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# Chiefdom Manual

One Health Risk Communication Training for  
Chiefdom-Level One Health Structures

2023



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## COMPILED WHO FACTSHEETS & APPROVED MESSAGES

### EBOLA VIRUS DISEASE

- <https://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>

#### KEY FACTS

- Ebola virus disease (EVD), formerly known as Ebola hemorrhagic fever, is a rare but severe, often fatal illness in humans.
- The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission.
- The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.
- Community engagement is key to successfully controlling outbreaks.
- Good outbreak control relies on applying a package of interventions, namely case management, infection prevention and control practices, surveillance and contact tracing, a good laboratory service, safe and dignified burials and social mobilization.
- Vaccines to protect against Ebola are under development and have been used to help control the spread of Ebola outbreaks in Guinea and in the Democratic Republic of the Congo (DRC).
- Early supportive care with rehydration, symptomatic treatment improves survival. There is no licensed treatment proven to neutralize the virus but a range of blood, immunological and drug therapies are under development.
- Pregnant and breastfeeding women with Ebola should be offered early supportive care. Likewise, vaccine, prevention and experimental treatment should be offered under the same conditions as for non-pregnant population.

#### BACKGROUND

The Ebola virus causes an acute, serious illness which is often fatal if untreated. EVD first appeared in 1976 in 2 simultaneous outbreaks, one in what is now Nzara, South Sudan, and the other in Yambuku, DRC. The latter occurred in a village near the Ebola River, from which the disease takes its name.

The 2014–2016 outbreak in West Africa was the largest Ebola outbreak since the virus was first discovered in 1976. The outbreak started in Guinea and then moved across land borders to Sierra Leone and Liberia. The current 2018-2019 outbreak in eastern DRC is highly complex, with insecurity adversely affecting public health response activities.

The virus family Filoviridae includes three genera: Cuevavirus, Marburgvirus, and Ebolavirus. Within the genus Ebolavirus, six species have been identified: Zaire, Bundibugyo, Sudan, Taï Forest, Reston and Bombali. The virus causing the current outbreak in DRC and the 2014–2016 West African outbreak belongs to the Zaire ebolavirus species.

#### TRANSMISSION

It is thought that fruit bats of the *Pteropodidae* family are natural Ebola virus hosts. Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals such as fruit bats, chimpanzees, gorillas, monkeys, forest antelope or porcupines found ill or dead or in the rainforest. Ebola then

spreads through human-to-human transmission via direct contact (through broken skin or mucous membranes) with:

- Blood or body fluids of a person who is sick with or has died from Ebola
- Objects that have been contaminated with body fluids (like blood, feces, vomit) from a person sick with Ebola or the body of a person who died from Ebola

Health-care workers have frequently been infected while treating patients with suspected or confirmed EVD. This occurs through close contact with patients when infection control precautions are not strictly practiced.

Burial ceremonies that involve direct contact with the body of the deceased can also contribute in the transmission of Ebola.

People remain infectious as long as their blood contains the virus.

Pregnant women who get acute Ebola and recover from the disease may still carry the virus in breastmilk, or in pregnancy related fluids and tissues. This poses a risk of transmission to the baby they carry, and to others. Women who become pregnant after surviving Ebola disease are not at risk of carrying the virus.

If a breastfeeding woman who is recovering from Ebola wishes to continue breastfeeding, she should be supported to do so. Her breast milk needs to be tested for Ebola before she can start.

## SYMPTOMS

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The incubation period, that is, the time interval from infection with the virus to onset of symptoms, is from 2 to 21 days. A person infected with Ebola cannot spread the disease until they develop symptoms.

Symptoms of EVD can be sudden and include:

- Fever
- Fatigue
- Muscle pain
- Headache
- Sore throat

This is followed by:

- Vomiting
- Diarrhea
- Rash
- Symptoms of impaired kidney and liver function
- In some cases, both internal and external bleeding (for example, oozing from the gums, or blood in the stools).
- Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes.

## DIAGNOSIS

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It can be difficult to clinically distinguish EVD from other infectious diseases such as malaria, typhoid fever and meningitis. Many symptoms of pregnancy and Ebola disease are also quite similar. Because of risks to the pregnancy, pregnant women should ideally be tested rapidly if Ebola is suspected.

Confirmation that symptoms are caused by Ebola virus infection are made using the following diagnostic methods:

- antibody-capture enzyme-linked immunosorbent assay (ELISA)
- antigen-capture detection tests
- serum neutralization test
- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- electron microscopy
- virus isolation by cell culture

Careful consideration should be given to the selection of diagnostic tests, which take into account technical specifications, disease incidence and prevalence, and social and medical implications of test results. It is strongly recommended that diagnostic tests, which have undergone an independent and international evaluation, be considered for use.

Current WHO recommended tests include:

- Automated or semi-automated nucleic acid tests (NAT) for routine diagnostic management.
- Rapid antigen detection tests for use in remote settings where NATs are not readily available. These tests are recommended for screening purposes as part of surveillance activities, however reactive tests should be confirmed with NATs.

The preferred specimens for diagnosis include:

- Whole blood collected in ethylenediaminetetraacetic acid (EDTA) from live patients exhibiting symptoms.
- Oral fluid specimen stored in universal transport medium collected from deceased patients or when blood collection is not possible.

Samples collected from patients are an extreme biohazard risk; laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions. All biological specimens should be packaged using the triple packaging system when transported nationally and internationally.

## TREATMENT

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Supportive care - rehydration with oral or intravenous fluids - and treatment of specific symptoms improves survival. There is as yet no proven treatment available for EVD. However, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated.

In the ongoing 2018-2019 Ebola outbreak in DRC, the first-ever multi-drug randomized control trial is being conducted to evaluate the effectiveness and safety of drugs used in the treatment of Ebola patients under an ethical framework developed in consultation with experts in the field and the DRC.

Pregnant and breastfeeding women with Ebola should be offered early supportive care, like general population. Likewise experimental treatment should be offered under the same conditions as for non-pregnant population.

### Vaccines

An experimental Ebola vaccine proved highly protective against EVD in a major trial in Guinea in 2015. The vaccine, called rVSV-ZEBOV, was studied in a trial involving 11 841 people. Among the 5837 people who received the vaccine, no Ebola cases were recorded 10 days or more after vaccination. In comparison, there were 23 cases 10 days or more after vaccination among those who did not receive the vaccine.

The rVSV-ZEBOV vaccine is being used in the ongoing 2018-2019 Ebola outbreak in DRC. Pregnant and breastfeeding women should have access to the vaccine under the same conditions as for the general population.

### PREVENTION AND CONTROL

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Good outbreak control relies on applying a package of interventions, including case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilization. Community engagement is key to successfully controlling outbreaks. Raising awareness of risk factors for Ebola infection and protective measures (including vaccination) that individuals can take is an effective way to reduce human transmission. Risk reduction messaging should focus on several factors:

- **Reducing the risk of wildlife-to-human transmission** from contact with infected fruit bats, monkeys, apes, forest antelope or porcupines and the consumption of their raw meat. Animals should be handled with gloves and other appropriate protective clothing. Animal products (blood and meat) should be thoroughly cooked before consumption.
- **Reducing the risk of human-to-human transmission** from direct or close contact with people with Ebola symptoms, particularly with their bodily fluids. Gloves and appropriate personal protective equipment should be worn when taking care of ill patients. Regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home.
- **Outbreak containment measures**, including safe and dignified burial of the dead, identifying people who may have been in contact with someone infected with Ebola and monitoring their health for 21 days, the importance of separating the healthy from the sick to prevent further spread, and the importance of good hygiene and maintaining a clean environment.
- **Reducing the risk of possible sexual transmission**, based on further analysis of ongoing research and consideration by the WHO Advisory Group on the Ebola Virus Disease Response, WHO recommends that male survivors of EVD practice safer sex and hygiene for 12 months from onset of symptoms or until their semen tests negative twice for Ebola virus. Contact with body fluids should be avoided and washing with soap and water is recommended. WHO does not recommend isolation of male or female convalescent patients whose blood has been tested negative for Ebola virus.

- **Reducing the risk of transmission from pregnancy related fluids and tissue,** Pregnant women who have survived Ebola disease need community support to enable them to attend frequent antenatal care (ANC) visits, to handle any pregnancy complications and meet their need for sexual and reproductive care and delivery in a safe way. This should be planned together with the Ebola and Obstetric health care expertise. Pregnant women should always be respected in the sexual and reproductive health choices they make.

#### CONTROLLING INFECTION IN HEALTH-CARE SETTINGS

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Health-care workers should always take standard precautions when caring for patients, regardless of their presumed diagnosis. These include basic hand hygiene, respiratory hygiene, use of personal protective equipment (to block splashes or other contact with infected materials), safe injection practices and safe burial practices.

Health-care workers caring for patients with suspected or confirmed Ebola virus should apply extra infection control measures to prevent contact with the patient's blood and body fluids and contaminated surfaces or materials such as clothing and bedding. When in close contact (within 1 meter) of patients with EVD, health-care workers should wear face protection (a face shield or a medical mask and goggles), a clean, non-sterile long-sleeved gown, and gloves (sterile gloves for some procedures). Healthcare staff working with ANC or obstetric care should be informed about risks of persisting virus in pregnancy related fluids and encouraged to follow protocol for their own safety and the safety of the women they are caring for.

Laboratory workers are also at risk. Samples taken from humans and animals for investigation of Ebola infection should be handled by trained staff and processed in suitably equipped laboratories.

#### CARE FOR PEOPLE WHO RECOVERED FROM EVD

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A number of medical complications have been reported in people who recovered from Ebola, including mental health issues. Ebola virus may persist in some body fluids, including semen, pregnancy-related fluids and breast milk.

Ebola survivors need comprehensive support for the medical and psychosocial challenges they face and also to minimize the risk of continued Ebola virus transmission. To address these needs, a dedicated program can be set up for care for people who recovered from Ebola.

Ebola virus is known to persist in immune-privileged sites in some people who have recovered from Ebola virus disease. These sites include the testicles, the inside of the eye, and the central nervous system. In women who have been infected while pregnant, the virus persists in the placenta, amniotic fluid and fetus. In women who have been infected while breastfeeding, the virus may persist in breast milk.

Relapse-symptomatic illness in someone who has recovered from EVD due to increased replication of the virus in a specific site is a rare event but has been documented. Reasons for this phenomenon are not yet fully understood.

Studies of viral persistence indicate that in a small percentage of survivors, some body fluids may test positive on reverse transcriptase polymerase chain reaction (RT-PCR) testing for Ebola virus for longer than 9 months.

More surveillance data and research are needed on the risks of sexual transmission, and particularly on the prevalence of viable and transmissible virus in semen over time. In the interim, and based on present evidence, WHO recommends that:

- All Ebola survivors and their sexual partners should receive counselling to ensure safer sexual practices until their semen has twice tested negative. Survivors should be provided with condoms.
- Male Ebola survivors should be offered semen testing at 3 months after onset of disease, and then, for those who test positive, every month thereafter until their semen tests negative for virus twice by RT-PCR, with an interval of one week between tests.
- Ebola survivors and their sexual partners should either:
  - abstain from all types of sex, or
  - observe safer sex through correct and consistent condom use until their semen has twice tested negative.
- Having tested negative, survivors can safely resume normal sexual practices without fear of Ebola virus transmission.
- Based on further analysis of ongoing research and consideration by the WHO Advisory Group on the Ebola Virus Disease Response, WHO recommends that male survivors of Ebola virus disease practice safe sex and hygiene for 12 months from onset of symptoms or until their semen tests negative twice for Ebola virus.
- Until such time as their semen has twice tested negative for Ebola, survivors should practice good hand and personal hygiene by immediately and thoroughly washing with soap and water after any physical contact with semen, including after masturbation. During this period, used condoms should be handled safely, and safely disposed of, so as to prevent contact with seminal fluids.
- All survivors, their partners and families should be shown respect, dignity and compassion.

## WHO RESPONSE

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WHO aims to prevent Ebola outbreaks by maintaining surveillance for Ebola virus disease and supporting at-risk countries to develop preparedness plans.

When an outbreak is detected WHO responds by supporting community engagement, disease detection, contact tracing, vaccination, case management, laboratory services, infection control, logistics, and training and assistance with safe and dignified burial practices.

## APPROVED EBOLA MESSAGES



## ABOUT EBOLA

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Ebola can be spread to others through direct contact (through broken skin or mucous membranes in, for example, the eyes, nose, or mouth) with:

- blood or body fluids (including but not limited to urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with Ebola
- objects (like needles and syringes) that have been contaminated with body fluids from a person who is sick with Ebola or the body of a person who has died from Ebola
- infected fruit bats or primates (apes and monkeys)

Ebola is not spread through the air, by water, or in general, by food.

- There is no evidence that mosquitoes or other insects can transmit Ebola virus. Only a few species of mammals (e.g., humans, bats, monkeys, and apes) have shown the ability to become infected with and spread Ebola virus.
- Fruits and vegetables, such as mangos, should be washed before eating. These products should not be eaten if they have been bitten by bat (bat mot) or an infected human, monkey or ape.

## AMBULANCES AND EBOLA

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Ambulances take sick people to get medical care at a clinic, hospital, or Ebola Treatment Unit.

Ambulances are the best and safest way to go to the hospital to get treatment.

- Ambulance drivers will treat you with respect. The ambulance team will help if you cannot walk on your own.
- Ambulance drivers have been asked to turn off their sirens, but sometimes, they use them to warn people and vehicles to not get in the way so that they can get to the sick person quickly.
- Ambulance teams wear protective clothing (PPE) to keep you, others, and themselves safe while working with sick people.
- When you are in the ambulance, the ambulance team may start giving you medical care.

Ambulance teams use chlorine to kill Ebola. Chlorine spray will not harm you.

- The ambulance will smell like chlorine, but the ambulance has plenty of air and is safe. People in the ambulance will be able to breathe freely.
- The stretcher is cleaned with chlorine after each patient leaves, so the stretcher will be clean and safe for the next person.
- You may be able to smell chlorine but the smell is not dangerous.

## BREASTFEEDING AND EBOLA

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Ebola can stay in breast milk even after you feel better.

- If you have survived Ebola, it is best not to breastfeed IF you have other safe ways to feed your baby. But if there is no other way to feed your baby safely, breastfeeding will still provide the nutrition your baby needs.

## BURIALS – SAFE, DIGNIFIED, MEDICAL

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It is very dangerous to touch the body of someone who is very sick or has died of Ebola—before, during, and after burial.

- Contact with a person who is dying or a dead body is a common way people are infected with Ebola.

- As a person becomes sicker and dies of Ebola, the amount of virus in the body increases.
- Touching a dead body is one of the most common ways people are infected with Ebola in Sierra Leone.

Calling 117 for safe, dignified medical burials is a way to show respect for the person who has died while keeping yourself and your family safe.

- Not touching the sick and calling 117 quickly will help protect Mama Salone.
- During this crisis, all deaths should be handled as if they could be Ebola.
- Call 117 or district call centers to report all deaths.

When someone dies of Ebola, the virus remains in the body and spreads easily.

- The dead body should only be handled by people who are trained in safe medical burial practices and are wearing protective equipment.
- Washing the body and changing the clothes of a loved one who has died can spread the Ebola virus.
- Protect yourself:
  - Do not touch, wash, or clean a person who is dying or has died.
  - Do not touch body fluids of a dead person or anything a person who has died from Ebola touched while they were sick.
  - Keep people away from the home.

Practicing safe, dignified medical burials is a way to show respect for the person who has died while keeping yourself, your family, and your community safe from Ebola. Until we get to zero, we have to stop practices that spread Ebola.

- Ebola does not change our respect and love for those who have died. However, for now we must stop practices that transmit Ebola. Safe burials are a way to show respect and honor those who have died.
- We all have a role in stopping the spread of Ebola and ensuring that our communities practice safe burials.
- Family and community members can pray for their loved one from a safe distance, and still make some decisions about the funeral while the body is being removed.

## BURIAL TEAMS

Burial teams can help make sure Ebola does not spread and can protect you, your family, and your community.

- After you call 117 or district alert line, someone will come investigate a reported death.
- A burial team of trained individuals arrive and a member of the burial team will talk to you about the death.
- The other burial team members will put on protective equipment to safely remove the body of the person who has died.
- Burial teams will help families understand the need for a safe, dignified, medical burial and will treat the body with respect.

The burial team will determine if a sample to test for Ebola should be collected from the body.

- If the burial team needs to test for Ebola, they will collect a swab sample from the mouth of the person who has died and send it to the laboratory to test for Ebola.
- Test results for Ebola may take 2-3 days.
- To keep you, your family, and your community safe, the burial team must remove the body quickly and can't wait for test results.
- The person who died will be placed in a protective body bag by the burial team.

- The burial team will remove the body from the house in a protective body bag, and take the body to a cemetery or burial space to safely bury the body.

To protect you and your family the burial team will disinfect the house with a safe chlorine solution.

- All items that the person who died touched such as a mattress and clothing should be taken from the house and not used by anyone else. Mattresses that have been burned will be replaced.
- If a swab was taken and sent to the laboratory, a health official will follow-up with the family to share the results of the Ebola test.

### CELEBRATE SURVIVORS

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People who survive Ebola need hope and social support from family, friends and the community. We must honor those who have survived Ebola! We are all Ebola fighters!

- Accept survivors and welcome them as heroes back into your family and your community.
- It is safe to be around someone who has survived Ebola.
- If a person has survived and recovered from Ebola, they can no longer spread Ebola to others through casual contact.

### CHLORINE

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Chlorine is a chemical used to clean. It is mixed with water to kill germs and viruses like Ebola. Healthcare workers use chlorine spray to kill viruses like Ebola. Chlorine spray will not harm you.

- Burial teams, ambulance workers, health care workers and other Ebola responders use a chlorine spray to kill Ebola in ambulances, at the patient's home, and at burial sites.
- Healthcare workers know how to mix chlorine safely so that it kills germs and protects you.
- You may be able to smell chlorine but the smell is not dangerous.

### CONTACT TRACING

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Contact tracing helps people who may have been exposed to Ebola get care quickly if they show symptoms of Ebola. Contact Tracers are working hard to try to stop Ebola from spreading.

- Health workers will visit the house every day for 21 days to check if anyone develops Ebola symptoms. Please cooperate with local health teams in their contact tracing efforts.
- Contact tracers will find and interview every person who came in contact with the person who died from Ebola.
- A person is a contact if they:
  - Slept in the same house with an Ebola patient
  - Touched the body or body fluids of an Ebola patient
  - Touched items from an Ebola patient

Contact tracing helps people who may have been exposed to Ebola get care quickly if they show symptoms of Ebola.

- Contact tracers will visit the house every day for 21 days to make sure no one in the house becomes sick.
- Everyone in the house will be quarantined- they will have to stay at home for 21 days without leaving the house or letting anyone else in the house.

### EARLY SYMPTOMS/EARLY TREATMENT

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The first Ebola symptoms are fever, chills, weakness, and headache. These are very similar to malaria symptoms.

- To be safe, think of these symptoms as if it could be Ebola and call 117 or your district hotline.
- If you are sick, show your love by staying 1 meter away from your family while you wait.

Call 117 at the first sign of Ebola symptoms to protect yourself, your family, and your community. If you don't have a way to call 117, contact your chief or a social mobiliser.

- Protect yourself and stay safe while you wait. Do not touch the sick person, their body fluids, or anything they touched.
- Support the sick person by giving them as much liquids as they can drink and oral rehydration solution (ORS).
- Show love by keeping a safe distance. Stop Ebola from hurting your family and future.
- Early care helps the sick person and can help protect others in the family.
- Encourage the sick person to drink plenty of Oral Rehydration Solution (ORS), water or other liquids.
- Show love by keeping a safe distance from your family if you are sick.

Early medical care saves lives.

- Early medical treatment at an (ETU) can significantly improve your chances of survival and can save your family from further exposure.
- The later signs of Ebola are vomiting and diarrhea. If you wait until these symptoms appear, you are reducing your chances of survival, and you risk infecting your family and loved ones.
- Patients who go to an Ebola Treatment Unit (ETU) or Community Care Center (CCC) are protecting their families and loved ones by helping to prevent infections in more family members.

### EBOLA NEGATIVE TEST RESULTS

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It is great news when your Ebola test is negative. But remember, you can still get Ebola and you need to take steps to keep you, your family, and Mama Salone safe.

- Keep your test result letter with you. Others may want proof that you tested negative for Ebola.
- Avoid contact with others. A health care worker will visit your home every day for 21 days to monitor your health and refer you to treatment if you get sick.

Show that you care and continue to protect yourself, your family, and your community.

- Wash your hands frequently with soap and water.
- Keep a safe distance from others (1.5 meters).
- Treat any death as if it could be Ebola and call 117 or your district hotline for a medically safe and dignified burial.
- Do not touch body fluids of a dead person or anything a person who has died from Ebola touched while they were sick.
- Be watchful of symptoms that include a fever greater 37.5 degrees Celsius, severe headache, muscle pain, diarrhea, vomiting, abdominal pain or unexplained bleeding.
- Call 117 or your district hotline immediately if you think you have Ebola symptoms again.
- Share your story with others. Tell your friends, family and community that you are glad you got tested and know your results.
- Let other know that if they develop symptoms, they should call 117 right away to keep their family and community safe.

### QUARANTINE

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When someone in your house has been confirmed to have Ebola, anyone who had direct contact with them will have to stay at home “in quarantine” for 21 days. This is how long it can take to develop Ebola symptoms.

- Quarantine will help us stop the spread of Ebola. We know it can be difficult, but it is necessary to keep you, your family, and your community safe.
- After 21 days, if no one has symptoms of Ebola, you will be released from quarantine.

During the 21-day period, a contact tracer will visit your home every day to check if anyone has become sick. Let them know if anyone in your home has Ebola symptoms — a fever greater than 37.5°C, severe headache, muscle pain, diarrhea, vomiting, stomach pain or unexplained bleeding.

- Food and supplies will be left for your family to pick up. Do not take food or any other items out of the quarantined area until the quarantine is declared over.
- Security (military or police) personnel will help make sure your family stays safe and that no one leaves or enters the quarantined area. Security personnel can call 117 for you if someone develops Ebola symptoms, and they can contact the District Ebola Response Center (DERC) if there are problems with the delivery of food and supplies.

If someone gets sick in your home during the 21-day period, call 117 immediately to get them quickly to medical treatment. Do this to help stop Ebola from spreading to other people in your home. If the sick person is confirmed to have Ebola, a new 21-day period must start again.

- Continue to protect yourself, your family, and your community from Ebola.
  - Wash your hands frequently with soap and water.
  - Keep a safe distance between you and others. Do not touch a sick person or their body fluids.
  - Early treatment saves lives. Call 117 or your district number at the first sign of Ebola symptoms: a fever greater than 37.5°C, severe headache, muscle pain, diarrhea, vomiting, stomach pain or unexplained bleeding.
  - Treat any death as if it could be Ebola and call 117 or your district number when someone dies. Practice safe and dignified medical burials.
  - Do not touch the body of someone who has died from Ebola. Do not touch anything a person who has died from Ebola has touched.

We all have a responsibility to protect ourselves, our families, and our communities from Ebola. You can encourage others to make the decision to keep everyone safe by always calling 117 at the first sign of symptoms and for every death in the community.

## STIGMA

There are over 2,000 Ebola survivors in Sierra Leone. Survivors are heroes. People who survive Ebola need hope and support from family, friends and the community, not to be isolated or stigmatized.

- Do not stigmatize Ebola survivors, isolate them from their communities, or arrest them because they had the disease.
- Stigma and social isolation of survivors will not help efforts to stop the spread of Ebola in Sierra Leone. In fact, it may discourage people with Ebola symptoms from seeking care and put themselves and their community at risk.
- Survivors and families affected by Ebola or stigma can get help by calling 117 or district hotlines. District Command Centres are operational to support the response in all districts.
- Our health care workers, ambulance workers, contact tracers, and burial teams are heroes taking care of people sick with Ebola.
- They are risking their lives to save yours.
- Cooperate with them and treat them with respect and dignity.
- Speak out against negative comments or negative behaviours.

