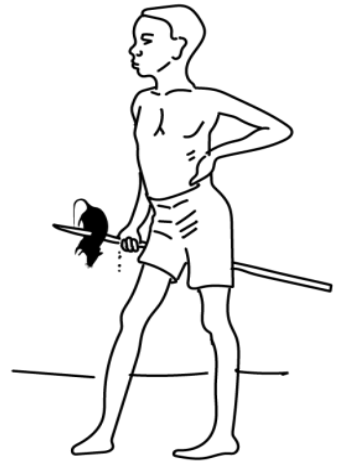


Introduction to Lassa fever

Managing
infectious hazards



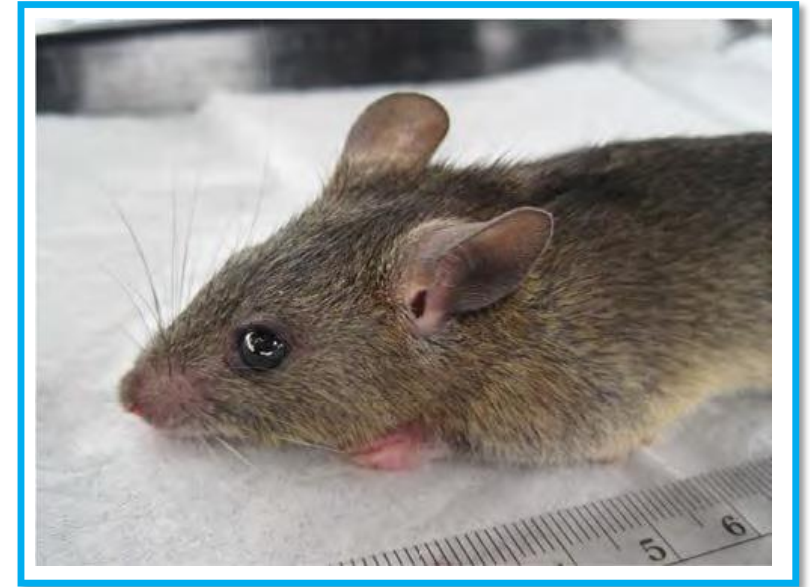
Store food in
containers with lids



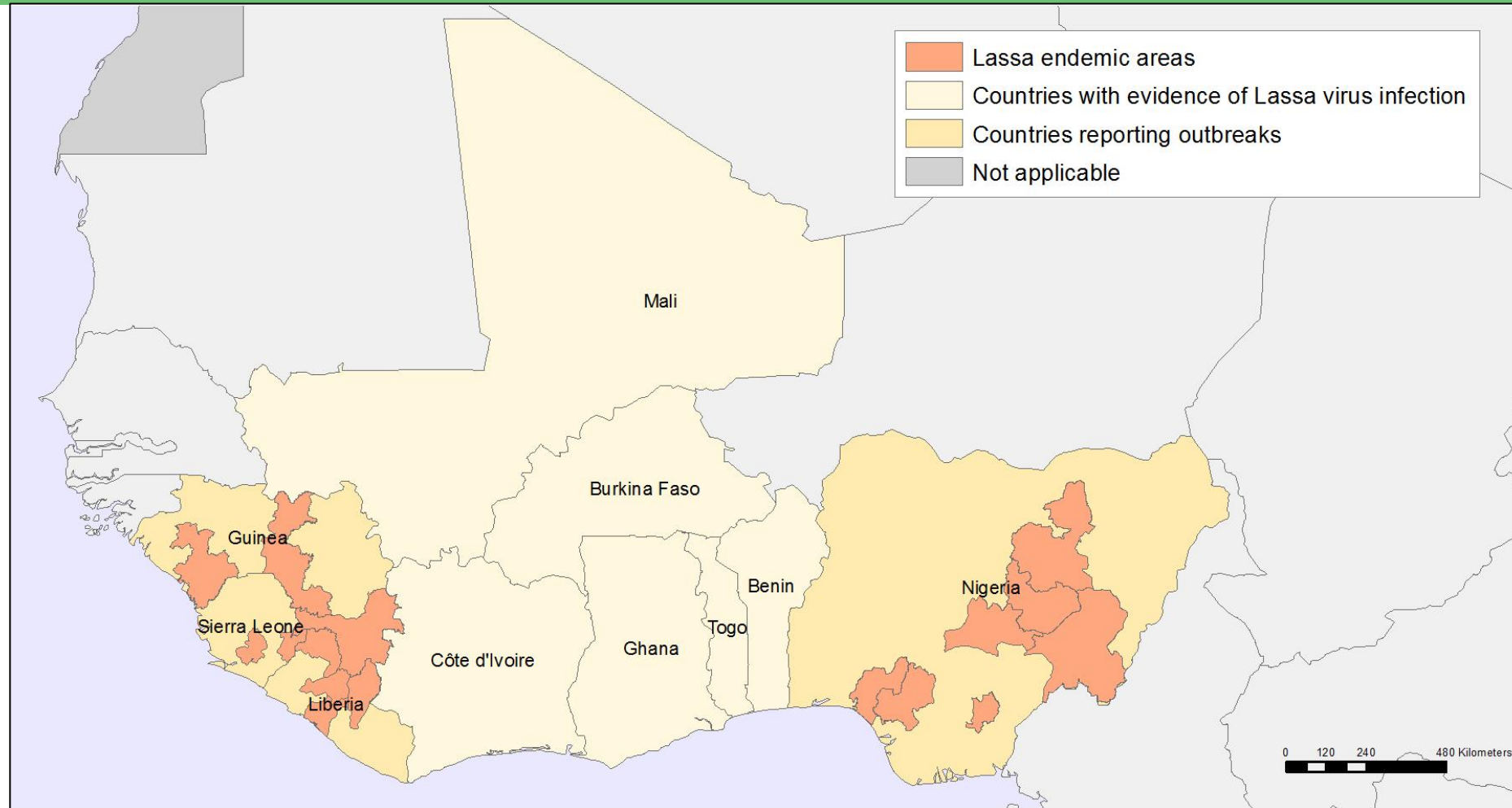
- Describe signs, symptoms, and transmission of Lassa fever
- List 4 preventive and control measures
- Describe why Lassa fever is a public health concern in West Africa



- Lassa fever is viral illness that occurs in West Africa.
- The reservoir of the Lassa virus is a rodent of the genus *Mastomys* known as “multimammate rat”.
- The Lassa virus is transmitted to humans mainly through food or household items contaminated by infected rats’ urine and faeces and by handling infected rats.
- 80% of people infected will have no or mild symptoms. One on five people will develop a severe disease.



