

# Epidemiology of Lassa Fever

Njideka E. Kanu

Department of Community Medicine, University of Medical Sciences,  
Ondo

A lecture delivered at the Academic Seminar of University of Medical  
Sciences, Ondo, 14<sup>th</sup> September 2017

# What is Lassa Fever?

## Background

- Acute Viral Hemorrhagic illness caused by the arenavirus; Lassa
- First Discovered in 1969 in Nigeria
- The virus is named after Lassa, a village in Bornu Nigeria
- A zoonotic disease

**Occurrence:** Endemic in West Africa – Guinea, Liberia, Sierra Leone and Nigeria

**Case fatality rate:** 1-15%, 20-25% of hospitalized cases

- Severe late in pregnancy, with maternal death and/or fetal loss in >80% of cases in 3rd trimester

# Epidemiology of Lassa Fever

- **Incubation period:** 6-21 days
- **Period of communicability** : Person to person spread occur during the acute febrile phase when virus is present in the throat
- Virus may be excreted in urine of patients for 3-9 weeks from onset of illness
- **Reservoir of Infection** – Wild Rodent reservoir – the multimammate rat – *Mastomys* species complex

# Mastomys Species Complex



- **Multimammate rat**
- Prolific breeder (~8-12 pups/litter)
- Inhabits fields and cleared forest
- Peri-domestic
- Infected at birth and become chronic asymptomatic carriers of Lassa virus
- Shed virus in the urine and feces
- *M. natalensis* - Nigeria
- *M. huberti* and *M. erythroleucus* – S/Leon

# Mode of Transmission

- **Rodent-human**

- Rodent excreta contaminating food
- Direct contact (consumption or bite) – with excreta of infected rodents deposited on surfaces such as floors, tables and beds or in food and water
- Aerosol (inhalation of excretions in air)

# Mode of Transmission

- **Human-human**
  - Contact with blood or body fluids
    - **Household transmission** – eg sexual contact via semen
    - **Community transmission**
    - **Nosocomial Transmission**– contaminated sharps, patient's blood, urine or pharyngeal secretions, contaminated medical equipment

# Identification of Lassa Fever

- Approx. 80% of people infected with Lassa virus have no symptoms
- 1 in 5 infections result in severe disease
- Mild onset over days: fever, general weakness, and malaise
- Few days later- headache, sore throat, muscle pain, chest pain, nausea, vomiting, diarrhoea, cough, and abdominal pain
- Severe cases – facial swelling, fluid in the lung cavity, bleeding from the mouth, nose, vagina or gastrointestinal tract and low blood pressure

# Identification of Lassa Fever

- Protein may be noted in the urine
- Shock, seizures, tremor, disorientation, and coma in the later stage
- Deafness occurs in 25% of patients who survive the disease
- Transient hair loss and gait disturbance may occur during recovery
- Death usually occurs within 14 days of onset in fatal cases
- Especially severe late in pregnancy



# Case Definitions

- **Suspected Case:** Patient with fever (37.8 °C or 100 °F or more) not responding to anti-malaria and antibiotic drugs
- **Probable Case:** A suspected case that is epidemiologically linked to a confirmed case
- **Confirmed Case:** A suspect case with laboratory confirmation (positive IgM antibody or viral isolation)