## SEXUAL TRANSMISSION

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Ebola survivors should not have sex for at least 3 months after recovery. If that is not possible, survivors should use a condom every time they have sex. It is otherwise safe to be around this person.

- Scientists continue to study Ebola and whether or not it can be spread through sex, and if so, for how long.
- Ebola survivors cannot spread the virus to others through casual contact. Although the virus is gone from blood and most other body fluids, the virus can stay in semen for 3 months or longer.
- As a safety measure, Ebola survivors (both men and women) should not have any sex (oral, vaginal, or anal) for at least three months. If they do have sex, they should use a condom every time. Condoms may help prevent the spread of disease to sexual partners.

## MARBURG VIRUS DISEASE

- <https://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>

## KEY FACTS

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- Marburg virus disease (MVD), formerly known as Marburg hemorrhagic fever, is a severe, often fatal illness in humans.
- The virus causes severe viral hemorrhagic fever in humans.
- The average MVD case fatality rate is around 50%. Case fatality rates have varied from 24% to 88% in past outbreaks depending on virus strain and case management.
- Early supportive care with rehydration, and symptomatic treatment improves survival. There is as yet no licensed treatment proven to neutralize the virus, but a range of blood products, immune therapies and drug therapies are currently under development.
- *Rousettus aegyptiacus*, fruit bats of the Pteropodidae family, are considered to be natural hosts of Marburg virus. The Marburg virus is transmitted to people from fruit bats and spreads among humans through human-to-human transmission.
- Community engagement is key to successfully controlling outbreaks.

## BACKGROUND

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Marburg virus is the causative agent of Marburg virus disease (MVD), a disease with a case fatality ratio of up to 88%, but can be much lower with good patient care. Marburg virus disease was initially detected in 1967 after simultaneous outbreaks in Marburg and Frankfurt in Germany; and in Belgrade, Serbia.

Marburg and Ebola viruses are both members of the Filoviridae family (filovirus). Though caused by different viruses, the two diseases are clinically similar. Both diseases are rare and have the capacity to cause outbreaks with high fatality rates.

There have been a number of recent Marburg outbreaks in the Africa region, including one case in 2021 in the southern prefecture of Gueckedou, Guinea (1/1 died – 100% case fatality rate), four cases in Ghana in 2022 (3/4 died – 75% case fatality rate), 25 cases in Equatorial Guinea in 2023 (11/25 died – 44% case fatality rate), and 8 cases in Tanzania (5/8 died – 63% case fatality rate).

## TRANSMISSION

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It is thought that *Rousettus aegyptiacus*, or fruit bats, are the natural hosts of Marburg virus. The Marburg virus is transmitted to people from fruit bats and spreads among humans through human-to-human transmission. Initially, it is believed that a person becomes infected by a fruit bat after prolonged exposure to mines or caves by fruit bat colonies.

Marburg spreads through human-to-human transmission via 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.

Health-care workers have frequently been infected while treating patients with suspected or confirmed MVD. This has occurred through close contact with patients when infection control precautions are not strictly practiced. Transmission via contaminated injection equipment or through needle-stick injuries is associated with more severe disease, rapid deterioration, and, possibly, a higher fatality rate.

Burial ceremonies that involve direct contact with the body of the deceased can also contribute in the transmission of Marburg.

People remain infectious as long as their blood contains the virus.

## SYMPTOMS

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The incubation period, that is, the time interval from infection with the virus to onset of symptoms, is from 2 to 21 days.

Illness caused by Marburg virus begins abruptly. In the first five days of symptoms, a person may experience:

- High fever
- Severe headache
- Severe malaise.
- Muscle aches and pains.
- Severe watery diarrhea, abdominal pain and cramping
- Nausea and vomiting can begin on the third day

Patients in the first week of their illness has been described as showing “ghost-like” drawn features, deep-set eyes, expressionless faces, and extreme lethargy. In the 1967 European outbreak, non-itchy rash was a feature noted in most patients between 2 and 7 days after onset of symptoms.

From day 5, most patients develop:

- severe hemorrhagic manifestations (fatal cases usually have some form of bleeding, often from multiple areas)
- Fresh blood in vomit and feces, as well as bleeding from the nose, gums, and vagina
- Spontaneous bleeding at venipuncture sites (where intravenous access is obtained to give fluids or obtain blood samples) can be particularly troublesome.
- Sustained high fevers
- Mental health signs, such as confusion, irritability, and aggression
- Orchitis (inflammation of one or both testicles) has been reported occasionally in the late phase of disease (15 days).

## DIAGNOSIS

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It can be difficult to clinically distinguish Marburg from other infectious diseases malaria, typhoid fever, shigellosis, meningitis and other viral hemorrhagic fevers.

Confirmation that symptoms are caused by Marburg virus infection are made using the following diagnostic methods:

- antibody-capture enzyme-linked immunosorbent assay (ELISA)
- antigen-capture detection tests
- serum neutralization test
- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- electron microscopy
- virus isolation by cell culture

Samples collected from patients are an extreme biohazard risk; laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions. All biological specimens should be packaged using the triple packaging system when transported nationally and internationally.

## TREATMENT

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Supportive care - rehydration with oral or intravenous fluids - and treatment of specific symptoms improves survival. There is as yet no proven treatment available for Marburg virus. However, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated.

### Vaccines

In May 2020, the EMA granted a marketing authorisation to Zabdeno (Ad26.ZEBOV) and Mvabea (MVA-BN-Filo) against EVD. The Mvabea contains a virus known as Vaccinia Ankara Bavarian Nordic (MVA) which has been modified to produce 4 proteins from Zaire ebolavirus and three other viruses of the same group (filoviridae). The vaccine could potentially protect against MVD, but its efficacy has not been proven in clinical trials.

## PREVENTION AND CONTROL

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Good outbreak control relies on using a range of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe and dignified burials, and social mobilization. Community engagement is key to successfully controlling outbreaks. Raising awareness of risk factors for Marburg infection and protective measures that individuals can take is an effective way to reduce human transmission.

Risk reduction messaging should focus on several factors:

- **Reducing the risk of bat-to-human transmission** arising from prolonged exposure to mines or caves inhabited by fruit bat colonies. During work or research activities or tourist visits in mines or caves inhabited by fruit bat colonies, people should wear gloves and other appropriate protective clothing (including masks). During outbreaks all animal products (blood and meat) should be thoroughly cooked before consumption.
- **Reducing the risk of human-to-human transmission** in the community arising from direct or close contact with infected patients, particularly with their body fluids. Close physical contact with Marburg patients should be avoided. Gloves and



appropriate personal protective equipment should be worn when taking care of ill patients at home. Regular hand washing should be performed after visiting sick relatives in hospital, as well as after taking care of ill patients at home.

- **Communities affected by Marburg** should make efforts to ensure that the population is well informed, both about the nature of the disease itself and about necessary outbreak containment measures.
- **Prompt, safe and dignified burial** of the deceased, identifying people who may have been in contact with someone infected with Marburg and monitoring their health for 21 days, separating the healthy from the sick to prevent further spread and providing care to confirmed patient and maintaining good hygiene and a clean environment need to be observed.
- **Reducing the risk of possible sexual transmission.** Based on further analysis of ongoing research, WHO recommends that male survivors of Marburg virus disease practice safer sex and hygiene for 12 months from onset of symptoms or until their semen twice tests negative for Marburg virus. Contact with body fluids should be avoided and washing with soap and water is recommended. WHO does not recommend isolation of male or female convalescent patients whose blood has been tested negative for Marburg virus.

#### CONTROLLING INFECTION IN HEALTH-CARE SETTINGS

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Healthcare workers should always take standard precautions when caring for patients, regardless of their presumed diagnosis. These include basic hand hygiene, respiratory hygiene, use of personal protective equipment (to block splashes or other contact with infected materials), safe injection practices and safe and dignified burial practices.

Healthcare workers caring for patients with suspected or confirmed Marburg virus should apply extra infection control measures to prevent contact with the patient's blood and body fluids and contaminated surfaces or materials such as clothing and bedding. When in close contact (within 1 meter) of patients with MVD, health-care workers should wear face protection (a face shield or a medical mask and goggles), a clean, non-sterile long-sleeved gown, and gloves (sterile gloves for some procedures).

#### CARE FOR PEOPLE WHO RECOVERED FROM MARBURG

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Ongoing presence and potential reactivation of Marburg virus is not yet well understood. Additional research and inquiry is needed to better understand the ongoing risk for Marburg survivors. In the interim, Marburg virus is known to persist in immune-privileged sites in some people who have recovered from Marburg virus disease. These sites include the testicles and the inside of the eye.

- In women who have been infected while pregnant, the virus persists in the placenta, amniotic fluid and fetus.
- In women who have been infected while breastfeeding, the virus may persist in breast milk.

Relapse-symptomatic illness in the absence of re-infection in someone who has recovered from MVD is a rare event, but has been documented. Reasons for this phenomenon are not yet fully understood.

Marburg virus transmission via infected semen has been documented up to seven weeks after clinical recovery. More surveillance data and research are needed on the risks of sexual transmission, and particularly on the prevalence of viable and transmissible virus in semen over time. In the interim, and based on present evidence, WHO recommends that:

- Male Marburg survivors should be enrolled in semen testing programs when discharged (starting with counselling) and offered semen testing when mentally and physically ready, within three months of disease onset. Semen testing should be offered upon obtention of two consecutive negative test results.
- All Marburg survivors and their sexual partners should receive counselling to ensure safer sexual practices until their semen has twice tested negative for Marburg virus.
- Survivors should be provided with condoms.
- Marburg survivors and their sexual partners should either:
  - abstain from all sexual practices, or
  - observe safer sexual practices through correct and consistent condom use until their semen has twice tested undetected (negative) for Marburg virus.
- Having tested undetected (negative), survivors can safely resume normal sexual practices with minimized risk of Marburg virus transmission.
- Male survivors of Marburg virus disease should practice safer sexual practices and hygiene for 12 months from onset of symptoms or until their semen twice tests undetected (negative) for Marburg virus.
- Until such time as their semen has twice tested undetected (negative) for Marburg, survivors should practice good hand and personal hygiene by immediately and thoroughly washing with soap and water after any physical contact with semen, including after masturbation. During this period used condoms should be handled safely, and safely disposed of, so as to prevent contact with seminal fluids.
- All survivors, their partners and families should be shown respect, dignity and compassion.

## WHO RESPONSE

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WHO aims to prevent Marburg outbreaks by maintaining surveillance for Marburg virus disease and supporting at-risk countries to develop preparedness plans. When an outbreak is detected WHO responds by supporting surveillance, community engagement, case management, laboratory services, contact tracing, infection control, logistical support and training and assistance with safe burial practices.

## APPROVED MARBURG MESSAGES

### ABOUT MARBURG

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- Marburg is a sickness that can make animals and people sick.
- Marburg causes a serious sickness in people and can even cause death.
- Marburg is not common, but once a person gets sick with Marburg, it can spread quickly from person to person.

- Marburg mainly lives in a type of bat that eats fruits and sleeps in caves.
- People most likely to get Marburg from bats are people that visit areas where bats live, especially caves, and that hunt, butcher, and eat bats.
- Bats with Marburg do not get sick but can still spread the sickness to other bats and to people.
- Because bats do not show signs and symptoms of Marburg, 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 MARBURG IN BATS

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- Bats do not show the signs and symptoms of Marburg, but can still spread the sickness to other bats and to people.
- Because bats do not show signs and symptoms of Marburg, 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 MARBURG IN PEOPLE

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- Many of the signs and symptoms of Marburg 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.
- Signs and symptoms of Marburg in people include:
  - Fever
  - Headache
  - Weakness
  - Diarrhea
  - Stomach and body pain
  - Bleeding from the nose or mouth
  - Bloody toilet or vomit

#### THE DIFFERENT WAYS MARBURG IS SPREAD

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- Marburg can spread from a bat to a person through:
  - Touching bats or the spit, wet, blood, toilet, or body parts of a bat with Marburg.
  - Touching surfaces, such as the inside of a cave, and items that a bat with Marburg or its spit, wet, blood, or toilet have touched.
  - Eating or drinking something that a bat with Marburg or its spit, wet, blood, or toilet have touched.
- Actions that make it more likely for Marburg to spread from bats to people include:
  - Touching bats.
  - Hunting, butchering, 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.
- Marburg can spread from person to person through:
  - Touching the body, blood, wet, toilet, vomit, or other body fluids of a person who is sick with or has died from Marburg.
  - Touching surfaces and items such as clothing or bedding that the body fluids of a person with Marburg have touched.
  - Unprotected sex with a person who is or has been sick with Marburg.
- Marburg enters a person's body through:
  - The mouth, nose, or eyes.
  - An opening in the skin like a cut or sore.
  - The private parts through unprotected sex.

#### HOW TO PROTECT AGAINST MARBURG

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- There are actions we can take to protect ourselves and our families from Marburg.
- Bats live all around us, so it is important we learn how to live with them safely.
- Trying to kill or chase all the bats from an area does not work and can actually make it *more* likely that Marburg and other sicknesses can spread from bats to people.
  - To keep you, your loved ones, and community healthy, do not kill or chase all the bats from an area.
- Bats are important for the environment. They help our plants, forests, and crops to grow well.
  - Some bats eat fruits and spread the seeds so that plants can become plenty and grow more fruits.
  - Some bats eat the insects that damage the crops that we eat.
- Because bats do not show signs and symptoms of Marburg, you cannot tell for sure which bats have the sickness. That is why it is important to avoid contact with all bats.

#### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD BATS

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- Bats can have different sicknesses, like Marburg, and do not show signs and symptoms of sickness, so it is important to avoid contact with all bats.
- Always wash your hands and arms with soap and water immediately after any contact with a bat, even if it looks healthy, because we cannot see the signs and symptoms of Marburg in bats.

- Do not try to kill or chase all the bats from an area.
  - Trying to kill or chase all the bats from an area does not work and can actually make it more likely that Marburg 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 body fluids of a bat.
  - To reduce contact with bats, avoid areas where plenty bats live or visit.
- Avoid visiting caves, including using caves for shelter or cultural ceremonies.
  - The bats that can have Marburg live mostly in caves. Touching bats, their body fluids such as spit, wet, blood, and toilet and surfaces or items that their body fluids have touched are ways that Marburg can spread from bats to people.
  - People who go into caves should be careful not to come in contact with bat body fluids, including touching surfaces and then touching their mouth, nose, eyes, or any opening in their skin like a cut or sore.
  - Always wash your hands and arms with soap and water immediately after visiting a cave.
  - If possible, protect yourself from coming into contact with any bat body fluids in the cave. Wear a head covering to protect your head and rubber gloves to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth.
  - After leaving the cave, wash the rubber gloves well with soap and water. Remove the head covering, glasses, and mask or cloth from your face and wash them immediately with soap and water. Place them along with the clean gloves in the sun to dry.
  - Then wash your hands and arms immediately with soap and water.
- Do not hunt, kill, butcher, prepare for cooking, or eat any bat, even if it looks healthy. Bats with Marburg 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 spit, wet, blood, and toilet are ways that Marburg can spread from bats to people.
  - Marburg lives in the meat and body fluids of bats with the sickness, so touching those things during butchering can make it easy for Marburg to spread to a person.
- When possible, avoid contact with bats.
- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any bat that looks sick or that you find dead. Even though bats do not show signs and symptoms of Marburg, a sick or dead bat may be a sign of some other sickness.
- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about a bat that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.
- Do not touch with bare hands the body or body fluids, such as spit, wet, blood, and toilet, of a bat. Bats with Marburg do not show signs and symptoms of sickness, but can spread their sickness to us if we touch them or their body fluids.
- Never prepare or eat, sell, or give away a bat that you find dead. Bats you find dead can spread

their sickness to those who touch them.

#### DISPOSE OF DEAD BATS SAFELY

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- If an animal health worker does not respond in one day to advise on how to dispose of a dead bat safely, it is important to dispose of the bat 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.
- To dispose of a dead bat safely, carefully 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 plenty people and where space is too small to safely bury the dead bat.
- Touching bats and their body fluids such as spit, wet, blood, or toilet are ways that Marburg can spread from bats to people. To dispose of a dead bat safely, do not touch with bare hands the body or body fluids of the bat.
  - Wear rubber gloves or plastic bags that cannot be easily pierced to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so any sickness cannot enter.
  - If rubber gloves or plastic bags are not available, use banana leaves, cloth, or some other item to cover the dead bat to avoid touching the bat with your bare hands.
  - 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.
  - If plastic bags are used, remove them carefully so that you do not touch any body fluids of the bat on the plastic. Burn or deeply bury the plastic bags along with the bat and wash your hands and arms immediately with soap and water.
  - If rubber gloves are used, wash the gloves well with soap and water while they are still on your hands.
  - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead bat and place the tools in the sun to dry. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.
- Always wash your hands and arms with soap and water immediately after any contact with a bat, even if it looks healthy, because we cannot always see the signs and symptoms of sickness.
- Never dig up a dead bat that has been buried.

#### TAKE GOOD CARE OF A BAT BITE OR SCRATCH IMMEDIATELY

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- Wash a bat bite or scratch immediately with soap and water 20 times (15 minutes).

- Washing a bite or scratch well with soap and 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, he or she has a better chance at healing quickly and with fewer problems.

### REDUCE BATS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

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- 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 spit, wet, blood, or toilet can make it easier for sicknesses to spread from bats to us and our families.
- When sweeping your house after bats have been in the house, always make sure to:
  - Cover your eyes with glasses and your nose and mouth with a mask or 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 water.
- Always wash your hands and arms with soap and 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 wet and toilet.
- Always cover food and water and their containers to make sure bat spit, wet, and toilet cannot enter. Bat spit, wet, or toilet that enters 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 bats and their spit, wet, or toilet.

### WASH YOUR HANDS AFTER ANY CONTACT WITH A BAT

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- We use our hands for many things, so it is easy for sickness to spread when we touch something with the sickness and then touch our eyes, nose, mouth, another animal or person, food, and other things.

- Washing our hands with soap and water frequently is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and water after touching a bat and cleaning areas where bats have been are some of the best ways we can stop the spread of sickness from a bat to ourselves and our families.
- Always wash your hands with soap and water immediately after touching any bat – even if the bat looks healthy. We cannot always see the signs and symptoms of sickness.
- Adults should help or make sure young children wash their hands well.
- Wash your hands with soap and water:
  - After touching any animal, including bats.
  - After disposing of a dead animal, including bats.
  - After visiting areas where animals, such as bats, live or have been.
  - After touching animal waste or cleaning an area where animals, such as bats, live or have been.
  - Before and after touching raw animal parts or animal products like milk or eggs.
  - Before, during, and after preparing food.
  - Before eating food.
  - Before feeding a child.
  - After using the toilet.
  - After changing diapers or cleaning a baby’s bottom.
  - After blowing your nose, coughing, or sneezing.
  - Before and after visiting or caring for someone who is sick.
  - Before and after treating a cut, bite, or scratch.
- You can stop the spread of sickness by washing your hands well.
  - Soak your hands with 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 water.
  - Dry your hands with a tissue or swing your hands to dry them in the air.

#### STORE AND PREPARE FOOD AND WATER SAFELY

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- Marburg can spread from animals to people when we touch, eat, or drink something that has the body fluids of a bat with Marburg on or in it.
- Do not eat fruit that has been bitten by bats. The type of bats that can have Marburg are mainly fruit-eating bats, and Marburg can spread from bats to people through the spit of the bat.



- 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.
  - The type of bats that can have Marburg are mainly fruit-eating bats. Bats that eat fruit may also wet and toilet on fruits or other crops while they are eating or flying around.
  - Marburg can spread from bats to people through the wet and toilet of the bat, including when people touch or eat something with bat wet or toilet on it.
- Always cover food and water and their containers to make sure bat spit, wet, and toilet cannot enter.
  - Marburg can spread from bats to people through the spit, wet, and toilet of the bat.
  - Bat spit, wet, or toilet that enters 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 wet or toilet.
- 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.

#### WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH A BAT

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- If you have any of the signs and symptoms of Marburg, go to your nearest health facility or community health worker right away.
  - Getting early treatment can save lives.
  - Getting early treatment can also protect your family and loved ones from getting sick.
- If you have signs and symptoms of Marburg, make sure to tell your health worker if you have had recent contact with a bat or spent time in an area where bats live, like a cave.
- If a person gets sick or dies after contact with a bat, go to your nearest health facility or community health worker and tell them about the contact with a bat.
- If a person gets sick or dies after contact with a bat, do not touch the person, their body fluids, or any items they or their body fluids have touched.
- Call 117 to report all deaths.

## LASSA FEVER

- <https://www.who.int/news-room/fact-sheets/detail/lassa-fever>

### KEY FACTS

- Lassa fever is an acute viral hemorrhagic illness of 2-21 days duration that occurs in West Africa.
- The Lassa virus is transmitted to humans via contact with food or household items contaminated with rodent urine or feces.
- Person-to-person infections and laboratory transmission can also occur, particularly in hospitals lacking adequate infection prevention and control measures.
- Lassa fever is known to be endemic in Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria, but probably exists in other West African countries as well.
- The overall case-fatality rate is 1%. Observed case-fatality rate among patients hospitalized with severe cases of Lassa fever is 15%.
- Early supportive care with rehydration and symptomatic treatment improves survival.

### BACKGROUND

Though first described in the 1950s, the virus causing Lassa disease was not identified until 1969. The virus is a single-stranded RNA virus belonging to the virus family **ARENNAVIRIDAE**.

About 80% of people who become infected with Lassa virus have no symptoms. 1 in 5 infections result in severe disease, where the virus affects several organs such as the liver, spleen and kidneys.

Lassa fever is a zoonotic disease, meaning that humans become infected from contact with infected animals. The animal reservoir, or host, of Lassa virus is a rodent of the genus *Mastomys*, commonly known as the “multimammate rat.” *Mastomys* rats infected with Lassa virus do not become ill, but they can shed the virus in their urine and feces.

Because the clinical course of the disease is so variable, detection of the disease in affected patients has been difficult. When presence of the disease is confirmed in a community, however, prompt isolation of affected patients, good infection prevention and control practices, and rigorous contact tracing can stop outbreaks.

Lassa fever is known to be endemic in Benin (where it was diagnosed for the first time in November 2014), Ghana (diagnosed for the first time in October 2011), Guinea, Liberia, Mali (diagnosed for the first time in February 2009), Sierra Leone, and Nigeria, but probably exists in other West African countries as well.

### SYMPTOMS OF LASSA FEVER

The incubation period of Lassa fever ranges from 6–21 days. The onset of the disease, when it is symptomatic, is usually gradual, starting with fever, general weakness, and malaise. After a few days, headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhea,

cough, and abdominal pain may follow. In severe cases facial swelling, fluid in the lung cavity, bleeding from the mouth, nose, vagina or gastrointestinal tract and low blood pressure may develop.

Protein may be noted in the urine. Shock, seizures, tremor, disorientation, and coma may be seen in the later stages. Deafness occurs in 25% of patients who survive the disease. In half of these cases, hearing returns partially after 1–3 months. Transient hair loss and gait disturbance may occur during recovery.

Death usually occurs within 14 days of onset in fatal cases. The disease is especially severe late in pregnancy, with maternal death and/or fetal loss occurring in more than 80% of cases during the third trimester.

### TRANSMISSION

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Humans usually become infected with Lassa virus from exposure to urine or feces of infected *Mastomys* rats. Lassa virus may also be spread between humans through direct contact with the blood, urine, feces, or other bodily secretions of a person infected with Lassa fever. There is no epidemiological evidence supporting airborne spread between humans. Person-to-person transmission occurs in both community and health-care settings, where the virus may be spread by contaminated medical equipment, such as re-used needles. Sexual transmission of Lassa virus has been reported.

