakeholder Analysis for the One health strategic plan for the prevention and control of zoonotic diseases in Kenya from 2021-2025

Stakeholder	Role Why they are Important?	Important or Influential?	Current Attitude to One Health approach; Favorable, Unfordable, Resourceful,	What we would engage them on?	Key Messages	How? Tactics or specificities to engaging them	When? [Timeline]	Champion
Government ministries								
MALF	Line ministry on matters animal health, vet public health, food safety, zoonosis response, AMR, monitor ports of entry	Both	Favorable & resourceful	Leadership, expertise, resource allocation, policy formulation	Animal resources productivity, welfare, and contribution to public health and social welfare	In policy and as key driver of the OH strategy	Always	DVS
MOH	Line ministry on matters human health, public health, food safety, zoonosis response, AMR, monitor ports of entry	Both	Favorable & resourceful	Leadership, expertise, resource allocation, policy formulation	Universal Health Coverage and the goal to eliminate communicable diseases	In policy and as key driver of the OH strategy	Always	DGH
MOTW	Line ministry in wildlife management & eco system health	Both	Favorable, resourceful	Leadership, expertise, resource allocation, policy formulation	Wildlife management and c onservation of rare and endangered species	In policy and Involved from conception to implementation of the strategic plan	Always	Director of Wildlife Conservation and Management
MOEF	Line ministry in environmental issues	Both	Favorable, resourceful	Leadership, expertise, resource allocation, policy formulation	Ecosystem services, environmental protection	In policy and Involved from conception to implementation of strategic plan	Always	Director of environment
County governments	Implementers of devolved functions	Both	Favorable & resourceful	Advocacy, implementation, resource allocation	County Development	Involved from conception to implementation of the strategic plan	Always	Chair- Council of Governors
MoI&CNG-law enforcement agencies	Security, enforcement, immigration	Important	Favorable, resourceful	Enforcement – border points, quarantine etc.	National Security	In planning and response to disease outbreaks	Occasional	Accounting officers
National disaster management agencies	Response	Important	Favorable, resourceful	Epidemic emergency response	National Disaster risk management	In planning and response to disease outbreaks	Always	Director
Local communities	Beneficiaries of their program. Their participation and acceptance of the concept is key	Both	Favorable Others – lack of information	Planning, implementation, feedback	Health, livelihoods and social welfare	In surveillance and response	Always	All key players

Stakeholder	Role Why they are Important?	Important or Influential?	Current Attitude to One Health approach; Favorable, Unfordable, Resourceful,	What we would engage them on?	Key Messages	How? Tactics or specificities to engaging them	When? [Timeline]	Champion
Government agencies								
KWS	Wildlife management, health, surveillance etc.	both	Favorable, resourceful	Expertise, resources,	Wildlife conservation and management	In policy, conception to implementation of the strategic plan	Always	Director general, head of vet services
KFS	Forest management, etc.	both	Favorable, resourceful	Expertise, resources,	Forest cover, water catchment protection	In policy, conception to implementation of the strategic plan	Always	Director Forest services
NMK –	Vector, reservoir research activities	both	Favorable, resourceful	Expertise, resources,	Preservation of national heritage	In policy, conception to implementation of the strategic plan	Always	Director
KTB-	Tourism promotion	both	Favorable, resourceful	Expertise, resources,	Development and protection of the tourism industry	In policy	On a needs basis	Director
Research Bodies								
KEMRI	Human health research, outbreak investigation and response	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	CEO KEMRI
ILRI	Animal health research	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	Director
KALRO	Animal and plant health research	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	Director
KEFRI	Plant research	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	Director
ICIPE	Vector ecology research health, surveillance etc.	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	Director
IPR	Non-human primate research	both	Favorable, resourceful	Expertise, resources,	Collaborative One Health research	In operational research and response support	Always	Director
International agencies								
World bank	Funding and technical support	both	Favorable, resourceful	Expertise, resources,	Socio-economic development, impact of pandemic threats	In resource mobilization, advocacy and technical support	On needs basis	Country representation
AfDB	Funding and technical support	both	Favourable	Expertise, resources,	Socio-economic development, impact of pandemic threats	In resource mobilization, advocacy and technical support	On needs basis	Country representation
WHO	Funding and technical support on human health	both	Favorable, resourceful	Expertise, resources,	Global Health security, compliance to International Health Regulations (IHR, 2005)	In resource mobilization, advocacy and technical support	On needs basis	Country representation