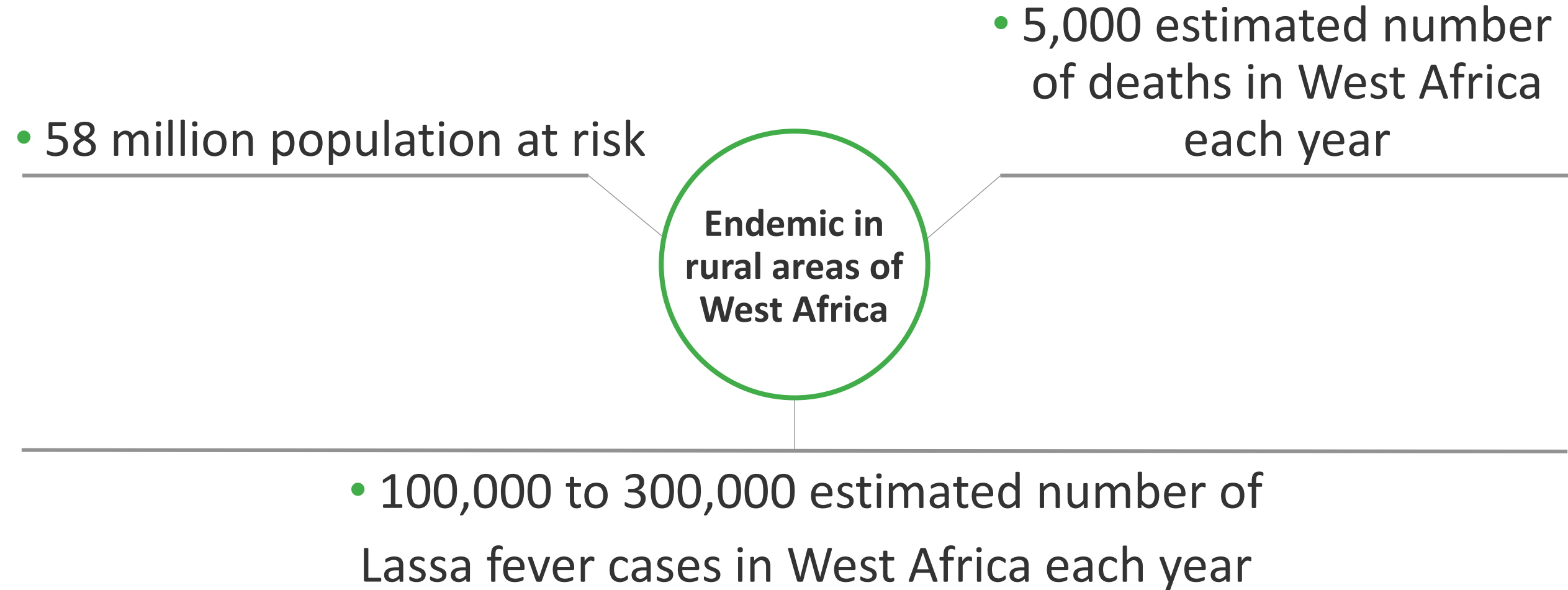
Geographic distribution of Lassa fever



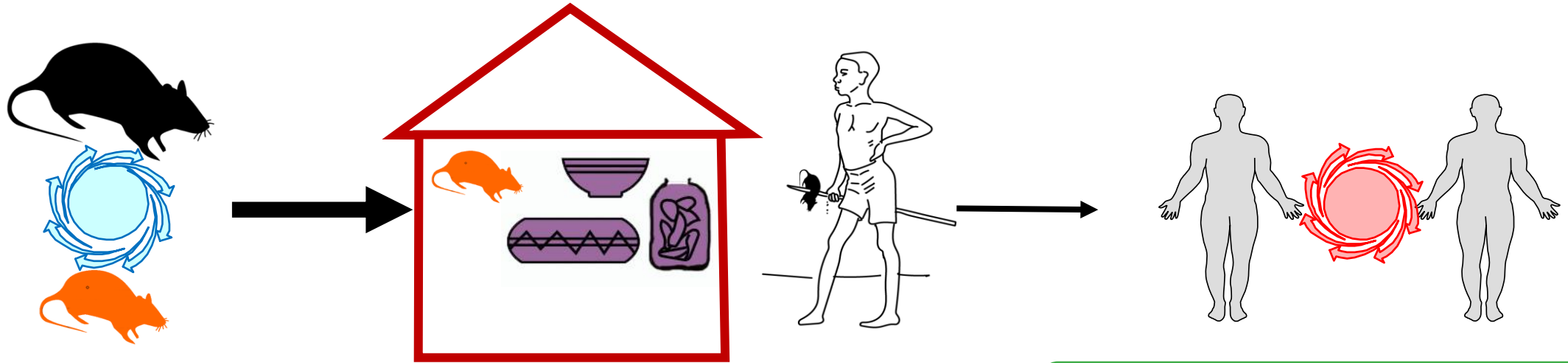
Lassa fever is reported in Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali, Nigeria, Sierra Leone and Togo

Map available at: <http://www.who.int/emergencies/diseases/lassa-fever/geographic-distribution.png?ua=1>