Lassa fever occurs in all age groups and both sexes. Persons at greatest risk are those living in rural areas where *Mastomys* are usually found, especially in communities with poor sanitation or crowded living conditions. Health workers are at risk if caring for Lassa fever patients in the absence of proper barrier nursing and infection prevention and control practices.

### DIAGNOSIS

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Because the symptoms of Lassa fever are so varied and non-specific, clinical diagnosis is often difficult, especially early in the course of the disease. Lassa fever is difficult to distinguish from other viral hemorrhagic fevers such as Ebola virus disease as well as other diseases that cause fever, including malaria, shigellosis, typhoid fever and yellow fever.

Definitive diagnosis requires testing that is available only in reference laboratories. Laboratory specimens may be hazardous and must be handled with extreme care. Lassa virus infections can only be diagnosed definitively in the laboratory using the following tests:

- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- antibody enzyme-linked immunosorbent assay (ELISA)
- antigen detection tests
- virus isolation by cell culture.

### TREATMENT AND PROPHYLAXIS

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The antiviral drug ribavirin seems to be an effective treatment for Lassa fever if given early on in the course of clinical illness. There is no evidence to support the role of ribavirin as post-exposure prophylactic treatment for Lassa fever.

There is currently no vaccine that protects against Lassa fever.

## PREVENTION AND CONTROL

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Prevention of Lassa fever relies on promoting good “community hygiene” to discourage rodents from entering homes. Effective measures include storing grain and other foodstuffs in rodent-proof containers, disposing of garbage far from the home, maintaining clean households and keeping cats. Because *Mastomys* rats are so abundant in endemic areas, it is not possible to completely eliminate them from the environment. Family members should always be careful to avoid contact with blood and body fluids while caring for sick persons.

In health-care settings, staff should always apply standard infection prevention and control precautions when caring for patients, regardless of their presumed diagnosis. These include basic hand hygiene, respiratory hygiene, use of personal protective equipment (to block splashes or other contact with infected materials), safe injection practices and safe burial practices.

Health-care workers caring for patients with suspected or confirmed Lassa fever should apply extra infection control measures to prevent contact with the patient’s blood and body fluids and contaminated surfaces or materials such as clothing and bedding. When in close contact (within 1 meter) of patients with Lassa fever, health-care workers should wear face protection (a face shield or a medical mask and goggles), a clean, non-sterile long-sleeved gown, and gloves (sterile gloves for some procedures).

Laboratory workers are also at risk. Samples taken from humans and animals for investigation of Lassa virus infection should be handled by trained staff and processed in suitably equipped laboratories under maximum biological containment conditions.

On rare occasions, travelers from areas where Lassa fever is endemic export the disease to other countries. Although malaria, typhoid fever, and many other tropical infections are much more common, the diagnosis of Lassa fever should be considered in febrile patients returning from West Africa, especially if they have had exposures in rural areas or hospitals in countries where Lassa fever is known to be endemic. Health-care workers seeing a patient suspected to have Lassa fever should immediately contact local and national experts for advice and to arrange for laboratory testing.

## WHO RESPONSE

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The Ministries of Health of Guinea, Liberia and Sierra Leone, WHO, the Office of United States Foreign Disaster Assistance, the United Nations, and other partners have worked together to establish the Mano River Union Lassa Fever Network. The program supports these 3 countries in developing national prevention strategies and enhancing laboratory diagnostics for Lassa fever and other dangerous diseases. Training in laboratory diagnosis, clinical management, and environmental control is also included.

- people.

## APPROVED LASSA FEVER MESSAGES

### ABOUT LASSA FEVER

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- Lassa fever is a virus that makes people sick.
- Lassa fever is spread by a certain type of rat that is common in Sierra Leone.

- People in both rural and urban communities can get Lassa fever
- Lassa fever can range from not too serious to very serious and can even cause death.
- Lassa fever is very dangerous to pregnant women and can lead to death of the mother and unborn baby.

#### SIGNS AND SYMPTOMS OF LASSA FEVER IN RATS

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- 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. That is why it is important to avoid contact with all rats.

#### SIGNS AND SYMPTOMS OF LASSA FEVER IN PEOPLE

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- 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 2 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 toilet 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.

#### THE DIFFERENT WAYS LASSA FEVER IS SPREAD

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- Lassa fever is spread by a certain type of rat that is common in Sierra Leone.
- 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 can spread from a rat to a person through:
  - Eating foods that have been touched by a rat

- Touching the body or wet or toilet of a rat when killing, butchering, and preparing the animal for cooking.
- Touching the items that the wet or toilet of a rat have touched.
- Getting in contact with dust that has wet or toilet of a rat.
- When one person gets sick with Lassa fever, they can easily spread it to others.
- Lassa fever can spread from person to person through:
  - Touching the wet, toilet, blood, vomit, tears, spit, 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 like 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.
- Lassa fever enters a person's body through:
  - An opening in the skin like a cut, scrape, or sore.
  - The mouth, nose, or eyes.
  - The private parts through unprotected sex.

#### HOW TO PROTECT AGAINST LASSA FEVER

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

#### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD RATS

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- Rats can have different sicknesses, like Lassa fever, and not show signs and symptoms of sickness, so it is important to avoid contact with all rats.
- Do not hunt, kill, butcher, prepare for cooking, or eat 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.
- When possible, avoid contact with rats.
- Do not touch with bare hands the body or body fluids, such as wet and toilet, 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.
- Never prepare or eat, sell, or give away a rat that you find dead or alive. Rats you find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and 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.

- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any rat that looks sick or that you find dead. 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.
- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about a rat that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.
- Keeping a cat at home can help you drive away rats in the home

#### DISPOSE OF DEAD RATS SAFELY

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- Safely dispose of dead rats or report to an animal health worker and or community health worker. 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 signs and symptoms of Lassa fever, but can still spread the sickness to other rats and to people, so it is important to dispose of a dead rat safely.
- To dispose of a dead rat safely, carefully bury the dead rat far from where water is collected and where household activities take place.
- Burying a dead rat is the best way to dispose of a rat especially in areas where plenty people live in, and where there is not much space.
- To dispose of a dead rat safely, do not touch with bare hands the body or body fluids of the rat.
  - Wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so the sickness cannot enter.
  - Place the dead rat in a plastic bag and tie it closed.
  - If rubber gloves or plastic bags are not available, use banana leaves, cloth, or some other item to cover the dead rat to avoid touching the rat with your bare hands.
  - Use a shovel, or other tools to move the dead rat to where you can bury it deeply.
  - Deeply bury the dead rat.
  - If plastic bags are used, remove them carefully so that you do not touch any body fluids of the rat on the plastic. Deeply bury the plastic bags along with the rat and wash your hands and arms immediately with soap and clean water.
  - If rubber gloves are used, wash the gloves well with soap and clean water while they are still on your hands.
  - Pour soapy water or disinfectant over the shovel or other tools used to move the dead rat and place the tools in the sun to dry. Then wash your hands and arms, or gloves if using them, immediately with soap and clean water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - If the mask or cloth are reusable, you should disinfect them. If they are not reusable, you should bury them.

- Always wash your hands and arms with soap and 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.
- Never dig up a dead rat that has been buried.

### PREVENT RATS FROM COMING IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

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- Keep a cat at home to drive away rats from the house and surrounding area.
- Always clean your homes and environment to help stop rats from entering your house. Close contact with rats and their wet and toilet can make it easier for Lassa fever to spread from rats with the sickness to you and your family.
- Always close holes and openings in your house, and practices proper storage of food and liquids to prevent rat from entering your homes and surroundings.
- Clean and sweep your house everyday. Close contact with rats and their wet and toilet can make it easier for Lassa fever to spread from rats with the sickness to us and our families.
- Always clean the home and household items (floor, mats, walls, clothes, and blankets) to prevent Lassa fever.
- When sweeping your house after rats have been in the house, always make sure to:
  - Sprinkle water to reduce the dust contents and cover your nose and mouth with mask or cloths
  - 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 mask or cloth from your face and wash them immediately with soap and water after sweeping, gathering and disposing of the dirt.
- Always wash your hands and arms with soap and 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 wet and/or toilet.
- Keep food and water in tight lids that rats cannot enter and away from where people sleep. This helps to avoid close contact with rats and stop rats and other animals from entering 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 wet or toilet.

### WASH YOUR HANDS AFTER ANY CONTACT WITH A RAT

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- We use our hands for many things, so it is easy for sickness to spread when we touch something with the sickness and then touch our eyes, nose, mouth, another animal or person, food, and other things.



- Washing our hands with soap and water frequently is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and water after touching a rat and cleaning areas where rats have been are some of the best ways we can stop the spread of sickness from a rat to ourselves and our families.
- Always wash your hands and arms with soap and 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.
- Adults should help or make sure young children wash their hands well.
- Wash your hands with soap and water:
  - After touching any animal, including rats.
  - After disposing of a dead animal, including rats.
  - Before and after visiting an area where animals, such as rats, live or have been.
  - After touching animal waste or cleaning an area where animals, such as rats, live or have been.
  - Before and after touching raw animal parts or animal products like milk or eggs.
  - Before, during, and after preparing food.
  - Before eating food.
  - Before feeding a child.
  - After using the toilet.
  - After changing diapers or cleaning a baby's bottom.
  - After blowing your nose, coughing, or sneezing.
  - Before and after visiting or caring for someone who is sick.
  - Before and after treating a cut, bite, or scratch.
- You can stop the spread of sickness by washing your hands well.
  - Wet your hands with 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 water.
  - Use a clean dry towel or swing your hands in the air to dry them.

#### STORE AND PREPARE FOOD AND WATER SAFELY

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- Lassa fever can spread from rats to people when we touch, eat, or drink something that has the wet or toilet of a rat with Lassa fever on or in it.

- Eat and drink away from rats and areas where rats visit.
- Do not eat fruit or food that has been bitten by a rat.
  - Avoid eating any food that has been contacted by rats
  - 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 areas where rat wet or toilet has touched.
- Keep food and water in tight lids that rats cannot enter and away from where people sleep. This helps to avoid close contact with rats and stops rats and other animals from entering 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 the water and then other people.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from rats and their wet or toilet.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and water before, during, and after preparing food.
- To keep your family and friends healthy, do not prepare food when you are sick.
- Store your food and water on a raised platform

#### WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH A RAT

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- If you feel sick or notice fever, go to the nearest health center or call 117
  - 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, he or she has a better chance at healing quickly and with fewer problems.
- If you feel sick or have a fever, make sure to tell your health worker if you have had recent contact with a rat or spent time in an area where rats live or enters.
- If a person gets sick or dies after contact with a rat, do not touch the person, their body fluids such as wet, toilet, blood, and 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 you have been in close contact with a person that is sick or dies after contact with a rat, go to the nearest health facility or community health worker or call 117.
- Telling a health worker about any sickness or death after contact with a rat can help district authorities find the reason for the sickness or death and can save the lives of others in Sierra Leone.
- Call 117 to report all deaths.

#### IF YOU HAVE RECOVERED FROM LASSA FEVER

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- Lassa fever survivors should abstain from sex for at least three months, or use condoms during sex (vaginal, anal or oral) for at least 3 months after recovery.
- To avoid spreading Lassa fever from the condom, the survivor should be the one to remove the condom and safely bury it or throw it in a pit latrine
- Condoms should be safely dispose of in a pit latrine or buried where no one is able to touch it.
- Once the condom is removed, wash your hands with clean water and soap.
- Survivors and their sexual partners should practice good hand washing and personal hygiene by washing well with soap and water immediately after masturbation and having sex.
- If you have questions about masturbation, sex, pregnancy, or breastfeeding as a Lassa fever survivor, talk to a health worker or 117

## HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI/BIRD FLU) AND SWINE FLU

- [https://www.who.int/news-room/fact-sheets/detail/influenza-\(avian-and-other-zoonotic\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(avian-and-other-zoonotic))

### KEY FACTS

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- Humans can be infected with avian, swine and other zoonotic influenza viruses, such as avian influenza virus subtypes A(H5N1), A(H7N9), and A(H9N2) and swine influenza virus subtypes A(H1N1), A(H1N2) and A(H3N2).
- Human infections are primarily acquired through direct contact with infected animals or contaminated environments, these viruses have not acquired the ability of sustained transmission among humans.
- Avian, swine and other zoonotic influenza virus infections in humans may cause disease ranging from mild upper respiratory tract infection (fever and cough), early sputum production and rapid progression to severe pneumonia, sepsis with shock, acute respiratory distress syndrome and even death. Conjunctivitis, gastrointestinal symptoms, encephalitis and encephalopathy have also been reported to varying degrees depending on subtype.
- The majority of human cases of influenza A (H5N1) and A(H7N9) virus infection have been associated with direct or indirect contact with infected live or dead poultry. Controlling the disease in the animal source is critical to decrease risk to humans.
- Influenza viruses, with the vast silent reservoir in aquatic birds, are impossible to eradicate. Zoonotic influenza infection in humans will continue to occur. To minimize public health risk, quality surveillance in both animal and human populations, thorough investigation of every human infection and risk-based pandemic planning are essential.

Humans can be infected with zoonotic influenza viruses such as avian or swine influenza viruses.

### THE PATHOGEN

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There are four types of influenza viruses: types A, B, C and D:

- Influenza A viruses infect humans and many different animals. The emergence of a new and very different influenza A virus with the ability to infect people and have sustained human to human transmission, can cause an influenza pandemic.
- Influenza B viruses circulate among humans and cause seasonal epidemics. Recent data showed seals also can be infected.
- Influenza C viruses can infect both humans and pigs, but infections are generally mild and are rarely reported.
- Influenza D viruses primarily affect cattle and are not known to infect or cause illness in people.

**Influenza type A viruses** are of most significance to public health due to their potential to cause an influenza pandemic. Influenza type A viruses are classified into subtypes according to the combinations of different virus surface proteins hemagglutinin (HA) and neuraminidase (NA). So far there are 18 different hemagglutinin subtypes and 11 different neuraminidase subtypes. Depending on the origin host, influenza A viruses can be classified as avian influenza, swine influenza, or other types of animal influenza viruses. Examples include avian influenza "bird flu" virus subtypes A(H5N1) and A(H9N2) or swine influenza "swine flu" virus subtypes A(H1N1) and A(H3N2). All of these animal influenza type A viruses are distinct from human influenza viruses and do not easily transmit among humans.

Aquatic birds are the primary natural reservoir for most subtypes of influenza A viruses. Most cause asymptomatic or mild infection in birds, where the range of symptoms depends on the virus properties. Viruses that cause severe disease in poultry and result in high death rates are called highly pathogenic avian influenza (HPAI). Viruses that cause mild disease in poultry are called low pathogenic avian influenza (LPAI).

#### SIGNS AND SYMPTOMS IN HUMANS

Avian, swine and other zoonotic influenza infections in humans may cause disease ranging from mild upper respiratory infection (fever and cough) to rapid progression to severe pneumonia, acute respiratory distress syndrome, shock and even death. Gastrointestinal symptoms such as nausea, vomiting and diarrhea has been reported more frequently in A(H5N1) infection. Conjunctivitis has also been reported in influenza A(H7). Disease features such as the incubation period, severity of symptoms and clinical outcome varies by the virus causing infection but mainly manifests with respiratory symptoms.

In many patients infected by A(H5) or A(H7N9) avian influenza viruses, the disease has an aggressive clinical course. Common initial symptoms are high fever (greater than or equal to 38°C) and cough followed by symptoms of lower respiratory tract involvement including dyspnea or difficulty breathing. Upper respiratory tract symptoms such as sore throat or coryza are less common. Other symptoms such as diarrhea, vomiting, abdominal pain, bleeding from the nose or gums, encephalitis, and chest pain have also been reported in the clinical course of some patients. Complications of infection include severe pneumonia, hypoxemic respiratory failure, multi-organ dysfunction, septic shock, and secondary bacterial and fungal infections. The case fatality rate for A(H5) and A(H7N9) subtype virus infections among humans is much higher than that of seasonal influenza infections.

For human infections with avian influenza A(H7N7) and A(H9N2) viruses, disease is typically mild or subclinical. Only one fatal A(H7N7) human infection has been reported in the

Netherlands so far. For human infections with swine influenza viruses, most cases have been mild with a few cases hospitalized and very few reports of deaths resulting from infection.

#### EPIDEMIOLOGY OF HUMAN INFECTIONS

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In terms of **transmission**, human infections with avian and other zoonotic influenza viruses, though rare, have been reported sporadically. Human infections are primarily acquired through direct contact with infected animals or contaminated environments, but do not result in efficient transmission of these viruses between people.

In 1997, human infections with the HPAI **A(H5N1)** virus were reported during an outbreak in poultry in Hong Kong SAR, China. Since 2003, this avian virus has spread from Asia to Europe and Africa, and has become endemic in poultry populations in some countries. Outbreaks have resulted in millions of poultry infections, several hundred human cases, and many human deaths. The outbreaks in poultry have seriously impacted livelihoods, the economy and international trade in affected countries. Other avian influenza A(H5) subtype viruses have also resulted in both outbreaks in poultry and human infections.

In 2013, human infections with **A(H7N9)** virus were reported for the first time in China. Since then, the virus has spread in the poultry population across the country and resulted in over 1500 reported human cases and many human deaths

**Other avian influenza viruses** have resulted in sporadic human infections including the A(H7N7) and A(H9N2) viruses. Some countries have also reported sporadic human infections with **swine influenza viruses**, particularly the A(H1) and A(H3) subtypes.

In term of **risk factors** for human infections:

- **for avian influenza viruses**, the primary risk factor for human infection appears to be direct or indirect exposure to infected live or dead poultry or contaminated environments, such as live bird markets. Slaughtering, defeathering, handling carcasses of infected poultry, and preparing poultry for consumption, especially in household settings, are also likely to be risk factors. There is no evidence to suggest that the A(H5), A(H7N9) or other avian influenza viruses can be transmitted to humans through properly prepared poultry or eggs. A few influenza A(H5N1) human cases have been linked to consumption of dishes made with raw, contaminated poultry blood. Controlling the circulation of avian influenza viruses in poultry is essential to reducing the risk of human infection. Given the persistence of the A(H5) and A(H7N9) viruses in some poultry populations, control will require long-term commitments from countries and strong coordination between animal and public health authorities.
- **for swine influenza viruses**, risk factors reported for most human cases includes close proximity to infected pigs or visiting locations where pigs are exhibited, but some limited human-to-human transmission has occurred.

For avian influenza A(H5N1) virus infections in humans, current data indicate an **incubation period** averaging 2 to 5 days and ranging up to 17 days. For human infections with the A(H7N9) virus, incubation period ranges from 1 to 10 days, with an average of 5 days. For both viruses, the average incubation period is longer than that for seasonal influenza (2

days). For human infections with swine influenza viruses, an incubation period of 2–7 days has been reported.

## DIAGNOSIS

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Laboratory tests are required to diagnose human infection with zoonotic influenza. WHO, through its Global Influenza Surveillance and Response System (GISRS), periodically updates technical guidance protocols for the detection of zoonotic influenza in humans using molecular e.g., RT-PCR and other methods.

Rapid influenza diagnostic tests (RIDTs) have lower sensitivity compared to PCR and their reliability depends largely on the conditions under which they are used. Commercially available RDTs in general cannot provide subtype information. RIDTs are sometimes used in clinical settings, but their use in detection of zoonotic viruses is limited.

Adequate, appropriate samples for influenza tests should be taken from patients and processed with diagnostics according to relevant guidance and protocols.

## TREATMENT

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Evidence suggests that some **antiviral drugs**, notably **NEURAMINIDASE INHIBITOR** (oseltamivir, zanamivir), can reduce the duration of viral replication and improve prospects of survival, however ongoing clinical studies are needed. Emergence of oseltamivir resistance has been reported.

- In suspected and confirmed cases, neuraminidase inhibitors should be prescribed as soon as possible (ideally, within 48 hours following symptom onset) to maximize therapeutic benefits. However, given the significant mortality currently associated with A(H5) and A(H7N9) subtype virus infections and evidence of prolonged viral replication in these diseases, administration of the drug should also be considered in patients presenting later in the course of illness.
- Treatment is recommended for a minimum of 5 days but can be extended until there is satisfactory clinical improvement.
- Corticosteroids should not be used routinely, unless indicated for other reasons (e.g., asthma and other specific conditions); as it has been associated with prolonged viral clearance, immunosuppression leading to bacterial or fungal superinfection.
- Most recent A(H5) and A(H7N9) viruses are **resistant** to adamantane antiviral drugs (e.g., amantadine and rimantadine) and are therefore not recommended for monotherapy.
- Presence of co-infection with bacterial pathogens can be encountered in critically ill patients.

## PREVENTION

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Apart from antiviral treatment, the public health management includes **personal protective measures** like:

- Regular hand washing with proper drying of the hands
- Good respiratory hygiene – covering mouth and nose when coughing or sneezing, using tissues and disposing of them correctly

- Early self-isolation of those feeling unwell, feverish and having other symptoms of influenza
- Avoiding close contact with sick people
- Avoiding touching one's eyes, nose or mouth

Health care workers performing aerosol generating procedures should use airborne precautions. Standard contact and droplet precautions and appropriate personal protective equipment (PPE) should be made available and used during epidemics.

Travelers to countries and people living in countries with known outbreaks of avian influenza should, if possible, avoid poultry farms, contact with animals in live poultry markets, entering areas where poultry may be slaughtered, and contact with any surfaces that appear to be contaminated with feces from poultry or other animals. Good food safety and food hygiene practices e.g., hands washing with soap and water should be followed. Travelers returning from affected regions should report to local health services if respiratory symptoms suspecting zoonotic influenza virus infection.

Pre-exposure or post-exposure prophylaxis with antivirals is possible but depends on several factors e.g., individual factors, type of exposure, and risk associated with the exposure.

#### PANDEMIC POTENTIAL

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Influenza pandemics are epidemics that affect a large proportion of the world due to a novel virus. Pandemics are unpredictable, but recurring events that can have health, economic and social consequences worldwide. An influenza pandemic occurs when a novel influenza virus emerges with the ability to cause sustained human-to-human transmission, and the human population has little to no immunity against the virus. With the growth of global travel, a pandemic can spread rapidly globally with little time to prepare a public health response.

Ongoing circulation of some avian influenza viruses in poultry, such as A(H5) and A(H7) viruses, are of public health concern as these viruses cause severe disease in humans and the viruses have the potential to mutate to increase transmissibility among humans. To date, although human-to-human transmission of these viruses is thought to have occurred in some instances when there had been close or prolonged contact with a patient, there has been no sustained human-to-human transmission identified.

Whether currently circulating avian, swine and other zoonotic influenza viruses will result in a future pandemic is unknown. However, the diversity of zoonotic influenza viruses that have caused human infections is alarming and necessitates strengthened surveillance in both animal and human populations, thorough investigation of every zoonotic infection and pandemic preparedness planning.

#### WHO RESPONSE

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WHO, in its capacity for providing leadership on global health matters, continuously monitors avian and other zoonotic influenza viruses closely through its Global Influenza Surveillance and Response System (GISRS). WHO, in collaboration with the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization (FAO), conducts surveillance at the human-animal interface, assesses the associated risks and coordinates response to zoonotic influenza outbreaks and other threats to public health.



Based on risk assessment, WHO provides guidance, develops and adjusts surveillance, preparedness and response strategies to influenza – seasonal, zoonotic and pandemic influenza, and communicates timely risk assessment outcomes and intervention recommendations with Member States to enhance preparedness and response nationally and globally.