# Risk Factors for Lassa Fever

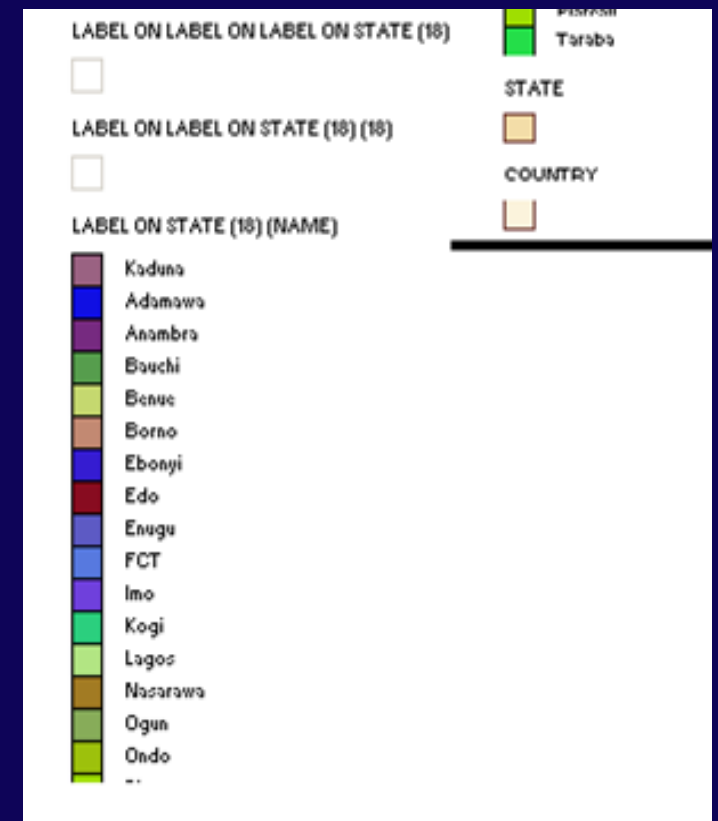
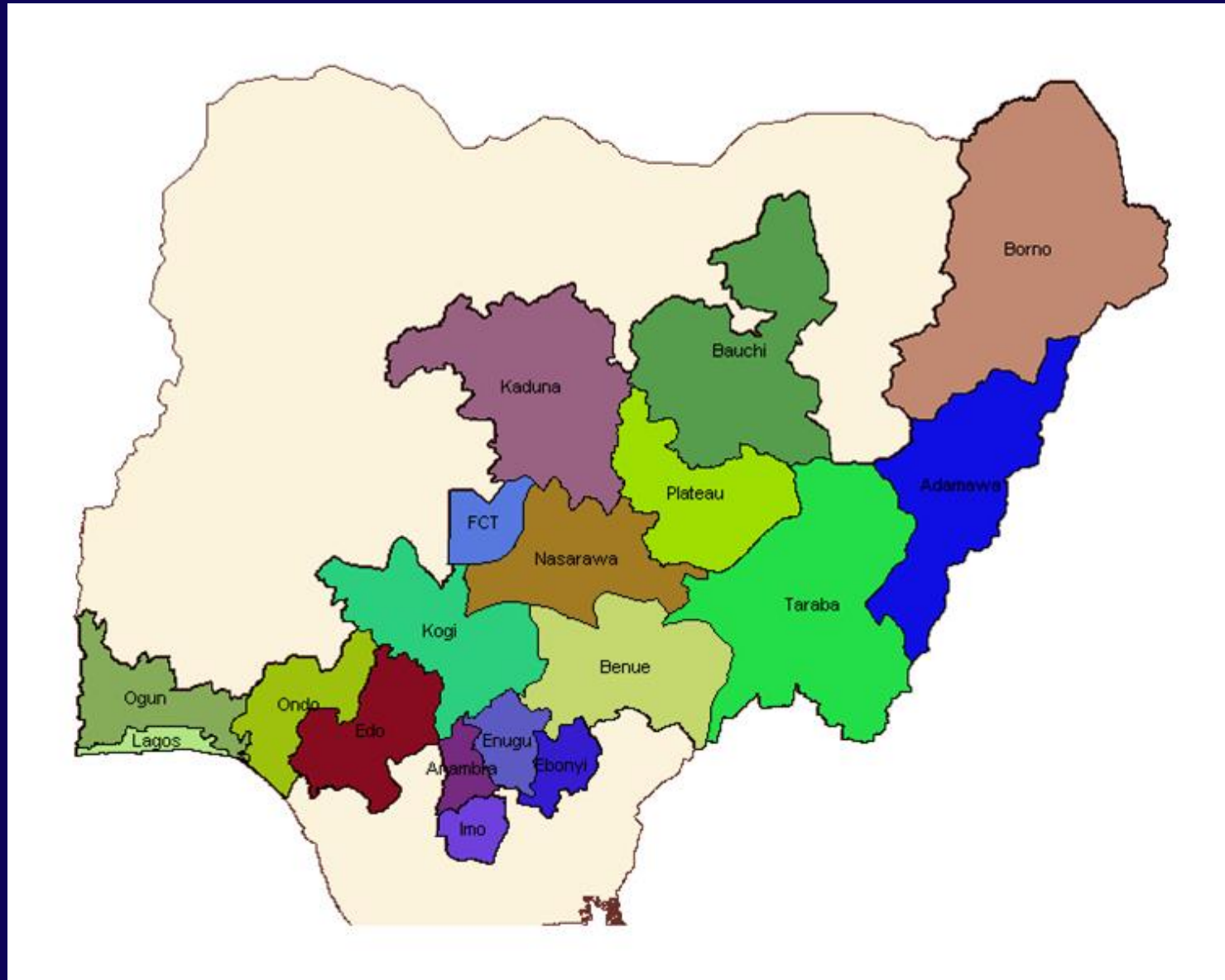
- All age groups and both sexes are at risk
- Rural areas mostly affected
- Close contact with sick persons
- Uncovered stored food
- Health care workers are at risk if proper barrier nursing and infection control are not maintained