Burden of Lassa fever in West Africa



Lassa fever Transmission



Reservoir *Mastomys* rats

- The virus maintains itself in *Mastomys* rat population
- Virus is present in urine and feces of infected rats

Primary human infections

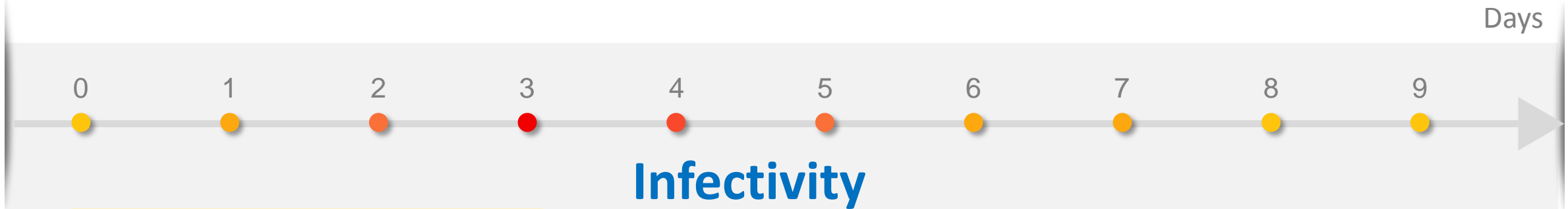
- 80 to 90 % of humans are infected through:
- Food or household items contaminated by infected rats' urine and faeces.
 - Direct contact while handling *Mastomys* rats (food source)

Secondary human infections

- Secondary human-to-human transmission occurs through direct contact with the blood, secretions, organs or other body fluids of infected persons.

- The incubation period ranges from 5-21 days.
- With 80% asymptomatic and mild symptoms presentation, overall case fatality rate (CFR) is 1%.
- CFR can reach 15% or more among patients hospitalized with severe presentation.
- Most common symptoms include:
 - Gradual onset of fever, malaise and general weakness;
 - After a few days: headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhea, cough, and abdominal pain.
- In severe cases, patient may present with bleeding, neck/facial swelling and shock.
- Sequelae: various degree of deafness have been shown to occur in 25% of survivors. Hearing return after 1-3 months in only 50% of these patients.

Evolution of Lassa fever disease from symptom onset



- Fever
- Extreme fatigue
- General weakness

- Headache
- Severe sore throat
- Diarrhoea
- Vomiting

- Face swelling
- Low blood pressure
- Nose bleeding



- Particularly severe in pregnant women and their fetuses (fetal death rate greater than 85%)
- Increased maternal mortality in third trimester (greater than 30%)

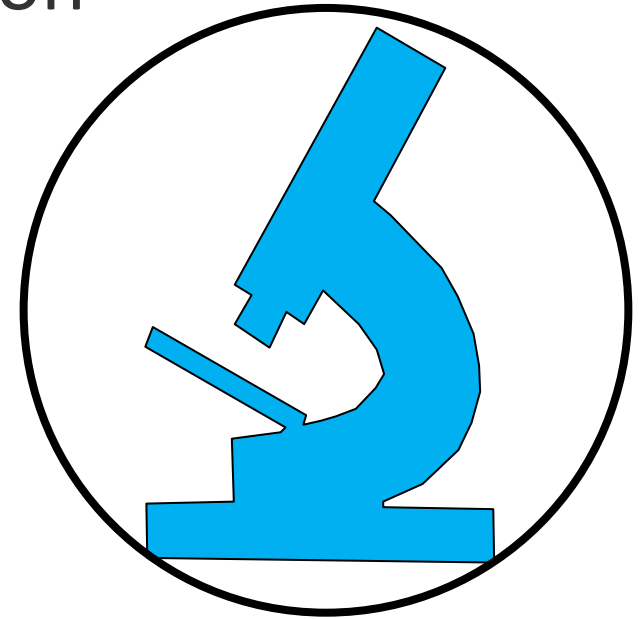


- Significant cause of pediatric hospitalizations in some areas of West Africa
- Infants (up to 2 years old) can present a 'swollen baby syndrome' and is associated with high case fatality rate