## APPROVED HIGHLY PATHOGENIC AVIAN INFLUENZA (BIRD FLU) MESSAGES

### ABOUT BIRD FLU

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- Bird flu is a very serious sickness in birds that can also make people very sick.
- Bird flu is a sickness that all birds can get, including chickens, ducks, geese, turkeys, quail, and wild birds.
- Bird flu can spread very quickly between birds and cause large numbers of birds to die very quickly if not controlled.
- Bird flu 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 market, or kill, defeather, butcher, or prepare birds for cooking, have more of a chance of getting bird flu.

### SIGNS AND SYMPTOMS OF BIRD FLU IN ANIMALS

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- We cannot always see the signs and symptoms of bird flu in birds.
- Sometimes birds, like ducks or geese, may not show any signs and symptoms of having bird flu, but can still spread the sickness to other birds and people.
- Because some birds do not show signs and symptoms of bird flu, you cannot know for sure which birds have the sickness. That is why it is important to be careful with all birds.
- Signs and symptoms of bird flu in birds include:
  - Sudden death of many birds
  - Watery diarrhea
  - Birds are unbalanced, walk unevenly or sit with head down
  - Serious drop in egg production
  - Lack of energy and appetite
- In birds, bird flu can cause death as quickly as in two days after signs and symptoms show.

### SIGNS AND SYMPTOMS OF BIRD FLU IN PEOPLE

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- The length of time from when bird flu enters a person's body to when the person starts to show signs and symptoms of bird flu ranges from one to 17 days.
- The signs and symptoms of bird flu in people include:
  - Fever
  - Tiredness
  - Cough or sore throat
  - Hard time breathing
  - Eye redness
  - Muscle, chest, and stomach pain
  - Nausea, vomiting, diarrhea
  - 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.

#### THE DIFFERENT WAYS BIRD FLU IS SPREAD

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- Bird flu lives in the toilet, spit, and snot of sick birds.
- Bird flu can live on surfaces, like tables or baskets, grass, or knives for hours and in the environment for days.
- Bird flu spreads easily between animals when they are kept closely 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.
- Any person who comes into close contact with sick or dead birds may be in danger of bird flu.
- 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 toilet, snot, or spit 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 have touched and then touching your eyes, nose, or mouth.
  - Eating uncooked or undercooked animal meat or animal products like eggs of an animal that has bird flu.
- Bird flu does not spread easily from person to person.
- Bird flu enters a person's body through the eyes, nose, or mouth.
- 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, butcher, 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 their toilet, spit, snot, feathers, and water contaminated with their toilet, spit, snot, and feathers (like waste water from a live poultry market or a slaughtering facility).
- Most people that get bird flu get it from handling, killing, defeathering, butchering, or preparing birds that are sick.

### HOW TO PROTECT AGAINST BIRD FLU

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

### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD BIRDS

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- When possible, avoid birds that look sick and those that you find dead.
- Do not touch with bare hands the body or body fluids, such as toilet, snot, and spit, of a bird that looks sick or that you find dead. Sick birds and birds we find dead can spread their sickness to us if we touch them or their body fluids.
- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away any bird that looks sick or that you find dead. Sick birds and birds we find dead can spread their sickness to those who touch them.
- If there is an outbreak of bird flu, avoid areas where chickens, ducks, and geese are kept, transported, sold, killed, butchered, or prepared.
- Always wash your hands and arms with soap and water immediately after any contact with a bird, even if it looks healthy, because we cannot always see the signs and symptoms of bird flu.
- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any bird that looks sick or that you find dead.
- When you talk to an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief, tell them:
  - 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.

- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about a bird that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.

### DISPOSE OF DEAD BIRDS SAFELY

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- If an animal health worker does not respond in one day to advise on how to dispose of a dead bird safely, it is important to dispose of 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 dispose of a dead bird safely, carefully burn or deeply bury the dead bird far from where water is collected and where household activities take place.
- Burning a dead bird is best in areas with plenty people and where space is too small to safely bury the dead bird.
- To dispose of a dead bird safely, do not touch with bare hands the body or body fluids of the bird.
  - Wear rubber gloves or plastic bags to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so the sickness cannot enter.
  - If rubber gloves or plastic bags are not available, use banana leaves, cloth, or some other item to cover the dead bird to avoid touching the bird with your bare hands.
  - Use a shovel, wheelbarrow, or other tools to move the dead bird to where you can burn or bury it deeply.
  - Burn or deeply bury the dead bird.
  - If plastic bags are used, remove them carefully so that you do not touch any body fluids of the bird on the plastic. Burn or deeply bury the plastic bags along with the bird and wash your hands and arms immediately with soap and water.
  - If rubber gloves are used, wash the gloves well with soap and water while they are still on your hands.
  - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead bird and place the tools in the sun to dry. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.
- Always wash your hands and arms with soap and water immediately after any contact with a bird, even if it looks healthy, because we cannot always see the signs and symptoms of bird flu.
- Never dig up a dead bird that has been buried.

### PROTECT YOURSELF WHEN KILLING OR BUTCHERING A BIRD

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- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away a bird that looks sick or that you find dead. Sick birds and birds we find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and water before and immediately after killing or butchering a bird, even if it looks healthy, because we cannot always see the signs and symptoms of bird flu.
- Wash any tools you use to kill or butcher a bird with soap and water or disinfectant before and after their use. This helps keep sickness from spreading to you and others.
- Covering your skin, eyes, nose, and mouth when killing or butchering a bird, even if the bird looks healthy, can help stop any sickness the bird may have from entering your body.
  - If gloves are available, wear rubber gloves to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so any sickness cannot enter.
  - If rubber gloves are used, after killing or butchering a bird, wash the gloves well with soap and water while they are still on your hands.
  - Wash any tools used to kill or butcher a bird with soap and water or disinfectant. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.

#### REDUCE BIRDS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

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- Chickens, ducks, and geese should be kept in an animal pen away from your house.
- Keep animals like chickens, ducks, and geese out of the house. Close contact with chickens, ducks, and geese and their toilet, snot, or spit can make it easier for bird flu to spread from birds with the sickness 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 toilet, snot, or spit can make it easier for bird flu to spread from birds with the sickness to us and our families.
- When sweeping your house after chickens, ducks, or geese have been in the house, always make sure to:

- Cover your eyes with glasses and your nose and mouth with a mask or 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 water.
- Always wash your hands and arms with soap and water immediately after cleaning or sweeping an area where birds 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 bird toilet, snot, or spit.
  - Keep food and water in covered containers that birds cannot enter and away from where people sleep. This helps to avoid close contact with birds and 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 wet or toilet.
  - Keeping a wild bird as a pet or bringing it into your house can make problems for the bird and your family. Leave wild animals to be wild.
  - Wild animals do not normally let a person come close to it, so if one does, remember that something could be wrong with the animal.

#### WASH YOUR HANDS AFTER ANY CONTACT WITH BIRDS

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- We use our hands for many things, so it is easy for sickness to spread when we touch something with the sickness and then touch our eyes, nose, mouth, another animal or person, food, and other things.
- Washing our hands with soap and water frequently is one of the best ways to keep healthy and help stop the spread of sickness.
- Washing our hands with soap and water after touching or butchering a bird, handling bird meat or products, and cleaning areas where birds have been are some of the best ways we can stop the spread of sickness from a bird to ourselves and our families.
- Always wash your hands with soap and water immediately after touching any bird – even if the bird looks healthy. We cannot always see the signs and symptoms of bird flu.
- Adults should help or make sure young children wash their hands well.
- Wash your hands with soap and water:
  - After touching any animal, including birds.
  - After disposing of a dead animal, including birds.

- Before entering and after leaving an area where animals, such as birds, have been or are kept.
  - After touching animal waste or cleaning an area where animals, such as birds, have been or are kept.
  - Before and after killing or butchering an animal, including birds.
  - Before and after touching raw animal parts or animal products like milk or eggs.
  - Before, during, and after preparing food.
  - Before eating food.
  - Before feeding a child.
  - After using the toilet.
  - After changing diapers or cleaning a baby's bottom.
  - After blowing your nose, coughing, or sneezing.
  - Before and after visiting or caring for someone who is sick.
  - Before and after treating a cut, bite, or scratch.
- You can stop the spread of sickness by washing your hands well.
    - Soak your hands with 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 water.
    - Dry your hands with a tissue or swing your hands to dry them in the air.

#### STORE AND PREPARE FOOD AND WATER SAFELY

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- 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 toilet, snot, or spit of a bird with bird flu on or in it.
- Eat and drink away from animals and areas where animals 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.
- 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 birds and other animals can touch it or areas where bird toilet, snot, or spit has touched.

- Keep food and water in covered containers that birds cannot enter and away from where people sleep. This helps to avoid close contact with birds and stop birds 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 to the water and then other people.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from birds and their toilet, snot, or spit.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and water before, during, and after preparing food.
- Wash hands with soap and 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 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 like soups, stews, and “plasas” 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.

### KEEP BIRD AREAS CLEAN

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- Bird flu in birds can be spread through their body fluids, such as toilet, spit, or snot. In areas where birds visit or are kept, the body fluids of a bird with bird flu can spread easily to other birds or live on surfaces that can spread to other birds and people who touch them.
- Chickens, ducks, and geese should be kept in an animal pen away from your house.
- Clean or sweep bird toilet and feathers from the yard and bird pen frequently to help stop the spread of bird flu to other birds or to people.
- Burn or deeply bury bird toilet and other waste away from the bird pen, where food is grown, water sources, and places that people and animals visit often.



- In areas with plenty people and where space is small to burn or bury, put bird toilet and other waste in plastic or a covered bin until it can be collected and taken away.
- Clean areas and surfaces that have come into contact with birds or their toilet, snot, or spit with soap and water.
- Clean any tools or items used to care for birds, like cages or food and water containers, outside of the house.
- We can help stop bird flu from entering our body when cleaning areas where birds visit or are kept by covering our skin, eyes, nose, and mouth.
  - If gloves are available, wear rubber gloves to protect your hands. Wash the rubber gloves well with soap and water before removing. Then wash your hands and arms immediately with soap and water.
  - Cover your eyes with glasses and your nose and mouth with a mask or cloth so the sickness cannot enter. Wash the glasses and mask or cloth with soap and water immediately after removing.
- Always wash your hands and arms with soap and water immediately after cleaning an area where birds have been or are kept.
- Have a separate set of shoes and clothes that you use just for working in animal areas. Wash them frequently.
- 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.
- Wash the wheels of bicycles, motorcycles, or other vehicles with soap and water as soon as possible after leaving animal areas and especially before you go indoors.
- Clean any clothes, shoes, equipment like cages or shovels, and vehicle wheels with soap and water. Then wash your hands and arms immediately with soap and water.

#### HOW TO PROTECT YOUR BIRDS FROM BIRD FLU

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- Animal health is important for human health. Taking good care of our chickens, ducks, geese, and other birds keep them healthy which helps keep us, our families, and our communities healthy.
- Keep chickens, ducks, and geese in the yard or closed area away from wild birds. Chickens, ducks, and geese that roam freely are more likely to come in contact with bird flu from wild birds and can then spread bird flu to other birds, our families, or our 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 bird flu to other birds.
- If you buy or get new birds, keep them separate from other birds for a period of three weeks while you watch the new birds for any signs and symptoms of sickness. This way you can make sure they are not sick with bird flu or any other sickness and do not spread any sickness to other birds.

- If your birds do not sell at the market, keep them separate from other birds 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 bird flu or any other sickness at the market that they might spread to other birds.
- If one or more of your birds get sick or dies, separate the sick or dead birds from the healthy ones to stop the spread of sickness and tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief.
  - Then wash anything that touched the birds, the area where the birds were kept, and your hands and arms immediately with soap and water.
- If you hear of an outbreak of an animal sickness nearby, tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief.
- To keep you and your animals safe, do not move or sell your birds if you hear of an outbreak of bird flu nearby.
- Do not throw dead birds or their waste into any water source or left in the yard or open field.
- Keep chickens, ducks, and geese away from any source of water that could have been infected by wild birds.
- Do not use bird toilet 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 couldn't access. It should be away from where people live, with at least 1 meter of ground between the pile and any water source (any run-off water from the decomposing material should be collected and treated).

#### WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH A BIRD

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- If you have any of the signs and symptoms of bird flu, go to your nearest health facility or community health worker right away.
  - Getting early treatment for bird flu can save lives.
  - Getting early treatment can also protect your family and loved ones from getting bird flu.
  - When someone gets early care and treatment, he or she has a better chance at healing quickly and with fewer problems.
- If you have signs and symptoms of bird flu, make sure to tell 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 such as toilet, snot, and 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 bird, go to your nearest health facility or community health worker or call 117.
- Telling a health worker about any sickness or death after contact with a bird can help district authorities find the reason for the sickness or death and can save the lives of others in Sierra Leone.
- Call 117 to report all deaths.
- Cough or sneeze into your upper arm or sleeve. To help keep others safe from sickness, wash your hands afterward.

## RABIES

- <https://www.who.int/news-room/fact-sheets/detail/rabies>

### KEY FACTS

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- Rabies is a vaccine-preventable viral disease which occurs in more than 150 countries and territories.
- Dogs are the main source of human rabies deaths, contributing up to 99% of all rabies transmissions to humans.
- Interrupting transmission is feasible through vaccination of dogs and prevention of dog bites.
- Infection causes tens of thousands of deaths every year, mainly in Asia and Africa.
- Globally rabies causes an estimated cost of US \$8.6 billion per year
- 40% of people bitten by suspect rabid animals are children under 15 years of age.
- Immediate, thorough wound washing with soap and water after contact with a suspect rabid animal is crucial and can save lives.
- Engagement of multiple sectors and One Health collaboration including community education, awareness programs and vaccination campaigns are critical.
- WHO leads the collective “United Against Rabies” to drive progress towards "Zero human deaths from dog-mediated rabies by 2030"

Rabies is a vaccine-preventable, zoonotic, viral disease. Once clinical symptoms appear, rabies is virtually 100% fatal. In up to 99% of cases, domestic dogs are responsible for rabies virus transmission to humans. Yet, rabies can affect both domestic and wild animals. It is spread to people and animals through bites or scratches, usually via saliva.

Rabies is present on all continents, except Antarctica, with over 95% of human deaths occurring in the Asia and Africa regions. Rabies is one of the Neglected Tropical Diseases (NTD) that predominantly affects poor and vulnerable populations who live in remote rural locations. Approximately 80% of human cases occur in rural areas. Although effective human vaccines and immunoglobulins exist for rabies, they are not readily available or accessible to those in need. Globally, rabies deaths are rarely reported and children between the ages of 5–14 years are frequent victims. Managing a rabies exposure, where the average cost of rabies post-exposure prophylaxis (PEP) is currently estimated at an average of US\$ 108 can be a catastrophic financial burden on affected families whose average daily income may be as low as US\$ 1–2 per person.

Every year, more than 29 million people worldwide receive a post-bite vaccination. This is estimated to prevent hundreds of thousands of rabies deaths annually. Globally, the economic burden of dog-mediated rabies is estimated at US\$ 8.6 billion per year.

### PREVENTION

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#### Eliminating rabies in dogs

Rabies is a vaccine-preventable disease. Vaccinating dogs is the most cost-effective strategy for preventing rabies in people. Dog vaccination reduces deaths attributable to dog-mediated rabies and the need for PEP as a part of dog bite patient care.

#### Awareness on rabies and preventing dog bites

Education on dog behavior and bite prevention for both children and adults is an essential extension of a rabies vaccination program and can decrease both the incidence of human rabies and the financial burden of treating dog bites. Increasing awareness of rabies prevention and control in communities includes education and information on responsible pet ownership, how to prevent dog bites, and immediate care measures after a bite. Engagement and ownership of the program at the community level increases reach and uptake of key messages.

### Immunization of people

The same vaccine is used to immunize people after an exposure (see PEP) or before exposure to rabies (less common). Pre-exposure immunization is recommended for people in certain high-risk occupations such as laboratory workers handling live rabies and rabies-related (lyssavirus) viruses; and people (such as animal disease control staff and wildlife rangers) whose professional or personal activities might bring them into direct contact with bats, carnivores, or other mammals that may be infected.

Pre-exposure immunization might be indicated also for outdoor travelers to and expatriates living in remote areas with a high rabies exposure risk and limited local access to rabies biologics. Finally, immunization should also be considered for children living in, or visiting such areas. As they play with animals, they may receive more severe bites, or may not report bites.

### SYMPTOMS

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The incubation period for rabies is typically 2–3 months but may vary from 1 week to 1 year, dependent upon factors such as the location of virus entry and viral load. Initial symptoms of rabies include a fever with pain and unusual or unexplained tingling, pricking, or burning sensation (paresthesia) at the wound site. As the virus spreads to the central nervous system, progressive and fatal inflammation of the brain and spinal cord develops.

There are two forms of the disease:

- Furious rabies results in signs of hyperactivity, excitable behavior, hydrophobia (fear of water) and sometimes aerophobia (fear of drafts or of fresh air). Death occurs after a few days due to cardio-respiratory arrest.
- Paralytic rabies accounts for about 20% of the total number of human cases. This form of rabies runs a less dramatic and usually longer course than the furious form. Muscles gradually become paralyzed, starting at the site of the bite or scratch. A coma slowly develops, and eventually death occurs. The paralytic form of rabies is often misdiagnosed, contributing to the under-reporting of the disease.

### DIAGNOSIS

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Current diagnostic tools are not suitable for detecting rabies infection before the onset of clinical disease, and unless the rabies-specific signs of hydrophobia or aerophobia are present, clinical diagnosis may be difficult. Human rabies can be confirmed intra-vitam and post mortem by various diagnostic techniques that detect whole viruses, viral antigens, or nucleic acids in infected tissues (brain, skin or saliva).

### Transmission

People are usually infected following a deep bite or scratch from an animal with rabies, and transmission to humans by rabid dogs accounts for 99% of cases.

In the Americas, bats are now the major source of human rabies deaths as dog-mediated transmission has mostly been broken in this region. Bat rabies is also an emerging public health threat in Australia and Western Europe. Human deaths following exposure to foxes, raccoons, skunks, jackals, mongooses and other wild carnivore host species are very rare, and bites from rodents are not known to transmit rabies.

Transmission can also occur if saliva of infected animals comes into direct contact with human mucosa or fresh skin wounds. Contraction of rabies through inhalation of virus-containing aerosols or through transplantation of infected organs is described, but extremely rare. Human-to-human transmission through bites or saliva is theoretically possible but has never been confirmed. The same applies for transmission to humans via consumption of raw meat or milk of infected animals.

### POST-EXPOSURE PROPHYLAXIS (PEP)

Post-exposure prophylaxis (PEP) is the immediate treatment of a bite victim after rabies exposure. This prevents virus entry into the central nervous system, which results in imminent death. PEP consists of:

- Extensive washing and local treatment of the bite wound or scratch as soon as possible after a suspected exposure;
- a course of potent and effective rabies vaccine that meets WHO standards; and
- the administration of rabies immunoglobulin (RIG), if indicated.

Starting the treatment soon after an exposure to rabies virus can effectively prevent the onset of symptoms and death.

#### Extensive wound washing

This first-aid measure includes immediate and thorough flushing and washing of the wound for a minimum of 15 minutes with soap and water, detergent, povidone iodine or other substances that remove and kill the rabies virus.

#### Exposure risk and indications for PEP

Depending on the severity of the contact with the suspected rabid animal, administration of a full PEP course is recommended as follows:

Categories of contact with suspect rabid animal	Post-exposure prophylaxis measures
<b>Category I</b> - touching or feeding animals, animal licks on intact skin (no exposure)	Washing of exposed skin surfaces, no PEP
<b>Category II</b> - nibbling of uncovered skin, minor scratches or abrasions without bleeding (exposure)	Wound washing and immediate vaccination

Categories of contact with suspect rabid animal	Post-exposure prophylaxis measures
<b>Category III</b> - single or multiple transdermal bites or scratches, contamination of mucous membrane or broken skin with saliva from animal licks, exposures due to direct contact with bats (severe exposure)	Wound washing, immediate vaccination and administration of rabies immunoglobulin

All category II and III exposures assessed as carrying a risk of developing rabies require PEP. This risk is increased if:

- the biting mammal is a known rabies reservoir or vector species
- the exposure occurs in a geographical area where rabies is still present
- the animal looks sick or displays abnormal behavior
- a wound or mucous membrane was contaminated by the animal’s saliva
- the bite was unprovoked
- the animal has not been vaccinated.

The vaccination status of the suspect animal should not be the deciding factor when considering initiating PEP or not when the vaccination status of the animal is questionable. This can be the case if dog vaccination programs are not being sufficiently regulated or followed out of lack of resources or low priority.

WHO continues to promote human rabies prevention through the elimination of rabies in dogs, dog bite prevention strategies, and more widespread use of the intradermal route for PEP which reduces volume and therefore the cost of cell-cultured vaccine by 60% to 80%.

#### Integrated bite case management

If possible, the veterinary services should be alerted, the biting animal identified, removed from the community and either quarantined for observation (for healthy dogs and cats) or submitted for immediate laboratory examination (dead or euthanized animals showing clinical signs of rabies). PEP must be continued during the 10-day observation period or while awaiting laboratory results. Treatment may be discontinued if the animal is proven to be free of rabies. If a suspect animal cannot be captured and tested, then a full course of PEP should be completed. Joint contact tracing by veterinary and public health services is encouraged to identify additional suspected rabid animals and human bite victims, with the goal to apply preventive measures accordingly.

#### WHO RESPONSE

Rabies is included in WHO’s new 2021–2030 road map. As a zoonotic disease, it requires close cross-sectoral coordination at the national, regional and global levels.

- WHO, FAO (Food and Agriculture Organization) and OIE (World Organisation for Animal Health), have prioritized rabies under a One Health approach
- WHO leads the ‘United Against Rabies’ (UAR) – a multi-stakeholder platform to advocate for, and prioritize investments in rabies control and coordinate the global rabies-elimination efforts to achieve zero human deaths from dog-mediated rabies by 2030

- WHO works with partners to guide and support countries as they develop and implement their national rabies elimination plans
- On the path towards rabies elimination countries can request WHO validation of achieving zero human deaths from dog-mediated rabies and seek OIE endorsement of their dog rabies control programs and self-declare freedom from dog rabies
- Mexico was the first country to have been validated by WHO in 2019 for eliminating human deaths from dog-mediated rabies
- Inclusion of rabies biologics into countries list of essential medicines and advocating for increased access of poor and rural populations to PEP is a WHO priority and strengthens the global movement towards achieving Universal Health Coverage
- In 2019 Gavi has included human rabies vaccines in its vaccine investment strategy 2021-2025 which will support scaling up rabies PEP in Gavi eligible countries, WHO will continue to advise on best strategies and practices for its roll out to countries requesting rabies vaccine.
- Monitoring of rabies programs and disease surveillance are needed to measure impact and for increasing awareness and advocacy.

The 2030 NTD Roadmap is a key guiding document for the global response to NTDs over the next decade and includes regional, progressive targets for rabies elimination.

The key towards sustaining and expanding the rabies programs to adjacent geographies has been to start small, catalyze local rabies programs through stimulus packages, demonstrate success and cost-effectiveness, and ensure the engagement of governments and affected communities.

Rabies elimination needs adequate and long-term investments. Showcasing local success and raising awareness on rabies have been proven effective to gain and maintain political will.

## APPROVED RABIES MESSAGES

### ABOUT RABIES

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- Rabies is a sickness that can make people and animals sick.
- Rabies is a very serious sickness and causes death without early treatment.
- 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 right away after an animal bite.
- Rabies is not known to spread from person to person.
- Rabies is spread through the spit of an animal with rabies usually when that animal bites or scratches 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 licks a person's skin or face, but it is very uncommon.



- Any animal that has hair can get and spread rabies, including dogs, cats, squirrels, and bats.
- In Sierra Leone, rabies is most commonly spread to people from a dog bite.
- Not all dogs or animals that bite have rabies. Dogs and other animals can bite for many different reasons, like when they are afraid or are protecting their food or their young.
- All animal bites and scratches, even small ones, should be taken seriously.
- Dogs and other animals are not born with rabies.
- Dogs and other animals do not get rabies at a certain age.
- Dogs and other animals can only get rabies from an animal with rabies.
- Not all stray dogs or wild animals have rabies.

