Republic of Liberia

National One Health Message Guide for Priority Zoonotic Diseases in Liberia

Anthrax

Bovine Tuberculosis

Brucellosis

Ebola Virus Disease

Highly Pathogenic Avian Influenza

Lassa Fever

Marburg Virus Disease

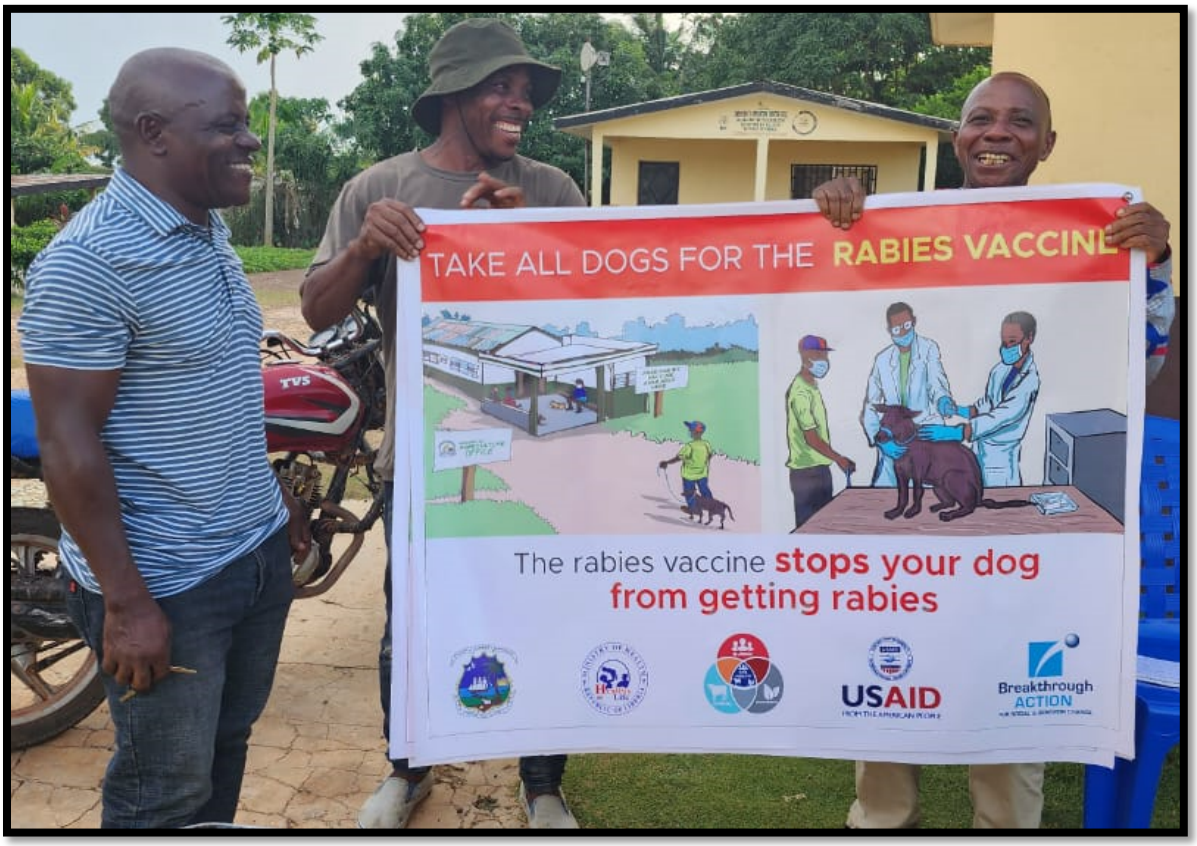
Monkeypox

Rift Valley Fever

Rabies

One Health Platform of Liberia

December 2022



Rabies vaccination awareness

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ACKNOWLEDGMENT

This One Health Message Guide for Priority Zoonotic Diseases in Liberia was developed through the collaborative effort of Liberia's One Health Risk Communication and Community Engagement Technical Working Group (RCCE TWG). The RCCE TWG was launched in November 2021 to strengthen multisector government coordination, collaboration, and communication for risk communication, emergency preparedness, and response to public health threats, such as outbreaks of zoonotic diseases.

The development process was jointly led by the Message and Materials Development Division of the National Health Promotion Unit of the Ministry of Health, One Health Secretariat, the Central Veterinary Epidemiology Unit of the Ministry of Agriculture, and Breakthrough ACTION Liberia. Many government ministries, departments, and agencies, as well as partners supporting One Health and risk communication activities in Liberia, aided this process by sharing existing messages, materials, and technical guidelines; contributing technical expertise to discussions to identify essential behaviors and actions needed to close critical information gaps; and dedicating time to ensuring that all information is presented in a language and format most useful for Liberia.

The authors would like to express their gratitude to all who informed and contributed to this process. Special thanks are extended to the National One Health Platform RCCE TWG members; the Message and Materials Development Division of the National Health Promotion Unit of the Ministry of Health; the Ministry of Agriculture; the National Public Health Institute of Liberia; the Environmental Protection Agency; the Ministry of Gender, Children, and Social Protection; the Forestry Development Authority; the Ministry of Internal Affairs; and the National Disaster Management Agency.

This effort was also greatly informed by the shared experience and national and global resources made available by partners working more broadly to strengthen One Health risk communication. These partners and resources include but are not limited to the following: the World Health Organization, the Food and Agriculture Organization of the United Nations, the U.S. Centers for Disease Prevention and Control, the World Organization for Animal Health, the Government of Sierra Leone's Message Guide for Zoonotic Diseases, the Government of Ghana's Message Guide for Priority Zoonotic Diseases in Ghana, and Ethiopia's One Health Steering Committee Priority Zoonotic Diseases Prevention and Control Message Guide. The authors extend their gratitude to those who developed these references and the full team who contributed to developing this resource in Liberia.

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Ministry of Health, Republic of Liberia

FOREWORD/ENDORSEMENT

Consistent, timely, and accurate public health messaging enables multiple stakeholders to speak and engage the public with one clear voice across multiple channels of communication, and it has a critical role to play in influencing individuals and communities in adopting protective behaviors. Development and testing of credible communication resources prior to an emergency not only aids in strengthening prevention and preparedness among communities, but it also allows the government and first responders to quickly adapt existing messages to address outbreaks and slow the spread of disease.

Effective messaging for priority zoonotic disease preparedness and response requires the collaboration of multiple government ministries and partners, including government agencies, donors, development and humanitarian partners, media outlets, and health workers at all levels. Coordination among these stakeholders is key for effective risk communication interventions that facilitate the dissemination of accurate and timely messages via various channels of communication.

The **National One Health Message Guide for Priority Zoonotic Diseases for Liberia** has been designed, developed, validated, and published by the National One Health stakeholders through the Risk Communication and Community Engagement Technical Working Group (RCCE TWG) in collaboration with the Message and Materials Development Division of the Health Promotion Unit, Ministry of Health, Republic of Liberia to support efforts by the Liberian government and its partners to guide risk communication interventions that aim to raise awareness, promote healthy behaviors, and engage communities in the prevention and management of zoonotic diseases in Liberia. By providing a standard, validated messaging reference for One Health stakeholders, the guide helps to ensure that messages are not only technically accurate and consistent across all communication channels, but that they also show respect for community values, communicate care and concern, and consider local context and culture.

The National One Health Stakeholders encourage human and animal health providers, program implementers, media professionals, and other stakeholders working across One Health sectors to consult this guide when designing and implementing risk communication interventions for the prevention and management of priority zoonotic disease in Liberia. The National One Health Stakeholders trust that the guide will support an increased understanding of the relationship between human and animal health, and how it is affected by their shared environment, as well as how to prevent and manage zoonotic diseases.

Identifying the many multidisciplinary issues that occur along the interface of human, animal, and ecosystem health involves improved coordination and partnership among sectors and agencies, and the government of Liberia reiterates its assurance that it will protect the health of its people by working together with partners, the private sector, and the community to fully integrate policies and take the necessary steps for preparedness, detection, and response to public threats and events in line with the International Health Regulations (IHR) requirements.

The One Health Message Guide will be used with policy and technical oversight from the RCCE TWG comprising the Ministries of Health and Agriculture, the National Public Health Institute of Liberia, the Forestry Development Agency, and the Environment Protection Agency. Successful implementation of the One Health Platform will meaningfully contribute to improving national health security and achieving the health-related Sustainable Development Goal of "Ensuring healthy lives and promoting well-being for all at all ages."

Francis N. Kateh, MD, MHA, MPS, HSL, FLCP
Chief Medical Officer/ Deputy Minister Health Service

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ACRONYMS

ADSR	Animal Disease Surveillance and Response
CDC	U.S. Centers for Disease Control and Prevention
EVD	Ebola Virus Disease
FAO	United Nations Food and Agriculture Organization
HPAI	Highly Pathogenic Avian Influenza
MOH	Ministry of Health
MVD	Marburg Virus Disease
NPHIL	National Public Health Institute
OIE	World Organization for Animal Health
PZD	Priority Zoonotic Disease
RCCE	Risk Communication and Community Engagement
RVF	Rift Valley Fever
TB	Tuberculosis
TWG	Technical Working Group
WHO	World Health Organization

PART 1: ORIENTATION TO THIS GUIDE

BACKGROUND CONTEXT: ZOONOTIC DISEASE AND THE ONE HEALTH APPROACH IN LIBERIA

Zoonotic diseases are illnesses that spread between animals and people and may then be able to spread from person to person. Most known human infectious diseases and about three out of every four new diseases originate from animals.

Many zoonotic diseases have the potential to spread quickly throughout a country, from one country to its neighbors, or even around the globe if strong, coordinated prevention and control mechanisms that incorporate community engagement processes are not in place. Zoonotic disease outbreaks can threaten families, communities, and society as a whole by causing illness or death in animals, which in turn causes a loss of livelihood for those that depend on animals for income or food; by causing illness and death across human populations; and by weakening health public systems and undermining socioeconomic well-being.

Such impacts are clearly evidenced in the Ebola virus disease (EVD) outbreak from 2014 to 2016, which primarily spanned across Liberia, Sierra Leone, and Guinea with devastating impact, and the COVID-19 pandemic, which began in 2020. The dangers associated with zoonotic diseases and other emerging pandemic threats to public health security and socioeconomic well-being are increasingly critical global concerns. Liberia faces an elevated risk of zoonotic diseases for many reasons. Forty-three percent of the remaining Upper Guinean forests lie within the country's borders, covering a total of 6.69 million hectares, and forests represent 45% to 69% of the country's land area (Central, 2022; Nthara and Srivastava, 2020). There are 881 known animal species in these forests, with 0.8% of them being uncommon and 4.2% being threatened (Nthara and Srivastava, 2020). High cross-border movement occurs between Mano River countries where forests, hunting and bush meat represents about 18% of forest products sold and eaten, improper land use. About 70% of Liberians are dependent on agriculture and have direct contact with livestock or other domestic animals (Central, 2022).

Although not at the same scale or severity as the EVD outbreak, Lassa fever and rabies are serious zoonotic diseases endemic in Liberia that continue to cause loss of life and disruptions to the well-being of the population. Liberia has also experienced two confirmed cases of monkeypox, recorded on June 23, 2017, by the River Cess County Health Team based on a communication from Dodain District (Lawrence, Zegbain, Larway, et al., 2021). The uncontrolled movement of people and animals between neighboring Sierra Leone, Guinea, Côte D'Ivoire, and other countries in the region also affects Liberia's risk of zoonotic disease. In 2018 the government of Sierra Leone announced the discovery of Bombali virus, a new Ebola virus in insect-eating bats. It is not yet known whether the Bombali virus can cause disease in humans; however, tests have shown the virus is capable of entering human cells. Rift Valley fever and Marburg virus disease (MVD) were also recently discovered in Sierra Leone in goats and bats, respectively. Following an EVD outbreak in the neighboring N'zérékoré region of Guinea in February 2021, the first case of MVD in humans in West Africa was also detected in N'zérékoré.

The prevention and control of zoonotic diseases remain a critical issue for Liberia, and zoonotic diseases (known and potential) serve as a primary focal point for preparedness activities.

The One Health concept is a collaborative, multisectoral approach that recognizes the interconnectedness of the health of humans, animals, and their shared environment. Recognizing the importance of this approach in Liberia, the following were identified as the priority zoonotic diseases (PZDs) for preparedness and response activities in the country:

- Anthrax
- Brucellosis
- Bovine tuberculosis (TB)

- Lassa fever
- Ebola virus disease (EVD)
- Rift Valley fever (RVF)
- Rabies
- Highly pathogenic avian influenza (HPAI)
- Monkeypox
- Yellow fever
- Dengue fever
- Marburg virus disease (MVD)

Communicating about the risk of these diseases with the public at large and through direct engagement with communities, is a critical component of preparedness and response. Understanding the current behaviors and behavioral barriers relevant to the effective prevention, detection, and rapid control of these PZDs is important for reducing their incidence. Effective emergency response often depends on complex behavioral changes at the individual, household, and community levels. Consistent, timely, accurate, and thoughtful public health messaging enables multiple stakeholders to speak and engage the public with one clear voice across multiple channels of communication, and it has a critical role to play in influencing individuals and communities in adopting protective behaviors. The key public sectors and other stakeholders that are actively engaged in the implementation of the Global Health Security Agenda under the national One Health platform can increase the multisectoral coordination and impact of their risk communication efforts to ensure that the PZD messages delivered to communities across different health service delivery systems are consistent, relevant, and trusted.

This guide was developed to support key public sectors and other stakeholders that are actively engaged in the implementation of the Global Health Security Agenda under the national One Health Platform to increase the impact of their risk communication efforts to ensure that the PZD messages delivered to communities across different health service delivery systems are consistent, relevant, and trusted by providing a ready-for-use and approved set of messages for PZDs that can be used to design or implement risk communication activities for the prevention, detection, and control of PZDs in Liberia.

PURPOSE OF THIS DOCUMENT

The purpose of this message guide is to provide a validated messaging reference for presenting accurate, standardized basic health information in simple language, using a health message format relevant to the prevention and management of PZDs in Liberia to:

- Facilitate consistent and credible communication across diverse channels and sources of information
- Inform the design of activities and materials to raise awareness, promote healthy behaviors, and engage communities in the prevention and management of zoonotic diseases
- Provide an informational foundation for timely communication of relevant information to which more detailed and specific information can be added in the event of a PZD outbreak as well as throughout response and recovery phases.

The primary intended audiences of this document include sector ministries, institutions, departments, agencies, media, and development partners that are designing or implementing programs, activities, or communication on zoonotic diseases. Specifically, the audience includes the Ministries of Health; Agriculture; Internal Affairs; Gender, Children, and Social Protection; Justice; Education; Commerce and

Industries; and Information, Cultural Affairs, and Tourism. The audience also comprises institutions such as the Environmental Protection Agency, the National Public Health Institute, the National Disaster Management Agency, the Forestry Development Authority, and the media, including the local media all at the national level. Additionally, county-level institutions and agencies that can use the guide include the county health team, Office of the Superintendent, local office of education, gender, Environmental Protection Agency, Forestry Development Authority, and civil society organizations. Target audiences of the document at the district level range from the district health team to the community and animal health workforce and to Port Health.

The target audiences of the individual messages provided are communities, particularly those involved in livestock rearing, hunting, butchering, and trading in animal products. Certain groups of people that work directly with communities, including community human and animal health workers, livestock owners, and those that work with animals, are eligible as audiences of the messages. Other audiences are organizations representing particular groups, such as women's groups, youth groups, marketing associations, and animal farmer associations, as well as religious leaders, traditional groups, schools, and community leaders.

ROLE OF MESSAGING IN RISK COMMUNICATION FOR PREPAREDNESS AND RESPONSE

Risk communication is the real-time exchange of information, advice, and opinions between experts or officials and people who face a threat to their survival, health, or economic or social well-being from a hazard, such as a zoonotic disease outbreak (World Health Organization [WHO], 2017). Effective risk communication can manage people's expectations during an emergency and assist response efforts by increasing efficiency and minimizing duplicated efforts or conflicting information.

An effective response can depend on changing behavioral and social norms. Such changes require robust, trustworthy communication and commitment to community engagement to support those affected by an outbreak to:

- Define the issue or problems affecting them.
- Reflect on the causes of the issues including how their behaviors affect them.
- Identify their ability to improve the issue.
- Organize themselves to address the issue.

Engaging communities prior to an outbreak event foster trust and strengthens feedback loops between communities and health facilities, enhances surveillance and early reporting, and can accelerate community-led action. Community engagement helps to ensure that communities see the benefit in adopting the behaviors advocated in an emergency response and willingly cooperate with response teams.

Messages that are complex, confusing, or unresponsive to community concerns can negatively affect efforts to contain an outbreak by amplifying fear and mistrust and can contribute to the spread of misinformation and rumors. Development and testing of credible communication resources prior to an emergency not only aids in strengthening prevention and preparedness among communities, but it also allows the government and first responders to quickly adapt existing messages to address outbreaks and slow the spread of disease.

Effective messaging for PZD preparedness and response requires the collaboration of multiple government ministries and partners to identify and share existing messages and materials; provide diverse technical expertise to identify essential behaviors and actions needed as well as how to perform them in local contexts; and to ensure that the language and format of the information being presented are appropriate for diverse communities.

PRINCIPLES OF EFFECTIVE MESSAGING

While messages may seem simple and straightforward, the process of ensuring their effectiveness in influencing the adoption of health protective behaviors is complex. Technical information alone—even if it is presented in simple, understandable language—is unlikely to prompt significant behavior change. In addition to providing essential health information that is actionable, messages and the interventions through which they are delivered must be designed to show respect for the community values; communicate care and concern; consider local context, culture, and potential stigma associated with the emergency; and be used as part of a responsive two-way exchange with the public.

Research also shows that messages that give specific information on an action, benefit, and risk are more likely to motivate behavior change than general messages (Health, 2017). The messages in this guide are designed according to the following principles:

- Use short words and common conversational language, limiting technical and scientific words as much as possible while maintaining accuracy and integrity of the concept.
- Provide essential health information in a positive way and encourage simple, doable actions for prevention and management of zoonotic diseases.
- Present one main idea at a time that focuses on **what** people need to know and do, **why** they should do it (benefits and risks), and **how** they should do it, to promote selection of messages and information appropriate to the channel of delivery.
- Consider the population's access to materials required to perform the behaviors and the local adaptations that may be required to perform promoted behaviors
- Acknowledge the concerns or emotions (e.g., fear, anxiety, sadness) that people may experience because of the emergency or the information presented.
- Appeal to emotions and sense of individual and collective responsibility.
- Respect cultural beliefs and values.
- Recognize that animals are an important and valuable part of people's livelihoods and cultural lives.
- Focus on preventing person-to-person transmission of disease in the event of an outbreak.
- Focus on available facts, with consistency across experts and acknowledgment of uncertainties and what is unknown.
- Maintain consistency in phrasing.
- Provide essential health information in a timely manner to which additional information can be added.

Use of these principles is recommended to guide further refinement and development of additional new messages for subsequent versions of this and related message guides.

HOW TO USE THIS GUIDE

Consulting this message guide is recommended when designing communication tools, messages, or interventions for zoonotic diseases. The messages can be applied through a full spectrum of communication activities and channels and in times of preparedness and response. These activities include, but are not limited to the following:

- Public announcements and press conferences/releases

- Media communication (print, video, radio, and public awareness campaigns) and social media
- Social mobilization and partner engagement
- Interpersonal communication and community engagement through local structures including county health workers, environmental coordinators, and community volunteers from across the One Health sectors

Social mobilization and community engagement activities may also include a number of complementary, mutually reinforcing approaches such as:

- House-to-house visits and distribution of informational materials
- Community theater and storytelling
- Community dialogues and action planning
- School-based activities
- Engagement of community dancers
- Town hall discussions and discussions held as a part of community court sessions
- Mobilization of local influencers such as traditional and religious leaders or community-based organizations
- Mobilization of town criers

USING THE GUIDE FOR PREPAREDNESS

During times when there is no outbreak as well as after outbreaks, this message guide can be used to:

- Increase awareness and knowledge around zoonosis

CORRECT COMMON MISINFORMATION

- Raise risk perception where appropriate
- Improve uptake of health protective behaviors including actions to take in the event of potential disease signs and symptoms, contributing to early detection of potential emergencies

The guide can be used by the Risk Communication and Community Engagement Technical Working Group (RCCE TWG) to support implementation of risk communication and One Health capacity building as identified by the country at the national and subnational levels. Integrating the guide as a material within the Ministry of Health (MOH) digital repository and publishing it on the Liberia One Health Platform website, and websites of RCCE TWG member institutions can be explored by the RCCE TWG. These actions will facilitate easy access by intended audiences.

Training for the entire workforce engaged in addressing zoonotic diseases such as students, government professionals, and workers in private and nongovernmental sectors is essential. Incorporating the guide into the curriculum of higher institutions, community colleges (animal and health sciences), preservice training, and so on, would help to improve understanding and acceptance of working collaboratively.

Many of the behaviors promoted in this guide cut across other priority health issues such as water, sanitation, and hygiene; food safety; infection prevention control; waste management for contaminated materials; and early care-seeking for fever. Additionally, these messages and their development highlight a collaborative One Health approach in which communication activities can be conducted to support human, animal, and environmental health. Thus, the messages are broadly relevant and well-suited for

easy integration into other health promotion and social mobilization activities.

Using this tool for preparedness helps ensure that, in the event of an emergency, trusted information sources (e.g., RCCE TWG) are already familiar with the messages, have had an opportunity to share them with their networks, and have assigned specific tasks to staff members.

USING THE GUIDE FOR EMERGENCIES

The content and intended audiences of messages are likely to evolve as the emergency progresses. For example, the response may change to include new vaccines, treatment, or testing procedures, requiring new messages to inform the public of what to expect. New messages may also be needed to directly address concerns or misinformation reported by the public.

- **In the initial phase** of an emergency, the focus needs to be on quickly and empathetically disseminating information on simple, doable, protective actions to the general public.
- **In the subsequent phases**, messages will need to be refined to reflect local perceptions associated with the emergency and the perceived consequences of performing the desired behaviors.

During and following an outbreak, the foundational messages in this guide can be quickly adapted to respond to concerns, feedback, changing circumstances, and shifts in context. The messages can also be used to encourage continuation of behaviors adopted during the emergency and over the course of recovery to support community resilience and preparation for potential future outbreaks.

CONSIDERING GENDER IN THE USE OF THE ONE HEALTH MESSAGE GUIDE

It is important to reflect issues related to gender relations and inequality that occur around zoonotic disease prevention and control. Men, boys, women, and girls are all directly engaged in livestock management, but women and girls are the key players in ensuring the health of the animals, as well as that of the family and the community. This role requires certain activities that are labor and time intensive, such as fetching water, sweeping the compound, cleaning the barn, and feeding and milking the animals. However, the work done by women and girls is often less appreciated and valued relative to that done by men and boys. Sociocultural values, norms, attitudes, and practices also underestimate the contributions of women and girls in livestock management. Women and girls have limited access to and control over animals and the benefits to be gained from them, but their roles in caring for livestock put them at higher risk of infection with zoonotic diseases (WHO, 2013).

Traditional practices regarding the use of animal sources for food exposes household members to the risk of zoonotic diseases. Meat, milk, and their products are consumed raw because cooking meat and boiling milk are believed to destroy the nutritional value of the food. Women and girls are socially expected to take up the responsibility of preparing food for the household and thus are obliged to adopt the traditional practices, which can transmit several diseases to humans. Although men and women may know of the diseases, they lack knowledge about their causes, how the diseases can be spread to humans, and what control measures are possible (Lemma et al., 2018).

When an outbreak of such a disease occurs, women and children are mostly affected. For instance, in Guinea, Liberia and Sierra Leone, 52.2% of cases of EVD were females (WHO, 2015). A study conducted in Sierra Leone specific to EVD transmission established that women had a higher incidence of infection (56.7%) than men (43.3%). Further, in Nigeria, 55% of EBV cases and 56.6% of contacts traced were females. These rates can be attributed to the gender-based roles and responsibilities of women, such as caring for sick people at home or in the health centers, serving as traditional healers, or cleansing the bodies of people who have died (WHO, 2007).

Different activity patterns based on gender therefore cause males and females to have different patterns of exposure to infectious pathogens. In managing zoonotic disease, women play significant roles as veterinarians, livestock producers, farmers, butchers, and handlers of animals and animal products, which exposes them to infection. They also serve as law enforcement personnel, health workers, and infrastructure workers, putting them at higher risk of contracting zoonotic diseases. These women most often do not wear protective clothes in their work, unlike men, who wear long trousers, long-sleeved shirts, and closed-toe shoes to protect themselves (WHO, 2007).