- Symptoms are non-specific; clinical diagnosis may be difficult.
- Differential diagnosis includes other viral haemorrhagic fevers, yellow fever, malaria, typhoid fever, shigellosis, and other viral and bacterial diseases.
- Patient history is essential and should include: exposure to rodents and/or area/village endemic for Lassa and/or contact with Lassa cases

Definitive diagnosis requires testing:

- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- IgG and IgM antibodies enzyme-linked immunosorbent assay (ELISA)
- antigen detection tests
- virus isolation by cell culture



Handling and processing specimen requires **suitably equipped laboratories under maximum biological containment conditions** and staff collecting samples should be **trained**

Lassa fever Treatment



- Intensive supportive care including: monitor fluid and electrolyte balance and renal function, careful rehydration
- Supportive drug therapy including : painkillers, antiemetic for vomiting, anxiolytic for agitation, +/-antibiotics and/or antimalarial drugs
- Antiviral drug ribavirin can be given early in course of the disease

Cases investigation

Care for sick people

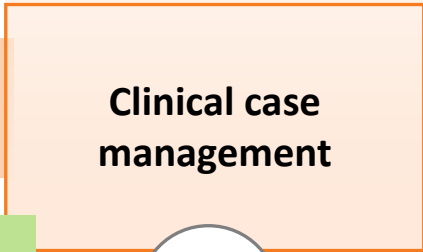
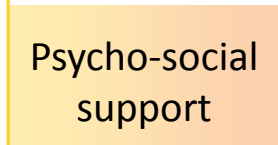
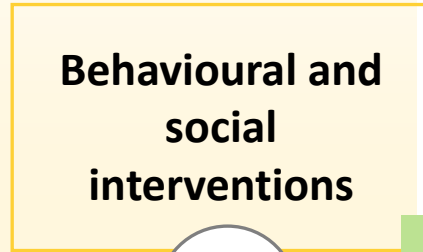


**National
leadership**

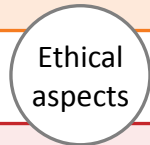
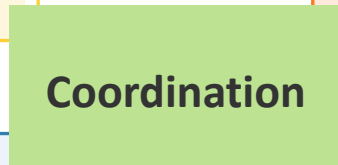
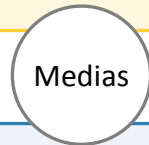
**Preventive measures in communities
and health care settings**

General strategy to control Lassa outbreaks

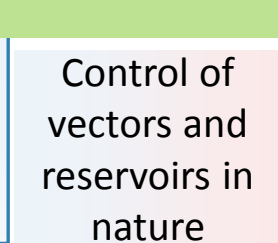
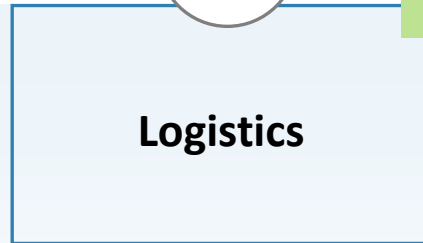
- Conduct social and cultural assessments
- Engage with key influencers: women and /or youth associations, traditional healers, local authorities, religious & opinion leaders
- Formal and informal communication
- Address community concerns



- Triage in/out
- Barrier nursing
- Infection control
- Organize funerals
- Clinical trials
- Ethics committee



- Security, police
- Lodging, food
- Social and epidemiological mobile teams
- Finances, salaries
- Transport vehicles



- Active case-finding
- Follow-up of contacts
- Specimens
- Laboratory testing
- Database analysis
- Search for the source

- Engage with communities to promote desired health practices and behaviours, including environmental hygiene and food consumption.
- Provide accurate and timely health advice and information on the disease.

How can I prevent getting infected with Lassa fever?