#### SIGNS AND SYMPTOMS OF RABIES IN ANIMALS

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- 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 a few days to several months.
- The signs and symptoms of rabies in animals include:
  - Acting mad/craze
  - Trying to bite other animals or people without fear
  - Having plenty spit or foaming at the corners of the mouth
  - A change in the way the animal sounds
  - Having a hard time eating or swallowing
- A skin rash is not a sign and symptom of rabies.
- Once an animal shows the signs and symptoms of rabies, it will die.
- An animal will show signs and symptoms of rabies ranging from 1 to 7 days before it dies.

#### SIGNS AND SYMPTOMS OF RABIES IN PEOPLE

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- 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.
  - 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.
- Once a person starts to show signs and symptoms of rabies, they will not survive. That is why it is so important for anyone with an animal bite to go to the nearest health facility or community health worker 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
- A person with rabies usually dies within a few days 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 protects you from rabies.

#### THE DIFFERENT WAYS RABIES IS SPREAD

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- 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, but it is not common.
- Any animal that has hair can get and spread rabies, including dogs, cats, squirrels, and bats.
- Animals that do not have hair, like birds, snakes, lizards, and fish, cannot get rabies.
- In Sierra Leone, 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 is not known to spread from person to person.

#### HOW TO PROTECT AGAINST RABIES

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- In Sierra Leone, treatment to prevent rabies is in Freetown and can cost plenty money. This can make it difficult for people to get the treatment they need and in time to prevent rabies.
- The best thing we can do to protect against rabies is to avoid animal bites.

#### PREVENTING ANIMAL BITES IS THE BEST WAY TO AVOID RABIES

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- If an animal shows signs and symptoms of rabies, avoid the animal and call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief 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.
- 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 body fluids of a bat.
- 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, like where they live, 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, 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.
- 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.
- 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.
- 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.

### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD ANIMALS

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- When possible, avoid animals that look sick and animals that you find dead.
- Do not touch with bare hands the body or body fluids, such as spit, of an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to us if we touch them or their body fluids.
- Never prepare or eat, sell, or give away an animal that showed signs or symptoms of rabies or that you find dead. Sick animals and animals we find dead can spread their sickness to those who touch them.
- Do not let your pet or any animal lick your face or any breaks in the skins such as cuts, scratches, or sores.
- Always wash your hands and arms with soap and water immediately after any contact with an animal.
- Keeping a wild animal as a pet or bringing it into your house can make problems for the animal and your family. Leave wild animals to be wild.
- Wild animals do not normally let a person come close to it, so if one does, remember that something could be wrong with the animal.
- If an animal shows signs and symptoms of rabies, avoid the animal and call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief immediately for advice.
- If you find any strange behavior or bites in your animals, separate those that have been bitten from the others and call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief.
- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any animal that looks sick or that you find dead.
- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about an animal that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.

### DISPOSE OF DEAD ANIMALS SAFELY

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- If a dog or other animal dies after showing signs and symptoms of rabies, avoid the animal and call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief immediately for advice.

- If an animal health worker does not respond in one day to advise on how to dispose of a dead animal safely, it is important to dispose of 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.
- To safely dispose of a dog or other animal that is found dead, carefully 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 plenty people and where space is too small to safely bury the dead animal.
- To dispose of a dead animal 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 and your nose and mouth with a mask or cloth so the sickness cannot enter.
  - If rubber gloves or plastic bags are not available, use banana leaves, cloth, or some other item to cover the dead animal to avoid touching the animal with your bare hands.
  - Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply.
  - Burn or deeply bury the dead animal.
  - If plastic bags are used, remove them carefully so that you do not touch any body fluids of the animal on the plastic. Burn or deeply bury the plastic bags along with the animal and wash your hands and arms immediately with soap and water.
  - If rubber gloves are used, wash the gloves well with soap and water while they are still on your hands.
  - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead animal and place the tools in the sun to dry. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.
- Always wash your hands and arms with soap and water immediately after any contact with an animal, even if it looks healthy, because we cannot always see the signs and symptoms of sickness.
- Never dig up a dead animal that has been buried.

#### TAKE GOOD CARE OF ANY ANIMAL BITE OR SCRATCH IMMEDIATELY

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- Wash any animal bite or scratch immediately with soap and water 20 times (15 minutes).
- Washing a bite or scratch well with soap and 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 for advice and treatment.
- Getting early treatment to prevent rabies saves lives.
- To stop rabies in people, you must get treatment before signs and symptoms begin to show. Once a person starts to show signs and symptoms, they will not survive.
  - Vaccine to stop rabies in people is currently only available in Freetown. It is important to go to your nearest health facility right away after an animal bite so that, if needed, there is time to get the vaccine to stop rabies before signs and symptoms start to show.
  - Plans are underway to make the rabies vaccine for people available in all district health facilities.
- Rabies vaccine for people is available in Freetown from Central Medical Stores at New England.
- Tell a health worker, animal health worker, traditional healer, religious leader, or your chief about the animal that bit or scratched you and how you were bitten or scratched. This information can help health workers to learn more about the animal and help protect other people.

#### HOW TO PROTECT YOUR ANIMALS FROM RABIES

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- Animal health is important for human health. Taking good care of our pets and 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, clean place to stay.
- Keep animals in the yard or closed area. Animals that roam freely are more likely to come in contact with sicknesses from other animals and can then spread the sicknesses to other animals, our families, or our communities.
- 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 two months old and once every year after that.
- Rabies vaccine for animals is available in Freetown from:
  - Sierra Leone Animal Welfare Society (SLAWS) at Congo Cross
  - Vetman animal pharmacy on Ross Road
- If you live outside of Freetown, contact your district livestock officer to find out how you can vaccinate your animal.
- If your cat or dog is not vaccinated and is bitten or scratched by another animal, tell an animal health worker, community health worker, environmental officer, traditional healer, religious

leader, or your chief immediately for advice.

## WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH AN ANIMAL

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- Getting early treatment to prevent rabies saves lives. To stop rabies, you must get treatment before signs and symptoms begin to show.
  - Vaccine to stop rabies is currently only available in Freetown. It is important to go to your nearest health facility right away after an animal bite so that, if needed, there is time to get the vaccine to stop rabies before signs and symptoms start to show.
  - Plans are underway to make the rabies vaccine available in all district health facilities.
- Rabies vaccine for people is available in Freetown from Central Medical Stores at New England.
- If you have any of the signs and symptoms of rabies, go to your nearest health facility or community health worker right away.
- If you have signs and symptoms of rabies, make sure to tell your health worker if you have had recent contact with a dog or other animal.
- If a person gets sick or dies after contact with an animal, go to your nearest health facility or community health worker or call 117.
- Telling 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 Sierra Leone.
- Call 117 to report all deaths.

## ANTHRAX

- <https://www.who.int/csr/disease/Anthrax/en/>

Anthrax is primarily a disease of herbivorous mammals, although other mammals and some birds have been known to contract it. Until the introduction and widespread use of effective veterinary vaccines, it was a major cause of fatal disease in cattle, sheep, goats, camels, horses, and pigs throughout the world. Anthrax continues to be reported from many countries in domesticated and wild herbivores, especially where livestock vaccination programs are inadequate or have been disrupted.

Humans generally acquire the disease directly or indirectly from infected animals, or occupational exposure to infected or contaminated animal products. Control in livestock is therefore the key to reduced incidence. The disease is generally regarded as being non-contagious. Records of person-to-person spread exist but are rare.

### How people get infected

People get infected with anthrax when spores get into the body. When this happens, the spores can be activated and become anthrax bacteria. Then the bacteria can multiply, spread out in the body, produce toxins (poisons), and cause severe illness. This can happen

when people breathe in spores, eat food or drink water that is contaminated with spores, or get spores in a cut or scrape in the skin.

#### ANTHRAX IS NOT CONTAGIOUS

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You cannot catch anthrax from another person the way you might catch a cold or the flu. In rare cases, person-to-person transmission has been reported with cutaneous anthrax, where discharges from skin lesions might be infectious.

Certain activities (described below) can increase a person's chances of getting infected.

#### WORKING WITH INFECTED ANIMALS OR ANIMAL PRODUCTS

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Most people who get sick from anthrax are exposed while working with infected animals or animal products such as wool, hides, or hair.

Inhalation anthrax can occur when a person inhales spores that are in the air (aerosolized) during the industrial processing of contaminated materials, such as wool, hides, or hair.

Cutaneous anthrax can occur when workers who handle contaminated animal products get spores in a cut or scrape on their skin.

#### EATING RAW OR UNDERCOOKED MEAT FROM INFECTED ANIMALS

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People who eat raw or undercooked meat from infected animals may get sick with gastrointestinal anthrax. This usually occurs in countries where livestock are not routinely vaccinated against anthrax and food animals are not inspected prior to slaughter. In the United States, gastrointestinal anthrax has rarely been reported. This is because yearly vaccination of livestock is recommended in areas of the United States where animals have had anthrax in the past, and because of the examination of all food animals, which ensures that they are healthy at the time of slaughter.

#### INJECTING HEROIN

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A newly discovered type of anthrax is injection anthrax. This type of anthrax has been seen in northern Europe in people injecting heroin. So far, no cases of injection anthrax have been reported in the United States.



## Who is at risk

Anyone who has come in contact with anthrax spores could be at risk of getting sick. Most people will never be exposed to anthrax. However, there are activities that can put some people at greater risk of exposure than others.

- People Who Handle Animal Products
- Veterinarians
- Livestock producers
- Travelers
- Laboratory Professionals
- Mail handlers, military personnel, and response workers who may be exposed during a bioterror event involving anthrax spores

## Symptoms

The symptoms of anthrax depend on the type of infection and can take anywhere from 1 day to more than 2 months to appear. All types of anthrax have the potential, if untreated, to spread throughout the body and cause severe illness and even death.

### CUTANEOUS ANTHRAX SYMPTOMS

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- A group of small blisters or bumps that may itch
- Swelling can occur around the sore
- A painless skin sore (ulcer) with a black center that appears after the small blisters or bumps
  - Most often the sore will be on the face, neck, arms, or hands

### INHALATION ANTHRAX SYMPTOMS

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- Fever and chills
- Chest Discomfort
- Shortness of breath
- Confusion or dizziness
- Cough
- Nausea, vomiting, or stomach pains
- Headache
- Sweats (often drenching)
- Extreme tiredness
- Body aches

### GASTROINTESTINAL ANTHRAX SYMPTOMS

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- Fever and chills
- Swelling of neck or neck glands
- Sore throat
- Painful swallowing
- Hoarseness

- Nausea and vomiting, especially bloody vomiting
- Diarrhea or bloody diarrhea
- Headache
- Flushing (red face) and red eyes
- Stomach pain
- Fainting
- Swelling of abdomen (stomach)

#### INJECTION ANTHRAX SYMPTOMS

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- Fever and chills
- A group of small blisters or bumps that may itch, appearing where the drug was injected
- A painless skin sore with a black center that appears after the blisters or bumps
- Swelling around the sore
- Abscesses deep under the skin or in the muscle where the drug was injected

#### Keep in Mind

Injection anthrax symptoms are similar to those of cutaneous anthrax, but injection anthrax can spread throughout the body faster and be harder to recognize and treat than cutaneous anthrax. Skin and injection site infections associated with injection drug use are common and do not necessarily mean the person has anthrax.

#### Diagnosis

CDC Guidance and case definitions are available to help doctors diagnose anthrax, take patient histories to determine how exposure may have occurred, and order necessary diagnostic tests.

If inhalation anthrax is suspected, chest X-rays or CT scans can confirm if the patient has mediastinal widening or pleural effusion, which are X-ray findings typically seen in patients with inhalation anthrax.

The only ways to confirm an Anthrax diagnosis are:

- To measure antibodies or toxin in blood
- To test directly for *BACILLUS ANTHRACIS* in a sample
  - blood
  - skin lesion swab
  - spinal fluid
  - respiratory secretions

Samples must be taken before the patient begins taking antibiotics for treatment.

#### Treatment

Doctors have several options for treating patients with anthrax, including antibiotics and antitoxin. Patients with serious cases of anthrax will need to be hospitalized. They may require aggressive treatment, such as continuous fluid drainage and help breathing through mechanical ventilation.

## ANTIBIOTICS

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All types of anthrax infection can be treated with antibiotics, including intravenous antibiotics (medicine given through the vein). If someone has symptoms of anthrax, it's important to get medical care as quickly as possible to have the best chances of a full recovery. Doctors will select antibiotics that are best for treating anthrax and that are best for the patient based on their medical history.

## ANTITOXIN

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When anthrax spores get inside the body, they can be “activated.” When they become active, anthrax bacteria can multiply, spread out in the body, and produce toxins—or poisons. Anthrax toxins in the body cause severe illness.

After anthrax toxins have been released in the body, one possible treatment is antitoxin. Antitoxins target anthrax toxins in the body. Doctors must use antitoxin together with other treatment options.

Currently, there are a few types of antitoxins that can be used for treating anthrax.

### Prevention

Antibiotics can prevent anthrax from developing in people who have been exposed but have not developed symptoms. Ciprofloxacin and doxycycline are two of the antibiotics that could be used to prevent anthrax.

Each of these antibiotics offers the same protection against anthrax. Anthrax spores typically take 1 to 6 days to be activated, but some spores can remain inside the body and take up to 60 days or more before they are activated. Activated spores release toxins—or poisons—that attack the body, causing the person to become sick. That's why people who have been exposed to anthrax must take antibiotics for 60 days. This will protect them from any anthrax spores in their body when the spores are activated.

## VACCINE

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Anthrax Vaccine Adsorbed (AVA) protects against anthrax. It does **not** contain any anthrax bacteria and **cannot** give people anthrax. It is not typically available to the general public. The vaccine is approved by the Food and Drug Administration (FDA) for two different situations.

### ROUTINE OCCUPATIONAL USE (BEFORE POSSIBLE EXPOSURE)

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Anthrax vaccine is approved for use in three groups of adults 18 to 65 years of age who may be at risk of coming in contact with anthrax because of their job. These at-risk adults will receive the vaccine before exposure:

- Certain laboratory workers who work with anthrax
- Some people who handle animals or animal products, such as some veterinarians
- Some members of the United States military

To build up protection against anthrax, these groups should get **5 shots** of anthrax vaccine over 18 months. To stay protected, they should get annual boosters. The shots are injected into a muscle (intramuscular).

People who should **not** get the anthrax vaccine for routine occupational use include:

- Pregnant women.
- Anyone who has had a serious allergic reaction to a previous dose of anthrax vaccine.
- Anyone who has a severe allergy to any component of the anthrax vaccine. Anyone with severe allergies, including allergy to latex, should tell their doctor.

For anyone with a moderate or severe illness, their doctor might ask them to wait until they recover to get the vaccine. People with mild illness can usually be vaccinated.

#### POST-EVENT EMERGENCY USE (AFTER POSSIBLE EXPOSURE)

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In certain situations, such as a bioterrorist attack involving anthrax, anthrax vaccine might be recommended to prevent the disease in people after they have been exposed to the anthrax germs.

If this were to happen, people who were exposed would get **3 shots** of anthrax vaccine over 4 weeks plus a 60-day course of antibiotics.

During an emergency, the **only** people who should **not** get the anthrax vaccine after possible exposure are those who have had a serious allergic reaction to a previous dose of anthrax vaccine. These people would receive the 60-day course of antibiotics only.

### APPROVED ANTHRAX MESSAGES

#### ABOUT ANTHRAX

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- Anthrax is a sickness that can make people and animals sick.
- Anthrax sickness in people and animals ranges from not too serious to very serious and even death.
- A person can get anthrax from an animal in two ways.
  - One way is through an opening in the skin, like a cut, scrape, or sore.
  - Another way is through the mouth by eating or drinking something with anthrax or by touching something that has anthrax and then touching your mouth.
- Anthrax can cause different types of signs and symptoms in people depending on how it enters a person's body.
- Anthrax does not easily spread from person to person and is very uncommon.
- If a person sick with anthrax does not get early treatment, the sickness can get worse and the person can die.

#### SIGNS AND SYMPTOMS OF ANTHRAX IN ANIMALS

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- 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 three weeks.

- Signs and symptoms of anthrax in animals include:
  - Hard time breathing
  - Sudden death
  - Bleeding from body openings after death
  - Swollen dead body of an animal
  - Dead body of animal does not get stiff

### SIGNS AND SYMPTOMS OF ANTHRAX IN PEOPLE

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- The length of time from when anthrax enters a person's body to when the person starts to show signs and symptoms of anthrax ranges from one day to two months.
- Anthrax can cause different types of signs and symptoms in people depending on how it enters a person's body.
- Anthrax through the skin is the most common type of anthrax in people. Signs and symptoms of anthrax through the skin include:
  - An itchy bump that looks like an insect bite that quickly changes into a painless sore with a black center. Most times it is on the face, neck, arms, or hands
  - Swelling around the sore
- Anthrax through the mouth is not common in people. Signs and symptoms of anthrax through the mouth include:
  - Vomiting
  - Bloody diarrhea
  - Loss of appetite
  - Fever
  - Headache
  - Sore or harsh throat and difficulty swallowing
  - Swollen neck
  - Red face and eyes
  - Fainting
  - Swelling of stomach
- The signs and symptoms of anthrax through the skin usually start to get better after 10 days but can take many weeks to go away completely.

### DIFFERENT WAYS ANTHRAX IS SPREAD

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- Anthrax is naturally present in soil, where it can survive for many years. Anthrax can also live on the wool or hair of an animal with anthrax.
- Anthrax is most commonly found in grazing animals including sheep, cattle, horses, and goats.
- Anthrax can spread from an animal to a person through:

- Touching an animal or animal products that have anthrax.
  - Eating uncooked or undercooked animal beef or other animal products like milk or eggs that has anthrax.
- Anthrax from an animal enters a person's body through a break in the skin such as a cut or scrape or through the mouth.
  - People most likely to get anthrax are people that work closely with animals and animal products, such as livestock owners or butchers, are at higher risk of getting anthrax.
  - Anthrax does not easily spread from person to person and is very uncommon.

#### HOW TO PROTECT AGAINST ANTHRAX

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

#### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD ANIMALS

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- When possible, avoid animals that look sick and animals that you find dead.
- Do not touch with bare hands the body or body fluids, such as wet, toilet, blood, and spit, of an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to us if we touch them or their body fluids.
- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and water immediately after any contact with an animal.
- If you think an animal may have died of anthrax, do not open the body of the dead animal. Call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief immediately for advice.
- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any animal that looks sick or that you find dead.
- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about an animal that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.

#### DISPOSE OF DEAD ANIMALS SAFELY

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- If you think an animal may have died of anthrax, do not open the body of the dead animal. Avoid touching the animal and call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief immediately for advice.

- An animal that has died of anthrax needs to be burned down to ashes or buried in a special way so that it cannot spread anthrax to other animals or people. Call an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief immediately for advice.
- Never dig up a dead animal that has been buried.
- Always wash your hands and arms with soap and water immediately after any contact with an animal.

### PROTECT YOURSELF WHEN KILLING OR BUTCHERING AN ANIMAL

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- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and water before and immediately after killing or butchering an animal.
- Wash any tools you use to kill or butcher an animal with soap and water or disinfectant before and after their use. This helps keep sickness from spreading to you and others.
- Covering your skin, eyes, nose, and mouth when killing or butchering an animal, even if the animal looks healthy, can help stop any sickness the animal may have from entering your body.
  - If gloves are available, wear rubber gloves to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so any sickness cannot enter.
  - If rubber gloves are used, after killing or butchering an animal, wash the gloves well with soap and water while they are still on your hands.
  - Wash any tools used to kill or butcher an animal with soap and water or disinfectant. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.
- When butchering an animal, if you notice the blood does not clot, the animal might have anthrax. Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief for advice.

### WASH YOUR HANDS AFTER ANY CONTACT WITH AN ANIMAL

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

- Washing our hands with soap and water after touching or butchering an animal, handling animal meat or products, and cleaning areas where animals have been are some of the best ways we can stop the spread of sickness from an animal to ourselves and our families.
- Always wash your hands with soap and water immediately after touching any animal – even if the animal looks healthy.
- Adults should help or make sure young children wash their hands well.
- Wash your hands with soap and water:
  - After touching any animal.
  - After disposing of a dead animal.
  - Before entering and after leaving an area where animals have been or are kept.
  - After touching animal waste or cleaning an area where animals have been or are kept.
  - Before and after killing or butchering an animal.
  - Before and after touching raw animal parts or animal products like milk or eggs.
  - Before, during, and after preparing food.
  - Before eating food.
  - Before feeding a child.
  - After using the toilet.
  - After changing diapers or cleaning a baby’s bottom.
  - After blowing your nose, coughing, or sneezing.
  - Before and after visiting or caring for someone who is sick.
  - Before and after treating a cut, bite, or scratch.
- You can stop the spread of sickness by washing your hands well.
  - Soak your hands with 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 water.
  - Dry your hands with a tissue or swing your hands to dry them in the air.

#### STORE AND PREPARE FOOD AND WATER SAFELY

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- Anthrax can spread from animals to people when we touch or eat an animal with anthrax or when we touch, eat, or drink something that has the body fluids of an animal with anthrax 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.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and water before, during, and after preparing food.
- Wash hands with soap and water before and after touching raw animal products such as beef or milk.
- Keep raw beef and other animal products away from fruits and vegetables and cooked foods.
- Wash all surfaces and items used to prepare food with soap and water immediately after they have been in contact with any animal parts or products including skin, guts, and raw beef or milk.
- Cook food well to help stop the spread of any sickness. Food should be hot to the touch all the way through.
  - Beef 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 like soups, stews, and “plasas” to boiling before eating.
  - Eat food while it is hot.
  - Reheat cooked food very hot.

#### WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH AN ANIMAL

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- If you think you may have come in contact with anthrax or if you have any of the signs and symptoms of anthrax, go to your nearest health facility or community health worker right away.
  - Getting early treatment for anthrax can save lives.
  - When someone gets early care and treatment, he or she has a better chance at healing quickly and with fewer problems.
- If you have signs and symptoms of anthrax, make sure to tell 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 117.
- Telling 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 Sierra Leone.
- Call 117 to report all deaths.

- <https://www.who.int/news-room/fact-sheets/detail/brucellosis>

## KEY FACTS

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- Brucellosis is found globally and is a reportable disease in most countries
- The disease causes flu-like symptoms, including fever, weakness, malaise and weight loss
- Person-to-person transmission is rare
- Brucellosis is a bacterial disease caused by various *Brucella* species, which mainly infect cattle, swine, goats, sheep and dogs

Brucellosis is a bacterial disease caused by various **BRUCELLA** species, which mainly infect cattle, swine, goats, sheep and dogs. Humans generally acquire the disease through direct contact with infected animals, by eating or drinking contaminated animal products or by inhaling airborne agents. Most cases are caused by ingesting unpasteurized milk or cheese from infected goats or sheep.

Brucellosis is one of the most widespread zoonoses transmitted by animals and in endemic areas, human brucellosis has serious public health consequences. Expansion of animal industries and urbanization, and the lack of hygienic measures in animal husbandry and in food handling, partly account for brucellosis remaining a public health hazard.

## WHO IS AT RISK?

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Brucellosis is found globally and is a reportable disease in most countries. It affects people of all ages and both sexes. In the general population, most cases are caused by the consumption of raw milk or its derivatives such as fresh cheese. Most of these cases are from sheep and goat products.

The disease is also considered an occupational hazard for people who work in the livestock sector. People who work with animals and are in contact with blood, placenta, fetuses and uterine secretions have an increased risk of contracting the disease. This method of transmission primarily affects farmers, butchers, hunters, veterinarians and laboratory personnel.