To meet the needs of all groups, it is important to engage communities, vulnerable groups, and individuals to promote understanding of disease epidemics and response in terms of gender. Initiating community engagement interventions and highlighting the varying impact of infections and emerging diseases such as zoonotic diseases based on gender will enable men, women, girls, and boys to all be viewed as people that can be infected by the diseases, despite the differences. The One Health National Messages Guide serves as a reference document to facilitate such community engagement interventions.

The use of the message guide further becomes paramount when seeking women's involvement in decision-making on actions to take when they come across signs and symptoms of zoonotic diseases among animals and people; supporting women's participation in capacity-building initiatives informed by the message guide to improve upon their knowledge and understanding of zoonotic disease prevention and control; and encouraging women's acceptance, adoption, and use of positive behaviors and actions outlined in the message guide to ensure preparedness and to facilitate the appropriate response.

NAVIGATING THE CONTENT IN THE GUIDE

This document is organized into four parts:

Part 1: Orientation to this Guide. Provides an orientation to the resource and message and material development for zoonotic diseases in Liberia.

Part 2: Cross-Cutting Messages. Provides cross-cutting messages for the prevention, detection, and general management of zoonotic diseases.

Part 3: Disease-Specific Messages. Provides disease-specific messages incorporating all relevant cross-cutting messages.

Part 4: Additional Resources. Provides additional resources and templates for submission of messages and materials.

Messages in Parts 2 and 3 are organized by **topic** (e.g., wash your hands, dispose of dead animals safely). Within each topic, topline messages are presented first, followed by messages that provide additional detail, anticipate audience concerns, and seek to answer the **how** and **why** for each promoted behavior. Each topic heading is included in the table of contents to facilitate easy location of relevant messages.

Efforts were taken to make sure each topic is comprehensive, as some readers may not have time to review entire sections of the guide. As a result, there is some **repetition** of messages between topics or across disease-specific messages.

SELECTING AND ADAPTING MESSAGES TO AUDIENCE NEEDS

This guide provides general messages that are adaptable to specific audiences. However, not all messages are appropriate for all channels of communication. Depending on the context of when, where, and how the messages will be used, the messages may need to be adapted for the intended audience, channel, or activity being designed.

Recommendations include identifying your intended audience and understanding their specific needs and barriers before designing interventions or selecting messages to use. Understanding the behaviors, knowledge, aspirations, and feelings of an audience can help identify messages and activities that resonate and motivate behavior change. It also informs the selection of approaches and delivery channels to which audiences are more likely to respond for the desired changes to occur.

Another recommendation is to review the **principles of effective messagin**g presented above on **Page 14** of this document before tailoring messages and when designing interventions to deliver them.

The messages in this guide are written in simple standard English with reference to some common Liberian English words or phrases. Translating the messages into the appropriate local language is recommended to increase understanding and to facilitate peer-to-peer sharing. Pretesting of all adapted messages and developed materials is also recommended, if possible.

REVIEW AND APPROVAL PROCESS FOR HEALTHY LIFE LOGO

All adapted or newly developed materials must be reviewed and approved by the MOH Health Promotion unit or your county One Health RCCE TWG prior to production, distribution, and use. The purpose of this review is to:

- Ensure messages are aligned with the messages in this guide to minimize conflicting information.
- Ensure messages and materials are appropriate for Liberian audiences.
- Support coordination across risk communication and One Health promotion activities.

Approved materials will be marked with the Ministry of Health, Healthy Life logos. Logos of implementing partners and other One Health Ministries can be added.

Contacting the MOH Health Promotion Unit, National RCCE TWG, or your county RCCE TWG is advised before you begin the design or implementation of any communication interventions to ensure coordination with ongoing activities and to facilitate connection to existing materials or additional resources that are helpful.

Materials for review should be submitted to the MOH National Health Promotion Unit, who will forward it to the Social Behavior Change Communication Core Team for approval. The materials may possibly be added to the repository of health promotion materials in Liberia.

Chester Allen Smith

Director

Ministry of Health

National Health Promotion Unit

Monrovia, Liberia

DEVELOPMENT PROCESS AND ONGOING UPDATES

This resource was developed through a consultative process with ministries, divisions, agencies, academic institutions, and implementing partners, and it is aligned with national policies and international standards. Steps in this process included:

- Review of existing materials and messages for priority and other recently relevant zoonotic diseases in Liberia and other countries (e.g., Ghana, Sierra Leone, Ethiopia) in December 2021.
- Review of global guidance and standards for messages from December 2021 to January 2022.
- A review of studies, surveys, and interviews from the region that reflect a PZD or a One Health approach from December 2021 to January 2022.
- Analysis of the available resources, infrastructure, and systems in place to prevent and treat zoonotic diseases as well as what actions are feasible and realistic for the majority of the population. This took place from January to March 2022.
- Consultation with stakeholders at national (MOH, Ministry of Agriculture, Environmental Protection Agency) and county level (RCCE TWG members) in February 2022.
- A five-day technical review of the draft One Health Message Guide by national and county RCCE TWG stakeholders in March 2022.
- A review by implementing partners working in One Health, RCCE in April 2022.
- A detailed review and edit informed by feedback received by central and county partners from multiple rounds of technical review from May to June 2022.
- A one-day validation workshop with those presumed to be end users from the animal, human, and environment sectors with national and county representation in July 2022.
- Endorsement and approval through the RCCE TWG (anticipated August 2022).

Existing materials, messages, and information were gathered from a variety of sources. Key sources included the following:

- Existing PZD materials and messages from Liberia, Ghana, Sierra Leone, Ethiopia, Nigeria, and Côte d'Ivoire
- World Health Organization (WHO)
- World Organization for Animal Health (OIE)
- United Nations Children's Fund (UNICEF)
- U.S. Centers for Disease Control and Prevention (CDC)
- Global Alliance for Rabies Control
- United Nations Food and Agriculture Organization

This message guide is intended to serve as a reference of approved messaging that supports preparedness and early response phases of an outbreak. The messages will need to be adapted to address rising concerns and changing situations. This message guide should be considered as a living document. While many of the messages in this guide were adapted from existing and approved materials, with the guidance and support of key stakeholders in Liberia, some messages in this guide have not yet been pretested with community members across the country.

Future plans to integrate cross-cutting messages into social and behavior change materials may create an opportunity to do so, as well as to integrate feedback from outbreak and response events. Additionally,

emerging public health threats, new research, global guidance, and feedback will inform future versions of this guide.

This document will be reviewed, updated, and distributed as new information becomes available. Please direct questions and feedback to:

Chester Allen Smith

Director

National Health Promotion Unit

Monrovia, Liberia

PART 2: CROSS-CUTTING MESSAGES

In the process of reviewing and compiling information and messages on the PZDs, several common behaviors relevant to the prevention, detection, and management of zoonotic diseases were identified.

Focusing on behaviors that protect against multiple zoonotic diseases can potentially lead to broader impact through a more manageable amount of information. Many of these behaviors cross-cut other priority health issues such as water, sanitation and hygiene, food safety, infection prevention control, and early care-seeking for fever. This makes the messages broadly relevant and well-suited for easy integration into other health promotion and social mobilization activities during times of non-emergency. Increasing familiarity with these behaviors can reduce the sense of overwhelm when confronted with new, and often life-threatening diseases.

Messages related to these cross-cutting behaviors are grouped together in the following section. These messages have been selected based on consideration of availability of systems to support the promoted behavior in Liberia, potential to interrupt transmission, and feasibility to practice the behavior.

SECTION 1.0: CONNECTION BETWEEN ANIMAL HEALTH AND HUMAN HEALTH

- Animal health, and the health of the areas they live, is important for human health.
- Animals are a source of food, a source of income, and help our plants and forests grow.
    - Many animals help grow the fruits that we eat by spreading the seeds. Without these animals, the plants would not multiply and grow fruits.
    - Some animals help the crops we grow stay healthy by eating the insects that damage the crops.
    - If the forest is cut, burned, or no longer safe for wild animals, the wild animals will be forced to find a new home which can bring them closer to people and other domestic animals, and can cause problems for people and animals. Taking care of our forests and land helps animals to live in peace and avoid problems.
- Animals can get sick just like people can, and some of them can spread some of those sicknesses to people and other animals, such as monkeys, bats, rats, cats, dogs, chickens, pigs, etc.
- Some of the sicknesses that can be spread are serious and can cause death.
- Some of these serious sicknesses that can be spread from animals to people are EVD, Lassa fever, rabies, anthrax, and animal flu (e.g., bird flu).
- It is important we take care when working with and living near animals because we cannot always see the signs that they are sick.

- Many of the signs and symptoms of the diseases are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.

SECTION 2.0: WAYS THAT SICKNESS SPREADS BETWEEN ANIMALS AND PEOPLE

- Sicknesses can spread between animals and people in different ways.
- Sickness can spread from an animal to a person through:
    - A bite of an insect or a bite or scratch of an animal with sickness
    - Eating meat or other products, such as milk or foods made with milk, from a sick animal or animal found dead
    - Eating or drinking raw milk or raw milk products
    - Touching an animal with sickness or its pee-pee, poo-poo, blood, snot, spit, or other body fluids such as birthing fluids
    - Touching, eating, or drinking something that has the pee-pee, poo-poo, blood, snot, spit, or other body fluids of an animal with sickness on it
    - Breathing in sickness from an animal through the air
- Some animals do not show the signs and symptoms of sickness but can still spread it to other animals and to people.
- Because some animals do not show signs and symptoms of sickness, you cannot know for sure which animals are ill. Therefore, it is important to be careful with all animals.

SECTION 3.0: ACTIONS TO PROTECT OUR ANIMALS, OURSELVES, AND OUR COMMUNITY ENVIRONMENT FROM SICKNESSES THAT CAN SPREAD BETWEEN ANIMALS AND PEOPLE

3.1: PROTECT YOUR ANIMALS AGAINST SICKNESSES

3.1.1: VACCINATE YOUR ANIMALS AGAINST SICKNESS

- Vaccinating your animals against sickness is one of the best ways to protect your animals, yourself, and your family.
- In Liberia, vaccines for animals are available at the Ministry of Agriculture Veterinary Services and private veterinary centers for some sicknesses such as rabies.
- You can get information on the schedule for regular animal vaccination at the Ministry of Agriculture Veterinary Services Offices at the national and county levels and private veterinary centers or from a veterinary officer, community animal health worker, or agriculture extension officer in your community. You can also call 4455.

3.1.2: MAINTAIN A SEPARATE SPACE FOR ANIMALS OUTSIDE OF THE HOUSE

- Taking good care of our pets (cats and dogs) and livestock helps keep them healthy, which also helps keep us, our families, and our communities healthy.
- All animals need enough food and water, exercise, kind treatment, and a safe, clean place to stay.
- However, keep chickens and birds, livestock animals and cattle, and all wild animals outside of the house or prepare a separate place for them outside the house to reduce the spread of sickness through close contact.
- Keep animals in the yard or within an enclosed area. Animals that roam freely are more likely to come into contact with sicknesses from other animals and can then spread the sicknesses to our other animals, our families, or our communities.
- Wild animals do not normally let a person come close to it, and if one does, something could be wrong with it.
    - Leave wild animals to be wild. Keeping a wild animal as a pet or bringing it into your house can cause problems for the animal and for your family.
- If you must bring animals indoors, keep them away from where the family sleeps and eats.
    - Sleeping with or eating near animals can allow sickness from an animal to easily spread to us and our families.

3.1.3: Keep new animals or animals that did not sell at market separate to observe them for signs of Sickness before mixing them with your other animals

- If you buy or get new animals, keep them separate from other animals for a period of three weeks while you watch the new animals for any signs and symptoms of sickness. This way you can make sure they are not sick and prevent the spread of any sickness to your other animals.
- If you take your animals to the market, keep them away from other animals.
- If you bring unsold animals back from the market, keep them separate from other animals while you watch them for any signs and symptoms of sickness. This way you can make sure they did not come in contact with any sickness at the market that could spread to other animals.

3.1.4: Safely clean areas where animals and the items used to care for them are kept

- Clean animal pens and feeding areas daily. Women, girls, and boys can help clean the animal pens.
- Wash all surfaces and items such as shovels and cages used to care for animals, as well as their living and feeding areas, with soap and clean, running water immediately after contact with the animals to remove any of their body fluids such as pee-pee, poo-poo, blood, snot, or spit.
    - Some sicknesses can live on surfaces such as tables or baskets, grass, or knives for hours and in the environment for days.
- Wash the wheels of bicycles, motorcycles, or other vehicles with soap and clean, running water as soon as possible after leaving animal areas and especially before you go indoors.
- Have a separate set of shoes and clothes that you use just for working in animal areas. Wash them daily.
    - Remove your shoes and clothes as soon as possible after leaving animal areas and keep them outside of the house. Wash the shoes and clothes before wearing them again.
- You can help stop sicknesses from entering your body when cleaning areas where animals are

kept by covering your skin, eyes, nose, and mouth with the appropriate personal protective equipment such as clean cloth, glasses, or gloves.

  - If available, wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth to prevent disease-causing germs from entering.
  - Wash anything used in caring for animals with soap and clean, running water or with disinfectant. Then immediately afterward wash your hands and arms with soap and clean, running water.
  - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
  - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
  - Wash your hands and arms immediately with soap and clean, running water.

- Burn or deeply bury animal pee-pee, poo-poo, and other droppings including feed and water away from:
  - The animal pen
  - Where food is grown and prepared
  - Water sources
  - Places that people and animals often visit
- Avoid throwing dead animals or their pee-pee and poo-poo into any water source or leaving them in the yard or an open field.
- Avoid using animal pee-pee and poo-poo as fertilizer unless it is composted first.
  - Composting should be done in a secure area, such as an enclosed shed, that birds, cats, dogs, pigs, and other animals cannot enter.
  - A composting site should be far from where people live and far from water sources and run-off water.
- In areas with many people and where spaces are too small to burn or bury animal pee-pee and poo-poo, throw it away in a plastic bag or in a covered bin until it can be collected and taken away.

3.1.5: Separate sick and aborting animals and call an animal health worker for advice

- Call a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or call 4455 if you think an animal is sick or if any unexpected or sudden animal death occurs.
  - This information can help county authorities and community health workers take action early before any sickness affects people or causes a problem for more animals.
- Abortions in animals are a sign of sickness and can indicate that an animal is sick and able to spread the sickness to other animals and humans.

- Separate an aborting animal to keep other animals away from their birthing fluids, pee-pee, poo-poo, blood, snot, or spit, and call your nearest community health worker, the town chief, or the community chairperson. You can also call 4455.
    - Tracking the number of abortions can help county authorities and community health workers take action to stop any outbreak before it causes big problems for people and their animals.
- Keep aborting animals and animals giving birth away from other animals and people until a community health worker can advise you.
    - Keep animals giving birth out of your house to reduce the risk that they will spread sickness to you and your family.
    - Fence the area where an aborted fetus was for a few days, and keep other animals away from the area.

3.2: PROTECT YOURSELF, YOUR FAMILY, AND YOUR COMMUNITY

3.2.1: AVOID SELLING, EATING, OR GIVING AWAY AN ANIMAL OR ANY ANIMAL PRODUCTS SUCH AS MILK OR MEAT IF THE ANIMAL IS SICK, HAS RECENTLY ABORTED, OR WAS FOUND DEAD

- Animals are an important food source.
- To keep healthy, it is important to never prepare or eat, sell, or give away an animal or its products if the animal has any signs of sickness, if it has recently aborted, or if you found the animal dead.
    - These animals can spread their sickness to other animals and to people.
    - We cannot always see the signs and symptoms of sickness.
- If you hear of an outbreak of animal sickness nearby, call a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer), your town chief, or community chairperson or call 4455.
- To keep you and your animals safe, do not move or sell your animals if you hear of an outbreak of animal sickness nearby.

3.2.2: HANDLE AND CONSUME MILK AND MILK PRODUCTS SAFELY

- Boil fresh and raw milk from any animal before drinking it or using it to make milk products.
    - Not all animals show signs and symptoms of sickness, so it is best to avoid all raw milk and products made from fresh or raw milk.
- Do not eat or drink raw milk or raw milk products from any animal that has aborted or has any signs of sickness.
- Check your health status regularly at your nearby health facility if you work in dairy production; eat or drink fresh, raw milk or raw milk products; slaughter animals; or handle animals or animal products as part of your normal activities.

3.2.3: PROTECT YOURSELF WHEN ASSISTING ANIMALS GIVING BIRTH OR ABORTING AND REPORT ALL ABORTING ANIMALS

- Abortions in animals are a sign of sickness and can indicate that an animal is sick and able to spread the sickness to other animals and humans.
- Keep aborting animals and animals giving birth away from other animals and people until a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) can advise you.
    - Keep animals giving birth out of your house to reduce the risk that they will spread sickness to you and your family.
    - Fence the area where the aborted fetus was for a few days and keep other animals away.
- Call a community health worker or call 4455 about any sick or aborting animals in the community.
    - Tracking the number of abortions can help county authorities and community health workers take action to stop any outbreak.
- Avoid touching body fluids, such as the milk, blood, birthing fluids, or placenta, and the fetus of an aborting animal with your bare hands, even if the animal looks healthy.
    - Aborting animals and animals that are giving birth can spread sickness to you and to other animals. We cannot always see the signs of sickness.
- If they are available, wear rubber gloves or plastic bags to protect your hands.
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
    - Wash all of the things used for animal care with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing an animal.
- Avoid selling or giving away an animal that is aborting because it can spread sickness to other animals and people.
- Avoid eating or drinking milk or milk products from any animal that has aborted or has other signs of sickness.

3.2.4: AVOID TOUCHING SICK AND DEAD ANIMALS WITH YOUR BARE HANDS AND SAFELY BURN OR BURY DEAD ANIMALS

- When possible, avoid animals that look sick and animals that you find dead.
- Avoid touching with your bare hands the body or body fluids, such as the pee-pee, poo-poo, blood, snot, spit, or birthing fluids, of an animal that looks sick or that you find dead.
    - Even if the animal looks healthy, it is important to take care because you cannot always

see the signs and symptoms of disease.

- Call the nearest community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) about any unexpected or sudden death of animals to get help to safely burn or bury the dead body.
    - This information can help county authorities and community health workers take action early before a sickness becomes a problem.
    - If more than ten animals get sick or die within a week's time, this can be a sign of an outbreak.
- Close off the area surrounding the dead animal to prevent other animals from coming into contact with it.
    - Do not leave a dead animal in an open field. This could spread sickness to healthy animals when they are grazing or drinking water.
- If a community health worker does not respond within one day to advise on how to burn or bury the dead animal safely, it is important to burn or bury the animal very carefully.
- There are seven key steps to safely handling and disposing of a dead animal if you are unable to get help or guidance from a community health worker.
    - **Step 1:** Wear rubber gloves or plastic bags to protect your hands and cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth. Do not touch the animal with bare hands.
    - **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
    - **Step 3:** Burn or deeply bury the dead animal in the soil far from where water is collected and household activities take place.
        - Burning a dead animal is best in areas with many people and where space is too small to safely bury it.
        - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
        - Burn to ash or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
    - **Step 4:** Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools you used to move the dead animal and put them in the sun to dry.
    - **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun to dry.
    - **Step 6:** Remove rubber gloves or plastic bags carefully. Burn or deeply bury them.
    - **Step 7:** Wash your hands and arms immediately with soap and clean, running water.
- Never dig up a dead animal that has been buried.

3.2.5: PROTECT YOURSELF WHEN KILLING AN ANIMAL

- Cover your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
    - If available, wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
    - Wash everything that you used while killing the animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing an animal.
- When killing an animal, if you notice the blood does not clot, the animal might have anthrax.
    - Keep all the equipment used while killing the animal together and immediately call an animal health worker or health extension worker.
    - Do not move equipment because this could spread the disease.
    - Do not eat the meat or blood or use the hide from this animal until you receive advice from a veterinary officer, community animal health worker, or agriculture extension officer.

3.2.6: AVOID ALL BATS WHEN POSSIBLE

- Bats can have different sicknesses and do not always show signs and symptoms of sickness, so it is important to avoid contact with all bats.
- Avoid visiting caves, including using caves for shelter or cultural ceremonies, to reduce contact with bats, and avoid areas where plenty bats live or visit.
    - Touching bats, their body fluids (such as the pee-pee, poo-poo, blood, snot, or spit), and surfaces or items that their body fluids have touched are ways that sickness can spread from bats to people.
    - People who go into caves should be careful not to come in contact with bat body fluids, such as pee-pee, poo-poo, blood, snot, or spit, or surfaces that may have body fluids on them, and should avoid touching their mouth, nose, eyes, or any opening in their skin such as a cut or sore.
    - Always wash your hands and arms with soap and clean, running water immediately after visiting a cave.
    - If possible, protect yourself from coming into contact with any bat body fluids such as pee-pee, poo-poo, blood, snot, or spit in the cave.
        - Wear a head covering to protect your head and rubber gloves or plastic bags to protect your hands.

        - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
        - Adults should help children cover their hands, eyes, and nose with the available protective items.
    - After leaving the cave, wash the rubber gloves or plastic bags well with soap and clean, running water before you remove them from your hands.
    - Remove the head covering, glasses, and mask or cloth from your face, and wash them immediately with soap and clean, running water. Hang them in the sun to dry and immediately wash your hands with soap and clean, running water.
    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
    - Adults should help children wash their hands with soap and clean, running water.
- Avoid killing, chasing, or driving bats from an area.
    - Trying to kill or chase bats from an area does not work and can actually make it more likely that sickness can spread from bats to people.
    - Protect your child's health. Mothers and fathers should always ensure the safety of their children and avoid sending children into the roof to drive bats out because they could be bitten or touch the pee-pee, poo-poo, blood, snot, spit, or other body fluids of a bat.
- Avoid hunting, killing, preparing for cooking, or eating any bat, even if it looks healthy.
- Always wash your hands and arms with soap and clean running water immediately after any contact with a bat, even if it looks healthy, because signs and symptoms of diseases may not be visible.

3.2.7: CALL AUTHORITIES ABOUT ANIMALS WITH STRANGE BEHAVIOR AND PREVENT ANIMAL BITES

- If an animal is acting strangely, avoid it and immediately call a community health worker (veterinary officer, community health animal worker, community health volunteers, community health assistant, community health service supervisor, agriculture extension officer) for advice and guidance on what to do next.
- If you find any bites on your animals or they are exhibiting strange behavior, separate them from other animals and people and call a community health worker.
- Let your family and neighbors know if you see any unusual behavior in animals, so that they can take care.
- Wild animals do not normally let a person come close to them, and if one does, something could be wrong with it.
- To reduce animal bites:
    - Avoid dogs, cats, monkeys, and other animals that are acting strangely.
    - Avoid stray dogs, cats, monkeys, and other animals that you do not know, even if they look friendly.

        - Leave dogs and other animals alone when they are sleeping, eating, or with their young.
        - Avoid dogs that are behind fences or tied up.
        - Avoid dogs that pull back their lips, show their teeth, growl, have hair that stands on end, and keep their tail straight up in the air.
        - Avoid dogs that move backwards or try to run away, lick their faces, lower their tails, flatten their ears back, and show their teeth.
        - Approach animals quietly and stay calm. Do not run from, chase, tease, or play roughly with animals.
        - Do not stare directly at animals.
        - Do not put your face near an animal's face or try to hug animals.
        - If you want to touch a dog, ask their owner for permission first.
        - If you want to touch a dog, make sure it can see you and sniff your hand first, and only pet it on its back.
- If an animal such as a dog comes close to you:
    - Stand very still and quiet like a tree.
    - Keep your hands at your side.
    - Look at your feet.
    - If you fall over, curl up and stay as still and heavy as a rock.
    - Let the dog sniff you and when it walks away, you should walk slowly and quietly away.
- Household members including women and men should advise their children to avoid playing with dogs even if they appear healthy and calm. This will prevent the children from being bitten or scratched by dogs.

3.2.8: CARE FOR ANY ANIMAL BITE IMMEDIATELY

- Wash any animal bite or scratch immediately with soap and clean, running water 20 times (for about 15 minutes).
    - Washing a bite or scratch well with soap and clean, running water can help stop sickness spreading from an animal to a person.
- After washing a bite or scratch very well, go quickly to your nearest health facility or community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) for advice and treatment. Do not delay, getting early treatment to prevent sickness (such as rabies) saves lives.
- To stop rabies, you must get treatment before signs and symptoms begin to show. Once a person starts to show signs and symptoms, the chance of survival is less.
    - Vaccines to stop rabies in people are currently at all referral hospitals. It is important to go to your nearest health facility right away after an animal bite so that there is time to get the vaccine, if needed, to stop rabies before signs and symptoms start to show.