Stakeholder	Role Why they are Important?	Important or Influential?	Current Attitude to One Health approach; Favorable, Unfordable, Resourceful,	What we would engage them on?	Key Messages	How? Tactics or specificities to engaging them	When? [Timeline]	Champion
FAO	Funding and technical support on animal health	both	Favorable, resourceful	Expertise, resources,	Global food security, production, productivity, welfare and public health	In resource mobilization, advocacy and technical support	On needs basis	Country representation
CDC	Funding and technical support on human and animal health and research	both	Favorable, resourceful	Expertise, resources,	Global Health Security, Research in One Health	In resource mobilization, advocacy and technical support	On needs basis	Country representation
USAID	Funding and technical support on human and animal health	both	Favorable, resourceful	Expertise, resources,	Global Health Security, development	In resource mobilization, advocacy and technical support	On needs basis	Country and Regional representation
WSU	Funding and technical support on research	both	Favorable, resourceful	Expertise, resources,	Research in One Health	In resource mobilization, advocacy and technical support	On needs basis	Country representation
DTRA	Funding and technical support on research	both	Favorable, resourceful	Expertise, resources,	Global Health Security, Research in One Health	In resource mobilization, advocacy and technical support	On needs basis	Country representation
OIE	Funding and technical support on animal health	both	Favorable, resourceful	Expertise, resources,	Animal Health, Productivity Welfare and compliance to the Terrestrial and Aquatic Animal Health Codes	In resource mobilization, advocacy and technical support	On needs basis	Regional representation
AU-IBAR	Funding and technical support on animal health	both	Favorable, resourceful	Expertise, resources,	Animal Resources productivity and health for economic development and social welfare in Africa	In resource mobilization, advocacy and technical support	On needs basis	Director
Non-governmental organizations								
IFAW	Animal welfare, advocacy, community outreach	both	Favourable	Expertise, resources	Animal welfare	In resource mobilization, advocacy and technical support	On needs basis	Director
WWF	Wildlife conservation, advocacy, community outreach	both	Indifferent	Create awareness	Conservation of endangered species	In resource mobilization, advocacy and technical support	On needs basis	Director
AWF	Wildlife conservation, advocacy, community outreach	both	Indifferent	Create awareness	Conservation of endangered species	In resource mobilization, advocacy and technical support	On needs basis	Director
WAP	Animal welfare, advocacy, community outreach	both	Favourable	Expertise, Resources	Animal welfare	In resource mobilization, advocacy and technical support	On needs basis	
ANAW	Animal welfare, advocacy, community outreach	both	Favourable	Expertise, Resources	Animal welfare	In resource mobilization, advocacy and technical support	On needs basis	Director

Stakeholder	Role Why they are Important?	Important or Influential?	Current Attitude to One Health approach; Favorable, Unfordable, Resourceful,	What we would engage them on?	Key Messages	How? Tactics or specificities to engaging them	When? [Timeline]	Champion
IFRC, Kenya Red Cross	Disaster and Emergency response, community outreach	both	Favourable, Resourceful	Expertise, Resources	Emergency and disaster response	In resource mobilization, advocacy and technical support	On needs basis	Country Director
World Vision	Community development and outreach	both	Somewhat favorable through involvement in GHSA	Create more awareness	Sustainable development of marginalized communities	In resource mobilization, advocacy and technical support	On needs basis	Country Representative
VSF-Germany	Animal Health, community outreach in cross border Counties and ASALs	both	Favourable' Resourceful	Expertise and resources	Animal health, welfare and productivity, community development	In resource mobilization, advocacy and technical support	On needs basis	Country Representative
VSF-Suisse	Animal Health, community outreach in cross border Counties and ASALs	both	Favourable, Resourceful	Expertise and resources	Animal health, welfare and productivity, community development	In resource mobilization, advocacy and technical support	On needs basis	Country Representative
AFROHUN KENYA	Capacity building, at in-service and pre-service levels, of a Multidisciplinary One Health Workforce ready to identify, detect, prevent and respond to emerging pandemic threats.	Both	Favorable & Resourceful	Leadership on One Health Core Competencies, Communication, One Health Multidisciplinary Expertise, Collaboration & Partnerships, Systems Thinking, Resources, Awareness creation, Training & Capacity building, One Health Policy & Advocacy, Research & Innovations,	Transformational change for continuous improvement of health & well-being of humans, animals and environment through One Health principles & approaches to research, training & community service.	In One Health Communication. In policy formulation. Conception & implementation of strategic plan. In planning & response to disease outbreaks. In surveillance and response. In research & innovations. Technical support. Training & capacity building. Development of One Health Programs & Modules. Integration of One Health Modules in Curriculums.	Always	Deans in respective One Health institutions
Universities- UON, MOI, Egerton. JKUAT, MT. Kenya, KU	Training, curriculum development, inculcating the One Health concept early	both	Favorable, resourceful	Expertise, resources,	Inculcating professional competences in training institutions that meet needs of industry	Integration of One Health approach to curriculum Pre-service and in-service training	Always	DVC, Deans, student professional associations/ clubs
Professional and Farmer associations								
Professional associations- KVA, KMA, APHOK	Membership/ outreach capabilities	both	Favorable, resourceful	Expertise, resources,	The welfare of members and continued professional development	In outreach, surveillance and provide surge capacity in response	Always	Respective leadership/ secretariats
Media owners association, editors guild	Dissemination of various messages to the public	both	Indifferent	Create awareness	Matters of public interest	Communication at all stages of implementation of the strategic plan	On a need basis	Directors or Chairpersons

Stakeholder	Role Why they are Important?	Important or Influential?	Current Attitude to One Health approach; Favorable, Unfordable, Resourceful,	What we would engage them on?	Key Messages	How? Tactics or specificities to engaging them	When? [Timeline]	Champion
Kenya livestock associations	Dissemination of messages to their members	both	Favourable	Expertise, resources	Improved production and productivity of animal resources	communication at all stages of the strategic plan	On a needs basis	Respective chairpersons
Regulatory bodies – KMPDB, KVB, KEBS	Oversight, membership, continuous development	both	Favorable, resourceful	Expertise, resources,	Upholding professional standards and ethics	In policy matters	Always	Respective leaderships

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