Worldwide, *Brucella melitensis* is the most prevalent species causing human brucellosis, owing in part to difficulties in immunizing free-ranging goats and sheep.

Human-to-human transmission is very rare.

## PREVENTION AND CONTROL

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Prevention of brucellosis is based on surveillance and the prevention of risk factors. The most effective prevention strategy is the elimination of infection in animals. Vaccination of cattle, goats and sheep is recommended in enzootic areas with high prevalence rates. Serological or other testing and culling can also be effective in areas with low prevalence. In countries where eradication in animals through vaccination or elimination of infected animals is not feasible, prevention of human infection is primarily based on raising awareness, food-safety measures, occupational hygiene and laboratory safety.

Pasteurization of milk for direct consumption and for creating derivatives such as cheese is an important step to preventing transmission from animals to humans. Education

campaigns about avoiding unpasteurized milk products can be effective, as well as policies on its sale.

In agricultural work and meat-processing, protective barriers and correct handling and disposal of afterbirths, animal carcasses and internal organs is an important prevention strategy.

#### TREATMENT AND CARE

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Brucellosis typically causes flu-like symptoms, including fever, weakness, malaise and weight loss. However, the disease may present in many atypical forms. In many patients the symptoms are mild and, therefore, the diagnosis may not be considered. The incubation period of the disease can be highly variable, ranging from 1 week to 2 months, but usually 2–4 weeks.

Treatment options include doxycycline 100 mg twice a day for 45 days, plus streptomycin 1 g daily for 15 days. The main alternative therapy is doxycycline at 100 mg, twice a day for 45 days, plus rifampicin at 15mg/kg/day (600-900mg) for 45 days. Experience suggests that streptomycin may be substituted with gentamicin 5mg/kg/daily for 7–10 days, but no study directly comparing the two regimes is currently available. The optimal treatment for pregnant women, neonates and children under 8 is not yet determined; for children, options include trimethoprim/sulfamethoxazole (co-trimoxazole) combined with an aminoglycoside (streptomycin, gentamycin) or rifampicin.

#### WHO RESPONSE

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WHO provides technical advice to member states through provision of standards, information and guidance for the management of brucellosis in humans and animals. The Organization works to support the coordination and sharing of information between the public health and animal health sectors. In collaboration with the Food and Agricultural Organization of the United Nations (FAO), the World Organization for Animal Health (OIE) and the Mediterranean Zoonoses Control Program (MZCP), WHO supports countries in the prevention and management of the disease through the Global Early Warning System for Major Animal Diseases (GLEWS).

WHO works with national governments, academia, non-governmental and philanthropic organizations, and regional and international partners to prevent and manage zoonotic threats and their public health, social and economic impacts. These efforts include fostering cross-sectoral collaboration at the human-animal-environment interface among the different relevant sectors at regional, national and international levels. WHO also works to develop capacity and promote practical, evidence-based and cost-effective tools and mechanisms for zoonoses prevention, surveillance and detection through reporting, epidemiological and laboratory investigation, risk assessment and control, and assisting countries in their implementation.

As part of the One Health approach, the World Health Organization collaborates with the Food and Agriculture Organization of the United Nations (FAO) and the World Organization for Animal Health (OIE) on the Global Early Warning System for Major Animal Diseases (GLEWS). This joint system builds on the added value of combining and coordinating alert mechanisms of the three agencies to assist in early warning, prevention and control of animal disease threats, including zoonoses, through data sharing and risk assessment.

## BRUCELLOSIS MESSAGES (FROM LIBERIA)

### ABOUT BRUCELLOSIS

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- Brucellosis is a very common sickness 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 IN ANIMALS

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- 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

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- 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

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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

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

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- 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.

- o If plastic bags or gloves are used, remove them carefully. Burn or deeply bury them.
- o Do not reuse any of the materials handled in suspected brucellosis cases.
- o 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

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- Boil fresh and raw milk from any animal before drinking or using it to make milk products.
  - o 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

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- 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.
  - o 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.
  - o 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.
  - o 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.
  - o If rubber gloves or plastic bags are used, remove them carefully. Burn or deeply bury them.
  - o 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

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- 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

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- 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

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- 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, its waste, or its body 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.

## SALMONELLA

- [https://www.who.int/news-room/fact-sheets/detail/salmonella-\(non-typhoidal\)](https://www.who.int/news-room/fact-sheets/detail/salmonella-(non-typhoidal))

## KEY FACTS

- Salmonella is 1 of 4 key global causes of diarrheal diseases.
- Most cases of salmonellosis are mild; however, sometimes it can be life-threatening. The severity of the disease depends on host factors and the serotype of Salmonella.
- Antimicrobial resistance is a global public health concern and Salmonella is one of the microorganisms in which some resistant serotypes have emerged, affecting the food chain.
- Basic food hygiene practices, such as "cook thoroughly", are recommended as a preventive measure against salmonellosis.

The burden of foodborne diseases is substantial: every year almost 1 in 10 people fall ill and 33 million of healthy life years are lost. Foodborne diseases can be severe, especially for young children. Diarrheal diseases are the most common illnesses resulting from unsafe food, 550 million people falling ill each year, including 220 million children under the age of 5 years. Salmonella is 1 of the 4 key global causes of diarrheal diseases.

Salmonella is a ubiquitous and hardy bacteria that can survive several weeks in a dry environment and several months in water, and within known species, over 2500 different serotypes or serovars have been identified to date.

While all serotypes can cause disease in humans, only a few cause severe or life-threatening illness to humans. When these particular serotypes cause disease in humans, it is often invasive and can be life-threatening. Most serotypes, however, are present in a wide range of hosts. Typically, such serotypes cause gastroenteritis (upset stomach that can lead to vomiting and diarrhea), which is often uncomplicated and does not need treatment, but disease can be severe in the young, the elderly, and patients with weakened immunity.



## SYMPTOMS

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Salmonellosis is a disease caused by the bacteria *Salmonella*. It is usually characterized by acute onset of fever, abdominal pain, diarrhoea, nausea and sometimes vomiting.

The onset of disease symptoms occurs 6–72 hours (usually 12–36 hours) after ingestion of *Salmonella*, and illness lasts 2–7 days.

Symptoms of salmonellosis are relatively mild and patients will make a recovery without specific treatment in most cases. However, in some cases, particularly in children and elderly patients, the associated dehydration can become severe and life-threatening.

Although large *Salmonella* outbreaks usually attract media attention, 60–80% of all salmonellosis cases are not recognized as part of a known outbreak and are classified as sporadic cases, or are not diagnosed as such at all.

## TRANSMISSION

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- *Salmonella* bacteria are widely distributed in domestic and wild animals. They are prevalent in food animals such as poultry, pigs, and cattle; and in pets, including cats, dogs, birds, and reptiles such as turtles.
- *Salmonella* can pass through the entire food chain from animal feed, primary production, and all the way to households or food-service establishments and institutions.
- Salmonellosis in humans is generally contracted through the consumption of contaminated food of animal origin (mainly eggs, meat, poultry, and milk), although other foods, including green vegetables contaminated by manure, have been implicated in its transmission.
- Person-to-person transmission can also occur through the faecal-oral route.
- Human cases also occur where individuals have contact with infected animals, including pets. These infected animals often do not show signs of disease.

## TREATMENT

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Treatment in severe cases is electrolyte replacement (to provide electrolytes, such as sodium, potassium and chloride ions, lost through vomiting and diarrhoea) and rehydration.

Routine antimicrobial therapy is not recommended for mild or moderate cases in healthy individuals. This is because antimicrobials may not completely eliminate the bacteria and may select for resistant strains, which subsequently can lead to the drug becoming ineffective. However, health risk groups such as infants, the elderly, and immunocompromised patients may need to receive antimicrobial therapy. Antimicrobials are also administered if the infection spreads from the intestine to other body parts. Because of the global increase of antimicrobial resistance, treatment guidelines should be reviewed on a regular basis taking into account the resistance pattern of the bacteria based on the local surveillance system.

## DIAGNOSIS

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CCHF virus infection can be diagnosed by several different laboratory tests:

- enzyme-linked immunosorbent assay (ELISA);

- antigen detection;
- serum neutralization;
- reverse transcriptase polymerase chain reaction (RT-PCR) assay; and
- virus isolation by cell culture.

Patients with fatal disease, as well as in patients in the first few days of illness, do not usually develop a measurable antibody response and so diagnosis in these individuals is achieved by virus or RNA detection in blood or tissue samples.

Tests on patient samples present an extreme biohazard risk and should only be conducted under maximum biological containment conditions. However, if samples have been inactivated (e.g. with virucides, gamma rays, formaldehyde, heat, etc.), they can be manipulated in a basic biosafety environment.

### TREATMENT

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General supportive care with treatment of symptoms is the main approach to managing CCHF in people.

The antiviral drug ribavirin has been used to treat CCHF infection with apparent benefit. Both oral and intravenous formulations seem to be effective.

### PREVENTION AND CONTROL

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Prevention requires control measures at all stages of the food chain, from agricultural production, to processing, manufacturing and preparation of foods in both commercial establishments and at home.

Preventive measures for Salmonella in the home are similar to those used against other foodborne bacterial diseases (see recommendations for food handlers below).

The contact between infants/young children and pet animals that may be carrying Salmonella (such as cats, dogs, and turtles) needs careful supervision.

National and regional surveillance systems on foodborne diseases are important means to know and follow the situation of these diseases and also to detect and respond to salmonellosis and other enteric infections in early stages, and thus to prevent them from further spreading.

#### Recommendations for travelers

The following recommendations will help ensure safety while travelling:

- Ensure food is properly cooked and still hot when served.
- Avoid raw milk and products made from raw milk. Drink only pasteurized or boiled milk.
- Avoid ice unless it is made from safe water.
- When the safety of drinking water is questionable, boil it or if this is not possible, disinfect it with a reliable, slow-release disinfectant agent (usually available at pharmacies).
- Wash hands thoroughly and frequently using soap, in particular after contact with pets or farm animals, or after having been to the toilet.

- Wash fruits and vegetables carefully, particularly if they are eaten raw. If possible, vegetables and fruits should be peeled.

### Recommendations for food handlers

WHO provides the following guidance for people handling food:

Both professional and domestic food handlers should be vigilant while preparing food and should observe hygienic rules of food preparation.

Professional food handlers who suffer from fever, diarrhea, vomiting or visible infected skin lesions should report to their employer immediately.

The WHO Five keys to safer food serve as the basis for educational programs to train food handlers and educate consumers. They are especially important in preventing food poisoning. The five keys to Safer Food are:

- keep clean
- separate raw and cooked
- cook thoroughly
- keep food at safe temperatures
- use safe water and raw materials.

### Recommendations for producers of fruits, vegetables, and fish

The WHO *Five keys to growing safer fruits and vegetables: promoting health by decreasing microbial contamination and the Five keys to safer aquaculture products to protect public health* provide rural workers, including small farmers who grow fresh fruits and vegetables and fish for themselves, their families and for sale in local market with key practices to prevent microbial contamination.

The *Five keys to growing safer fruits and vegetables* are:

- Practice good personal hygiene.
- Protect fields from animal fecal contamination.
- Use treated fecal waste.
- Evaluate and manage risks from irrigation water.
- Keep harvest and storage equipment clean and dry.

The *Five keys to safer aquaculture products to protect public health* are:

- Practice good personal hygiene.
- Clean the pond site.
- Manage water quality.
- Keep fish healthy.
- Use clean harvest equipment and containers.

### WHO RESPONSE

In partnership with other stakeholders, WHO is strongly advocating the importance of food safety as an essential element in ensuring access to safe and nutritious diets. WHO is providing policies and recommendations that cover the entire food chain from production to consumption, making use of different types of expertise across different sectors.

WHO is working towards the strengthening of food safety systems in an increasingly globalized world. Setting international food safety standards, enhancing disease surveillance, educating consumers and training food handlers in safe food handling are amongst the most critical interventions in the prevention of foodborne illnesses.

WHO is strengthening the capacities of national and regional laboratories in the surveillance of foodborne pathogens, such as Campylobacter and Salmonella.

WHO is also promoting the integrated surveillance of antimicrobial resistance of pathogens in the food chain, collecting samples from humans, food and animals and analyzing data across the sectors.

## APPROVED SALMONELLA MESSAGES

### ABOUT SALMONELLA

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- Salmonella is a sickness that can make people and animals sick.
- Salmonella most commonly spreads from an animal to a person by eating food that has salmonella.
- Salmonella can cause different types of sicknesses in people and animals ranging from not too serious to serious and even death.
- Salmonella sickness is not too serious for most people. Children younger than 5 years, adults older than 65 years, and people with weakened immune systems are more likely to get very sick from salmonella. To keep healthy, they should avoid handling animals and animal products such as eggs and take care to eat food that is always cooked very well.

### SIGNS AND SYMPTOMS OF SALMONELLA IN ANIMALS

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- We cannot always see the signs and symptoms of salmonella in animals.
- Many animals do not show any signs and symptoms of salmonella but can still spread the sickness to other animals and to people.
- Because many animals do not show signs and symptoms of salmonella, you cannot know for sure which animals have the sickness. That is why it is important to be careful with all animals.
- Signs and symptoms of salmonella in animals include:
  - Diarrhea that may have blood or mucus
  - Acting more tired than usual
  - Vomiting
  - Fever

### SIGNS AND SYMPTOMS OF SALMONELLA IN PEOPLE

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- The length of time from when salmonella enters a person's body to when the person starts to show signs and symptoms of salmonella ranges from six hours to three days.

- Signs and symptoms of salmonella in people include:
  - Fever
  - Diarrhea
  - Stomach pain
  - Nausea
  - Vomiting
- The signs and symptoms of salmonella usually last two to seven days.
- Most people recover from salmonella without treatment.
- Some people may have very serious diarrhea and need to go to a health facility.
- For people who have diarrhea from salmonella, it may take several months before their normal habit of toileting returns.

### THE DIFFERENT WAYS SALMONELLA IS SPREAD

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- Salmonella has been found in many domestic and wild animals, including chickens, geese, ducks, wild birds, cattle, goats, sheep, pigs, rabbits, cats, dogs, lizards, snakes, frogs, and rats.
- Salmonella can spread from an animal to a person through:
  - Eating an animal or animal products (e.g., eggs, milk) that has salmonella.
  - Touching an animal that has salmonella and then touching your eyes, nose, or mouth.
  - Touching the toilet of an animal that has salmonella and then touching your eyes, nose, or mouth.
  - Touching items that the toilet of an animal with salmonella have touched (e.g., fur, feathers, cage, bedding, surfaces, food) and then touching your eyes, nose, or mouth.
- Salmonella can spread from person to person through:
  - Touching the toilet or items with toilet on them of a person that has salmonella and then touching your mouth.
- Salmonella enters a person's body through the mouth, nose, or eyes.

### HOW TO PROTECT AGAINST SALMONELLA

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

### PROTECT YOURSELF AND OTHERS FROM SICK AND DEAD ANIMALS

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- When possible, avoid animals that look sick and animals that you find dead.
- Do not touch with bare hands the body or body fluids, such as toilet, of an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to us if we touch them or their body fluids.

- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and water immediately after any contact with an animal, even if it looks healthy, because we cannot always see the signs and symptoms of salmonella.
- Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about any animal that looks sick or that you find dead.
- Telling an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief about an animal that looks sick or that you find dead can help district authorities know about sicknesses before they become a problem for people.

#### DISPOSE OF DEAD ANIMALS SAFELY

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- If an animal health worker does not respond in one day to advise on how to dispose of a dead animal safely, it is important to dispose of 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.
- To dispose of a dead animal safely, carefully 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 plenty people and where space is too small to safely bury the dead animal.
- To dispose of a dead animal 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 and your nose and mouth with a mask or cloth so the sickness cannot enter.
  - If rubber gloves or plastic bags are not available, use banana leaves, cloth, or some other item to cover the dead animal to avoid touching the animal with your bare hands.
  - Use a shovel, wheelbarrow, or other tools to move the dead animal to where you can burn or bury it deeply.
  - Burn or deeply bury the dead animal.
  - If plastic bags are used, remove them carefully so that you do not touch any body fluids of the animal on the plastic. Burn or deeply bury the plastic bags along with the animal and wash your hands and arms immediately with soap and water.
  - If rubber gloves are used, wash the gloves well with soap and water while they are still on your hands.
  - Pour soapy water or disinfectant over the shovel, wheelbarrow, or other tools used to move the dead animal and place the tools in the sun to dry. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.

- Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.
- Always wash your hands and arms with soap and water immediately after any contact with an animal, even if it looks healthy, because we cannot always see the signs and symptoms of salmonella.
- Never dig up a dead animal that has been buried.

### PROTECT YOURSELF WHEN KILLING OR BUTCHERING AN ANIMAL

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- Animals are an important food source. To keep healthy, it is important to never prepare or eat, sell, or give away an animal that looks sick or that you find dead. Sick animals and animals we find dead can spread their sickness to those who touch them.
- Always wash your hands and arms with soap and water before and immediately after killing or butchering an animal, even if it looks healthy, because we cannot always see the signs and symptoms of salmonella.
- Wash any tools you use to kill or butcher an animal with soap and water or disinfectant before and after their use. This helps keep sickness from spreading to you and others.
- Covering your skin, eyes, nose, and mouth when killing or butchering an animal, even if the animal looks healthy, can help stop any sickness the animal may have from entering your body.
  - If gloves are available, wear rubber gloves to protect your hands. Cover your eyes with glasses and your nose and mouth with a mask or cloth so any sickness cannot enter.
  - If rubber gloves are used, after killing or butchering an animal, wash the gloves well with soap and water while they are still on your hands.
  - Wash any tools used to kill or butcher an animal with soap and water or disinfectant. Then wash your hands and arms, or gloves if using them, immediately with soap and water.
  - Remove the glasses and mask or cloth from your face, wash them immediately with soap and water or disinfectant, and place them in the sun to dry.
  - Wash the rubber gloves well once more with soap and water and dispose of safely. Then wash your hands and arms immediately with soap and water.

### REDUCE ANIMALS IN YOUR HOUSE AND KEEP THE HOUSE CLEAN

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- Animals should be kept in an animal pen away from your house.
- Keep animals like chickens, goats, sheep, and pigs out of the house. Close contact with animals and their toilet can make it easier for salmonella to spread from animals with the sickness 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 animals 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 unwanted animals from visiting 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 that animals such as rats or chickens have been inside. Close contact with animals and their toilet can make it easier for salmonella to spread from animals with the sickness to us and our families.
- When sweeping your house after animals have been in the house, always make sure to:
  - Cover your eyes with glasses and your nose and mouth with a mask or 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 water.
- Always wash your hands and arms with soap and 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 wet and toilet.
- Keep food and water in covered containers that animals cannot enter and away from where people sleep. This helps to avoid close contact with rats and other animals and 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 animals and their toilet.
- Keeping a wild animal as a pet or bringing it into your house can make problems for the animal and your family. Leave wild animals to be wild.
- Wild animals do not normally let a person come close to it, so if one does, remember that something could be wrong with the animal.

#### WASH YOUR HANDS AFTER ANY CONTACT WITH AN ANIMAL

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



- Washing our hands with soap and water after touching or butchering an animal, handling animal meat or products, and cleaning areas where animals have been are some of the best ways to stop the spread of sickness from an animal to ourselves and our families.
- Always wash your hands with soap and water immediately after touching any animal – even if the animal looks healthy. We cannot always see the signs and symptoms of salmonella in animals.
- Adults should help or make sure young children wash their hands well.
- Wash your hands with soap and water:
  - After touching any animal.
  - After disposing of a dead animal.
  - Before entering and after leaving an area where animals have been or are kept.
  - After touching animal waste or cleaning an area where animals have been or are kept.
  - Before and after killing or butchering an animal.
  - Before and after touching raw animal parts or animal products like milk or eggs.
  - Before, during, and after preparing food.
  - Before eating food.
  - Before feeding a child.
  - After using the toilet.
  - After changing diapers or cleaning a baby’s bottom.
  - After blowing your nose, coughing, or sneezing.
  - Before and after visiting or caring for someone who is sick.
  - Before and after treating a cut, bite, or scratch.
- You can stop the spread of sickness by washing your hands well.
  - Soak your hands with 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 water.
  - Dry your hands with a tissue or swing your hands to dry them in the air.

#### STORE AND PREPARE FOOD AND WATER SAFELY

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- Salmonella can spread from animals to people when we touch, eat, or drink something that has the toilet of an animal with salmonella on 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 rats, cats, dogs, and other animals can touch it or areas where animal toilet has touched.
- Keep food and water in covered containers that animals cannot enter and away from where people sleep. This helps to avoid close contact with rats and other animals and 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 the water and then other people.
- Keep your cooking area and all food, cups, spoon, trays, and all cooking items clean and away from animals and their toilet.
- When preparing and cooking food, use clean surfaces, bowls, knives, spoons, forks, cups, and other items.
- Wash hands with soap and water before, during, and after preparing food.
- Wash hands with soap and water before and after touching raw animal products such as beef, chicken, milk, and eggs.
- Keep raw beef, 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 water immediately after they have been in contact with any animal parts or products including skin, feathers, guts, and raw beef, chicken, milk, or eggs.
- Cook food well to help stop the spread of any sickness. Food should be hot to the touch all the way through.
  - Beef 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 like soups, stews, and “plasas” 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.

### KEEP ANIMAL AREAS CLEAN

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- Salmonella in animals can be spread through their body fluids, such as toilet. In areas where animals visit or are kept, the body fluids of an animal with salmonella can spread easily to other animals or live on surfaces that can be spread to other animals and people who touch them.
- The best way to prevent salmonella in animals is to keep animal areas clean, remove animal toilet, and throw it away safely.

- Clean or sweep animal toilet from the yard or animal pen frequently to help stop the spread of any sickness to other animals or to people.
- Burn or deeply bury animal toilet and other waste away from the animal pen, where food is grown, water sources, and places that people and animals visit often.
- In areas with plenty people and where space is small to burn or bury, put animal toilet and other waste in plastic or a covered bin until it can be collected and taken away.
- Clean areas and surfaces that have come into contact with animals or their toilet with soap and water.
- Clean any tools or items used to care for animals, like cages or food and water containers, outside of the house.
- We can help stop salmonella from entering our body when cleaning areas where animals visit or are kept by covering our skin, eyes, nose, and mouth.
  - If gloves are available, wear rubber gloves to protect your hands. Wash the rubber gloves well with soap and water before removing. Then wash your hands and arms immediately with soap and water.
  - Cover your eyes with glasses and your nose and mouth with a mask or cloth so the sickness cannot enter. Wash the glasses and mask or cloth with soap and water immediately after removing.
- Always wash your hands and arms with soap and water immediately after cleaning an area where animals have been or are kept.
- 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.
- Have a separate set of shoes and clothes that you use just for working in animal areas. Wash them frequently.
- Wash the wheels of bicycles, motorcycles or other vehicles with soap and water as soon as possible after leaving animal areas and especially before you go indoors.
- Clean any clothes, shoes, equipment like cages or shovels, and vehicle wheels with soap and water. Then wash your hands and arms immediately with soap and water.

#### HOW TO PROTECT YOUR ANIMALS FROM SALMONELLA

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- Animal health is important for human health. Taking good care of our pets and 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, clean place to stay.
- Clean the animal pen frequently to help prevent the spread of salmonella to other animals.

- Keep animals in the yard or closed area. Animals that roam freely are more likely to come in contact with salmonella from other animals and can then spread the salmonella to other animals, our families, or our communities.
- If one or more of your animals get sick or dies, separate the sick or dead animals from the healthy ones to stop the spread of sickness. Tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief.
  - Then wash anything that touched the animals, the area where the animals were kept, and your hands and arms immediately with soap and water.
- 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 any symptoms of sickness. This way you can make sure they are not sick with salmonella 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 salmonella or any other sickness at the market that they might spread to other animals.
- If you hear of an outbreak of an animal sickness nearby, tell an animal health worker, community health worker, environmental officer, traditional healer, religious leader, or your chief.
- To keep you and your animals safe, do not move or sell your animals if you hear of an outbreak of salmonella nearby.