- Call a community health worker, town chief, or community chairperson about the animal that bit or scratched you and report how you were bitten or scratched.
    - This information can help county authorities and community health workers learn more about the animal and help protect other people.
- Any animal that has bitten someone or another animal should be examined by an animal health worker and kept away from other animals and people for 14 days while it is observed for signs and symptoms of rabies.
    - Call your nearest community health worker or call 4455 for advice on how to handle the animal.
    - Take extra care to keep the animal in one area away from other animals and people.
    - Make sure the animal has food and water while it is being observed.
    - Do not kill or harm the animal.
- If the animal does not show signs of rabies after 14 days, postexposure treatment with immunoglobulin (for people) can be discontinued.

3.2.9: REDUCE ANIMALS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

- Avoid having animals in the house.
    - Close contact with animals and their body fluids such as pee-pee, poo-poo, blood, snot, or spit can spread sicknesses from animals to us and our families.
- If you must bring animals indoors, keep them away from where the family sleeps and eats.
    - Sleeping with or eating near animals can allow sickness from an animal to easily spread to us and our families.
- Keep the house area as clean as possible to help stop unwanted animals from entering your house.
- Keep your house in good repair to make it difficult for unwanted animals to enter and make their home there.
- Clean and sweep the house every day so that animals such as rats, or chickens will not enter.
- When sweeping your house after animals have been in it, always make sure to:
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
    - Wet the floor with water before sweeping to keep dust from spreading in the air.
    - Clear away dirt in and around the house and throw it away far from the house.
    - Remove the glasses and mask or cloth from your face, and wash them immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water immediately after cleaning or sweeping an area where animals have been.
- Regularly wash the floors, mats, and walls; clothes and blankets; and all of the food and water covers and containers to remove any animal pee-pee, poo-poo, blood, snot, spit, or other body fluids.

- Keep the house clean, including the floor, mats, clothes, and blankets, as well as all food and water containers; keeping the entire compound clean should be enforced by all members of the household.

3.2.10: STORE AND PREPARE FOOD SAFELY AND PROTECT FOOD PREPARATION AREAS FROM ANIMALS

- Sickness can spread from animals to people through touching, eating, or drinking something that has the pee-pee, poo-poo, blood, snot, spit, or other body fluids of an animal with sickness on or in it.
- Eat and drink away from animals and areas where animals are kept.
- Keep animals away from areas where food or drink is stored, prepared, or eaten.
- Avoid eating any fruit or food that has been bitten by an animal.
    - Do not eat any part of the bitten fruit or food.
    - Do not give the bitten fruit or food to an animal to eat.
- Always wash all fruits and vegetables with water before cooking or eating.
- Dry food on a clean surface and on high ground away from where rats, cats, dogs, and other animals can touch it or away from areas that have come into contact with animal pee-pee, poo-poo, blood, snot, spit, or other body fluids.
- Keep food and water in covered containers that animals cannot enter and away from where people sleep.
    - This helps to prevent contact with rats and other animals and to stop animals from visiting and eating and drinking your food and water.
- Always use a clean cup to collect water from a container so that your hands do not touch the water. Dirty cups and hands can spread sickness to other people through the water.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from animals and their pee-pee, poo-poo, blood, snot, spit, or other body fluids.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and clean, running water before, during, and after preparing food.
- Wash hands with soap and clean, running water before breastfeeding.
- Wash your hands after coming back from the bush.
- Wash your hands before and after changing baby diapers or cleaning up a child who has used the toilet.
- Wash hands with soap and clean, running water before and after touching raw animal products such as meat, chicken, milk, and eggs.
- Keep raw meat and chicken and other animal products away from fruits and vegetables and cooked foods.
- Wash all surfaces and items used to prepare food with soap and clean, running water immediately after they have been in contact with any animal parts or products including skin, feathers, guts, raw meat, chicken, milk, or eggs.

- Cook food well to help stop the spread of any sickness. Food should be hot and fully cooked.
    - Meat and chicken should be cooked until no pink is left.
    - Eat and drink only cooked milk and eggs. Boil or fry eggs until they are cooked solid.
    - Bring foods such as soups and stews to boiling before eating.
    - Eat food while it is hot.
    - Reheat cooked food until it is very hot.
- To keep your family and friends healthy, do not prepare food when you are sick.
- Household members, especially women and girls, ensure that these behaviors are practiced to keep the house, cooking areas, and items clean and to cook foods well. Men and boys support the women and girls in carrying out these actions to keep the family healthy.

3.2.11: ALWAYS WASH YOUR HANDS, ESPECIALLY AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - After using the toilet
    - After coming from the bush
    - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- **To wash your hands well follow these steps**:
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.

- Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
- Rinse hands well with clean, running water.
- Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.

- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

3.2.12: PROTECT YOURSELF FROM MOSQUITO BITES

- Mosquitoes can spread many types of sickness including ones that can make both animals and people sick.
- Some of these sicknesses are spread by mosquitoes that bite during the day and night.
- Cover stored water and get rid of still or dirty water in your yard to reduce the number of mosquitoes.
- Protect against mosquito bites by using personal insect repellent if available and wearing light colored, long-sleeved shirts and trousers if possible.
- Always sleep under an insecticide-treated mosquito net. Household heads (men and women) are expected to provide mosquito nets to the family and to ensure that family members sleep under them every night and throughout the night. Make sure the nets are washed regularly and mended when torn.

3.2.13: SEEK IMMEDIATE CARE AT A HEALTH FACILITY FOR ANY SUDDEN FEVER

- Many of the signs and symptoms of sicknesses that spread between animals and people are like those for malaria and typhoid. We may not always know what sickness we have.
- It is important to go to a health facility for early testing and the correct treatment for any fever.
- Getting early treatment for any problem can save lives.
    - Getting early treatment can also protect your family and loved ones from getting the sickness.
    - When someone gets early care and treatment, they have a better chance of recovering quickly and with fewer problems.

3.2.14: SEEK IMMEDIATE CARE AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW GETS SICK OR DIES AFTER CONTACT WITH AN ANIMAL

- If you have signs and symptoms of sickness, go to your nearest health facility or notify a community animal health worker right away.
- Getting early treatment for any problem can save lives.
    - Getting early treatment can also protect your family and loved ones from getting the sickness.
    - When someone gets early care and treatment, they have a better chance of recovering quickly and with fewer problems.

- If you have signs and symptoms of sickness, make sure to call your health worker if you have had recent contact with any animal or spent time in an area where animals live, visit, or are kept.
- If a person gets sick or dies after contact with an animal, do not touch the person; their body fluids such as pee-pee, poo-poo, blood, snot, or spit; or any items they or their body fluids have touched.
    - Touching the body of a sick or dead person, their body fluids, or items they or their body fluids touched can spread sickness to other people.
- If a person gets sick or dies after contact with an animal, go to your nearest health facility or a community health worker (veterinary officer, community health animal worker, community health volunteers, community health assistant, community health service supervisor, agriculture extension officer) or call 4455.
    - Calling a health worker about any sickness or death after contact with an animal can help county authorities and community health workers find the reason for the sickness or death and can save the lives of others in Liberia.
    - Call 4455 to report all deaths.
- Report all deaths of animals to a community health worker or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

PART 3: DISEASE-SPECIFIC MESSAGES

ANTHRAX

Anthrax must be reported immediately in Liberia when it is suspected in either animals or humans.

Anthrax is a serious infectious disease caused by bacteria Bacillus anthracis. It naturally lives in soil, where it can survive for many years. Domestic and wild animals such as cattle, sheep, goats, antelope, and deer become infected with anthrax when they ingest spores from contaminated soil, plants, or water. Once spores enter the body, they multiply, producing toxins (poisons) that can cause severe illness. Cattle, sheep, and pigs are particularly vulnerable to anthrax infection and can suffer from serious effects, including sudden death without signs of disease. When bacilli from infected animals are exposed to air, they immediately form spores that contaminate the environment.

Anthrax can affect all warm-blooded animals, including people. There are three main types of anthrax, which are closely related to how a person or animal is infected:

- **Cutaneous anthrax** occurs when a person or animal is exposed to anthrax spores via contact with meat, hide, skin, or bones of an infected animal or animal carcass. Symptoms in humans include a cluster of itchy blisters or bumps around the exposure site and swelling, and a painless sore with a black center may appear after the blisters erupt. Without treatment, the case fatality rate of cutaneous anthrax in humans is up to 20%. Treatment can be very effective in reducing mortality rate.
- **Gastrointestinal anthrax** occurs when a person or animal eats meat or drinks water that is contaminated with anthrax spores. Symptoms of gastrointestinal anthrax in humans may be hard to differentiate from other stomach illnesses, and they can include nausea, loss of appetite, vomiting, bloody vomit, fever, abdominal pain, and severe diarrhea. The symptoms generally develop one to seven days after exposure. Without treatment, the case fatality rate for

gastrointestinal anthrax is up to 60%. Although early treatment can be effective in reducing mortality, the mortality rate remains up to 40%.

- **Inhalation anthrax** occurs when a person or animal inhales spores through breathing in anthrax spores from the wool, hide, or skin of an animal or animal carcass infected with anthrax. Symptoms of inhalation anthrax are flu-like and thus may be hard to differentiate from other respiratory diseases. Symptoms generally appear shortly after exposure and include fever, cough, headache, vomiting, chills, weakness, abdominal pain, and chest pain. Inhalation anthrax is the deadliest form of anthrax and is 90% fatal. Even with early and aggressive treatment, mortality for inhalation anthrax remains up to 45%.

Person-to-person spread can occur but is rare. Individuals that work closely with animals or their skin and hides are at increased risk of anthrax infection, as are those that consume raw or undercooked meat from animals infected with anthrax. **Risky behaviors** that increase the risk of anthrax infection in people and animals include the following:

- Unsafe handling and disposal of dead animals
- Delay in seeking early care for affected humans and animals
- Consumption of the meat and blood from sick animals and animals found dead
- Unsafe contact with the hide, wool, or skin of an animal that is sick with or that has died from anthrax
- Not vaccinating at-risk livestock against anthrax

Vaccination of animals against anthrax is a key element of control in areas where it is available. Vaccination is available for humans in limited circumstances. For individuals in high-risk occupations (e.g., farmers, veterinarians, abattoirs, hunters, animal husbandry workers), it is important to self-monitor for possible anthrax exposure and symptoms. Anthrax can be treated with antibiotics, but outcomes are significantly better with earlier care.

In Liberia, anthrax outbreaks occur from time to time in almost all districts in the country causing disease in both livestock and humans. Outbreaks of anthrax in Liberia mostly occur during the onset of the rainy season between March and April. Although there are vaccines for anthrax, they are not available in Liberia at the moment of drafting this text (2022). Early treatment of anthrax infections in people at the health facility can save lives.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- CDC Resource Page on Anthrax (CDC, 2020a)
- OIE Resource Page on Anthrax (World Organization for Animal Health, 2022a)
- WHO Anthrax Questions and Answers (WHO, 2016)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia

ABOUT ANTHRAX

- Anthrax is a disease that can affect both humans and animals. It may cause serious illness and death.
- Anthrax is found naturally in soil, where it can survive for many years. Anthrax can also be found on the wool or hair of an animal that died of anthrax.

- Anthrax is most commonly found in grazing animals such as cows, sheep, horses, pigs, and goats.
- Anthrax infections in people and animals range from not too serious to very serious and may even cause death.
- A person can get anthrax through direct contact with infected animals or animal products. This includes:
    - Coming into contact with infected meat, hide/skin, or bones
    - Breathing in the spores from the wool/hide/skin of an anthrax-infected animal
    - Eating meat or drinking water contaminated with anthrax spores
- Anthrax can cause different types of signs and symptoms in humans depending on how it enters a person's body.
- Anthrax does not easily spread from person to person.
- If a person with anthrax does not get early treatment, the sickness can get worse and the person may die.

SIGNS AND SYMPTOMS OF ANTHRAX

SIGNS AND SYMPTOMS OF ANTHRAX IN ANIMALS

- The length of time from when anthrax enters an animal's body to when the animal starts to show signs and symptoms of anthrax ranges from one day to two weeks. The signs and symptoms of anthrax in animals include:
    - Difficulty breathing
    - Sudden death
    - Bleeding from the mouth, nose, and other body openings after death
    - Swelling of the body after death
    - Lack of body stiffness after death

SIGNS AND SYMPTOMS OF ANTHRAX IN PEOPLE

- The length of time from when anthrax enters a person's body to when signs and symptoms of anthrax begin to show ranges from one day to two months.
- The signs and symptoms of anthrax are different depending on how anthrax entered a person's body.
- **Anthrax through the skin** is the most common type of anthrax in people. The signs and symptoms of this type of anthrax include:
    - An itchy bump that looks like an insect bite that quickly changes into a painless sore with a black center
    - Swelling around the sore, which is most commonly found on the face, neck, arms, or hands
- **Anthrax caused by eating or drinking something contaminated with anthrax** is less common, but it is more serious. Without early treatment, this type of anthrax can cause death. The signs

and symptoms of this type of anthrax are

- Running stomach (diarrhea) that may contain blood
- Nausea
- Loss of appetite
- Vomiting
- Fever
- Headache
- Sore throat, hoarseness, and difficulty swallowing
- Swollen neck
- Flushing (red or hot face) and red eyes
- Fainting
- Swelling of abdomen (stomach area)

- **Anthrax caused by inhaling anthrax spores through the nose or mouth** is the most serious type of the disease. It will cause death without rapid treatment.
  - Livestock owners and people who work in slaughterhouses or process the wool, hides, or meat of an infected animal are the most likely to get this type of anthrax.
  - The signs and symptoms of this type of anthrax usually start within one week after contact with anthrax, but may not appear for up to two months. They include the following:
    - Trouble breathing
    - Fever and chills
    - Swelling of the neck or glands in the neck,
    - Sore throat, painful swallowing, and hoarse voice
    - Vomiting especially with blood
    - Diarrhea or bloody diarrhea
    - Headache
    - Flushing (red or hot face) and red eyes
    - Stomach pain
    - Bloating
    - Fainting

HOW ANTHRAX IS SPREAD

- Anthrax is a sickness that can spread between animals and from animals to humans.
  - Anthrax rarely spreads from person to person.
- Anthrax can spread from an animal to a person through:

- A break or opening in the skin such as a cut or a scrape when a person has direct contact with blood or other body fluids, such as urine, stool, blood, snot, or saliva, or animal products such as meat from an animal that has anthrax
- Eating the meat or blood of an animal that is sick with or died from anthrax
- Touching or breathing in anthrax spores from the bones, skin, or hide of an animal that died with anthrax

WHO CAN CONTRACT ANTHRAX

Anyone can contract anthrax, but those who work directly with animals, such as cattle farmers, hunters, health workers (community animal health workers, laboratory technicians), butchers, and miners, are particularly at risk.

HOW TO REDUCE THE SPREAD OF ANTHRAX

- Keep birds, goats, sheep, chickens, cows, and all wild animals outside of the house or prepare a separate place for them to reduce the spread of sickness through close contact.
- To stop the spread of anthrax in animals, report all sick animals to the nearest community structure (community animal health workers, community health workers, and community stakeholders).
- To stop the spread of anthrax in humans, refer all sick people to the nearest health facility and community structure.

PROTECTING YOURSELF, YOUR FAMILY, AND YOUR ANIMALS FROM ANTHRAX

VACCINATE YOUR ANIMALS AGAINST ANTHRAX EVERY YEAR

- Vaccinating your animals every year is the best way to protect your animals, yourself, your family, and your community from anthrax.
- Anthrax vaccines for animals are available at government veterinary services and private veterinary centers.
- You can get information on the schedule for regular animal vaccination at a government veterinary service and private veterinary center or from a Veterinary Officer, Community Animal Health Worker, or Agriculture Extension Officer in your community. You can also call 4455.

CAREFULLY ISOLATE ANY SICK OR DEAD ANIMALS AND CALL YOUR NEAREST VETERINARY OFFICER, COMMUNITY ANIMAL HEALTH WORKER, OR AGRICULTURE EXTENSION OFFICER

- Call a health worker (veterinary officer, community animal health worker, or agriculture extension officer) or call 4455 if you think an animal is sick, or if any unexpected or sudden animal death occurs.
    - This information can help health officials take action early before any sickness affects people or causes a problem for more animals.
    - Animals with anthrax can be treated.
- Keep sick animals away from other animals and people until a veterinary officer, community animal health worker, or agriculture extension officer comes to treat them and advise you.

- If you think that your animal has anthrax or has been near another animal known to have anthrax, do not move or sell the animal. If you move or sell the animal, it could spread the sickness to others.
- Avoid touching with your bare hands the body and body fluids such as pee-pee, poo-poo, blood, snot, spit, or birthing fluids of an animal that looks sick or that you think may have died from anthrax.
- Sick animals can spread their sickness to you if you touch them or their body fluids such as pee-pee, poo-poo, blood, snot, spit, or birthing fluids.

- During an outbreak of anthrax, avoid using the hides of animals that you think may have died from the disease.

AVOID KILLING, EATING, OR SELLING SICK ANIMALS OR ANIMALS FOUND DEAD

- Avoid eating the meat and blood from a sick animal or any animal that you find dead.
- Avoid selling or giving away an animal that is sick or looks sick.
- Avoid killing any animals that you think may be infected with anthrax.

ALLOW COMMUNITY HEALTH WORKERS TO BURN OR BURY DEAD ANIMALS SAFELY

- An animal that has died of anthrax needs to be burned to ashes or buried at least two meters deep so that anthrax cannot be passed to other animals or people.
- Call the nearest community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or call 4455 about any unexpected or sudden death of animals to get help to safely burn or bury the dead body.
    - This information can help county authorities and community health workers take action early before any sickness becomes a problem.
- If you think an animal may have died of anthrax, avoid touching the body and do not open it.
- Close off the area surrounding the dead animal to prevent other animals from coming into contact with it.
    - Do not leave a dead animal in an open field. This can easily spread anthrax to healthy animals when they are grazing or drinking water.
- If a community health worker does not respond within one day to advise on how to burn or bury a dead animal safely, it is important to burn or bury the animal very carefully.
- Do not touch the body or the pee-pee, poo-poo, blood, snot, spit, birthing fluids, or other body fluids of a dead animal with your bare hands.
    - Even if the animal looks healthy, taking care is important because you cannot always see the signs and symptoms of disease.
- There are seven key steps to handling and disposing of a dead animal safely if you are unable to get help or guidance from a community health worker.
    - **Step 1:** Wear rubber gloves or plastic bags to protect your hands and cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth. Do

not touch the animal with bare hands.

- **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
- **Step 3:** Burn or deeply bury the dead animal in the soil far from where water is collected and household activities take place.
  - Burning a dead animal is best in areas with many people and where space is too small to safely bury the dead animal.
  - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
  - Burn to ash or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
- **Step 4:** Pour soapy water or disinfectant over the shovel, wheelbarrow, and other tools you used to move the dead animal and put them in the sun to dry.
- **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun to dry.
- **Step 6:** If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
- **Step 7**: Wash your hands and arms immediately with soap and clean, running water.

- Never dig up a dead animal that has been buried.

PROTECT YOURSELF WHEN KILLING AN ANIMAL

- Cover your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
  - If available, wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
  - Wash all of the things you used while killing the animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
  - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
  - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
  - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing an animal.
- When killing an animal, if you notice the blood does not clot, the animal might have anthrax.
  - Keep all the equipment used while killing the animal together and immediately call an animal health worker or health extension worker.
  - Do not move equipment because this could spread the disease.

- Do not eat the meat or blood or use the hide from this animal until you receive advice from a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer).

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
  - After assisting animal birth
  - After caring for a sick animal
  - After cleaning or touching areas where animals are kept
  - After milking
  - After using the toilet
  - After coming from the bush
  - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
  - Before and after preparing food
  - Before and after killing any animal
  - Before eating
- **To wash your hands well follow these steps**:
  - Wet your hands with clean, running water.
  - Use enough soap to cover all hand surfaces.
  - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
  - Rinse hands well with clean, running water.
  - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

SEEK EARLY TREATMENT AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW HAS COME INTO CONTACT WITH ANTHRAX OR HAS SIGNS AND SYMPTOMS OF ANTHRAX

- If you think you may have come into contact with an animal that died from anthrax, or if you have any of the signs and symptoms of anthrax, go to the nearest health facility or call your community health officer/nurse right away.
    - Getting early treatment for anthrax can save lives.
    - When someone gets early care and treatment, they have a better chance of recovering quickly and with fewer problems.
- If you have signs and symptoms of anthrax, make sure to call your nearest health facility or your community health officer/nurse if you have had recent contact with any animal or spent time in an area where animals live, visit, or are kept.
    - This information can help health officials take action early before any sickness becomes a problem.
- If a person gets sick or dies after contact with an animal, go to the nearest health facility or call a veterinary officer, community animal health worker, or agriculture extension officer or call 4455 to get information on how to protect yourself and others.
- Report all deaths of animals to a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

BRUCELLOSIS

Brucellosis must be reported immediately in Liberia when it is suspected in either animals and humans.

Brucellosis is one of the most common zoonotic diseases. It can cause significant economic losses for farmers raising goats, cows, sheep, or pigs owing to low rates of successful reproduction. It can also lead to poor health in humans, but it remains unrecognized and underreported in many places.

Brucellosis is a bacterial disease caused by different types of Brucella spp. that can infect many types of animals, especially milk-producing animals such as cows, pigs, goats, sheep, and camels. It also infects dogs and horses, and a number of wild animals including wild pigs and rabbits.

Brucellosis spreads rapidly between animals from the fluids associated with abortion and birth. The bacteria can survive in the environment for months and can infect animals that ingest them. Visible symptoms may be rare until an animal aborts. Brucellosis infection in animals must be confirmed by a laboratory test.

Humans become infected with the disease after direct contact with infected animals. The bacteria can enter the body through mucus membranes or breaks in the skin; through consumption of animal products such as raw milk and cheeses from infected animals, particularly sheep and goats; or by inhalation of airborne particles. The incubation period for the disease ranges from seven days to 60 days after exposure, but is typically 14–30 days. Symptoms may be mild and can include intermittent fever, sweating and chills, headache, and general malaise. Person-to-person spread of the disease is rare. Brucellosis in humans is treatable with antibiotics.

Animal doctors, butchers, hunters, individuals involved in raising animals, and people who drink raw milk products or work in laboratory settings are at a higher risk of brucellosis infection compared with the

general population. **Risky behaviors** that increase the risk of brucellosis infection in people and animals include:

- Eating or drinking of raw dairy products from animals infected with brucellosis
- Drinking the blood of an animal infected with brucellosis
- Direct contact with the blood, placenta, aborted fetus, or birthing fluids of an animal infected with brucellosis
- Poor hygiene and infection prevention and control measures during animal care, cleaning, killing, and birth assistance
- Poor processing of raw milk
- Poor food safety measures
- Raising a group of animals that are in close contact

Animal vaccination against brucellosis is a key part of control in areas where it is available, along with the killing of infected animals. In areas where testing and vaccination are not available, prevention behaviors such as careful practice of hygiene and infection prevention and control measures during animal handling and care, careful food safety practices, and avoidance of raw milk products are of elevated importance.

According to the Central Veterinary Laboratory report, Liberia had one confirmed case of brucellosis in 2021. Forty-nine of the 52 countries in Africa have reported confirmed cases of brucellosis. Surveillance activities on brucellosis and other diseases are ongoing in Liberia, with close monitoring increasing the probability of detecting outbreaks.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- OIE Resource Page on Brucellosis (OIE, 2022d)
- WHO Resource Page on Brucellosis (WHO, 2020)
- CDC Resource Page on Brucellosis (CDC, 2021a)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

ABOUT BRUCELLOSIS

- Brucellosis is a very common disease in animals such as cattle, sheep, and goats, and it can spread between animals and from animals to people.
- Brucellosis can cause loss of livelihood related to livestock and death among livestock.