1. Wash your hands regularly
2. Store food in containers with lids
3. Keep your home clean and tidy to discourage rats from entering
4. Keep a cat
5. Cook all foods thoroughly

Prevention relies on promoting good community hygiene to discourage rodents from entering homes.

- **Removing source of attraction for rats:** Storing grain and other foodstuffs in rodent-proof containers, disposing of garbage far from the home, and maintaining clean households and washing dish after eating.
- **Preventing rats from entering house:** block holes around the house, improving building materials and structures (ceiling, walls) and keeping cats and dogs.
- **Avoid contact with infected rats** and consumption of their raw meat. Rats should be handled with gloves and other appropriate protective clothing.
- **All animal products should be thoroughly cooked.**



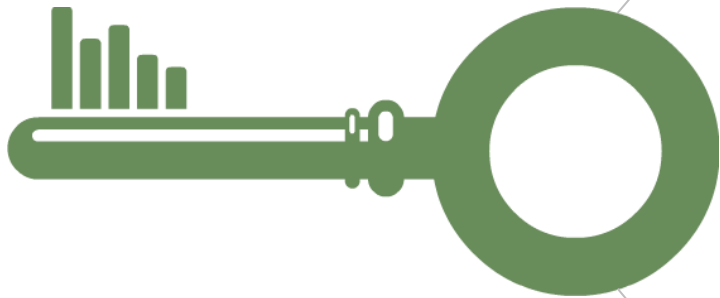
- Avoid contact with infected Lassa patients and deaths.
- Regular hand washing with soap and water.
- Encourage early treatment in Lassa Treatment Center.
- Hand-washing, using gloves and mask when caring for suspect Lassa patient at home and seek for health advice.

What do I do if I think I have Lassa fever?

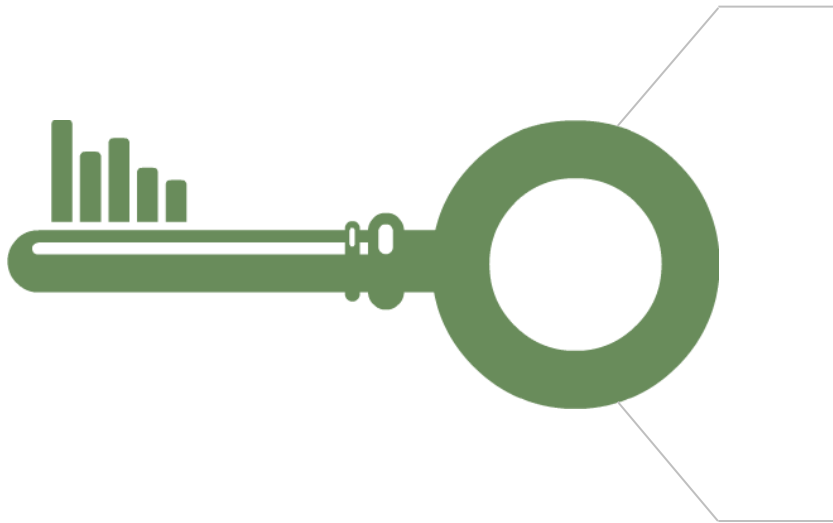


1. Avoid contact with other people
2. Seek health advice immediately
3. Drink plenty of fluids
4. Ribavirin, an antiviral drug, can be an effective treatment if given early

- Implement Standard Precautions with all patients – regardless of their diagnosis – in all work practices at all times including safe injection practices. <http://www.who.int/csr/resources/publications/standardprecautions/en/index.html>
- Health care workers treating patient with 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.
http://www.who.int/csr/resources/publications/ebola/filovirus_infection_control/en/?ua=1
- Laboratory workers are also at risk. Samples taken from suspected human Lassa fever cases for diagnosis should be handled by trained staff and processed in suitably equipped laboratories.