#### WHAT TO DO IF SOMEONE GETS SICK OR DIES AFTER CONTACT WITH AN ANIMAL

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- If you have any of the signs and symptoms of salmonella, go to your nearest health facility or community health worker right away.
  - Getting early treatment for salmonella can save lives.
  - Getting early treatment can also protect your family and loved ones from getting salmonella.
  - When someone gets early care and treatment, he or she has a better chance at healing quickly and with fewer problems.
- If you have signs and symptoms of salmonella, make sure to tell 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 toilet, or any items they or their toilet have touched.
- Touching the body of a sick or dead person, their toilet, or items they or their toilet touched can spread salmonella to other people.
- If a person gets sick or dies after contact with an animal, go to your nearest health facility or community health worker or call 117.

- Telling 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 Sierra Leone.
- Call 117 to report all deaths.
- Wash your hands frequently with soap and water.

## RUMOR SCENARIOS:

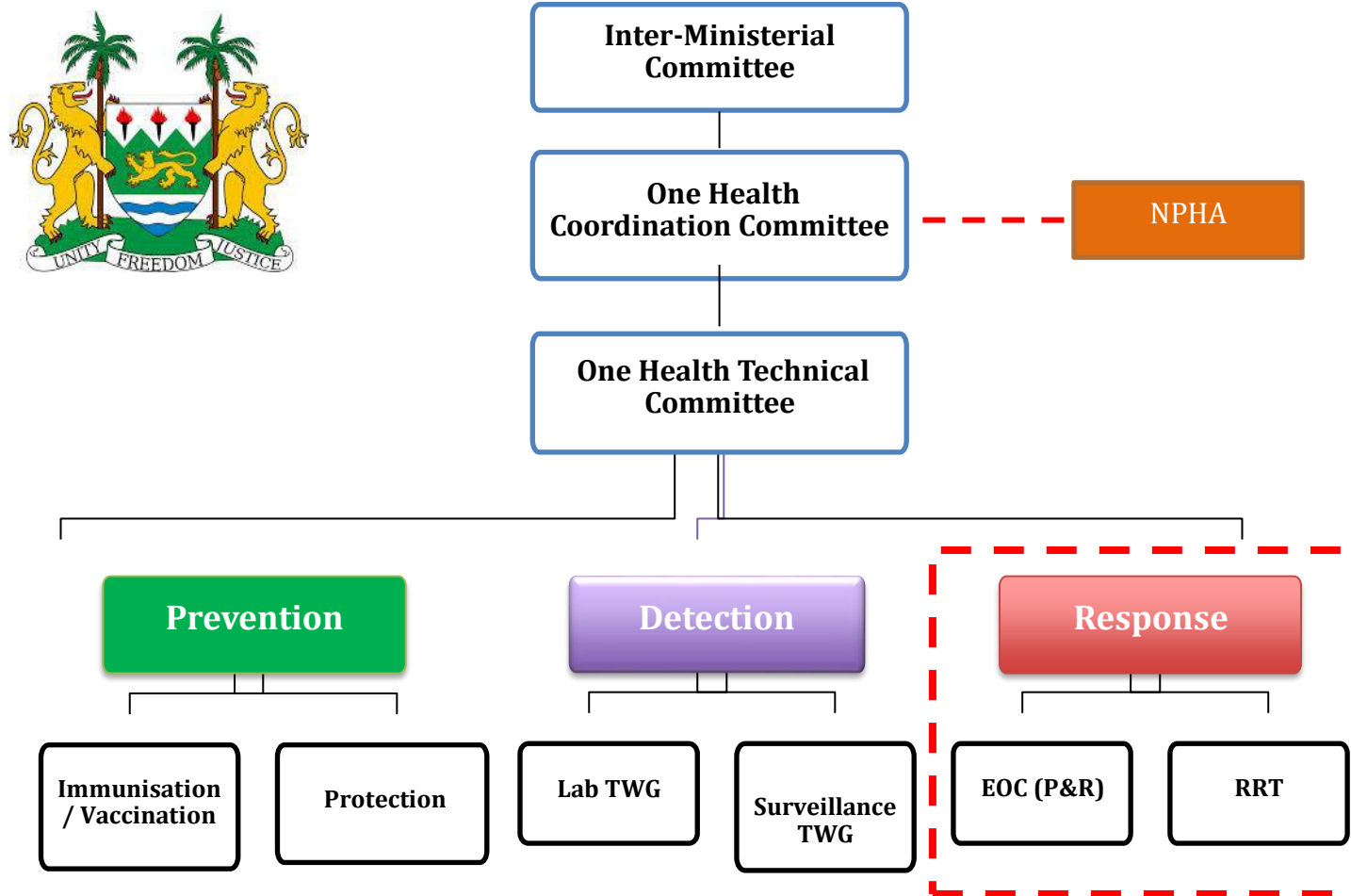
### Scenario 1:

- Marburg outbreak in Kono
  - Five youth meet in a cinema hall to watch a football match between Arsenal and Manchester. Whilst they were enjoying the game, the lights went out. The angry youth started complaining that the NPA authorities are not doing their job. Then one said, “ have you also saw GoSL press release of a Marburg case reported in Kono?” The eldest among them all replied, “This is not true, there is no Marburg in Sierra Leone. The government just wants donor funding again because COVID-19 outbreak has slow down.”
  - Cast: Five: Angry youth 1, angry youth 2, angry youth 3, news carrier, elder

### Scenario 2:

- Scenario 2: Anthrax outbreak in Karene
  - An 18-year-old student from Njala University is visiting his father, who is cattle rearing in Karene District. When the father offered the young man cow milk, he refuses explaining that the MoA has banned the consumption of meat or meat products in Karene District due the current anthrax outbreak in the area. The young man goes on to share the public notice with his dad. However, his father scoffs at the public notice and insists his son try the fresh cow milk. The father explains to his son that the government is against cattle rearing in certain chiefdoms in Karene District because they want to give our land to some investors. The father continues to explain that the government is responsible for the death of our animals by giving boys a medicine that poisons their animals so that they die and the government can claim an outbreak.
  - Cast: Three: Father, son, mother

# NATIONAL ONE HEALTH STRUCTURE

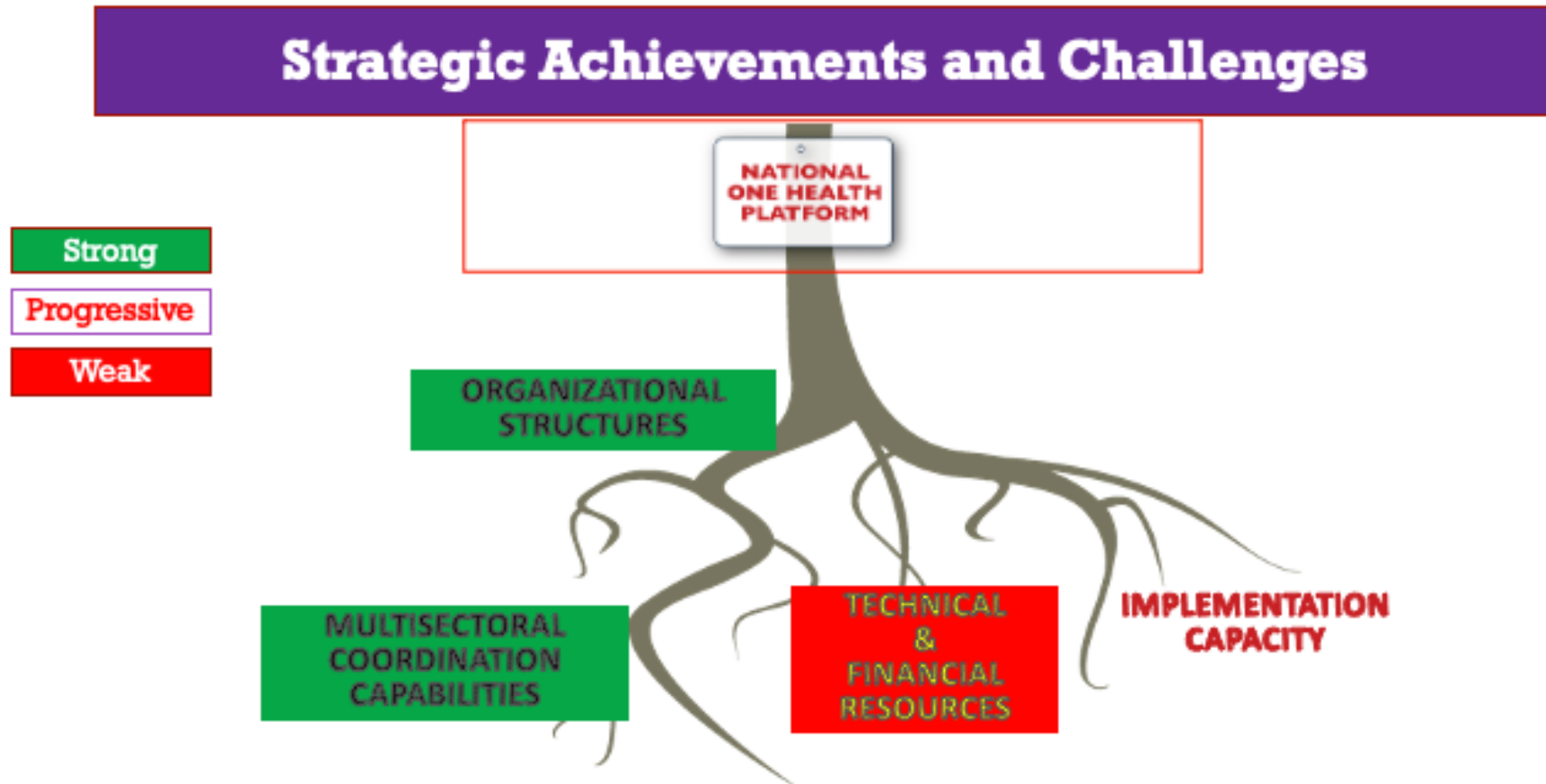


## TECHNICAL WORKING GROUPS UNDER ONE HEALTH

- Integration surveillance:
- Laboratory:
- Points of entry: Supports the
- Emergency preparation and response
- Anti-microbial resistance
- Food and food safety
- Biosafety and biosecurity
- Risk communication
- Immunization/vaccination
- Occupational health and safety
- Zoonotic disease



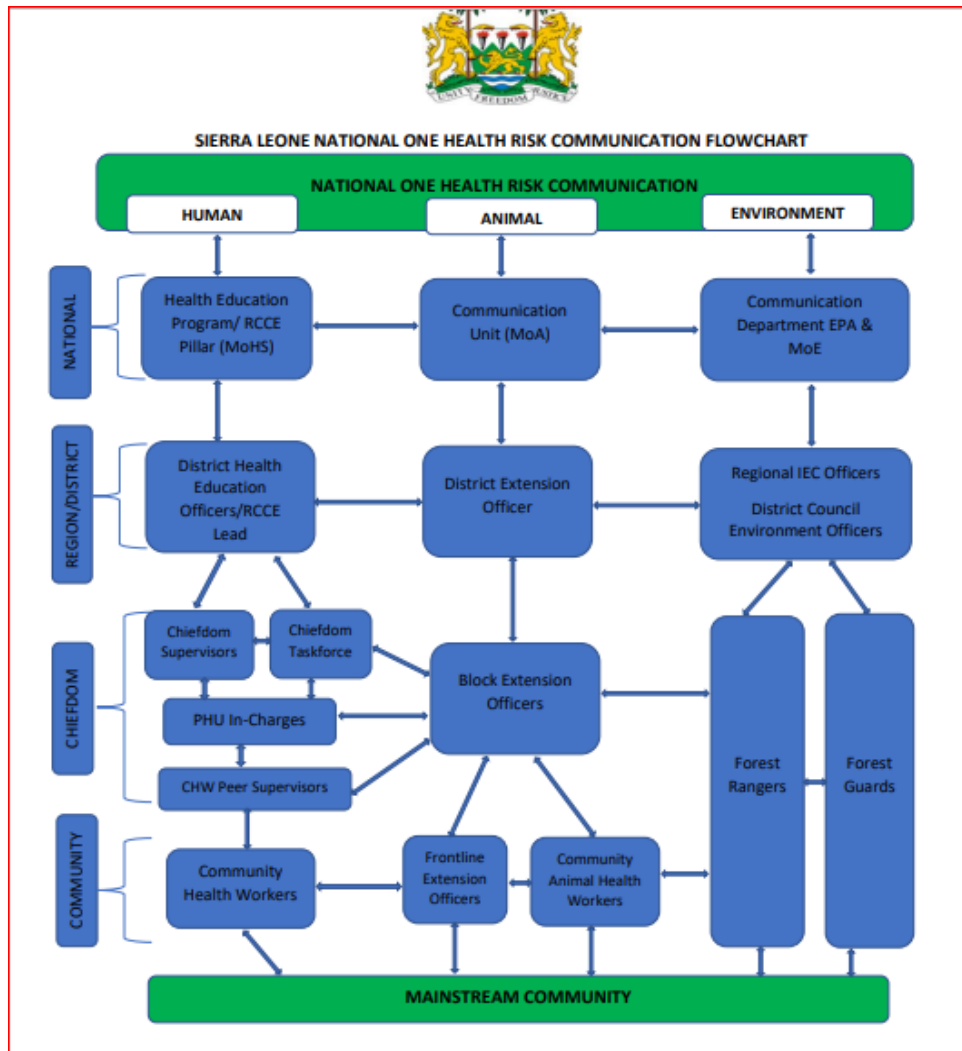
## ONE HEALTH ACHIEVEMENTS AND CHALLENGES



# LET'S COLLABORATE TO SAVE LIVES



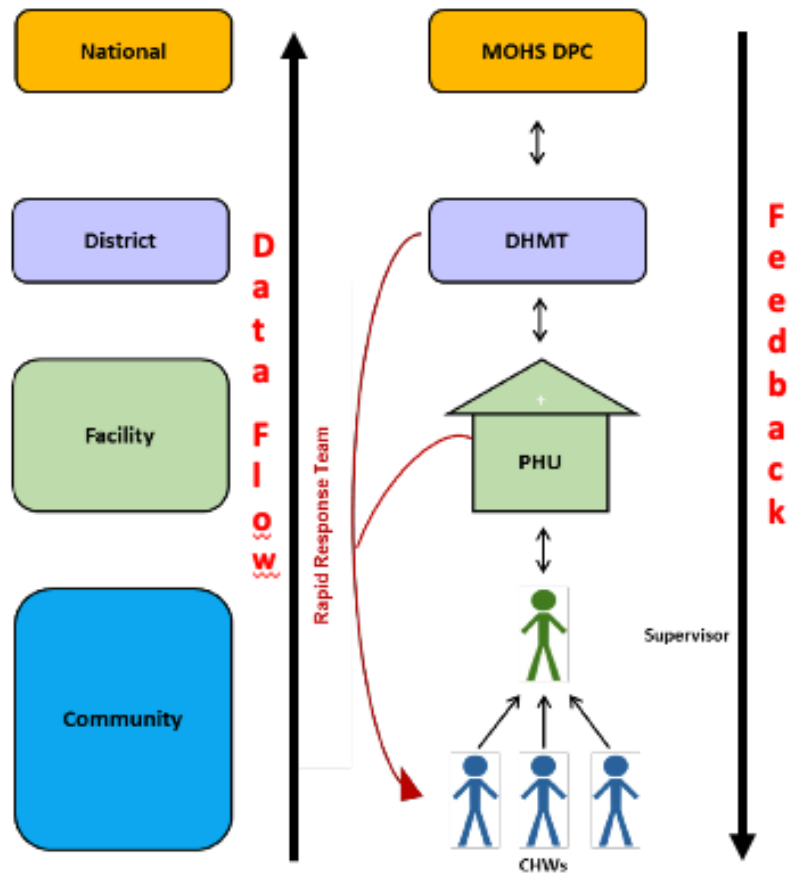
# ONE HEALTH FLOWCHART



## ONE HEALTH COMMUNICATION AND COORDINATION IMPROVEMENT CHART

No	Action	Purpose of the action	Actors to involve	Frequency	Responsible person

# CBS Reporting & Feedback Structure



## PRIORITY ZOOONOTIC DISEASES: YOUR TURN!

The 7 questions to consider when considering RCCE approaches:

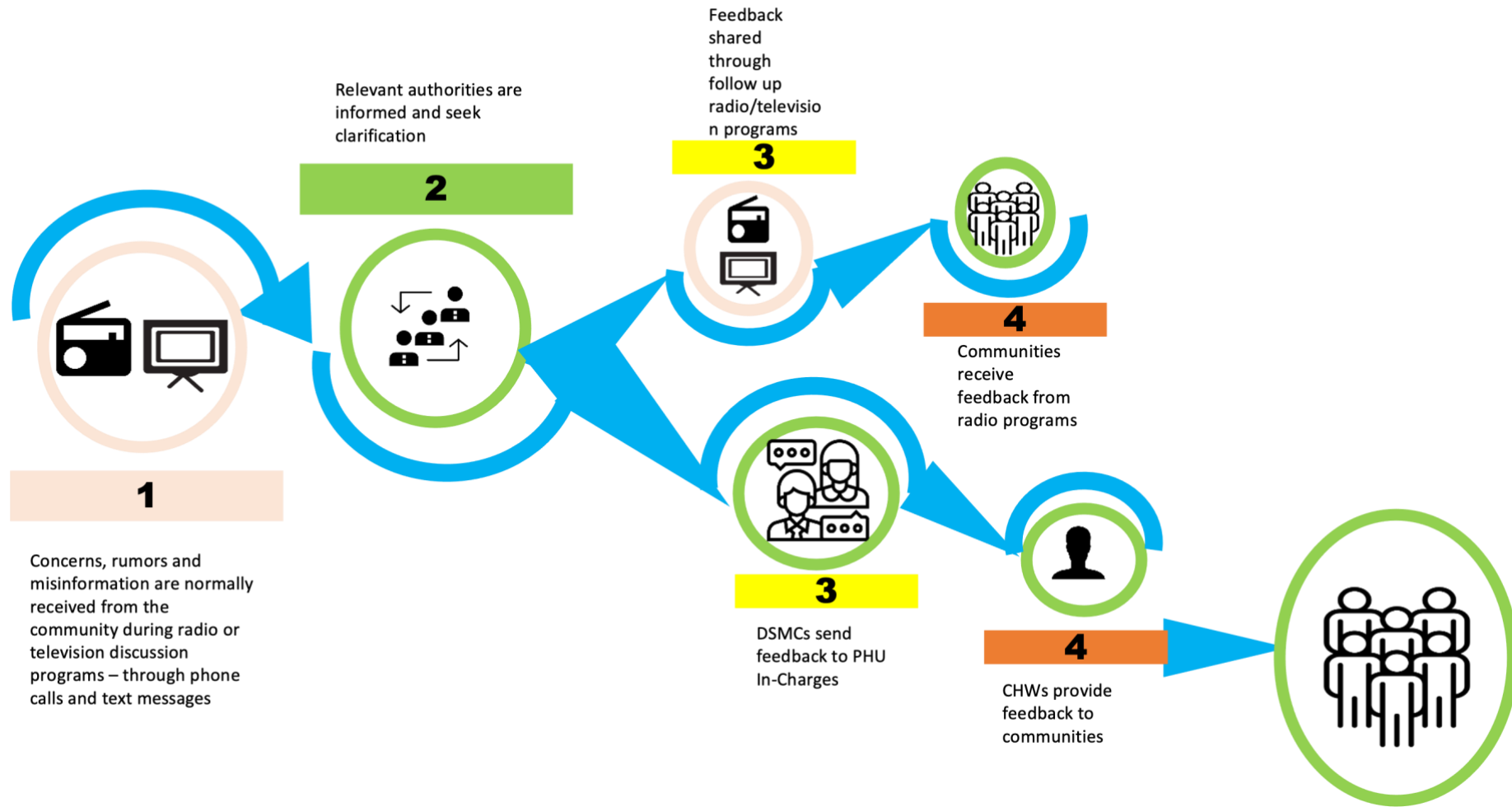
1. What are 2 key behaviors people need to practice in order to protect themselves from this disease? (there may be more than two you think are important but just prioritize two)
2. What particular groups or audiences would you direct your communication on the behaviors to and why?
3. What (if any) information does your audience need in order to practice the 2 key behaviors?
  - Think about what questions people may have about how to practice a behavior, what they need to practice it, their daily circumstances, etc.
4. What is one key challenge people may face receiving this information or in practicing the behaviors?
5. Are there any potential ways that communication could help address this challenge?
6. What is one area where you think coordination between national, district, and chiefdom structures is needed to communicate to your audience more effectively?
7. Now imagine an emergency outbreak scenario where there is a confirmed cluster of 5-10 cases of your PZD in an urban neighborhood. Public health authorities notify local health workers to keep an eye out for potential additional cases. Soon there are dozens of suspected cases, localized to the same town or neighborhood area. What do you think would be the biggest barriers to the response? Would you change your non-emergency strategy to be better prepared to respond to what you think could be challenges in an outbreak scenario?