SIGNS AND SYMPTOMS OF BRUCELLOSIS

SIGNS AND SYMPTOMS OF BRUCELLOSIS IN ANIMALS

- Not all animals that have brucellosis will show signs or symptoms.
- Signs of brucellosis in animals include:
    - Abortion
    - Stillbirth (born dead)

- Weakness in a newborn animal (baby cow, baby pig, baby sheep, puppy, baby goat)
- Retention of fetal membranes (placenta or afterbirth)
- Signs of infection in the membranes
- Swollen testicles in bulls

SIGNS AND SYMPTOMS OF BRUCELLOSIS IN PEOPLE

- The length of time from when brucellosis enters a person's body to when signs and symptoms of brucellosis begin to show ranges from five days to 180 days, but it is usually 14–28 days.
- Signs and symptoms of brucellosis in people include:
  - Fever, joint and muscle aches, fatigue, headache, and night sweats
  - Weight loss
  - Anorexia (unable to eat)
  - Meningitis (swelling of the membranes that surround the brain and spinal cord)

HOW BRUCELLOSIS IS SPREAD

Brucellosis is spread to people during killing of animals for meat and when preparing infected dead animals such as bush animals, cows, sheep, and goats.

- Brucellosis spreads rapidly from animal to animal through contact with an aborted fetus or body fluids including blood, birthing fluids, and unscreened sperm of bulls.
- Brucellosis is spread to people when they touch the body fluids of infected animals, such as the blood (for example when killing an animal) or birthing fluids (when assisting during birth), or tissues, such as an aborted fetus or placenta, with bare hands.
- Brucellosis is spread to people from animals when people drink the blood or raw milk or eat raw milk products from an animal with brucellosis.
- Brucellosis is spread to people through consumption of raw bone marrow and internal organs from freshly killed animals.
- Brucellosis is spread when sick animals are mixed with other animals or sick people are brought together with others.
- However, it is uncommon for brucellosis to spread from person to person, but it can be spread from mother to child during pregnancy or delivery. In some cases, it can cause pregnant women to have a miscarriage.

HOW TO PROTECT YOURSELF, YOUR FAMILY, AND YOUR ANIMALS FROM BRUCELLOSIS

PROTECT YOURSELF WHEN ASSISTING ANIMALS THAT ARE GIVING BIRTH OR ABORTING AND REPORT ALL ABORTING ANIMALS

- Abortion in an animal is a sign of brucellosis and can indicate that the animal is sick and able to spread the sickness to other animals and humans.
- Protect or separate an aborting animal to keep other animals away from the birthing and other body fluids such as urine, feces blood, snot, or spit and call your nearest community health worker (veterinary officer, community animal health worker, community health volunteer, community

health assistant, community health services supervisor, or agriculture extension officer), town chief, or community chairperson or call 4455.

  - Tracking the number of abortions can help county authorities and community health workers take action to stop any outbreak before it causes big problems for people and their animals.
  - Keep in mind that infected animals may show no clinical signs at all.

- Keep aborting animals and animals giving birth away from other animals and people until a community health worker can advise you.
  - Keep animals giving birth out of your house to reduce the risk that they will spread brucellosis to you and your family.
  - Fence the area where the aborted fetus was for a few days and keep other animals away.
- Avoid raising a sick animal or animal aborted together with other animals and people.
- Avoid touching body fluids, such as the milk, blood, birthing fluids, or placenta, or the fetus from an aborting animal. Avoid touching an animal giving birth with your bare hands, even if it looks healthy.
  - Aborting animals and animals that are giving birth can spread brucellosis to you and to other animals. The signs of sickness are not always visible.
  - If they are available, wear rubber gloves or plastic bags to protect your hands.
  - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth. Do not touch the animal with your bare hands.
  - Wash all the things you used to care for the animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms, with soap and clean, running water.
  - Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
  - If plastic bags or gloves are used, remove them carefully. Burn or deeply bury them.
  - Do not reuse any of the materials handled in suspected brucellosis cases.
  - Wash your hands and arms immediately with soap and clean running water.
- Avoid selling or giving away an animal that is aborting or has the signs of brucellosis. This can spread brucellosis to other animals and people

HANDLE AND CONSUME MILK AND MILK PRODUCTS SAFELY

- Boil fresh and raw milk from any animal before drinking or using it to make milk products.
  - Not all animals that have brucellosis abort or show signs and symptoms, so it is best to avoid drinking raw animal milk and products made from raw milk.
- Do not eat or drink fresh, raw, or half boiled milk or milk products from any animal that has aborted or has other signs of sickness.
- Regularly check your health status at a nearby healthy facility when you are having persistent fever if you work in dairy production, eat or drink fresh, raw milk, or milk products, kill animals, or handle animals or animal products as part of your normal activities.

PROTECT YOURSELF WHEN KILLING AN ANIMAL

- Cover your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
    - Always wear rubber gloves, plastic bags, aprons, and boots especially during slaughtering operations or activities to protect yourself. Always cover your eyes, glasses, your nose and mouth with a mask or clean cloth.
    - Wash all of the things you used with soap and clean running water, or disinfectant, before and after killing the animal. Then immediately after, wash your hands and arms with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean running water before and immediately after killing an animal.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- To wash your hands well follow these steps:
    - Wet your hands with clean, running water.

- Use enough soap to cover all hand surfaces.
- Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
- Rinse hands well with clean, running water.
- Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.

- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

SEEK EARLY TREATMENT FOR ANIMALS WITH SIGNS AND SYMPTOMS OF BRUCELLOSIS

- If you see one of the following signs or symptoms in your animals, call your community health worker (veterinary officer, community animal health worker, community health assistant, community health promoters), or call 4455.
  - Abortion
  - Stillbirth
  - Weakness in a newborn calf
  - Retention of fetal membranes
  - Signs of infection in the membranes
  - Swollen testicles in bulls
- Call your community health worker or call 4455 if abortions are occurring frequently or among multiple animals. This could be a sign of a brucellosis outbreak.

SEEK EARLY TREATMENT FOR PEOPLE WITH SIGNS AND SYMPTOMS OF BRUCELLOSIS

- If you think you may have come into contact with brucellosis-infected animals, or if you have any of the symptoms of brucellosis, call a community health worker (veterinary officer, community health animal worker, community health promoters, community health assistant, community health service supervisor, agriculture extension officer), or call 4455 immediately.
  - Symptoms of brucellosis include a fever that comes and goes, fatigue, a severe headache, and night sweats.
- If a person gets sick or feels sick after having contact with an animal or its body fluids, such as pee-pee, poo-poo, blood, snot, saliva, or birthing fluids, or after eating or drinking raw milk or dairy products, they should call a community health worker or call 4455.
- Seek treatment early. If someone gets early care and treatment, they have a better chance of being cured.
- Brucellosis in humans is treatable with antibiotics at the health facility.
- Report all deaths of animals to a community health worker or call 4455.
  - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

BOVINE TUBERCULOSIS

Bovine TB must be reported immediately in Liberia when it is suspected in either animals or humans.

Bovine TB, also known as zoonotic TB, is a chronic disease of animals caused by the bacterium Mycobacterium bovis, which is closely related to the bacteria that cause human and avian TB. Outbreaks of bovine TB can result in the loss of lives among both people and animals as well as the loss of livelihood, a reduction in animal production, and an increase in the cost of animal production. Limited surveillance of the disease makes estimation of the true burden of the disease difficult. It is endemic to many areas in Africa.

This disease can affect almost all mammals, causing a general state of illness, coughing, and eventual death. Bovine TB is found most commonly in cattle and deer, but it can affect almost all mammals, including humans. Bovine TB spreads between cattle most commonly when they inhale tiny airborne droplets created when an infected cow coughs. The disease progresses slowly. As a consequence, animals may be infected without displaying symptoms and can spread the disease as they move.

People most commonly get bovine TB through eating or drinking raw milk or dairy products from animals infected with bovine TB. It is also possible for the disease to spread through a break or opening in the skin, such as a cut or a scratch, when touching an infected animal through activities such as hunting, slaughter, milking, or processing hides. It is rare, yet still possible to breathe in the small droplets released by an animal with bovine TB when it coughs or sneezes. People that work or live in close contact with cattle or other animals are most at risk of bovine TB. Once a person has bovine TB in their lungs, they can spread it directly to other people when they cough or sneeze.

Bovine TB can damage the lungs, lymph nodes, and other parts of the body if not treated early in humans. Some people that become infected with the disease do not feel sick, do not show symptoms, and cannot spread the disease to others. These people have a form of the disease called latent TB infection. In time, they may develop bovine TB. Bovine TB in people may be indistinguishable from human TB and the prescribed treatment is the same. Vaccination is not available and diagnosis and treatment are challenging, which elevates the importance of prevention behaviors.

People that work or live in close contact with cattle or other animals are most at risk of bovine TB, as are those that consume raw milk or mild products. **Risky behaviors** that increase the risk of bovine TB infection in people and animals include:

- Eating or drinking raw dairy products from animals infected with bovine TB
- Poor infection prevention control and hygiene measures among veterinarians, abattoirs, and farmers
- Poor food safety practices

To prevent bovine TB in cows, farmers can work with animal health workers to perform skin tuberculin testing to detect any cow with an active infection and contain them.

To prevent bovine TB in humans, people should only eat pasteurized dairy products, and self-monitor for TB-like symptoms if they believe they may have been exposed by an infected animal.

In Liberia, bovine TB occurs around the country, causing disease both in animals and humans. Outbreaks of bovine TB in Liberia mostly take place at the onset of the rainy season. There is a high risk of importation of bovine TB into Liberia owing to:

- Secret border areas for cattle, other animals, and people from countries near Liberia where zoonotic TB is common

- High movement of cattle to and from countries near Liberia
- Underreporting on these animals
- Poor biosecurity practices at slaughtering facilities
- Poor hygienic practices at slaughtering facilities
- Limited rapid tuberculin testing at points of entry
- Limited identification and traceability systems within the region

Liberia's policy on bovine TB surveillance includes restriction of movement and breeding of cattle infected with the disease; however, enforcement remains challenging.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- WHO Zoonotic Tuberculosis Fact Sheet (WHO, 2017)
- CDC Bovine Tuberculosis in Humans Factsheet (CDC, 2011)
- OIE Bovine Tuberculosis Resource Page (OIE, 2022c)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)20

ABOUT BOVINE TB

- Bovine TB is a sickness that can make both animals and people sick.
- Bovine TB is mostly found in cattle but can also be found in other animals such as goats.
- Bovine TB can cause loss of lives both in humans and animals, loss of livelihood, reduction in animal production, and increase in animal production cost.

SIGNS AND SYMPTOMS OF BOVINE TB

SIGNS AND SYMPTOMS IN ANIMALS

- Animals do not often show signs or symptoms of zoonotic TB until later stages of the disease, which can vary greatly in time from a month to many years after infection. The signs and symptoms include:
    - Weight loss
    - Dullness or tiredness
    - Weakness
    - Unwillingness to eat
    - Small fever (low-grade fever),
    - Cough that will not go away (pneumonia with a chronic wet cough)
    - Enlarged glands (lymph nodes)

SIGNS AND SYMPTOMS IN PEOPLE

- Signs and symptoms of bovine TB in animals are similar to TB in humans and include:
    - Fever
    - Night sweats
    - Weight loss
    - Cough
- Additional signs and symptoms may depend on where the infection is located in the body, such as a cough when the infection is in the lungs, and pain and running stomach (diarrhea) when it is in the stomach and intestines (gastrointestinal tract).
    - Some people that are infected with bovine TB will show no signs and symptoms and cannot spread the sickness to others.
- It is important to go to a health facility for early testing and treatment for any fever.

HOW BOVINE TB SPREADS

HOW BOVINE TB SPREADS BETWEEN ANIMALS

- Bovine TB most often spreads from animal to animal when your mammals drink the milk of mothers that have bovine TB.
- Bovine TB can also spread from animal to animal when animals that are not sick breath in the small droplets released with the cough or sneeze of an animal that has bovine TB.
- Sharing cows across farms can spread bovine TB from farm to farm.

HOW BOVINE TB SPREADS BETWEEN PEOPLE

- Bovine TB is most often spread from animals to people through:
    - Eating raw, undercooked, or pink meat
    - Drinking raw milk or eating raw milk products
    - Breathing in the small droplets released when an infected animal coughs or sneezes
    - Having direct contact with an infected animal, animal products, or body fluids from an infected animal (e.g., pee-pee, poo-poo, blood, snot, spit, or birthing fluids) through small cuts and wounds when working with animals on farms or in slaughterhouses
- The people who are most at risk of getting bovine TB are those who work closely with animals, and those that kill and sell animals and milk products.
- Once a person has bovine TB in their lungs, they can spread it directly to other people when they cough or sneeze, especially to those in close contact.

PROTECTING YOUR ANIMALS AGAINST BOVINE TB

- To reduce the spread of bovine TB within a herd, avoid sharing cows across farms if they have any of the signs and symptoms of bovine TB.

- Always contact a community health worker (veterinary officer, community animal health l worker, community health promoters, community health assistants, community health service supervisor, agriculture extension officer), town chief, or community leader or call 4455 if you have an animal with the signs or symptoms of bovine TB.
- To stop the spread of sickness to other animals or people, do not eat, sell, or give away any animal that has aborted recently, that looks sick, or that is found dead.
    - Do not take animals with any of the signs or symptoms of bovine TB to market.
    - Do not sell, eat, or give away milk or other animal products from sick animals.
        - Sick animals and animals that are found dead can pass their diseases to other people and animals when you touch them, eat them, or move them from place to place to sell them.
- Quickly separate any sick or dead animals from the ones that are not sick to stop the spread of sickness.
- Call a community health worker (veterinary officer, community animal health l worker, community health promoters, community health assistant, community health service supervisor, agriculture extension officer) or call 4455 if you see an unusual number of sick or dead animals. This could be a sign of an outbreak.
    - Informing a community health worker can enable fast action to be taken before a sickness affects people in the community.

PROTECTING YOURSELF, YOUR FAMILY, AND YOUR COMMUNITY FROM BOVINE TB

HANDLE AND CONSUME MILK AND MILK PRODUCTS SAFELY

- Always boil raw milk from any animal before drinking or using it to make milk products.
    - Not all animals that have bovine TB show signs and symptoms, so it is best to avoid all raw milk and products made from raw milk.
- Do not eat or drink raw milk or milk products from any animal that has aborted recently or has any signs of sickness.
- To reduce the spread of bovine TB to other animals and humans, avoid selling the milk or milk products from an animal that shows any sign or symptom of the disease.
- Check your health status regularly at the nearby health facility if you work in dairy production, eat or drink raw milk or raw milk products, kill animals, or handle animals or animal products as part of your normal activities.

AVOID SELLING, MOVING OR EATING ANY ANIMAL THAT HAS ANY SIGNS OF SICKNESS, THAT DIED SUDDENLY, OR THAT WAS FOUND DEAD

- To reduce the spread of bovine TB to other animals and humans, avoid selling or giving away an animal that shows any sign or symptom of the disease.
- Separate sick animals from your herd and contact a veterinary officer, community animal health worker, or agriculture extension officer to conduct a test to prevent the spread of bovine TB.

- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal (or its products) that looks sick or that you find dead.
    - Sick or dead animals can spread their sickness to those who touch them.

Maintain a separate place for animals outside of your house

- Keep animals in the yard or in an enclosed area. Animals that roam freely are more likely to come into contact with sicknesses from other animals and can then spread the sicknesses to other animals, our families, or our communities.
- Wild animals do not normally let a person come close to it, so if one does, something could be wrong with it.
    - Leave wild animals to be wild. Keeping a wild animal as a pet or bringing it into your house can cause problems for the animal and for your family.
- If you must bring animals indoors, keep them away from where the family sleeps and eats.
    - Sleeping with or eating near animals can allow sickness from an animal to easily spread to us and our families.
    - Keep animals brought indoors in a bag, basket, or covered cage, so they cannot roam freely.

Protect yourself when killing an animal

- Cover your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
    - Wear gloves or plastic bags to protect your hands. Cover your eyes with glasses, and cover your nose and mouth with a mask or clean cloth.
    - Wash all of the things you used while killing an animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - When gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Immediately wash your hands and arms with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing an animal.

Burn or bury dead animals safely

- Call the nearest community health worker (veterinary officer, community animal health worker, community health promoters, community health assistants, community health service supervisor, agriculture extension officer) or call 4455 about any unexpected or sudden death of animals, especially cows, to get help to safely burn or bury the dead body.
    - This information can help county authorities and community health workers take action early before any sickness becomes a problem.

- If you see more than ten animals get sick or die within a week's time, this can be a sign of an outbreak.

- Close off the area surrounding the dead cow to prevent other cows and animals from coming into contact with it.
    - Do not leave a dead cow in an open field. This could spread sickness to healthy cows when they are grazing or drinking water.
- If a community health worker does not respond within one day to advise on how to burn or bury a dead cow safely, it is important to burn or bury the animal very carefully.
- Avoid touching the body or body fluids (urine, feces, blood, snot, saliva, or birthing fluids) of a dead cow with your bare hands.
    - Even if the animal looks healthy, it is important to take care because you cannot always see the signs and symptoms of disease.
- There are seven key steps to handling and disposing of a dead cow safely if you are unable to get help or guidance from a community health worker.
    - **Step 1:** Wear gloves or plastic bags to protect your hands and cover your eyes with glasses and cover your nose and mouth with a mask or clean cloth. Do not touch the animal with bare hands.
    - **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
    - **Step 3:** Burn or deeply bury the dead animal in the soil far from where water is collected and household activities take place.
        - Burning a dead animal is best in areas with many people and where space is too small to safely bury the dead animal.
        - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
        - Burn to ash or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
    - **Step 4:** Pour soapy water or disinfectant over the shovel, wheelbarrow, or other things you used to move the dead animal and put them in the sun to dry.
    - **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun to dry.
    - **Step 6:** When gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - **Step 7:** Wash your hands and arms immediately with soap and clean, running water.
- Never dig up a dead animal that has been buried.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- **To wash your hands well follow these steps**:
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.
    - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
    - Rinse hands well with clean, running water.
    - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

SEEK EARLY CARE AND TREATMENT IF YOU HAVE SYMPTOMS OF BOVINE TB OR THINK YOU HAVE BEEN IN CLOSE CONTACT WITH AN ANIMAL OR PERSON THAT YOU THINK HAS BOVINE TB

- People that have bovine TB can be treated.
- Treatment for bovine TB is the same as treatment for other forms of TB.
- To protect the health of yourself and your family, seek advice from your nearest health facility or your community health officer/nurse if you or someone in your family has any of the following symptoms:

- Fever
- Night sweats
- Weight loss
- Persistent cough

- Call a health worker if you have had recent contact with any animals that have similar symptoms.
- When someone gets early care and treatment, they have a better chance at healing quickly and with fewer problems.
- Report all deaths of animals to a community health worker (veterinary officer, community animal health worker, community health promoters, community health assistants, community health service supervisor, agriculture extension officer) or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

HIGHLY PATHOGENIC AVIAN INFLUENZA (BIRD FLU)

HPAI must be reported immediately in Liberia when it is suspected in either animals or humans.

HPAI is a type A influenza virus that can cause rapid death of a large number of birds, and as a result has severe consequences for poultry farmers or others that depend on birds for their livelihood.

Since the beginning of the ADSR in 2019, there have been no confirmed outbreaks of HPAI in Liberia. However, the United Nations Food and Agriculture Organization (FAO) supported Liberia in April 2020 to conduct a risk assessment and risk mapping addressing HPAI introduction, spread, and occurrence in the country. Findings from the report show that Liberia is at moderate risk of introduction and spread of HPAI owing to ongoing outbreaks and importation of poultry products in the West African region (Food, 2022).

Avian influenza, also known as bird flu, is a group of respiratory viruses found most commonly in migratory waterfowl that spread easily to several species of birds produced for food such as chickens, turkeys, quails, ducks, and guinea fowls, as well as pet birds and wild birds. It causes morbidity and mortality rates of **90% to 100%** in chickens (Center, 2022). Avian influenza can occasionally spread to other animals such as rats, mice, pigs, cats, dogs, and people.

HPAI can also cause serious illness in humans. Human infection happens when HPAI virus gets into a person's eyes, nose, or mouth, and it is often associated with humans and birds living in close proximity. In humans, HPAI symptoms mimic flu-like symptoms and include fever, chills, cough, sore throat, difficult breathing, eye redness, headaches, stuffy nose, body aches, and diarrhea. Case fatality rates vary, but HPAI in humans has an estimated 60% mortality rate. Anyone that has been near birds that have tested positive for HPAI should self-monitor for these symptoms for ten days.

Vaccination for birds does exist, but it is not readily available in many places. In the event of an outbreak, control in the animal population depends on elimination of infected birds and birds in contact with them; quarantine of potentially exposed birds as well as people and equipment; and adherence to robust decontamination, biosafety and biosecurity, and surveillance protocols. These strict measures can induce livelihood hardships for some farmers, and without appropriate compensation measures, the measures can influence reporting and early detection of the disease. HPAI can be treated with antiviral medication in humans.

Groups of individuals with an increased risk of HPAI include people who own or live near birds; work in a poultry farms/market; or kill, defeather, or prepare birds for cooking.

Risky behaviors that increase the risk of HPAI infection in people and animals are primarily related to limited practice of biosafety measures including:

- Unsafe handling, killing, and cleaning practices for birds and associated areas and equipment
- Transport, sale, and consumption of sick animals
- Keeping birds in the house or sleeping areas
- Extensive, semi-intensive, and intensive farming practices and movement to and from live bird markets
- Increased interactions between wild and domesticated birds

To prevent HPAI in humans, it is best to limit exposure to sick birds. For animal health workers or those that may handle sick or dead birds, it is important to use personal protective equipment (e.g., gloves, facemask, eye protection), hand wash carefully after contact with sick birds, and dispose of used personal protective equipment.

Livestock and poultry-keeping are fundamental to the food and livelihood systems of Liberian communities, raising the threat of HPAI in the country. Several factors can contribute to the spread of HPAI. These include unregulated international poultry product trade, including the importation of infected day-old chicks, contaminated feeds, egg cages, abundance of free-range domestic birds with interaction with wild birds, and human movement to and from neighboring countries with HPAI. Other factors include marketing and farming practices; the presence of the virus in wild birds; limited biosecurity and biosafety practices at production sites; poor regulation of the poultry sector due to limited or unenforced policy guidelines and standards; and low investment in developing the poultry value chain in Liberia.

Women have an important role in preventing the spread of bird flu. Traditionally, they are primarily in charge of caring for backyard poultry, maintaining environmental cleanliness around the animal farm, and being responsible for the health of the family, including preparing food for the household. Their knowledge about the disease can effectively make a difference in reducing risks for their children and family and to society in general.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- CDC Avian Flu Resource Page (CDC, 2022b)
- OIE Avian Influenzas Resource Page (WHO, 2022b)
- WHO Influenza (Avian and Other Zoonotic) Resource Page (WHO, 2018a)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

ABOUT BIRD FLU

- Bird flu is a very serious sickness in birds that can also make people sick.
- Bird flu is a sickness that all birds can get, including chickens, ducks, geese, turkeys, guinea fowl, and wild birds. Bird sickness can spread very quickly between birds and cause large numbers of birds to die very quickly if it is not controlled.
- Bird sickness does not easily spread from person to person, but it can cause death in people if it is not treated quickly.
- People that own or live near birds, work in a poultry farms/ market, or kill, defeather, or prepare birds for cooking have a higher risk of getting bird flu.

SIGNS AND SYMPTOMS OF BIRD FLU

SIGNS AND SYMPTOMS OF BIRD FLU IN ANIMALS

- Bird flu is a sickness that affects all birds, including chickens, ducks, geese, turkeys, quail, and wild birds.
- Signs and symptoms of bird flu in birds include:
    - Sudden death of many birds
    - Watery diarrhea (running stomach)
    - Birds are unbalanced, walk unevenly, or sit with their head down
    - Severe drop in egg production
    - Lack of energy and appetite
    - Purple discoloration/cyanosis of the wattles, combs, and legs
    - Ruffled feathers
    - Sudden death of many birds
- In birds, bird flu can cause death as quickly as in two days after signs and symptoms show.
- Some birds, such as ducks or geese, may not show any signs or symptoms of bird flu, but can still spread the sickness to other birds and people. That is why it is important to be careful with all birds.

SIGNS AND SYMPTOMS OF BIRD FLU IN PEOPLE

- Bird flu can also make people very sick. Any person who comes into close contact with sick or dead birds may be at risk of contracting bird flu.
- The length of time from when the bird flu virus enters a person's body to when the person starts to show signs and symptoms of sickness ranges from one day to 17 days.
- The signs and symptoms of bird flu in people include:
    - Fever
    - Tiredness
    - Cough or sore throat
    - Difficulty breathing
    - Eye redness
    - Muscle, chest, and stomach pain
    - Nausea, vomiting, diarrhea (running stomach)
    - Seizures/shaking
- Many of the signs and symptoms of bird flu in people are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.