- **Difficulty to control environmental factors**
- **Difficulty to diagnose patients based on clinical presentation**
- **Case investigation to confirm mode of transmission/exposure**

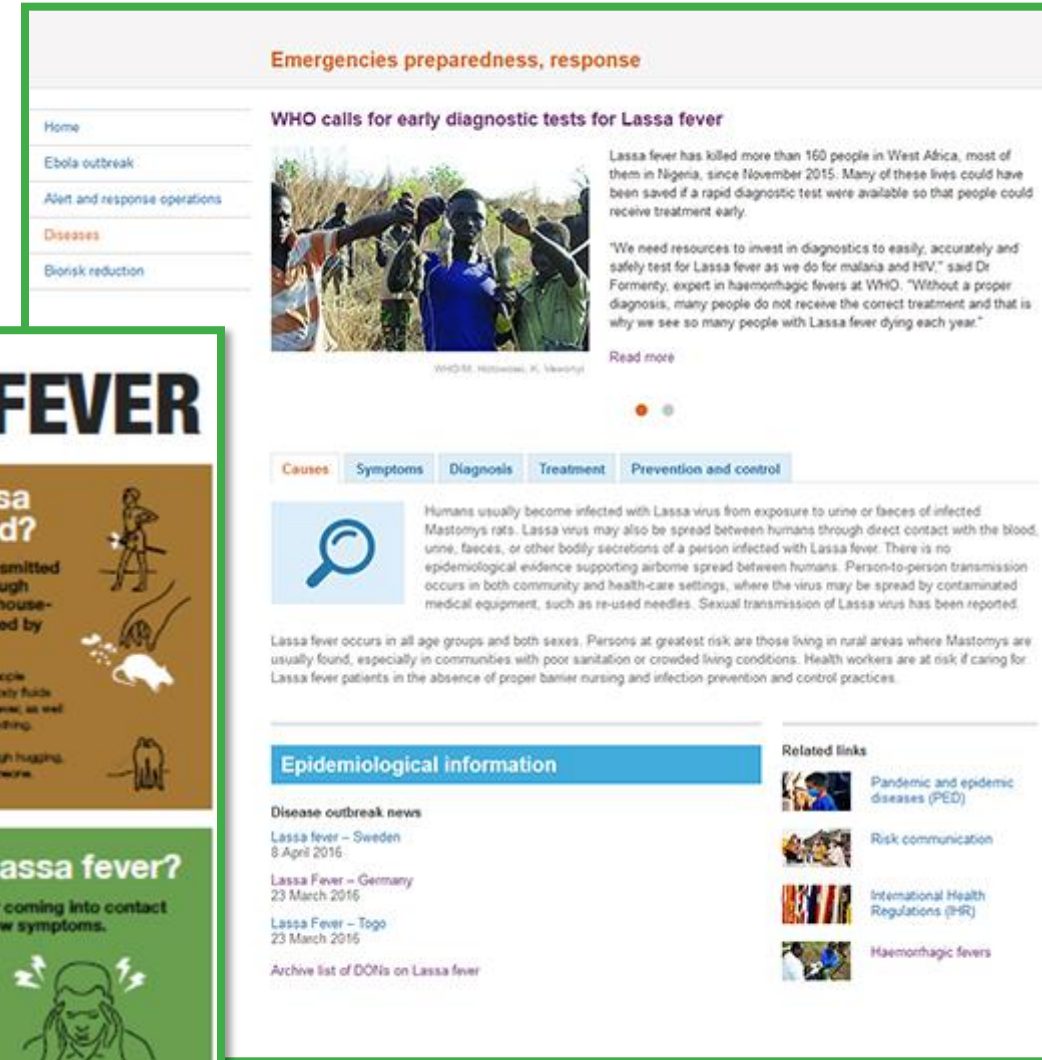


- **Close to patient diagnostic test are in late stage of assessment**
- **Candidate drugs are in early stages of testing**
- **Vaccines are in development**
- **Affected countries are at the heart of R&D product development**

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<http://www.who.int/csr/disease/lassafever/>

- Technical information
- Fact Sheet
- Disease outbreak news
- Infographics
- Related links



- Dr Pierre Formenty

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