## M&E TEMPLATE TABLE

Activity Description	Indicator	Data source (where does the data come from?)	Frequency (how often?)	Responsible (who will collect?)
Activity 1	Indicator 1 Indicator 2 Indicator 3			

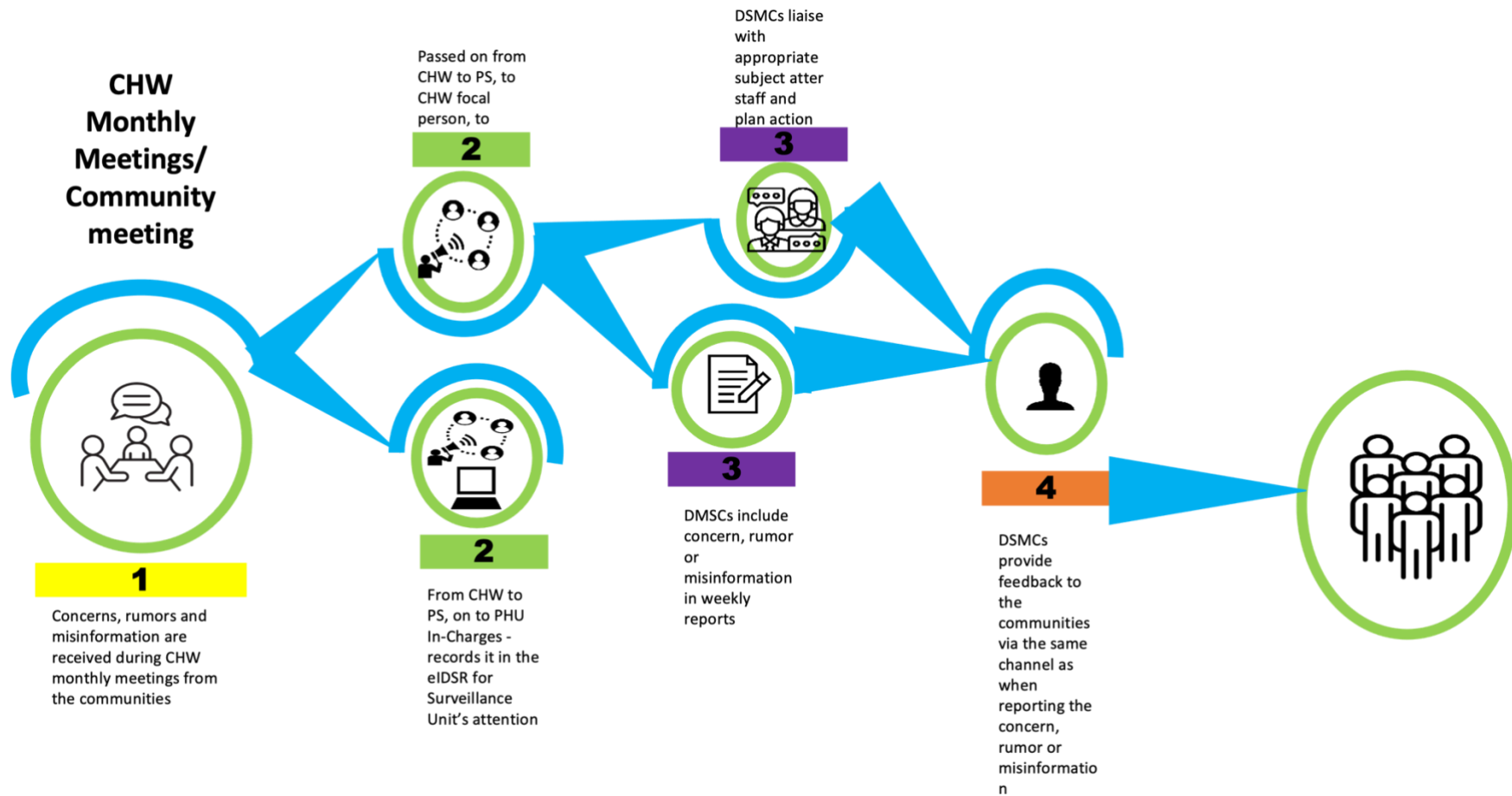
# RUMOR MANAGEMENT – TV AND RADIO

## Rumor Management: Radio and Television

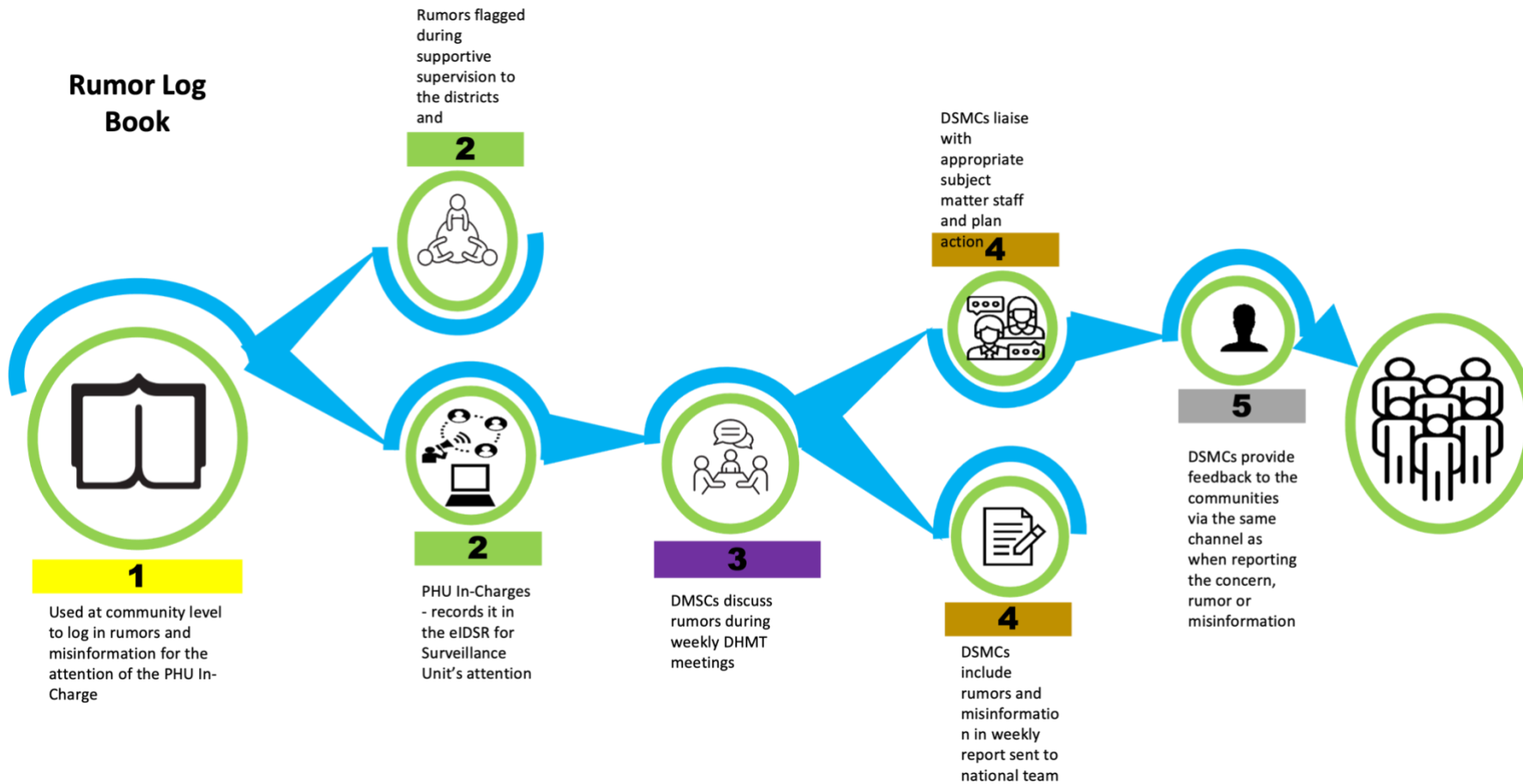




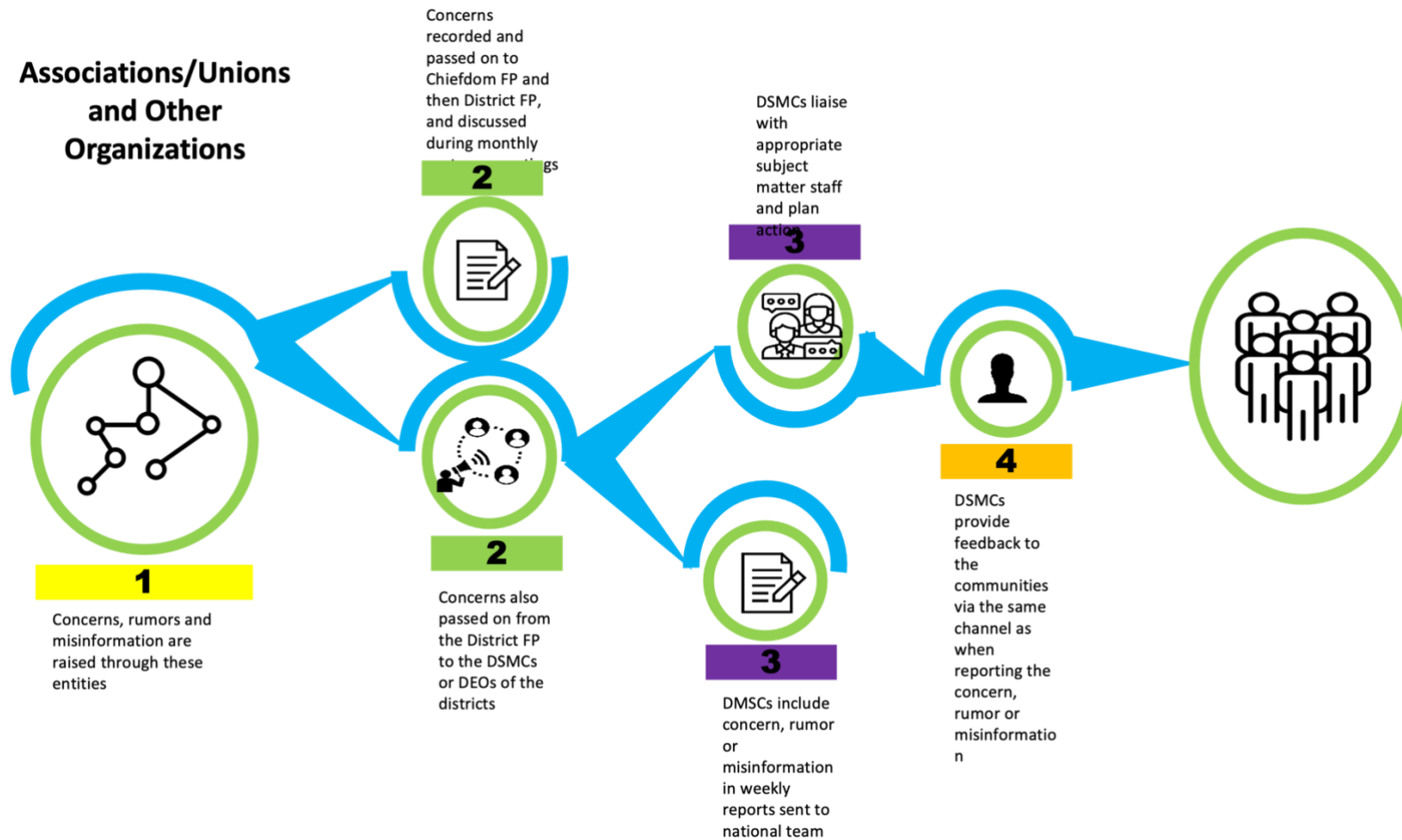
# RUMOR MANAGEMENT – CHWs



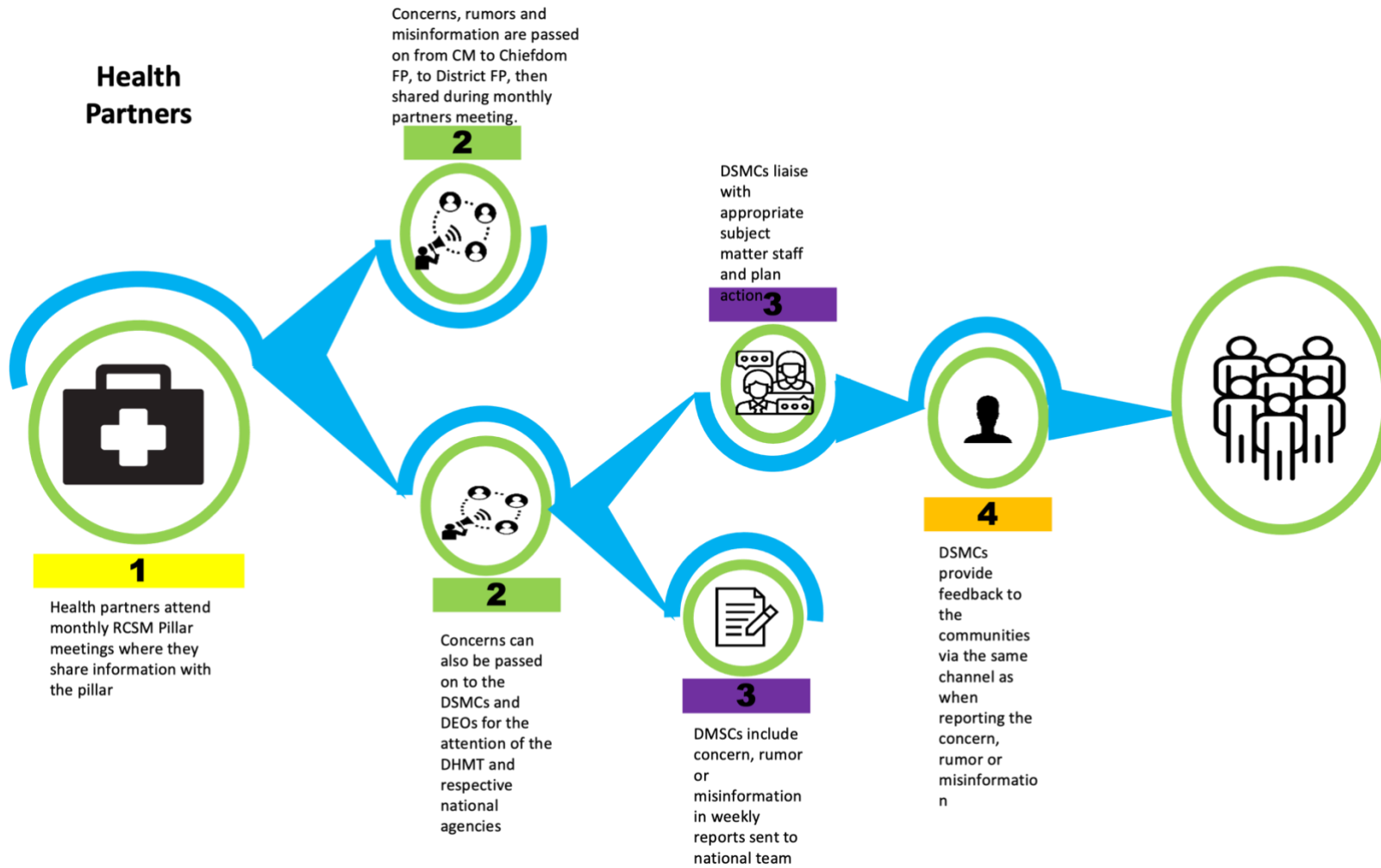
# RUMOR MANAGEMENT – RUMOR LOG



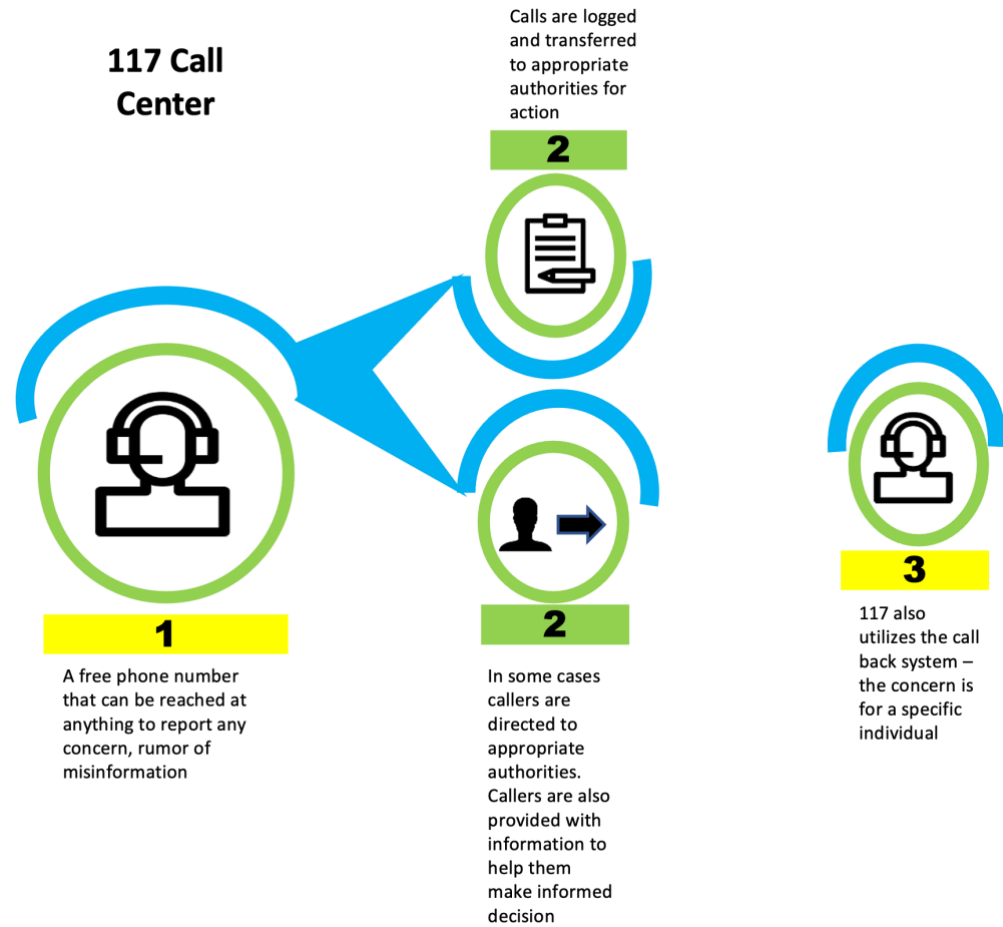
## RUMOR MANAGEMENT – ASSOCIATIONS AND OTHER ORGANIZATIONS



# RUMOR MANAGEMENT – HEALTH PARTNERS

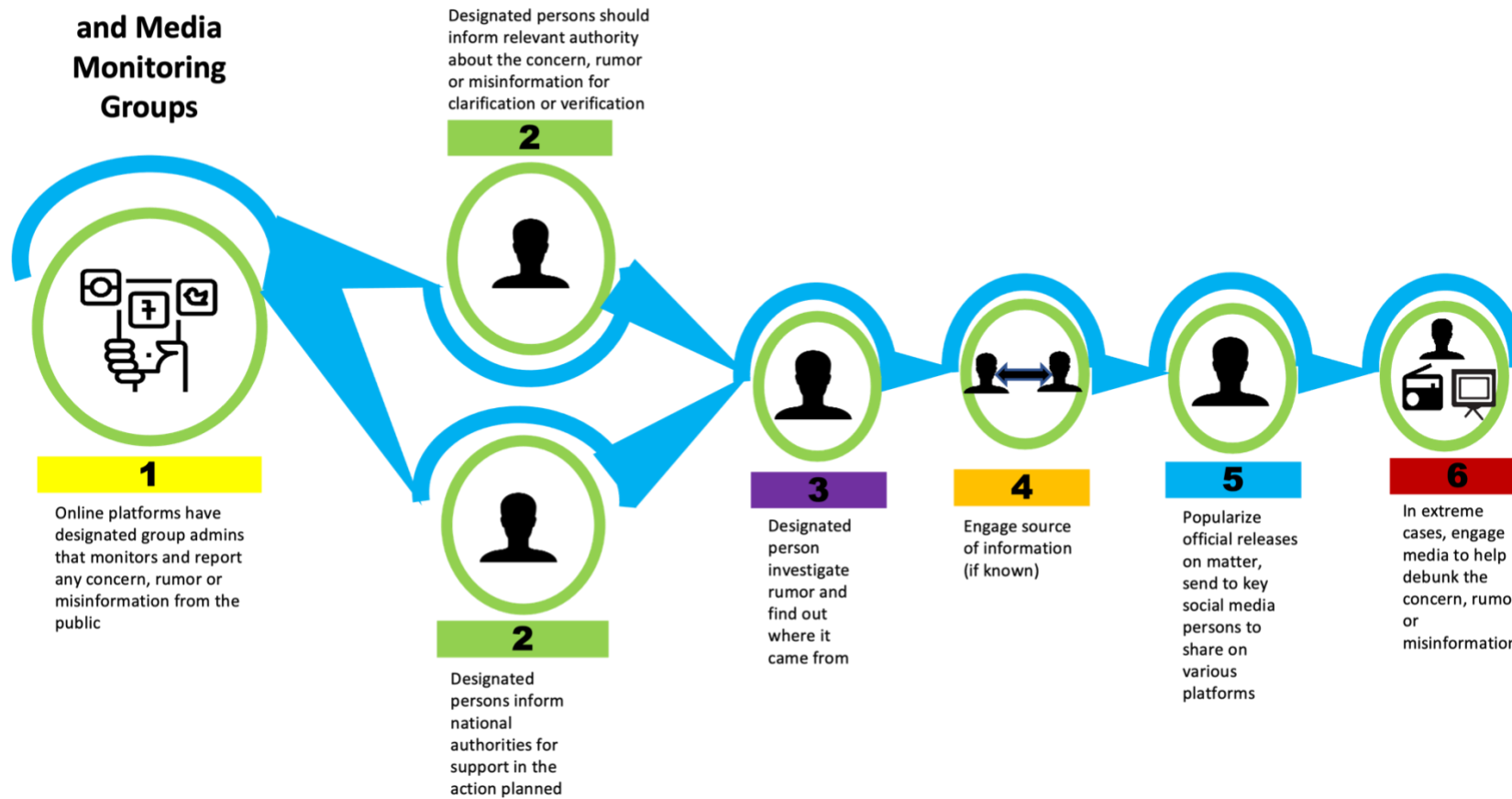


# RUMOR MANAGEMENT – 117

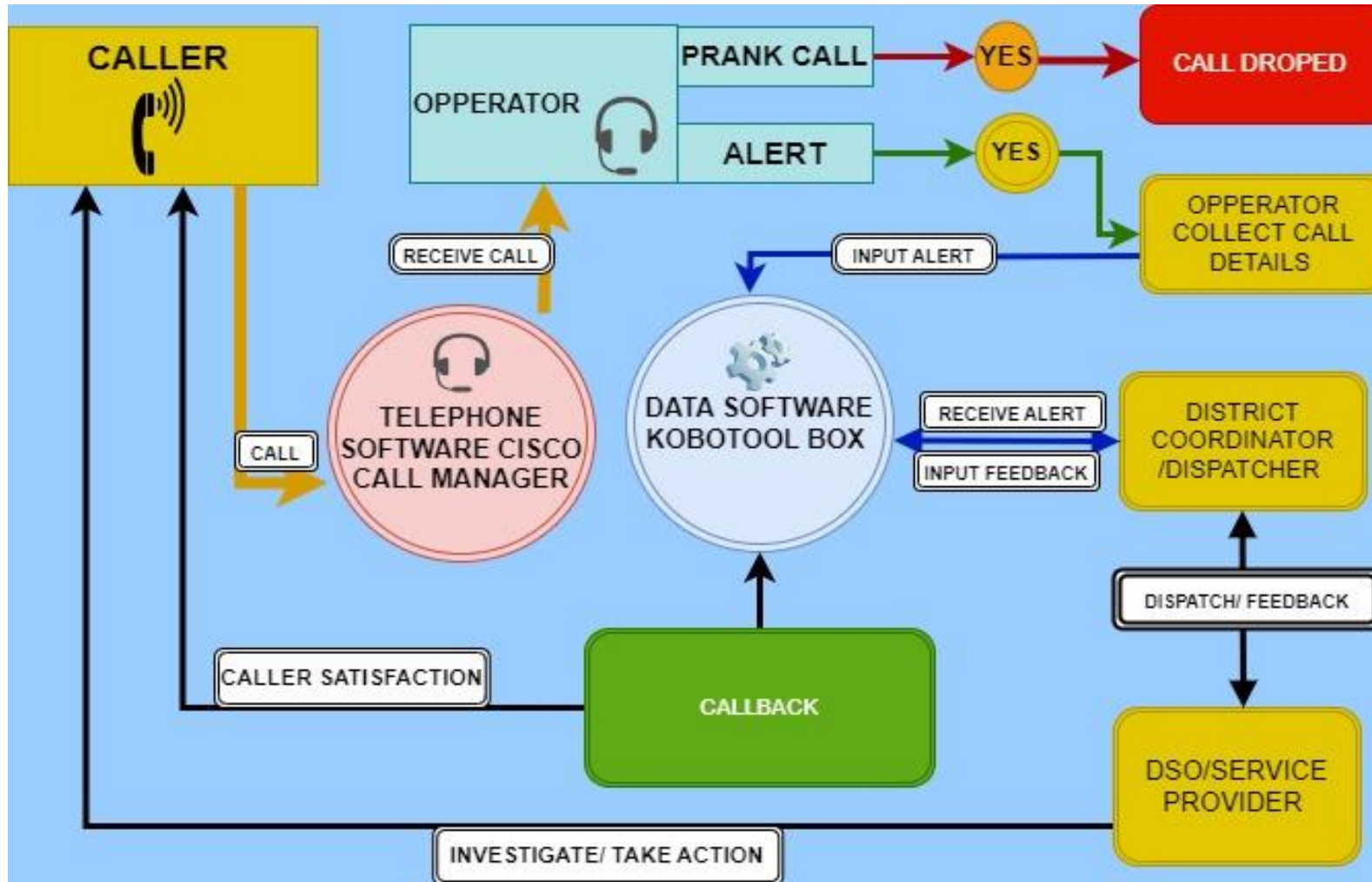


# RUMOR MANAGEMENT – WHATSAPP

## WhatsApp Facebook and Media Monitoring Groups



## 117 PROCESS FLOW



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