HOW BIRD FLU SPREADS

HOW BIRD FLU SPREADS BETWEEN ANIMALS

- Bird flu is spread through direct contact with urine, feces, saliva, and snot from the nose of sick birds and through contaminated feed, water, equipment, or clothing.
- Bird flu spreads easily between animals when they are kept close together.
- Sick birds spread the sickness in their area and to other birds directly when they shake their heads, scratch, flap their wings, and toilet.
- Bird flu is easily spread from farm to farm by movement of domestic birds, contaminated vehicles, equipment, feed, and cages, and by people, especially through contaminated shoes and clothing.
- Bird flu can live on surfaces such as tables or baskets, grass, or knives for 14–60 days and in the environment.

HOW BIRD FLU SPREADS BETWEEN HUMANS AND ANIMALS

- Bird flu enters a person's body through the eyes, nose, or mouth.
- Bird flu can spread from an animal to a person through:
    - Touching an animal that has bird flu and then touching your eyes, nose, or mouth
    - Touching the urine, feces, blood, snot, or saliva of an animal that has bird flu and then touching your eyes, nose, or mouth
    - Touching items and surfaces that an animal that has bird flu or its body fluids such as l blood, snot, or spit have touched and then touching your eyes, nose, or mouth
    - Eating raw or half cooked animal meat or animal products such as eggs of an animal that has bird flu
- Bird flu does not spread easily from person to person.
- Any person who comes into close contact with sick or dead birds may be in danger of bird flu.
- When bird flu is around, all the people who are around the birds or areas where they stay are at risk of bird flu, especially people who:
    - Keep live chickens, ducks, and geese in their backyards or houses.
    - Buy or sell live chickens, ducks, and geese or birds at markets.
    - Transport or sell live or dead chickens, ducks, and geese.
    - Kill, defeather, and prepare chickens, ducks, and geese.
    - Eat raw or undercooked chicken, duck, and goose products.
    - Clean the areas where chickens, ducks, and geese are kept, including where their urine, feces, saliva, snot, feathers, and water have contaminated the environment.
- Most people that get bird flu get it from handling, killing, defeathering, or preparing birds that are sick.

PROTECTING OUR FARM BIRDS, OURSELVES, AND OUR FAMILIES AGAINST BIRD FLU

- HPAI (or bird flu) must be reported immediately when it is suspected in either birds or humans.
- Taking good care of your chickens, ducks, geese, and other birds keeps them healthy, which helps keep you, your families, and your community healthy.
- The most important protection against bird flu among farm birds are
    - Proper care of birds
    - Regularly disinfect equipment, vehicles, and clothing used in the care of birds.
    - Restriction of visitors
    - Foot baths at the entrance of the farm and pens

MAINTAIN A SEPARATE SPACE FOR FARM BIRDS

- Keep chickens, ducks, geese, and other birds in the yard or in an enclosed area away from wild birds.
- Chickens, ducks, geese, and other birds that roam freely are more likely to come into contact with bird flu from wild birds and can then spread the sickness to other birds, your families, or your community.
- Keep chickens separate from other birds such as ducks and geese. Some birds, especially ducks, often do not show signs and symptoms of bird flu but can still spread the sickness to other birds.
- Keep birds such as chicken, duck, and geese separate from pigs to avoid spreading the sickness to other animals.

KEEP NEW BIRDS AND BIRDS THAT DID NOT SELL AT MARKET SEPARATE FROM OTHER BIRDS

- If you buy or get new birds, keep them separate from other birds for a period of three weeks while observing the new birds for any signs and symptoms of sickness. This protects your other birds from any disease the new birds may bring with them.
- If your birds do not sell at the market, keep them separate from other birds for a period of three weeks while you observe them for any signs and symptoms of disease. This way you can make sure they did not come in contact with bird flu or any other disease at the market that they might spread to other birds.

SEPARATE SICK BIRDS IMMEDIATELY

- When you recognize that a bird is sick, immediately isolate it from healthy birds and call a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) to obtain treatment for sick birds.
    - Then wash anything that touched the birds, the area where the birds were kept, and your hands and arms immediately with soap and clean, running water.
- Call a community health worker about any bird that you find dead for guidance on how to properly burn or bury dead birds and protect your other birds from getting sick.

    - This information can help county authorities and community health workers identify the cause of the sickness or death and provide support before it becomes a bigger problem.
- Chickens and other birds are an important food source, but to protect your health, never eat, sell, or give away any chicken or bird that looks sick.
- If you hear of an outbreak of animal sickness nearby, or see more than ten birds get sick or die within a week's time, call a veterinary officer, community animal health worker, or agriculture extension officer. This can be a sign of an outbreak.
- To keep you and your animals safe, do not move or sell your birds if you hear of an outbreak of bird flu nearby.

REDUCE BIRDS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

- Keep animals such as chickens, ducks, and geese out of the house. Close contact with chickens, ducks, and geese and their urine, feces, snot, or saliva can make it easier for bird flu to spread from infected birds to us and our families.
- If you must bring birds indoors, keep them away from where the family sleeps and eats. Sleeping with or eating near birds can allow sickness from a bird to easily spread to us and our families.
- Keep birds brought indoors in a bag, basket, or covered cage, so they cannot roam freely.
- Keep the house area as clean as possible to help stop birds and unwanted animals from visiting your house.
- Keep your house in good repair to make it difficult for birds and unwanted animals to enter.
- Clean and sweep the house every day that chickens, ducks, or geese have been inside. Close contact with birds and their urine, feces, snot, or saliva can allow bird flu to spread from infected birds to us and our families.
- When sweeping your house after chickens, ducks, or geese have been inside, always make sure to:
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
    - Wet the floor with water before sweeping to keep dust from spreading in the air.
    - Clear away dirt in and around the house and throw it away far from the house.
    - Remove the glasses and mask or cloth from your face, and wash them immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water immediately after cleaning or sweeping an area where birds have been.
- To remove any bird urine, feces, snot, or saliva, regularly wash the floors, mats, and walls; clothes and blankets; and all of the food and water covers and containers.
- Keep food and water in covered containers so that birds cannot enter, and keep the containers away from where people sleep. This helps to avoid close contact with birds and to stop birds and other animals from visiting and eating and drinking your food and water.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from birds and their urine and feces.

- Leave wild animals to be wild. Keeping a wild bird as a pet or bringing it into your house can cause problems for the bird and for your family.
- Wild animals do not normally let a person come close to it, so if one does, something could be wrong with it.

SAFELY CLEAN AREAS WHERE BIRDS ARE KEPT AND ALL THINGS USED TO CARE FOR BIRDS

- Clean the bird house/cage and their feeding place daily with soap and clean, running water to protect your birds from bird flu.
- Wash all surfaces, equipment such as shovels and cages used to care for birds, and their living and feeding areas with soap and clean, running water immediately after contact with birds to remove their pee-pee, poo-poo, blood, snot, spit, or other body fluids.
    - Bird flu can live on surfaces, such as tables or baskets, grass, or knives, for hours and in the environment for days.
- Wash the wheels of bicycles, motorcycles, or other vehicles with soap and clean, running water as soon as possible after leaving animal areas and especially before you go indoors.
- Have a separate set of shoes and clothes that you use just for working in animal areas. Wash them daily.
    - Remove your shoes and clothes as soon as possible after leaving animal areas and keep them outside of the house. Wash the shoes and clothes before wearing them again.
- You can help stop bird flu from entering your body when cleaning areas where birds visit or are kept by covering your skin, eyes, nose, and mouth with the appropriate personal protective equipment such as clean cloth, glasses, or gloves.
    - If rubber gloves are available, wear them to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth to prevent sickness from entering.
    - Wash all of the things that you used with soap and clean, running water or with disinfectant. Then wash your hands and arms immediately with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Properly dispose them using designated means approved.
    - Wash your hands and arms immediately with soap and clean, running water.
- Burn or deeply bury bird urine, feces and other droppings including feed and water away from:
    - The bird pen
    - Where food is grown and prepared
    - Water sources
    - Places that people and animals often visit
- Avoid throwing dead birds or their pee-pee and poo-poo into any water source or leaving dead birds in the yard or open field.

- Avoid using bird pee-pee and poo-poo as fertilizer unless it is composted first.
    - Composting should be done in a secure area, such as an enclosed shed that birds, cats, dogs, pigs, and other animals cannot access, and the area should be far from where people live and far from water sources and run-off water.
- In areas with many people and where spaces are too small to burn or bury animal pee-pee and poo-poo, throw the waste away in a plastic bag or in a covered bin until it can be collected and taken away.

BURN OR BURY DEAD BIRDS SAFELY

- Call a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer), your town chief, or your community leader or call 4455 about any bird that looks sick or that you find dead on your farm or in your community. Report the following information:
    - The types of birds that became sick or died
    - The number of sick or dead birds and how many birds you have overall
    - The signs and symptoms of sickness of the birds
    - If you noticed wild birds in the area, and if so, if they appeared sick
    - If you recently brought live birds or other live animals home from the market or another farm, and if so, where the market or farm was located
- Calling a community health worker about a bird that looks sick or that you find dead can help county authorities and community health workers know about sicknesses before they affect people.
- If a community health worker does not respond within one day to advise on how to burn or bury a dead bird safely, it is important to burn or bury the bird very carefully. Even if the bird looks healthy, it is important to take care because we cannot always see the signs and symptoms of sickness.
- To avoid spreading sickness to chickens and other birds, burn or deeply bury dead birds far from where water is collected and where household activities take place.
- Do not leave dead chickens and other birds in an open field. Bird sickness could spread to other birds.
- There are seven key steps to handling and disposing of a dead animal safely if you are unable to get help or guidance from a community health worker.
    - **Step 1:** Wear rubber gloves or plastic bags to protect your hands, cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter. Do not touch the animal with bare hands.
    - **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
    - **Step 3:** Burn or deeply bury the dead bird in the soil far from where water is collected and where household activities take place.
        - Burning a dead bird is best in areas with many people and where space is too

small to safely bury the dead animal.

- Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals. If you must move the bird, take care to prevent spreading HPAI around the area.
- Burn to ash or deeply bury the dead bird in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.

- **Step 4:** Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools you used to move the dead animal and put them in the sun to dry.
- **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun to dry.
- **Step 6:** If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
- **Step 7:** Wash your hands and arms immediately with soap and clean, running water.

- Always wash your hands and arms with soap and clean, running water immediately after any contact with a bird, even if it looks healthy, because the signs and symptoms of bird flu are not apparent.
- Never dig up a dead bird that has been buried.

PROTECT YOURSELF WHEN KILLING BIRDS

- Covering your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
  - If available, wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
  - Wash all of the things you used while killing the animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
  - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
  - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
  - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing a bird.
- When killing a bird, if you notice the blood does not clot, the animal might have bird flu.
  - Keep all the equipment used while killing the animal together and immediately call an animal health worker or health extension worker.
  - Do not move equipment because this could spread the sickness.

- Do not eat the meat or blood or use the hide, skin, and feathers from this animal until you receive advice from a veterinary officer, community animal health worker, or agriculture extension officer.

STORE AND PREPARE FOOD AND WATER SAFELY

- Bird flu can spread from birds to people when we touch or eat a bird with bird flu or when we touch, eat, or drink something that has the pee-pee, poo-poo, snot, or spit of a bird with bird flu on or in it.
- Eat and drink away from animals and areas where birds are kept.
- Keep birds away from areas where food or drink is stored, prepared, or eaten.
- Do not eat fruit or food that has been bitten by any animal, including birds.
    - Do not eat any part of the bitten fruit or food.
    - Do not give the bitten fruit or food to an animal to eat.
- Keep food and water in covered containers so that birds cannot enter, and keep the containers away from where people sleep. This helps to avoid close contact with birds and to stop birds and other animals from visiting and eating and drinking your food and water.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from birds and their pee-pee, poo-poo, snot, or spit.
- Wash hands with soap and clean, running water before and after touching raw animal products such as chicken, duck, goose, and eggs.
- Keep raw chicken, duck, goose and other animal products away from fruits and vegetables and cooked foods.
- Wash all surfaces and items used to prepare food with soap and clean, running water immediately after they have been in contact with any animal parts or products including skin, feathers, guts, and raw chicken, duck, goose or eggs.
- Cook food well to help stop the spread of any sickness. Food should be hot to the touch all the way through.
    - Chicken, duck, goose, and other birds should be cooked until no pink is left.
    - Eat and drink only cooked milk and eggs. Boil or fry eggs until they are cooked solid.
    - Bring foods such as soups, and stews to boiling before eating.
    - Eat food while it is hot.
    - Reheat cooked food very hot.
- To keep your family and friends healthy, do not prepare food when you are sick.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH BIRDS

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - After using the toilet
    - After coming from the bush
    - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- **To wash your hands well follow these steps:**
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.
    - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
    - Rinse hands well with clean, running water.
    - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

SEEK EARLY TREATMENT FOR ANY SIGNS AND SYMPTOMS OF HPAI

- When you recognize that chicken or other bird is sick, immediately isolate it from healthy chickens/birds.

- If you have any of the signs and symptoms of bird flu, go to your nearest health facility or other health facility right away.
    - Getting early treatment for bird flu can save lives.
    - Getting early treatment can also protect your family and others from getting bird flu.
    - When someone gets early care and treatment, they have a better chance of recovering quickly and with fewer problems.
- If you have signs and symptoms of bird flu, make sure to call your health worker if you have had recent contact with any birds or spent time in an area where birds live, visit, or are kept.
- If a person gets sick or dies after contact with a bird, do not touch the person, their body fluids (e.g., pee-pee, poo-poo, snot, or spit), or any items they or their body fluids have touched. Touching them can spread sickness to other people.
- If a person gets sick or dies after contact with a bird, go to your nearest health facility or community health worker and call a veterinary officer, community animal health worker, or agriculture extension office.
    - This information can help county authorities and community health workers identify the cause of the sickness before it affects people.
- Report all deaths of animals to a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

RABIES

Every case of rabies must be reported immediately to either the Community Health Workers (CHA, CHP), the CAHW, the nearest health facility and or the community leaders in Liberia when it is suspected in either animals or humans.

Rabies is a vaccine-preventable viral disease of warm-blooded animals that is spread through contact with saliva or brain/nervous system tissue from an infected animal via an open wound or mucous membrane. Rabies is most often spread from animal to human through a bite, although it can also be spread if a rabid animal licks an open wound or broken skin.

Rabies affects the central nervous system, ultimately causing disease in the brain that leads to death. Initial rabies symptoms in humans can look similar to flu—weakness, discomfort, fever, and headache. Within a period of 14 days, these symptoms progress to behavior disturbance symptoms, including increased anxiety, confusion, agitation, delirium and hallucinations, and hydrophobia (fear of water). The incubation period ranges from weeks to months in humans and can vary based on the location and severity of exposure. Rabies is one of the deadliest zoonotic diseases; without early intervention, rabies is 100% fatal in humans.

Although the disease is vaccine preventable, many places lack access to essential vaccines for both humans and animals, postexposure treatment (required for someone that has been exposed and not already received the human rabies vaccines course), and other essential public health resources. According to WHO rabies fact sheets of 2021, the burden of the disease is heaviest in Africa and Asia and is borne by both children and adults.

Dogs are the main source of rabies globally and in Liberia, although other animals such as cats and

monkeys can also spread the disease. Without human rabies vaccines and immunoglobulin (i.e., postexposure treatment), prevention is integral to lowering the burden of rabies. In Liberia, the best ways to prevent rabies are to vaccinate local dogs and household pets (e.g., cats) with animal rabies vaccine, implement dog population control methods, and sensitize communities, particularly children and youth, about safe behavior around dogs. Behaviors that increase risk of rabies infection include:

- Low rate of animal vaccinations
- High population of uncontrolled dogs
- Delay in care seeking for animal bites
- Irresponsible animal ownership

All dog bites and scratches are treated as possible rabies exposures until proven otherwise. Victims of dog bites must immediately report to health facilities, where they are assessed for appropriate management. Where indicated, they may need post-exposure care (prophylaxis). Unfortunately, lifesaving prophylactics are not always available in health facilities and individuals are referred to the private pharmacies to purchase them. In addition to medical care for the victim, the dog should be quarantined under the supervision of a veterinary officer Community Animal Health Surveillance Officer, community animal health worker, livestock) for confirmation of the disease. All individuals involved in the provision of veterinary services or animal researchers involved with cats, bats, dogs, and other canines should consider receiving the pre-exposure prophylactics.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- OIE Resource Page on Rabies (OIE, 2002e)
- WHO Factsheet on Rabies (WHO, 2021c)
- CDC Resource Page on Rabies (CDC, 2022e)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

ABOUT RABIES

- Rabies is a disease that can affect people and animals.
- Rabies is a very serious sickness and causes death if it is not treated early.
- Once the signs and symptoms of rabies begin to show, it is too late for treatment. That is why it is so important to go to your nearest health facility or community health worker (community animal health worker, community health assistant right away after an animal bite.
- Rabies is not known to spread from person to person.
- Any animal that has hair can get and spread rabies, including dogs, cats, squirrels, and bats.
- In Liberia, most animal bite cases involve a dog. Dogs and other animals are not born with rabies.
- Dogs and other animals can only get rabies from an animal with rabies.
- Liaise with the animal health worker in your community to vaccinate your dogs or cats against rabies.
- Not all stray dogs or wild animals have rabies.
- All animal bites and scratches, even small ones, should be taken to the nearer facility.

SIGNS AND SYMPTOMS OF RABIES

SIGNS AND SYMPTOMS OF RABIES IN ANIMALS

- The length of time from when rabies enters an animal's body to when the animal starts to show signs and symptoms of rabies ranges from zero to 14 days.
- Once an animal begins to show the signs and symptoms of rabies, it will die within one to 14 days.
- The signs and symptoms of rabies in animals include:
    - Acting mad/crazy, anxious
    - Trying to bite other animals or people, while showing no fear
    - Having a lot of saliva or foaming at the corners of the mouth
    - Sounding different than it normally would
    - Having difficulty eating or swallowing
    - Having difficulty moving (tired or lethargic) or being unable to move (paralysis)
    - Having difficulty walking in a straight line
    - Showing fear of light or sound and water/hydrophobic
- A skin rash is not a sign or symptom of rabies.

SIGNS AND SYMPTOMS OF RABIES IN PEOPLE

- The length of time from when rabies enters a person's body to when the person starts to show signs and symptoms of rabies ranges from a few days to as long as one year or above depending on the site of the bite.
    - Because the length of time is different for each person and once signs and symptoms of rabies show, the person will die. It is important to go to a health facility or community health worker right away after an animal bite.
    - Wash the place quickly with clean water and soap and allow the area to dry in the air.
- Once a person starts to show signs and symptoms of rabies, it will be hard for them to survive. Therefore, anyone with an animal bite must go to the nearest health facility or community health worker or community leader right away.
- The signs and symptoms of rabies in people include:
    - Fever
    - Headache
    - Pain or an unusual tingling feeling around the bite
    - Being unusually active
    - Acting angry, easily annoyed, depressed, confused, nervous
    - Seeing things that are not really there
    - Fear of water
    - Feeling disturbed by air or light

- Unable to move parts of the body
- Weakness or discomfort
- Talking like dogs at certain point

- A person with rabies usually dies after they show signs and symptoms of the sickness.
- Take all animal bites and scratches seriously, even small ones, and do not wait for signs or symptoms before going to the health facility.
    - Treatment before signs and symptoms appear protects you from rabies.

HOW RABIES SPREADS

- Rabies is spread through the spit of an animal with rabies, usually when that animal bites another animal or person.
- Rabies can also enter a person's body through the mouth or nose or through small cuts or openings in the skin. This can happen when an animal with rabies scratches a person or licks a person's face or skin.
- Any animal that has hair can get and spread rabies, including dogs, cats, squirrels, and bats.
- In Liberia, rabies is most commonly spread to people from the bite of a dog with rabies.
- It is possible for an animal with rabies to spread the sickness to another animal or a person before the animal shows signs and symptoms of rabies. Any animal bite or scratch, even small ones, should be taken very seriously.
- Rabies has not been shown to spread from person to person, but to be safe, avoid kissing or sharing spit with any person that may have rabies or avoid someone who is acting confused.

PROTECTING OUR ANIMALS, OURSELVES, AND OUR FAMILIES AGAINST RABIES

- There are actions we can take to protect our animals, ourselves, and our families from rabies.

VACCINATE YOUR DOGS AND CATS AGAINST RABIES EVERY YEAR AND CARE FOR THEM WELL

- Animal health is important for human health. Taking good care of our pets (dogs, cats), birds and livestock (goats, sheep, cows) helps keep animals, us, our families, and our communities healthy.
- All animals need enough food and water, exercise, kind treatment, and a safe, clean place to stay.
- There is a rabies vaccine for dogs and cats that can protect them from rabies.
- Giving your dog or cat the rabies vaccine keeps them from getting rabies and also protects you, your family, and other animals from getting rabies from them.
- Dogs and cats should be vaccinated for rabies after they turn three months old and once every year after that.
- Rabies vaccine is available at the Ministry of Agriculture Veterinary Services.
- Call a veterinary officer, community animal health worker, agriculture extension officer, or community health officer/nurse to direct you to a government veterinary service or private veterinary center to vaccinate your dog to ensure the vaccine is genuine.
- If your animals are not vaccinated and are bitten or scratched by another animal, call a community health worker (veterinary officer, community animal health worker, community health volunteer,

community health services supervisor, agriculture extension officer), town chief, or community chairperson or call 4455 immediately for advice.

- Keep your dogs in the yard or in an enclosed area. Dogs that roam freely are more likely to come into contact with rabid dogs and other animals and can spread the sickness to other dogs/animals, your family, or your community.
- Feed your dog regularly so it does not roam in search of food.
- Avoid letting your pet or any animal lick your face or any breaks in the skin such as cuts, scratches, or sores.
    - Rabies is spread through the saliva of an animal, and the signs of sickness are not always apparent.

PREVENT ANIMAL BITES

- In Liberia, treatment to prevent rabies is in Monrovia and can cost a lot of money. This can make it difficult for people to get the treatment they need and in time to prevent rabies.
- One of the best things we can do to protect against rabies is to avoid (prevent) animal bites.
- If an animal shows signs and symptoms of rabies, avoid the animal and call an animal health worker, community health worker, call 4455, or your community leaders immediately for advice.
- Avoid dogs and other animals that are acting strangely.
- Avoid stray dogs and animals that you do not know, even if they look friendly.
- Dogs and other animals may bite for many reasons. For example, they might bite because they feel afraid or are trying to protect something that is theirs, such as their home, their owner, their young, or their food.
    - Leave dogs and other animals alone when they are sleeping, eating, or with their young.
    - Avoid dogs that are behind fences or tied up.
- When dogs are angry, they pull back their lips, show their teeth, and growl; their hair stands on end; and they keep their tail straight up in the air.
    - When dogs show any of these signs, back away slowly and quietly and stay away from them.
- When dogs are afraid, they move backwards or try to run away, lick their faces, lower their tails, flatten their ears back, and show their teeth.
    - When dogs show any of these signs, back away slowly and quietly and stay away from them.
- Treat dogs and other animals with kindness. Do not shout or throw things at them, kick or hit them, or pull their ears or tails.
- If approaching a dog, do so quietly and stay calm. Do not run from, chase, tease, or play roughly with dogs.
    - Do not stare directly at dogs.
    - Do not put your face near a dog's face or try to hug dogs.
    - If you want to touch a dog, ask their owner for permission first.

- If you want to touch a dog, make sure it can see you and sniff your hand first, and only pet it on its back.

- Watch small children closely when they are playing with dogs.
  - Protect your child's health. Children should not chase and kill dogs because they could be bitten or scratched or touch the dog's saliva.
- Protect your child's health. Do not send children into the roof to chase bats because they could be bitten or scratched or touch the pee-pee, poo-poo, blood, snot, spit, and other body fluids of a bat.
- If a dog comes close to you:
  - Stand very still and quiet like a tree.
  - Keep your hands at your side.
  - Look at your feet.
  - If you fall over, curl up and stay as still and heavy as a rock.
  - Let the dog sniff you and when it walks away, you should walk slowly and quietly away.
- Leave wild animals to be wild. Keeping a wild animal as a pet or bringing it into your house can cause problems for the animal and for your family.

CARE FOR ANY ANIMAL BITE IMMEDIATELY

- Wash any animal bite or scratch immediately with soap and clean, running water (15 minutes).
- After washing a bite or scratch very well, go quickly to your nearest health facility or community health worker for advice and treatment.
- To stop rabies, you must get treatment before signs and symptoms begin to show. Once a person starts to show signs and symptoms, they will not survive.
  - The treatment to stop rabies in people are found in health facilities. It is important to go to your nearest health facility right away after an animal bite to get the treatment before signs and symptoms start to show.
- Call a health worker, animal health worker, or your chief about the animal that bit or scratched you and report how you were bitten or scratched.
  - This information can help health workers to learn more about the animal and help protect other people.
- Any animal that has bitten someone or another animal should be examined by an animal health professional and kept away from other animals and people for 14 days while it is observed for signs and symptoms of rabies. You should also do the following:
  - Call your nearest animal health worker or 4455 for advice on how to handle the animal.
  - Taking extra care to not get bitten, corral or trap the animal in one area to keep it away from other animals and people.
  - Make sure the animal has food and water while it is being observed.
  - Do not kill or harm the animal.

- If the animal does not show signs of rabies after 14 days, post-exposure vaccines (for people) can be discontinued.

CALL AUTHORITIES ABOUT ANIMALS WITH STRANGE BEHAVIOR

- If an animal shows signs and symptoms of rabies or is acting strangely, avoid it and immediately call the nearest health worker (veterinary officer, community animal health worker, community health worker, environment officer) for advice and guidance on what to do.
- If you find any bites on your animal or it is exhibiting strange behavior, separate it from other animals and people and call an animal health extension worker.
- Let your family and neighbors know if you see any unusual behavior in dogs, so that they can take care to avoid it.
- Wild animals do not normally let a person come close to it, so if one does, something could be wrong with it.

AVOID TOUCHING ANIMALS OR THEIR BODY FLUIDS IF THEY APPEAR TO BE SICK WITH OR HAVE DIED FROM RABIES

- When possible, avoid animals that look sick and animals that you find dead. We cannot always see the signs of sickness.
- Do not touch with bare hands the body or body fluids, such as spit, pee-pee, poo-poo, blood, or snot, of an animal that looks sick or that you find dead.
- Never prepare or eat, sell, or give away an animal that showed signs or symptoms of rabies or was found dead.
- Do not let your pet or any animal lick your face or any breaks in the skin such as cuts, scratches, or sores.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal.
- Call the nearest health worker (veterinary officer, community animal health worker, community health worker, environmental officer), town chief, or community leader or call 4455 about any animal that looks sick or that you find dead.
    - This information can help animal health workers know about the sicknesses before they affect people.

BURN OR BURY DEAD ANIMALS SAFELY

- Call the nearest community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or your town chief or community leader or call 4455 about any unexpected or sudden death of animals to get help to safely burn or bury the dead body.
    - This information can help county authorities and community health workers take action early before a sickness becomes a problem.
    - If more than ten animals get sick or die within a week's time, this can be a sign of an outbreak.

- Close off the area surrounding a dead animal to prevent other animals from coming into contact with it.
    - Do not leave a dead animal in an open field. This could spread sickness to healthy animals when they are grazing or drinking water.
- If a community health worker does not respond within one day to advise on how to burn or bury the dead animal safely, it is important to burn or bury the animal very carefully.
- Avoid touching the body or body fluids such as urine, toilet, blood, snot, spit, or birthing fluids of a dead animal with your bare hands.
    - Even if the animal looks healthy, it is important to take care because you cannot always see the signs of sickness.
- There are seven key steps to handling and disposing of a dead animal safely if you are unable to get help or guidance from a community health worker.
    - **Step 1:** Wear rubber gloves or plastic bags to protect your hands and cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth. Do not touch the animal with bare hands.
    - **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
    - **Step 3:** Burn or deeply bury the dead animal in the soil far from where water is collected and household activities take place.
        - Burning a dead animal is best in areas with many people and where space is too small to safely bury the dead animal.
        - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
        - Burn to ash or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
    - **Step 4:** Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools you used to move the dead animal and put them in the sun to dry.
    - **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun to dry.
    - **Step 6:** If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - **Step 7:** Wash your hands and arms immediately with soap and clean running water.
- Never dig up a dead animal that has been buried.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.

- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - After using the toilet
    - After coming from the bush
    - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- **To wash your hands well follow these steps:**
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.
    - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
    - Rinse hands well with clean, running water.
    - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

VIRAL HEMORRHAGIC FEVERS

Viral hemorrhagic fevers are a group of sicknesses that can cause serious sickness and death. In Liberia, the most common viral hemorrhagic fevers are Ebola virus disease (EVD) and Lassa fevers. In 2018, the Zaire EVD was found in the mountainous area of Nimba County. Also in 2018, the presence of Rift Valley fever (RVF) was identified in goats and Marburg virus was found in bats in neighboring Sierra Leone. The first West African case of Marburg virus disease (MVD) in a person was confirmed in the neighboring N'zérékoré region of Guinea in 2021. The movement of people, livestock, and animals across the borders of these neighboring countries highlights the need for awareness of and preparedness to quickly respond to any outbreak of viral hemorrhagic fevers. Although the severity of the different viral hemorrhagic fevers

varies with the individual disease, once a person has become infected, the diseases can spread from person to person with very serious consequences if not quickly identified and brought under control.

Many of the signs and symptoms of viral hemorrhagic fevers are the same as the signs and symptoms for other common sicknesses in Liberia such as malaria and typhoid. This makes early testing and treatment for any fever very important. Getting early treatment can save lives. Getting early treatment gives the person who is sick a better chance of healing and with fewer problems. Early testing and treatment also help protect family members and loved ones from getting sick too.

EBOLA VIRUS DISEASE

EVD must be reported immediately in Liberia when it is suspected in humans.

EVD is a rare but severe and often deadly disease. EVD is spread from animals to people through contact with the infected blood and other body fluids (spit, sweat, urine, sperm, breastmilk, vomit) or organs or other tissues of infected animals such as bats, primates (monkeys, chimpanzees, gorillas), antelope, or porcupines. EVD then can spread from person to person through direct contact (through broken skin or mucous membranes) with the blood or other body fluids of a person who is sick with or has died from the disease as well as objects contaminated with blood, feces, vomit, or other body fluids from a person with EVD or who has died from EVD. For those that recover from the disease, the virus can continue to be found in other body fluids, such as semen (sperm), several years after recovery and can be a possible mechanism of EVD transmission. We are still learning more about EVD and the long-term health effects it has on those that survive the disease (Keita et al., 2021; WHO, n.d.a.).

Early supportive care with rehydration and symptomatic treatment improves survival from EVD. No licensed treatment has been proven to neutralize the virus, but a range of blood, immunological, and drug therapies are under development. It is essential that EVD is confirmed by a laboratory test as it has similar clinical presentations to other diseases such as malaria, typhoid fever, and meningitis. Vaccines to protect against EVD are under development and were a component of successfully ending a 2021 outbreak of EVD in Guinea. Liberia has a preparedness plan for the emergence of the EVD outbreak whereby technical working groups (surveillance, workforce, preparedness and response, laboratory) are activated under the One Health platform Moreso, and surge capacity and isolation facilities are available across the countries.

The 2014–2016 outbreak in West Africa was the largest EVD outbreak since the disease was first discovered in 1976. The outbreak started in Guinea and then moved across land borders to Liberia and Sierra Leone in March 2014. In Liberia, the outbreak resulted in over 10,000 cases that killed almost 4,800 people (Soucheray, 2018). Subsequent outbreaks in Democratic Republic of Congo have also been highly complex, with insecurity adversely affecting public health response activities. Individuals that have direct contact with wild animals, and caretakers of those with EVD are at a higher risk of infection.

Risky behaviors that increase risk of EVD infection include:

- Unsafe handling and consumption of bushmeat/ wild animals found dead
- Poor infection prevention and control measures that expose health workers or and close contacts to the body, body fluids, or belongings of someone that has EVD
- Traditional healing or burial practices for a person that is sick with or has died from EVD
- Unprotected sex with a survivor of EVD
- Myth and disinformation
- Community resistance
- Harmful religious and traditional practices

- Limited isolation centers in counties
- Adherence to infection, prevention and control practices.

Control of EVD outbreaks require adoption of protective behaviors that are challenging and conflict with many traditional and societal norms, such as burial practices. Control also requires a lot of involvement of the environment, animal health, and human health sectors in preparedness and response activities. A high degree of stigma can be experienced by those sick with EVD and their family members, as well as health workers, responders, and survivors. Compassionate community engagement and coordinated, clear guidance are essential to controlling an outbreak of EVD.

Liberia developed a comprehensive messaging guide for EVD during the 2014–2016 outbreak and updated supplemental preparedness messaging in 2021. Please refer to these resources for all approved EVD-related messages. They can be accessed by contacting the National Health Promotion Unit, Ministry of Health, Government of Liberia.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- WHO Ebola Virus Disease Factsheet (WHO, 2021a)
- CDC Ebola Resources Pages on Ebola (CDC, 2022a)
- OIE Ebola Virus Disease Resource Page (OIE, 2022e)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

LASSA FEVER

Lassa fever must be reported immediately in Liberia when it is suspected in either animals or humans.

Lassa fever is an acute viral disease carried by a certain species of rat called the Mastomys rat. The disease does not cause sickness or symptoms of disease in the rats, but they actively spread it among themselves through their urine and feces.

People become infected with Lassa fever through direct contact with the body fluids of infected rats, including blood, and secretions such as urine or feces. They also can become infected by eating or drinking food contaminated with urine or feces of infected rats, or through direct contact with household items that are contaminated with the rat's urine or feces. People can possibly become infected indirectly by ingestion (swallowing) or inhaling dust contaminated with the urine or feces of infected rats.

Once a person is infected with Lassa fever, it can spread from person to person through direct contact with the blood and body fluids of the infected person. It can also easily spread in laboratories or health care settings without strict adherence to proper infection prevention and control measures.

People that live in close contact with rats and those working in health care settings or providing care are at highest risk of infection with Lassa fever. Environmental and climate-related factors can increase risk. In endemic areas, for example, heavy rains may drive rats into homes more frequently, while factors such as deforestation or urbanization that limit the rats' natural habitat may increase human and rat interactions.

Symptoms may occur from two days to 21 days after exposure. It is essential that Lassa fever is confirmed by a laboratory test because it has similar clinical presentations to other diseases such as malaria, typhoid fever, and meningitis, although many people who become infected with Lassa virus have no symptoms or only mild symptoms, which highlights the importance of widespread awareness in endemic areas. Infections can result in severe disease, with the virus affecting several organs such as the liver, spleen,

and kidneys, and it can lead to death. Lassa fever is particularly dangerous for pregnant women, particularly in late pregnancy. Early detection and medical care for Lassa fever improve health outcomes. Survivors of Lassa fever may have resulting health problems, such as deafness.

No vaccines for Lassa fever currently exist. The disease can be treated with antiviral medication and supportive care, and the chances of positive outcomes are improved with early diagnosis and appropriate care. These factors elevate the importance of prevention behaviors. **Risky behaviors that increase the chance of Lassa fever include:**

- Killing, playing with, preparing, or eating rats
- Eating food or drinking water contaminated with the urine or feces of rats
- Living in close contact with rats and their urine and feces
- Poor observance of infection prevention and control measures and personal hygiene in health care settings, slaughterhouses, public gatherings, schools, households, and other settings across all sectors
- Always wear nose mask s and gloves when you are cleaning a surface suspected to be habitat of rats
- Poor food storage and safety practices

Lassa fever is present in Benin, Ghana, Guinea, Liberia, Sierra Leone, Togo, and Nigeria, as well as endemic to areas of Sierra Leone and Liberia. In Liberia, Lassa fever was traditionally endemic in Nimba, Lofa, Bong, and Grand Bassa. However, owing to the population movement and climate change, other counties such as River Gee and Montserrado, among others, began reporting Lassa fever in 2018.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- CDC Resource Pages on Lassa Fever (CDC, 2022c)
- OIE Infographic on Lassa Fever Viral Cycle (OIE, 2018)
- WHO Lassa Fever Factsheet (WHO, 2017)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

About Lassa fever

- Lassa fever is a sickness that can range from not too serious to very serious, potentially causing death and disability.
- Lassa fever is very dangerous to pregnant women and can lead to the deaths of the mother and unborn baby.
- Lassa fever is spread by Mastomys rats, which are common in Liberia.
- People who get Lassa fever live in rural, urban, and very crowded areas where the type of rat that has Lassa fever usually lives.
- One confirmed case of Lassa fever triggers an outbreak alert

Signs and symptoms of Lassa fever

Signs and symptoms of Lassa fever in rats

- Rats do not show the signs and symptoms of Lassa fever but can still spread the sickness to other rats and to people.
- Because rats do not show signs and symptoms of Lassa fever, you cannot know for sure which rats have the sickness. Therefore, it is important to avoid contact with or touching all types of rats.

SIGNS AND SYMPTOMS OF LASSA FEVER IN PEOPLE

- The length of time from when the Lassa fever enters a person's body to when the person starts to show signs and symptoms of Lassa fever ranges from two days to 21 days.
- The signs and symptoms of Lassa fever can start slowly and get stronger. They usually last about two days to three weeks).
- Signs and symptoms of Lassa fever include:
    - Fever
    - Headache
    - Bleeding from the mouth, nose, or ear
    - Bloody stool or vomit
    - Weakness and feeling tired
    - Chest pain and body pains
- Many of the signs and symptoms of Lassa fever are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.
- If not treated quickly, death can occur as early as 14 days after symptoms begin to show.

HOW LASSA FEVER SPREADS

- Lassa fever is spread by rats that are common in Liberia.
- Lassa fever can spread from rat to rat, but it is hard to know which rats have the sickness because they do not show the signs of sickness.
    - Because we cannot see the signs and symptoms of Lassa fever in rats, it is best to keep safe from all rats.
- Lassa fever enters a person's body through:
    - An opening in the skin such as a scrape, or sore
    - The mouth, nose, or eyes
    - Breathing it in
    - The private parts through unprotected sex
- Lassa fever can spread from an infected rat to a person through:
    - Eating food or drinking water that has the urine or feces of an infected rat
    - Touching the body or urine or feces of an infected rat when playing with or when killing and preparing the animal for cooking
    - Touching the items that the urine or feces of an infected rat has touched

    - Breathing in dust that has the urine or feces of an infected rat
- Lassa fever can spread from person to person through:
    - Touching the urine, feces, blood, snot, tears, saliva, or other body fluids of a person who is sick with or has died from Lassa fever
    - Touching the body of a person who is sick or has died from Lassa fever
    - Touching items such as clothing, bedding, cups, or phones, that a person who is sick or has died from Lassa fever touched
    - Unprotected sex with a person who is or has been sick with Lassa fever in the last three months
- When one person gets sick with Lassa fever, they can easily spread it to others.

Protecting ourselves, our families and our communities from Lassa fever

- There are actions we can take to protect ourselves, our families, and our communities from Lassa fever.

Avoid all rats at all times

- Rats can have different sicknesses, such as Lassa fever, and may not show signs and symptoms of sickness, so it is important to avoid contact with all rats at all times.
- To reduce the chance of getting Lassa fever, avoid killing, preparing for cooking, or eating any rat, even if it looks healthy.
- Rats with Lassa fever do not show signs and symptoms of sickness, so it is important to avoid contact with all rats
- Do not touch with bare hands the body or body fluids, such as the urine, feces, blood, snot, or saliva, of a rat.
    - Rats with Lassa fever do not show signs and symptoms of sickness but can spread their sickness to us if we touch them or their body fluids such as urine or feces.

Bury dead rats safely

- Never prepare or eat, sell, or give away a rat that you find dead. Dead rats can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with a rat, even if it looks healthy, because we cannot see the signs and symptoms of Lassa fever in rats.
- If you live in an area with Lassa fever, call a community health worker (veterinary officer, community animal health worker, community health volunteer, community health assistant, community health services supervisor, or agriculture extension officer)
- Wear disposable hand gloves or plastic bags on your hands or other risk-appropriate personal protective equipment to protect your hands. Avoid touching the dead rat with your bare hands.
- After using PPE, properly package them and dispose at the designated disposal site

- Even though rats do not show signs and symptoms of Lassa fever, a sick or dead rat may be a sign of some other sickness.
- This information can help county authorities know about sicknesses before they affect people.

- If a community health worker does not respond within one day to advise on how to dispose of or bury the dead rat safely, it is important to burn or bury the rat very carefully.
  - Even if the rat looks healthy, it is important to take care because we cannot always see the signs and symptoms of sickness.
- Rats do not show the signs and symptoms of Lassa fever but can still spread the sickness to other rats and to people, so it is important to burn or bury a dead rat safely.
- To burn or bury a dead rat safely, do not touch its body or body fluids such as the pee-pee, poo-poo, blood, snot, or spit with bare hands.
  - Wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
  - Use a shovel, wheelbarrow, or other tools to move the dead rat to where you can burn or bury it deeply.
  - Burn or deeply bury the dead rat far from where water is collected and where household activities take place. The rat should be buried 50 meters away from dwelling spaces and water sources.
    - Burning a dead rat is best in areas with many people and where space is too small to safely bury the dead rat.
    - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals. If you must move the body, take care to prevent spreading the disease around the area.
    - Burn to ash or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
  - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead animal and put them in the sun to dry. Then immediately wash your hands and arms, with soap and clean, running water.
  - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
  - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
  - Wash your hands immediately and arms with soap and clean, running water
  - Never dig up a dead rat that has been buried.

REDUCE RATS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

- Keep a cat at home to drive away rats from the house and surrounding area.
- Keep the house area as clean as possible to help stop rats from visiting your house. Close contact with rats and their urine and feces can make it easier for Lassa fever to spread from infected rats

to you and your family.

- Keep your house in good repair to make it difficult for rats to enter and make their home there.
- Clean and sweep the house every day that rats have been inside. Close contact with rats and their urine and feces can allow Lassa fever to spread from infected rats to us and our families.
- When sweeping your house after rats have been in the house, always make sure to:
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
    - Wet the floor with water before sweeping to keep dust from spreading in the air.
    - Clear away dirt in and around the house and throw it away far from the house.
    - Remove the glasses and mask or cloth from your face, and wash them immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water immediately after cleaning or sweeping an area where rats have been.
- Regularly wash the floors, mats, and walls; clothes and blankets; and all of the food and water covers and containers to remove any rat urine, feces.
- Keep food and water in covered containers that rats cannot enter, and keep the containers away from where people sleep. This helps to avoid close contact with rats and to stop rats and other animals from visiting and eating and drinking your food and water.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from rats and their urine and feces.

STORE AND PREPARE FOOD AND WATER SAFELY

- Lassa fever can spread from rats to people when we touch, eat, or drink something that has the feces or urine of a rat with Lassa fever on or in it.
- Eat and drink away from rats and areas where rats visit.
- Avoid eating fruit or food that has been bitten by an animal.
    - Do not eat <u>any</u> part of the bitten fruit or food.
    - Do not give the bitten fruit or food to an animal to eat.
- Always wash all fruits and vegetables with water before cooking or eating.
- Dry food on a clean surface and on high ground away from where rats can touch it or away from areas that rat urine or feces have touched.
- Keep food and water in covered containers so that rats cannot enter, and keep the containers away from where people sleep. This helps to avoid close contact with rats and to stop rats and other animals from visiting and eating and drinking your food and water.
- Always use a clean cup to collect water from a container so that your hands do not touch the water. Dirty cups and hands can spread sickness through the water to other people.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from rats and their urine or feces.

- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and clean, running water before, during, and after preparing food.
- Household members, especially women and girls, ensure that these behaviors are practiced to keep the house and cooking areas and items clean. Men and boys support the women and girls in carrying out these actions to keep the family healthy.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways, we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - After using the toilet
    - After coming from the bush
    - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- **To wash your hands well follow these steps:**
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.
    - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
    - Rinse hands well with clean, running water.
    - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.

- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

SEEK IMMEDIATE CARE AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW GETS SICK OR DIES AFTER CONTACT WITH A RAT

- If you have any of the signs and symptoms of Lassa fever, go to your nearest health facility or contact a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or your town chief or community leader or call 4455 immediately.
    - Many of the signs and symptoms of Lassa fever are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.
    - Getting early treatment for Lassa fever can save lives.
    - Getting early treatment can also protect your family and loved ones from getting Lassa fever.
    - When someone gets early care and treatment, they have a better chance of healing quickly and with fewer problems.
- If you have signs and symptoms of Lassa fever, make sure to call your community health worker if you have had recent contact with a rat or spent time in an area where rats live or visit.
- If a person gets sick or dies after contact with a rat, do not touch the person, their body fluids such as urine or feces, blood, snot, or spit, or any items they or their body fluids have touched.
    - Touching the body of a sick or dead person, their body fluids, or items they or their body fluids touched can spread sickness to other people.
- If a person gets sick or dies after contact with a rat, go to your nearest health facility contact or community health worker or call 4455
    - Calling a community health worker about any sickness or death after contact with a rat can help district authorities or health officers find the reason for the sickness or death and can save the lives of others in Liberia.
    - Call 4455 to report all death cases.
- Report all deaths of animals to a community health worker or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

PROTECT YOUR SEXUAL PARTNER IF YOU HAVE RECOVERED FROM LASSA FEVER

- Lassa fever survivors should use condoms during man woman business (vaginal or anal) for at least three months after recovery.
- To avoid spreading Lassa fever from the condom, the survivor should be the one to remove the condom and throw it away.
- Condoms should be thrown away safely where no one is able to touch it, such as in a deep

pit latrine.

- Once the condom is thrown away safely, wash your hands with soap and clean, running water.
- Survivors of Lassa fever and their sexual partners should practice good hand washing and personal hygiene by washing well with soap and clean, running water immediately after having sex (man and woman business).
- If you have questions about sex (man and woman business), pregnancy, or breastfeeding as a Lassa fever survivor, talk to a health care worker or community health worker.

RIFT VALLEY FEVER

RVF must be reported immediately in Liberia when it is suspected in either animals or humans.

RVF is an acute, fever-causing viral disease most commonly observed in domesticated animals such as cattle, buffalo, sheep, goats, and camels. It can also make people sick. Globally, 1,104 unique human or animal RVF virus transmission events were reported in 39 countries during 1999–2021 (Gerken et al., 2022).

RVF causes fever, inability to eat or a loss of appetite, generalized weakness, and loss of pregnancy/abortion in pregnant domesticated animals. In animals, mortality among young goats, young sheep, and young cows can range from 20% to 100%. High rates of death and abortion in domesticated animals can lead to significant economic losses for people that depend on them for their livelihood. In people, the disease ranges from a mild flu-like disease to a severe hemorrhagic fever that can be deadly.

RVF is most commonly spread among animals by biting flies, including mosquitoes. Infections usually follow heavy rains and the subsequent expansion of mosquito populations. Human infections have also resulted from the bites of infected mosquitoes, most commonly in the Aedes and Culex mosquitoes, as well as from the bites of hematophagous (blood-feeding) mosquitoes. However, the virus is most commonly transmitted to people through unprotected contact with the fluids and body excretions of infected animals during slaughtering, assisting with animal births, cleaning an abortus unprotected, conducting veterinary procedures, or disposing of carcasses. Consumption of raw and undercooked animal products including meat, blood, milk, and milk products also carries transmission risk.

The virus infects people when it enters the body through a wound or through contact with broken skin. It may also enter the body when a person breathes in the small droplets produced during the slaughter of infected animals. RVF has not been shown to pass from person to person.

While RVF causes severe illness, loss of pregnancy, and death in animal populations, it most commonly is mild in people. Those infected may not have any symptoms at all and most recover without hospitalization. RVF can less commonly develop into serious hemorrhagic fever with significant consequences in a small number of cases. Treatment for severe cases requires hospitalization, and it is limited to supportive care, which elevates the importance of awareness and early care seeking in endemic areas.

Vaccines preventing RVF in animals exist and can be an effective means of controlling the disease. However, the vaccines face challenges that limit their use and availability in many areas, and if given once an outbreak has occurred can accelerate the outbreak. Vaccines for people are not currently available. Awareness of risk and uptake of prevention behaviors for those living in or near endemic areas is a cornerstone for control of the disease, along with routine surveillance.

Certain occupational groups such as herdsmen, farmers, slaughterhouse workers, and veterinarians are at higher risk of infection.

Risky behaviors that increase the chance of an RVF infection include:

- Unsafe handling of animals during processes such as assisting birth, slaughter, and care of sick animals; disposal of dead animals; and cleaning of abortus
- Unsafe consumption of animals and their products
- Poor mosquito control and prevention measures
- Avoid feeding animals at close range

A number of questions and challenges remain in the control and prevention of RVF.

Structured animal disease surveillance in Liberia is relatively new amidst limited population awareness on RVF. Therefore, RVF cases among humans and animals have not been recorded in Liberia. However, a Central Veterinary Diagnostic Laboratory has the capacity to test and confirm RVF in Liberia. Further, with specifics to Sierra Leone and Ivory Coast which shares borders with Liberia poses an increased risk of Transboundary Animal Disease for which Liberia is at higher risk.

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- CDC Resource Pages on Rift Valley Fever (CDC, 2020b)
- OIE Resource Page on Rift Valley Fever (OIE, 2022g)
- WHO Factsheet on Rift Valley Fever (WHO, 2018b)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

About Rift Valley fever

- RVF is a sickness that can make animals and people sick and must be reported immediately when suspected.
- RVF causes fever and abortion in pregnant animals as well as death among newborn animals, which can lead to problems for those that depend on animals for their livelihood.
- RVF is often a mild sickness, but it can occasionally be very serious in people and look similar to EVD and Lassa fever.
- RVF has been found in some animals in some African - countries.
- RVF most commonly spreads from animals to people through contact with the body fluids, feces, birthing fluids, or body parts of infected animals through activities such as handling meat.
- People that can easily get RVF are people that work closely with animals such as herders, veterinarians, hunters and butchers.
- RVF can also be spread between animals and humans through the bite of a mosquito.
- Much remains unknown about this sickness. Therefore, we must be careful with animal abortus, meat, mosquito bites, and so forth.

SIGNS AND SYMPTOMS OF RVF

SIGNS AND SYMPTOMS OF RVF IN ANIMALS

- Sign and symptoms of RVF in animals include:
    - Fever
    - Fluids leaking from the nose and eyes
    - Bloody diarrhea (running stomach)
    - Vomiting
    - Stomach pain
    - Yellowing of the skin and eyes
    - Abortion at any stage of pregnancy
    - Death in a large number of newborn or young animals
- RVF harms sheep more than other animals and most lambs that have the sickness will die.
- Young animals are more likely to die from RVF than adult animals.

SIGNS AND SYMPTOMS OF RVF IN PEOPLE

- The length of time from when the RVF enters a person's body to when the person starts to show signs and symptoms of RVF ranges from two to six days.
- The signs and symptoms of RVF may show slowly, and some people with the sickness may not show any signs or symptoms. That is why you need to go to the hospital for a checkup.
- Signs and symptoms of RVF in people generally include:
    - Fever
    - Fatigue and weakness
    - Back pain
    - Dizziness.
- The signs and symptoms are usually not too serious and only last for a few days.
- However, the signs and symptoms of RVF may sometimes become very severe. Serious signs and symptoms include:
    - Sensitivity to light
    - Losing ability to see
    - Strong headache, convulsions, or coma
    - Bleeding from the nose or mouth
    - Bloody stool-or vomit
- Herdsmen, farmers, slaughterhouse workers, veterinarians, and people who live close to animals and play with them are more likely to get RVF.
- Many of the signs and symptoms of RVF can be like those for malaria and typhoid, so it is

important to go to a health facility for early testing and treatment for any fever.

How RVF spreads

- RVF can spread from an animal to a person through:
    - Touching the body parts or body fluids such as pee-pee, poo-poo, blood, birthing fluids, or abortus of an animal with RVF, such as during killing or preparing and cooking beef
    - Drinking fresh, raw milk from an animal that has RVF
    - Being bitten by a mosquito that carries the RVF virus
    - Breathing in the RVF when killing an animal that has RVF
- RVF enters a person's body through:
    - The mouth, nose, or eyes
    - Small cuts or openings in the skin
    - Insect bite
    - Breathing it in
- At this time, RVF is not known to spread from person to person.

How to protect our animals, ourselves, and our families against RVF

- There are actions we can take to protect ourselves and our families from RVF.
- Vaccinate livestock animals against RVF and care for them well.
- Animal health is important for human health. Taking good care of our livestock helps keep animals healthy, which helps keep us, our families, and our communities healthy.
- All animals need enough food and water, exercise, kind treatment, and a safe and clean place to stay.
- When you see any signs and symptoms of RVF in your animals, please contact the Ministry of Agriculture for clarity.
- If you buy or get new animals, keep them separate from other animals for a period of three weeks while you watch the new animals for any signs and symptoms of sickness. This way you can make sure they are not sick with RVF or any other sickness and do not spread any sickness to other animals.
- If your animals do not sell at the market, keep them separate from other animals for a period of three weeks while you watch them for any signs and symptoms of sickness. This way you can make sure they did not come in contact with RVF or any other sickness at the market that they might spread to other animals.
- If one or more of your animals gets sick, aborts, or dies, separate them from the healthy animals to stop the spread of the sickness and call the community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer), the town chief, or community leader or call 4455.
    - This information can help county officials and health workers identify the cause before it affects people or their livestock.

- Then wash anything that touched the animals, the area where the animals were kept, and your hands and arms immediately with soap and clean, running water.

SEPARATE AND REPORT ABORTING ANIMALS

- Abortion in animals is one of the signs of RVF and can indicate that an animal is sick and able to spread the sickness to other animals and humans.
- Keep aborting animals and animals giving birth away from other animals and people until a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) can advise you.
    - Keep animals giving birth out of your house to reduce the risk that they will spread RVF to you and your family.
- Call a community health worker or call 4455 about any sick or aborting animals in the community.
    - Tracking the number of abortions can help a community health worker take action to stop any outbreak.

PROTECT YOURSELF WHEN ASSISTING ANIMAL BIRTHS AND ABORTIONS AND REPORT ALL ABORTING ANIMALS

- Abortion in animals is one of the signs of RVF and indicates that an animal is sick and able to spread the sickness to other animals and humans.
- Keep aborting animals and animals giving birth away from other animals and people until a community health worker (veterinary officer, community animal health worker, community health worker, community health volunteer, community health services supervisor, or agriculture extension officer) can advise you.
    - Keep animals giving birth out of your house to reduce the risk that they will spread RVF to you and your family.
- Call a community health worker about any sick or aborting animals in the community.
    - Tracking the number of abortions can help county authorities a community health workers take action to stop any outbreak.
- Avoid touching with your bare hands an animal or any of the urine and feces, blood, birthing fluids, fetal fluids or fetus, placenta, or milk of an animal that is giving birth or aborting, even if the animal looks healthy because you cannot always see the signs of sickness.
- Cover your skin, eyes, nose, and mouth, if you are assisting the animal during birth or abortion, even if the animal looks healthy.
    - If they are available, wear rubber gloves or strong plastic bags to protect your hands.
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
    - Wash all of the things that you used with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.

    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
- To reduce the spread of RVF to other animals and humans, avoid selling or giving away an animal or products such as milk or meat from an animal that recently aborted.
- To reduce the spread of RVF do not eat or drink milk or milk products from any animal that has aborted or has other signs of sickness.

HANDLE AND CONSUME MILK AND MILK PRODUCTS SAFELY

- Always boil raw milk from any animal before drinking it or using it to make milk products.
- Do not eat or drink raw milk or milk products from any animal that has aborted or has any signs of sickness.
- To reduce the spread of RVF to other animals and humans, avoid selling the milk or milk products from an animal that shows any sign or symptom of the sickness.
- Check your health status regularly at your nearby health facility or hospital if you work in dairy production; eat or drink fresh, raw milk or raw milk products; kill animals; or handle animals or animal products as part of your normal activities.

AVOID SELLING OR EATING SICK ANIMALS OR ANIMALS THAT DIED SUDDENLY OR WERE FOUND DEAD

- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal (or its products), if the animal looks sick or was found dead.
    - Sick and dead animals can spread sickness to those who touch them.
- When possible, avoid animals that look sick and animals that you find dead.
- Do not touch with bare hands the body or body fluids (urine and feces and blood or birthing fluids), or dead fetus/abortus of an animal that looks sick or that you find dead.
    - Sick and dead animals can spread sickness to us if we touch them or their body fluids.
- Call an animal health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or your chief or call 4455 about any animal that looks sick or that you find dead.
    - This information can help county authorities and community health workers know about sicknesses before they become a problem for people.
- To reduce the spread of RVF to other animals and humans, avoid selling or giving away an animal or animal products such as milk or meat from an animal that recently aborted.

BURN OR BURY DEAD ANIMALS SAFELY

- Call the nearest community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer, environmental inspectors/technicians) about any unexpected or sudden death of animals to get help to safely burn or bury the dead body.

- This information can help health officials take action early before a sickness becomes a problem.
- If more than ten animals get sick or die within a week's time, this can be a sign of an outbreak.

- Close off the area surrounding the dead animal to prevent other animals from coming into contact with it.
  - Do not leave a dead animal in an open field. This could spread sickness to healthy animals when they are grazing or drinking water.
- If a community health worker does not respond within one day to advise on how to burn or bury the dead animal safely, it is important to burn or bury the animal very carefully.
- Avoid touching the body or body fluids such as pee-pee, poo-poo, blood, snot, spit, or birthing fluids of a dead animal with your bare hands.
  - Even if the animal looks healthy, it is important to take care because you cannot always see the signs and symptoms of sickness.
- There are seven key steps to handling and disposing of a dead animal safely if you are unable to get help or guidance from a community health worker.
  - **Step 1:** Wear rubber gloves or plastic bags to protect your hands and cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter. Do not touch the animal with bare hands.
  - **Step 2:** Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply in the soil when possible.
  - **Step 3:** Burn or deeply bury the dead animal in the soil far from where water is collected and household activities take place.
    - Burning a dead animal is best in areas with many people and where space is too small to safely bury the dead animal.
    - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals. If you must move the animal, take care to prevent spreading the RVF around the area.
    - Burn to ashes or deeply bury the dead animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
  - **Step 4:** Pour soapy water or disinfectant on the shovel, wheelbarrow, or other tools you used to move the dead animal and put them in the sun to dry for several hours.
  - **Step 5:** Remove the glasses and mask or clean cloth from your face; wash them immediately with soap and clean, running water; and hang them in the sun for several hours to dry.
  - **Step 6:** If rubber gloves or plastic bags are used, remove them carefully and properly dispose of them.
  - **Step 7:** Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water immediately after any

contact with an animal, even if it looks healthy, because the signs and symptoms of sickness are not always apparent.

- Never dig up a dead animal that has been buried.

PROTECT YOURSELF WHEN KILLING AN ANIMAL

- Cover- your skin, eyes, nose, and mouth when killing an animal, even if the animal looks healthy. This action can help prevent any sickness the animal may have from spreading to you.
    - If available, wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
    - Wash all of the things you used while killing the animal with soap and clean, running water or with disinfectant. Then immediately wash your hands and arms with the gloves or bags still on them immediately with soap and clean, running water
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Properly dispose of them (burn or deeply bury them).
    - Wash your hands and arms immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water before and immediately after killing an animal.
- When killing an animal, if you notice the blood does not clot, the animal might have anthrax.
    - Keep all the equipment used while killing the animal together and immediately call an animal health worker or health extension worker.
    - Do not move equipment because this could spread the sickness.
    - Do not eat the meat or blood or use the hide from this animal until you receive advice from a veterinary officer, community animal health worker, or agriculture extension officer.

STORE AND PREPARE FOOD AND WATER SAFELY

- RVF can spread from animals to people when we touch, eat, or drink something that has the body fluids (pee-pee, poo-poo, blood, snot, spit, or birthing fluids) of an animal with RVF on or in it.
- Eat and drink away from animals and areas where animals are kept.
- Keep animals away from areas where food or drink is stored, prepared, or eaten.
- Always wash all fruits and vegetables with water before cooking or eating.
- Dry food on a clean surface and on high ground away from where sheep, goats, cattle, and other animals can touch it or areas that animal pee-pee or poo-poo has touched.
- Keep food and water in covered containers so that animals cannot enter, and keep containers away from where people sleep. This helps to avoid close contact with rats and other animals and to stop animals from visiting and eating and drinking your food and water.

- Always use a clean cup to collect water from a container so that your hands do not touch the water. Dirty cups and hands can spread sickness through the water to other people.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and clean, running water before, during, and after preparing food.
- Wash hands with soap and clean, running water before and after touching raw animal products such as beef or milk.
- Keep raw meat and other animal products away from fruits and vegetables and cooked foods.
- Wash all surfaces and items used to prepare food with soap and clean, running water immediately after they have been in contact with any animal parts or products including skin, guts, and raw meat or milk.
- Cook food well to help stop the spread of any sickness. Food should be hot to the touch all the way through.
    - Meat should be cooked until no pink is left.
    - Drink only cooked milk.
    - Bring foods such as soups and stews to boiling before eating.
    - Eat food while it is hot.
    - Reheat cooked food very hot.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - Before and after preparing food
    - Before and after killing any animal

- Before eating

- **To wash your hands well follow these steps:**
  - Wet your hands with clean, running water.
  - Use enough soap to cover all hand surfaces.
  - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
  - Rinse hands well with clean, running water.
  - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

PROTECT YOURSELF FROM MOSQUITO BITES

- RVF can be spread by mosquito bites during the day and at night.
- Cover stored water and reduce standing water in your yard to reduce the number of mosquitoes.
- Protect against mosquito bites by using personal insect repellent if available and wearing light-colored, long-sleeved shirts and trousers if possible.
- Always sleep under an insecticide-treated mosquito net.

SEEK IMMEDIATE CARE AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW GETS SICK OR DIES AFTER CONTACT WITH AN ANIMAL

- RVF must be reported immediately in Liberia when it is suspected in either animals or humans.
- If you have any of the signs and symptoms of RVF, go to your nearest health facility or community health worker right away.
  - Many of the signs and symptoms of RVF are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.
  - When someone gets early care and treatment, they have a better chance at healing quickly and with fewer problems.
- If you have signs and symptoms of RVF, call your health worker if you have had recent contact with any animal or spent time in an area where animals live, visit, or are kept.
- If a person gets sick or dies after contact with an animal, go to your nearest health facility or community health worker or call 4455.
- Calling a health worker about any sickness or death after contact with an animal can help district authorities find the reason for the sickness or death and can save the lives of others in Liberia.
- Report all deaths of animals to a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or call 4455.
  - Reporting every death helps community health workers to know about the death and to

decide if any investigation is needed.

MARBURG VIRUS DISEASE

MVD must be reported immediately in Liberia when it is suspected in either animals or humans.

MVD, formerly known as Marburg hemorrhagic fever, is a rare but severe hemorrhagic fever that affects both human and nonhuman primates such as monkeys and apes. MVD is caused by a virus that is part of the same family of viruses as Ebola virus. Both Marburg and Ebola viruses are rare, but they have the capacity to cause dramatic outbreaks with high fatality rates. Marburg virus was first recognized in 1967, when outbreaks of hemorrhagic fever occurred simultaneously in laboratories in Marburg and Frankfurt, Germany, and in Belgrade, Yugoslavia (now Serbia). Thirty-one people became ill; initially, the affected people were laboratory workers, with subsequent cases occurring among several medical personnel and family members who had cared for them. Seven deaths were reported. The first people infected had been exposed to imported African green monkeys or their tissues while conducting research. One additional case was diagnosed retrospectively. The reservoir host of Marburg virus is the bat, especially the Egyptian fruit bat or Egyptian rousette, Rousettus aegyptiacus. This bat is a sighted, cave-dwelling bat widely distributed across Africa.

Science Daily reported on January 24, 2020, that scientists confirmed Marburg virus in fruit bats in Sierra Leone, marking the first time the deadly virus was spotted in West Africa. It was confirmed in 11 Egyptian rousettes. The bats were caught by three different research teams in three different health districts in Sierra Leone (Burns, 2020).

The first outbreak of MVD in the West African subregion was reported in Guinea in August 2021. Marburg virus has also been detected in cave-dwelling bats in Sierra Leone. These facts emphasize the potential risk of the sickness in Liberia.

Fruit bats infected with Marburg virus do not show obvious signs of disease. Monkeys, apes, and people can become infected with Marburg virus and may develop serious and often fatal disease.

Initial infection in people is most often due to long-time exposure in caves or mines where cave-dwelling bats live. Once people are infected, MVD spreads rapidly from person to person through direct contact (through broken skin or mucous membranes) with the blood, secretions, organs, or other bodily fluids of infected people, and with surfaces and materials (e.g., bedding, clothing) contaminated with these fluids. Cultural practices, including traditional burial ceremonies that involve washing or touching the deceased, can spread the disease in communities. Health workers are also at high risk when they do not strictly adhere to infection prevention and control measures. Those that survive infection may also spread the infection without proper precaution.

Marburg virus has been found in the testicles and the inside of the eye in some people who have recovered from the disease. In women who have been infected while pregnant, the virus remains in the placenta, amniotic fluid, and fetus, and the virus may persist in breast milk. All MVD survivors and their sexual partners should receive counseling to ensure safer sexual practices. MVD survivors and their sexual partners should either abstain from all sexual practices or observe safer sexual practices through correct and consistent condom use until the men's semen has tested negative twice for Marburg virus.

MVD must be confirmed by a laboratory test because it has similar clinical presentations to other diseases such as malaria, typhoid fever, and meningitis. There is currently no proven treatment or vaccines available for MVD, but some people can recover through supportive treatment in the hospital. Survival is improved with early diagnosis and care, emphasizing the importance of awareness and early care seeking for fever, particularly in areas with high fruit bat populations and known presence of the disease.

Miners, people that spend time in caves for shelter or cultural practices, people that eat or handle bats,

and health care workers are at higher risk of infection. Risky behaviors that increase the likelihood of Marburg virus infection include:

- Spending time in areas where bats live, especially caves for activities such as mining, cultural ceremonies, or when seeking shelter
- Hunting, preparing, and eating bats
- Eating foods that have been bitten by bats or contaminated by bats
- Poor infection prevention and control measures that expose health workers and close contacts to the body, body fluids, or belongings of someone that has MVD

This section was developed with reference to the below WHO, CDC, and Liberian resources:

- CDC Marburg Virus Disease Resource Pages (CDC, 2021b)
- WHO Factsheet on Marburg Virus Disease (WHO, 2021b)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

About Marburg

- MVD is a sickness that can make animals and people sick.
- MVD causes serious sickness in people and can even cause death.
- MVD is not common, but once a person gets sick with the disease, it can spread quickly from person to another.
- Marburg virus is mainly found in a type of bat that eats fruits and sleeps in caves.
- The type of bat that carries Marburg virus lives in many parts of Africa, including Liberia and its neighbors Sierra Leone and Guinea.
- Bats with the Marburg virus do not get sick but can still spread it to other bats and to people.
- Because bats do not show signs and symptoms of MVD, you cannot know for sure which bats carry the virus. That is why it is important to avoid contact with all bats.
- People that are the most likely to get MVD from bats are those that visit areas where bats live, especially caves, and those that hunt, prepare, and eat bats.

Signs and symptoms of MVD Signs and symptoms of MVD in bats

- Bats do not show the signs and symptoms of MVD but can still spread the sickness to other bats and to people.
- Because bats do not show signs and symptoms of MVD, you cannot know for sure which bats have the sickness. That is why it is important to avoid contact with all bats.

Signs and symptoms of MVD in people

- Many of the signs and symptoms of MVD in people are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever. After an incubation period of five to ten days, symptom onset is sudden and marked by fever, chills, headache, and myalgia. Around the fifth day after the onset of symptoms, a rash with flat and

bumpy areas (maculopapular rash), particularly on the trunk (chest, back, stomach), may occur. Nausea, vomiting, chest pain, a sore throat, abdominal pain, and diarrhea may then appear.

- Symptoms become increasingly severe and can include jaundice, inflammation of the pancreas, severe weight loss, delirium, shock, liver failure, massive hemorrhaging, and multi-organ dysfunction.
- Signs and symptoms of MVD in people include:
    - Fever
    - Headache
    - Weakness
    - Diarrhea (running stomach)
    - Stomach and body pain
    - Nausea and vomiting
    - Bleeding from the nose, ears, mouth, or other body openings

HOW MVD SPREADS

- Marburg virus can spread from a bat to a person through:
    - Touching bats that carry Marburg virus, their body fluids (urine, feces, blood, snot, or saliva), or their body parts
    - Touching surfaces, such as the inside of a cave, and other items that a bat with Marburg virus or its urine, feces, blood, snot, or saliva, have touched
    - Eating or drinking something an infected bat or its urine, feces, blood, snot, or saliva has touched
    - It is unknown how Marburg virus was first transmitted from its animal host to humans
    - In 2008, unprotected contact with infected bat feces or contaminated fluid were the most likely routes of infection.
- Actions that make it more likely for Marburg virus to spread from bats to people include:
    - Touching bats
    - Hunting, preparing, or eating bats
    - Visiting caves, including using them for shelter or cultural ceremonies
    - Eating fruit that has been bitten by bats
    - Eating fruit and vegetables without washing them
    - Leaving food and water and their containers uncovered
    - Trying to kill or chase all the bats from an area
    - Working in caves or underground areas where bats live, such as mining
- MVD can spread from person to person through:
    - Touching the body or any of the body fluids such as urine, feces, blood, snot, or saliva of a person who is sick with or has died from MVD

- Touching surfaces and items such as clothing or bedding that the body fluids such as urine, feces, blood, snot, or saliva of a person with MVD have touched
- Unprotected sex with a person who is or has been sick with MVD

- Marburg virus enters a person's body through:
  - The mouth, nose, or eyes
  - An opening in the skin such as a cut or sore
  - The private parts through unprotected sex

PROTECTING OURSELVES, OUR FAMILIES, AND OUR COMMUNITIES AGAINST MVD

- There are actions we can take to protect ourselves and our families from MVD.

AVOID CHASING OR DRIVING BATS OUT OF YOUR AREA

- Bats live all around us, so it is important we learn how to live with them safely.
- Bats are important for the environment. They help our plants, forests, and crops to grow well.
  - Bats eat fruits and spread the seeds so that plants can become plentiful and grow more fruits.
  - Bats eat the insects that damage the crops that we eat.
- Do not try to kill or chase bats from an area.
  - Trying to kill or chase bats from an area does not work and can actually make it more likely that MVD can spread from bats to people.
  - Protect your child's health. Do not send children into the roof to chase bats because they could be bitten or touch the urine, feces, blood, snot, or saliva of a bat.

AVOID ALL BATS WHEN POSSIBLE

- Bats can have different sicknesses or carry viruses such as Marburg virus and may not show signs and symptoms of sickness; therefore, it is important to avoid contact with all bats.
- Because bats do not show signs and symptoms of MVD, you cannot know for sure which bats have the sickness. That is why it is important to avoid contact with all bats.

AVOID VISITING CAVES AND OTHER AREAS WHERE BATS LIVE

- Avoid visiting caves, including using caves for shelter or cultural ceremonies to reduce contact with bats, and avoid areas where plenty bats live or visit.
  - The bats that can have Marburg virus live mostly in caves. Touching bats, their body fluids such as urine, feces, blood, snot, or saliva, and surfaces or items that their body fluids have touched are ways that MVD can spread from bats to people.
  - People who go into caves should be careful not to come into contact with bat body fluids such as urine, feces, blood, snot, or saliva, including touching surfaces such as cave walls and then touching their mouth, nose, eyes, or any opening in their skin such as a cut or sore.

- Always wash your hands and arms with soap and clean, running water immediately after visiting a cave.
- Protect yourself from coming into contact with any bat body fluids such as urine, feces, blood, snot, or saliva in the cave.
    - Wear a head covering to protect your head and rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth.
- After leaving the cave, wash the rubber gloves well with soap and clean, running water.
- Remove the head covering, glasses, and mask or cloth from your face, and wash them immediately with soap and clean, running water. Hang them in the sun to dry and immediately wash your hands.
- If rubber gloves or plastic bags are used, remove them carefully and properly dispose them
- Wash your hands and arms immediately with soap and clean, running water.

AVOID HUNTING, KILLING, OR EATING BATS AND REPORT DEAD BATS

- Avoid hunting, killing, preparing for cooking, or eating any bat, even if it looks healthy. Bats with Marburg virus do not show signs and symptoms of sickness, so it is important to avoid contact with all bats.
    - Touching bats and their body fluids such as urine, feces, blood, snot, or saliva are ways that MVD can spread from bats to people.
    - Marburg virus lives in the meat and pee-pee, poo-poo, blood, snot, or spit, and other body fluids of infected bats, so touching those things during killing or preparing the animal can make it easy for the virus to infect a person.
- Avoid touching with bare hands the body or the urine, feces, blood, snot saliva, or other body fluids of a bat.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with a bat, even if it looks healthy, because we cannot see the signs and symptoms of Marburg virus in bats.

REDUCE BATS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

- Keep your house in good repair to make it difficult for unwanted animals to enter and make their home there.
- Clean and sweep the house every day that bats have been inside. Close contact with bats and their body fluids such as urine, feces, blood, snot, or saliva can allow sicknesses to spread from bats to people
- When sweeping your house after bats have been in the house, always make sure to:
    - Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
    - Wet the floor with water before sweeping to keep dust from spreading in the air.
    - Clear away dirt in and around the house and throw it away far from the house.

- Remove the glasses and mask or cloth from your face, and wash them immediately with soap and clean, running water.

- Always wash your hands and arms with soap and clean, running water immediately after cleaning or sweeping an area where bats have been.
- Regularly wash the floors, mats, and walls; clothes and blankets; and all of the food and water covers and containers to remove any bat urine, feces, blood, snot, or saliva.

PROTECT FOOD AND WATER AND FOOD PREPARATION AREAS FROM BATS

- Marburg virus can spread from animals to people when we touch, eat, or drink something that has the urine, feces, blood, snot, or saliva, or other body fluid of an infected bat on or in it.
- Do not eat fruit that has been bitten by bats. The type of bats that can have Marburg virus are mainly fruit-eating bats, and the virus can spread from bats to people through the spit of the bat.
    - Do not eat <u>any</u> part of the bitten fruit.
    - Do not give the bitten fruit to an animal to eat.
- Always wash all fruits and vegetables with water before cooking or eating.
    - The type of bats that can have Marburg virus are mainly fruit-eating bats. Bats that eat fruit may also pee-pee or poo-poo on fruits or other crops while they are eating or flying around.
    - Marburg virus can spread from bats to humans through the urine or feces of the bat, including when people touch or eat something with bat urine or feces or saliva on it.
    - Always cover food and water and their containers to make sure the urine, feces, blood, snot, or saliva of bats cannot enter.
    - Marburg virus can spread from bats to people through the urine, feces, blood, snot, or saliva, or other body fluid of an infected bat.
    - Bat urine, feces, blood, snot, saliva, or other body fluids that enter our food, water, or containers of food and water can make us sick.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from bat urine, feces, blood, snot, or saliva.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- To keep your family and friends healthy, do not prepare food when you are sick.

BURN OR BURY DEAD BATS SAFELY

- Never prepare or eat, sell, or give away a bat that you find dead. Dead bats can spread their sickness to those who touch them.
- Call a community health worker (veterinary officer, community animal health worker, community health promoters, community health assistant, community health service supervisor, agriculture extension officer) about any bat that looks sick or that you find dead. Even though bats do not always show signs and symptoms of MVD, a sick or dead bat may be a sign of some other sickness.

    - This information can help county authorities know about sicknesses before they become a problem for people.
- If a community health worker does not respond within one day to advise on how to burn or bury a dead bat safely, it is important to burn or bury the rat very carefully.
    - Even if the bat looks healthy, it is important to take care because we cannot always see the signs and symptoms of sickness.
- Bats do not show the signs and symptoms of MVD but can still spread the sickness to other bats and to people, so it is important to burn or bury a dead bat safely.
- To burn or bury a dead bat safely, do not touch with bare hands the body or urine, feces, blood, snot, saliva, or other body fluids of the bat.
    - Wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
    - Use a shovel, wheelbarrow, or other tools to move the dead bat to where you can burn or bury it deeply.
    - Burn or deeply bury the dead bat far from where water is collected and where household activities take place.
        - Burning a dead bat is best in areas with many people and where space is too small to safely bury the dead rat.
        - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
        - Burn to ash or deeply bury the bat in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
    - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead animal and put them in the sun to dry. Then immediately wash your hands and arms, or gloves/bags if using them, with soap and clean, running water.
    - Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
    - If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
    - Wash your hands and arms immediately with soap and clean, running water.
- Never dig up a dead bat that has been buried.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of sickness.

- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.
- It is very important to wash your hands:
    - After assisting animal birth
    - After caring for a sick animal
    - After cleaning or touching areas where animals are kept
    - After milking
    - After using the toilet
    - After coming from the bush
    - Before and after changing a baby's diaper or cleaning up a child who has used the toilet
    - Before and after preparing food
    - Before and after killing any animal
    - Before eating
- To wash your hands well follow these steps:
    - Wet your hands with clean, running water.
    - Use enough soap to cover all hand surfaces.
    - Rub hands together and scrub the backs of your hands, wrists, between your fingers, and under your fingernails.
    - Rinse hands well with clean, running water.
    - Dry your hands with a clean towel or tissue, or swing your hands to dry them in the air.
- Adults should help or make sure young children wash their hands well. Men within the household should take responsibility for making the handwashing materials such as buckets, soap, and stand available. Women, girls, and boys within the household should ensure that water is always available for frequent handwashing.

CARE FOR ANY BAT BITE OR SCRATCH IMMEDIATELY

- A bat that bites you may have rabies, Marburg virus, or other illnesses.
- Wash a bat bite or scratch immediately with soap and clean, running water for 20 minutes (15 minutes).
- Washing a bite or scratch well with soap and clean, running water can help stop sickness spreading from an animal to a person.
- After washing a bite or scratch very well, go immediately to your nearest health facility or community health worker for advice and treatment.
- Getting early treatment for any problem can save lives.

- When someone gets early care and treatment, they have a better chance of healing quickly and with fewer problems.

SEEK IMMEDIATE CARE AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW HAS SYMPTOMS OF MVD OR BECAME SICK AFTER CONTACT WITH A BAT

- Once there has been a case of MVD in the area near where you live, it is important to take care and be watchful for any potential case in your community.
- Know the early symptoms of MVD—fever, weakness, running stomach, headache, and body ache.
- Many of the symptoms of MVD are like those for malaria and typhoid, so it is important to go to a health facility for early testing and treatment for any fever.
- If you or someone you know has symptoms of MVD, go to the nearest health facility or call 4455 immediately.
    - Early treatment is the best chance of survival for a person sick with MVD. When someone gets early care and treatment, they have a better chance of healing quickly and with fewer problems.
    - Getting early treatment can also protect your family and loved ones from getting MVD.
- If someone you know gets sick or dies with symptoms of MVD, do not touch the person, their body fluids (urine and feces, blood, snot, or spit), or anything they have used or their body fluids have touched.
- If someone you know gets sick or dies after caring for another sick person, make sure to call your nearest hospital or community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) about the person's earlier contact with a sick person.
- If someone you know is afraid that they have MVD, help them do what is best for them, best for their family, call 4455 right away to make sure they get checked so that they can get the proper care. Do not help them hide.
- Another way that we can watch for MVD is by reporting all deaths.
- Report all deaths of animals and people to a community health worker or call 4455.
    - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

MONKEYPOX

Monkeypox must be reported immediately in Liberia when it is suspected in either animals or humans.

Monkeypox is a viral zoonotic infection that was first discovered in 1958 when outbreaks of a pox-like disease occurred in monkeys kept for research. Monkeypox belongs to the Poxviridae family and is often thought of as a less severe smallpox virus. Monkeypox was first detected in humans in the 1970s in a 9-month-old boy in the Democratic Republic of the Congo (then Zaire).

Prior to 2022, large-scale, ongoing monkeypox outbreaks were rare and human-to-human spread of monkeypox was limited, with most cases of monkeypox being derived from zoonotic infection. Case fatality rates from monkeypox range from 0% to 10%, although people under 40 are more susceptible to the disease because they never received smallpox immunization, which is somewhat protective against monkeypox.

Monkeypox has been found in multiple animal species, including multiple monkey species, squirrels, Gambian pouched rats, and dormice (species of mice). The natural reservoir species that hosts monkeypox remains unclear, although scientists have identified mice as the most likely hosts. Since monkeypox was first detected in humans in the 1970s, the majority of outbreaks have clustered in the Congo basin. Monkeypox infections have been reported to be locally acquired in 11 African countries, including Benin, Cameroon, the Central African Republic, the Democratic Republic of the Congo, Gabon, Ivory Coast, Liberia, Nigeria, the Republic of the Congo, Sierra Leone, and South Sudan. In these countries, people have been infected through zoonotic spread (from animals to humans). In 2022, a global outbreak of monkeypox has infected more than 60,000 persons (as of Sep 2022) in over 100 countries, primarily through person-to-person transmission and in countries that have not previously experienced monkeypox outbreaks.

Most human monkeypox cases that have been identified were attributed to direct contact with blood, bodily fluids, or lesions (affected part of the body) of infected animals or humans as the mode of zoonotic spillover. However, infection is also possible through the consumption of improperly cooked infected meat. Transmission can also occur via the placenta from mother to fetus (congenital monkeypox).

Prior to the 2022 global monkeypox outbreak, sustained human transmission via person-to-person spread was less common, though it was documented to occur through direct contact and respiratory spread, including longer-term contact with lesions, respiratory secretions and droplets, and objects contaminated by an infected person. Respiratory spread is most common among members of the same household, as it usually requires prolonged contact. The 2022 global monkeypox outbreak has proven that sustained human-to-human transmission can commonly occur, particularly through prolonged, direct contact, such as through sex or other forms of intimate and skin-to-skin contact.

Monkeypox has an incubation period of five days to 21 days. The incubation period can be divided into two phases: the invasion period and the eruption period. The symptoms during the first five days are generalized symptoms such as fever, headache, back pain, muscle ache, and fatigue. The skin eruption period usually begins one to three days after onset of fever and moves through different stages over 2–4 weeks before lesions dry up and fall off. Lesions are typically present on the palms of the hands and soles of the feet, and usually appear 1–3 days after the fever, first on the face before spreading to other parts of the body. Skin lesions can vary from a few to a few thousand. In extreme cases, lesions can join, causing large sections of skin slough off. Atypical presentations are a feature of the current, global outbreak however, including where the rash may be the only symptom present.

In humans, monkeypox infection usually clears on its own after 2–4 weeks, but it can be severe or cause death, especially for children, pregnant women, and the immunocompromised. Treatment of monkeypox focuses on relief from the symptoms like pain from the rash or fever, until the lesions dry up, fall off, and a new layer of skin grows, usually in 2–4 weeks. Isolation from others is important for the duration of an active infection, as is use of personal protective equipment and practices by the health worker or caregiver.

There are currently no vaccines available in Liberia that protect against monkeypox, though they may be available in other countries (e.g., Jynneos and ACAM); guidance and access to vaccines are currently evolving. Previous inoculation against smallpox may be somewhat protective against monkeypox. There are currently no approved treatments for monkeypox available in Liberia, though they may be available in other countries (e.g., Tecovirimat a.k.a. TPOXX). The disease can be treated with supportive care, although positive outcomes are improved with early diagnosis and appropriate care. Ultimately, prevention, early testing, identification of contacts, and treatment in a health facility is the best way at this point to protect ourselves from monkeypox and stop the spread of the disease. These factors elevate the importance of prevention behaviors.

Risky behaviors that increase the chance of monkeypox include:

- Close contact with animals that may harbor monkeypox (e.g., mice, prairie dogs)
- Close contact with humans that are confirmed with monkeypox
- Engage large numbers of sexual partners and/ or frequent, anonymous sexual partners
- Non-compliance to infection prevention and control (IPC)
- Sexual contact with infected person
- Touching of surfaces, objects, etc. that have been contaminated by infected persons
- Breathing in exposed skin flakes in the air or virus e.g., clothing, bedding or towels, etc.
- Sores in the mouth can be infectious, meaning the virus can spread through direct contact with mouth-to-mouth (kissing, etc.)

This section was developed with reference to the below WHO, CDC, OIE, and Liberian resources:

- CDC's Monkeypox Resource Page (CDC, 2022d)
- WHO's Monkeypox Overview (WHO, n.d.c)
- WHO's Clinical Management for Monkeypox (WHO, 2022i)
- OIE's Monkeypox Page (OIE, 2022h)
- Animal Disease Surveillance and Response (ADSR) system, Liberia Report
- National Public Health Institute of Liberia (NPHIL)

About Monkeypox

- Monkeypox can make people and animals sick.
- Monkeypox is a sickness in people and animals that can range from not too serious to very serious.
- People that are most likely to get monkeypox are people that hunt, kill, and prepare animals such as squirrels, rats, and monkeys etc.
- Monkeypox can make a person very sick, but death is not common.
- Children, pregnant women, and those with other health conditions are most at risk of dying from monkeypox.
- Monkeypox can spread from person-to-person through physical contact

Signs and Symptoms of Monkeypox

Signs and symptoms of monkeypox in animals

- We cannot always see the signs and symptoms of monkeypox in animals.
- Even though monkeypox has "monkey" in its name, it is also found in other animals, including squirrels, rats, mice etc.
- Most animals do not show the signs and symptoms of monkeypox but can still spread the sickness to other animals and to people.
- Because many animals do not show signs or symptoms of monkeypox, you cannot be sure which

animals have the sickness. That is why it is important to be careful with all animals, including squirrels, rats, mice, and monkeys.

SIGNS AND SYMPTOMS OF MONKEYPOX IN PEOPLE

- The length of time from when monkeypox enters a person's body to when the person starts to show signs and symptoms of monkeypox ranges from five days to 21 days.
- Early signs and symptoms of monkeypox in people include:
    - Fever
    - Headache
    - Swelling of the neck and armpit
    - Back and muscle pain
    - Tiredness and low energy
    - Rash with large bumpy areas, particularly on the face and trunk (around the belly)
    - Swollen lymph nodes (knot under the throat)
- Usually within one to three days after getting a fever, a person with monkeypox develops a rash on the face and sometimes on other parts of the body.
    - The rash/bumps usually appear first on the face before spreading to other parts of the body.
    - The rash/bumps can appear in the mouth or genital areas.
    - The rash moves through different stages over 2–4 weeks before it dries up and falls off.
    - Swelling of lymph nodes is a symptom that distinguishes monkeypox from other sicknesses that cause lesions like chickenpox and measles.
    - The rash can take around 2–4 weeks to dry and fall off.
- We are still learning more about monkeypox and some people have displayed unusual signs and symptoms that are different from the usual pattern. These include:
    - Only having a few or even just one lesion.
    - The rash/bumps that begin in the genital or perineal/perianal area and do not spread further across the body.
    - Appearance of the rash/bumps before the appearance of other signs and symptoms like fever.
    - The rash/bumps appearing at different stages of development.
- The signs and symptoms of monkeypox usually last for 2–4 weeks.

HOW MONKEYPOX SPREADS

- Monkeypox can spread from an animal to a person through:
    - A bite or scratch from an animal that has monkeypox
    - Contact with the rash/bumps or pee-pee, poo-poo, blood, snot, spit, or other body fluids of an animal that has monkeypox

- Contact with urine and feces, blood, snot, spit, or other body fluids of an animal with monkeypox have touched

- Monkeypox can spread from person to person through:
  - Touching the rash that appears
  - Touching the pee-pee and poo-poo, blood, snot, spit, or other body fluids of a person who is sick or has died from monkeypox
  - Touching items that a person who is sick with monkeypox or their pee-pee and poo-poo, blood, snot, spit, or other body fluids touched
  - Breathing in respiratory droplets of an infected person during face-to-face contact over long periods of time, such as between those living in the same household or exchanged through kissing, or other close or sexual contact.
  - Close contact over a long time e.g., through intimate contact and sex (man and woman business). Condoms and other forms of contraceptives do not protect against monkeypox.
    - While it is not yet known if monkeypox is transmitted through sexual body fluids like semen or vaginal fluids, the disease does spread through face-to-face, skin-to-skin, mouth-to-mouth, and mouth-to-skin contact with a person that has rash/bumps.
  - Monkeypox may also spread between a pregnant mother and her baby during pregnancy or the birthing process.
- Monkeypox enters a person's body through:
  - An opening in the skin such as a cut, scrape, or sore
  - The mouth, nose, or eyes
  - Breathing it in
  - In the genital region such as the penis, testicles, labia, and vagina or anus (butthole) during intimate contact and sex (man and woman business)
- Once a person has monkeypox, they can spread it to others for the entire time that they have symptoms (usually 2–4 weeks).

PROTECTING OURSELVES AND OUR FAMILIES AGAINST MONKEYPOX

There are actions we can take to protect ourselves and our families from monkeypox.

- Avoid contact (including eating) of all wild animals (alive or dead) – especially those that are known to carry the virus like rodents or monkeys and those that appear sick or that have been found dead.
- Always avoid contact with squirrels, rats, mice, monkeys, especially those that are sick or found dead
- Squirrels, rats, mice, and monkeys can have different sicknesses, such as monkeypox, and not show signs and symptoms of sickness, so it is important to avoid contact with them
- Avoid touching, eating, and selling any animal that looks sick or that you find dead to be safe

- Never cook, eat, sell, or give away an animal that looks sick or dead animals. Sick or dead animals can spread their sickness to those who touch them.
- Avoid touching the body, urine, toilet, blood, snot, spit, or other body fluids of a squirrel, rat, mouse, or monkey with your bare hands.
    - To be safe, avoid hunting, killing, and preparing for cooking, or eat any squirrel, rat, mouse, or monkey, even if it looks healthy.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because we cannot always see the signs and symptoms of monkeypox.
- Always call a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer), town chief, or community leaders or call 4455 about any animal that looks sick or that you find dead. Even though animals do not always show signs and symptoms of monkeypox, a sick or dead animal may be a sign of some other sickness.
    - This information can help county authorities and community health workers know about sicknesses before they affect other family members or people.
- Where possible, avoid close (face-to-face, skin-to-skin, mouth-to-skin and mouth-to-mouth) contact with people that have been confirmed to have monkeypox or that have signs and symptoms of monkeypox.
- Where possible, avoid touching or sharing the personal items like bedding, eating utensils, clothes, phone, or other belongings of a person that has the signs and symptoms of monkeypox.
- Avoid sexual contact with anyone that has a rash/bump, especially a rash in the anogenital area, and limit the number of sexual partners you have.
- Practice respiratory hygiene by always covering your coughs and sneezes with a bent elbow or tissue, disposing of used tissues immediately, and then washing your hands with soap and water.
- Regularly wash your hands with soap and water for at least 20 seconds. Use an alcohol-based hand sanitizer/rub with at least 60% alcohol, if soap and water are not available.
- Seek immediate care at a health facility if you develop a fever or rash while traveling or immediately after travel.

BURN OR BURY DEAD ANIMALS SAFELY

- If an animal health worker does not respond within one day to advise on how to burn or bury a dead animal safely, it is important to burn or bury the animal very carefully.
    - Even if the animal looks healthy, it is important to take care because we cannot always see the signs and symptoms of sickness.
- Never prepare or eat, sell, or give away an animal that you find dead. Animals you find dead can spread their sickness to those who touch them.
- To burn or bury a dead monkey safely, do not touch with bare hands the body or body fluids of the animal.
    - Wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses if available, and cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.

- Avoid touching the monkey or any other animal with your bare hands.
- Use a shovel, wheelbarrow, or other things to move the dead monkey to where you can burn or bury it deeply.
- Burn or deeply bury the dead animal far from where water is collected and where household activities take place.
    - Burning a dead animal is best in areas with many people and where space is too small to safely bury the dead animal
    - Choose a burial location that is far from water sources, such as wells, rivers, and lakes, and is not used by animals.
    - Burn to ash or deeply bury the animal in a pit that is at least four arm lengths deep (two meters) and cover it with soil properly.
- Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools you used to move the dead animal and put them in the sun to dry. Then immediately wash your hands and arms, with soap and clean, running water.
- Remove the glasses and mask or cloth from your face; wash them immediately with soap and clean, running water or with disinfectant; and hang them in the sun to dry.
- If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
- Wash your hands and arms immediately with soap and clean, running water.

- Never dig up a dead animal that has been buried.

ALWAYS WASH YOUR HANDS AFTER ANY INTERACTION WITH AN ANIMAL

- We use our hands for many things, and we can easily spread sickness when we touch something that carries the sickness and then touch our eyes, nose, mouth, another person or animal, food, and other things.
- Washing our hands frequently with soap and clean, running water is one of the best ways to keep healthy and help stop the spread of monkeypox.
- Washing our hands with soap and clean, running water after touching an animal and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from animals to ourselves and our families.
- Always wash your hands and arms with soap and clean, running water immediately after any contact with an animal, even if it looks healthy, because animals do not always show signs and symptoms of sicknesses.

REDUCE ANIMALS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

- Keep your house in good repair to make it difficult for unwanted animals such as rats and monkeys to enter and make their home there.
    - Close contact with these animals and their body fluids, such as urine, feces, blood, snot, and saliva, can allow monkeypox to spread from infected animals to us and our families.
- Clean and sweep the house every day so that animals including monkeys are less likely to enter inside.

- Close contact with animals and their body fluids, such as pee-pee, poo-poo, blood, snot, and spit, can allow sicknesses to spread from monkeys, rats, and other animals to us and our families.

- When sweeping your house after animals have been in the house, always make sure to:
  - Cover your nose and mouth with a mask or clean cloth so the sickness cannot enter.
  - Wet the floor with water before sweeping to keep dust from spreading in the air.
  - Clean the area around the house and throw the dirt far away from the house.
  - Remove the mask or cloth from your face and wash it immediately with soap and clean, running water.
- Always wash your hands and arms with soap and clean, running water immediately after cleaning or sweeping an area where animals have been.
- Regularly wash the floors, mats, and walls; clothes and blankets; and all of the food and water covers and containers to remove any animal pee-pee and poo-poo.

PROTECT FOOD AND WATER AND FOOD PREPARATION AREAS FROM ANIMALS

- Monkeypox can spread from animals to people when we touch, eat, or drink something that has body fluids such as pee-pee, poo-poo, blood, snot, or spit of an animal that has monkeypox virus on or in it.
- Avoid eating fruit that has been bitten by animals.
  - Do not eat any part of the bitten fruit.
  - Do not give the bitten fruit to an animal to eat.
- Always wash all fruits and vegetables with water before cooking or eating.
- Always cover food and water and their containers to make sure animal pee-pee, poo-poo, blood, snot, spit, and other body fluids cannot enter.
- Keep food and water in covered containers that animals cannot enter, and keep the containers away from where people sleep.
  - This helps to avoid close contact with rats and other animals and to stop animals from visiting and eating and drinking your food and water.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from animal pee-pee or poo-poo.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- To keep your family and friends healthy, do not prepare food when you are sick.

SEEK IMMEDIATE CARE AT A HEALTH FACILITY IF YOU OR SOMEONE YOU KNOW HAS SYMPTOMS OF MONKEYPOX OR BECAME SICK AFTER CONTACT WITH AN ANIMAL

- If you have any of the signs and symptoms of monkeypox, go to your nearest health facility, call 4455, or a community health worker right away.
  - Getting early treatment for monkeypox can save lives.

- Getting early treatment can also protect your family and loved ones from getting monkeypox.
- When someone gets early care and treatment, they have a better chance at healing quickly and with fewer problems.

- If you have signs and symptoms of monkeypox, make sure to call your health worker if you have had recent contact with any animal or spent time in an area where animals live, visit, or are kept.
  - Keep to one area, away from other people and animals (isolate) until the rash/bump dries up and falls off to reduce the chance of spreading the sickness.
  - Avoid all types of close face-to-face, skin-to-skin, mouth-to-mouth, or mouth-to-skin contact, including all types of sex until the rash/bump has completely disappeared and a fresh layer of skin has appeared.
  - Avoid sharing personal items like clothes, eating utensils, phones, and bedding, until the rash/bump has completely disappeared and a fresh layer of skin has appeared.
  - Avoid traveling if you have a fever and a rash/bump, and seek immediate advice of a health worker at your closest health facility.
  - Tell health workers about every person you have had close contact with so the health authorities can help them to immediately receive treatment if signs and symptoms appear.
- If a person gets sick or dies after contact with an animal, do not touch the person, their body fluids such as pee-pee, poo-poo, blood, snot, spit, and birthing fluids, or any items they or their body fluids have touched.
- Touching the body of a sick or dead person, their body fluids, or items they or their body fluids touched can spread sickness to other people.
- If a person gets sick or dies after contact with an animal, go to your nearest health facility or contact a community health worker (veterinary officer, community health animal worker, community health volunteer, community health assistant, community health service supervisor, agriculture extension officer) or surveillance officer, or call 4455.
- Calling a community health worker about any sickness or death after contact with an animal can help county authorities or community health workers find the reason for the sickness or death and can save the lives of others in Liberia.
- Report all deaths of animals to a community health worker or call 4455.
  - Reporting every death helps community health workers to know about the death and to decide if any investigation is needed.

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