# Occurrence of Lassa Fever in Nigeria

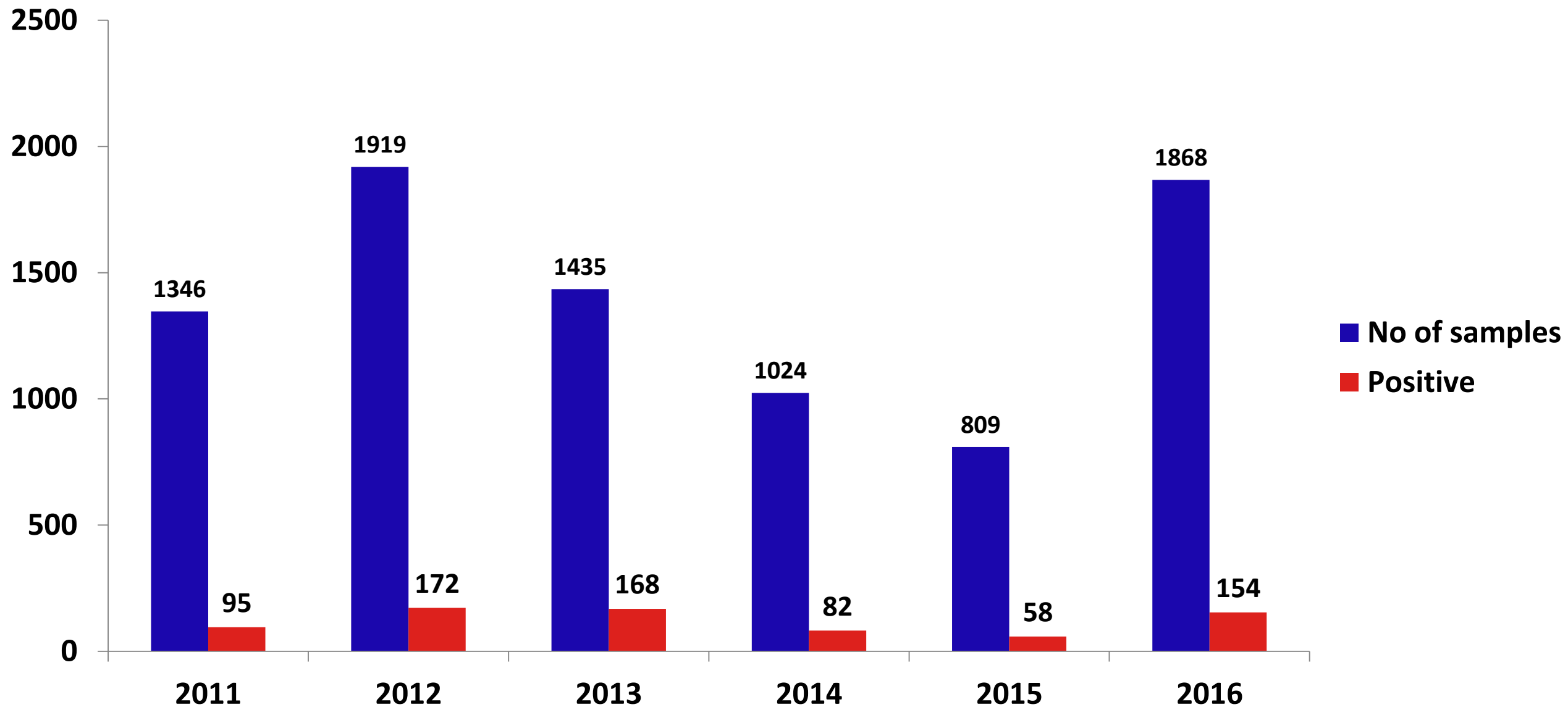
# Epidemiological Profile of Cases

- Highest incidence among age group 20-29 years
- Students are the most affected group
- Seasonal variation
- Endemic in Edo State and Ondo State
- Spread to new geographical locations - from 8 states in 2008, to 28 states cumulatively as at August, 2017
- Cuts across all geopolitical zones

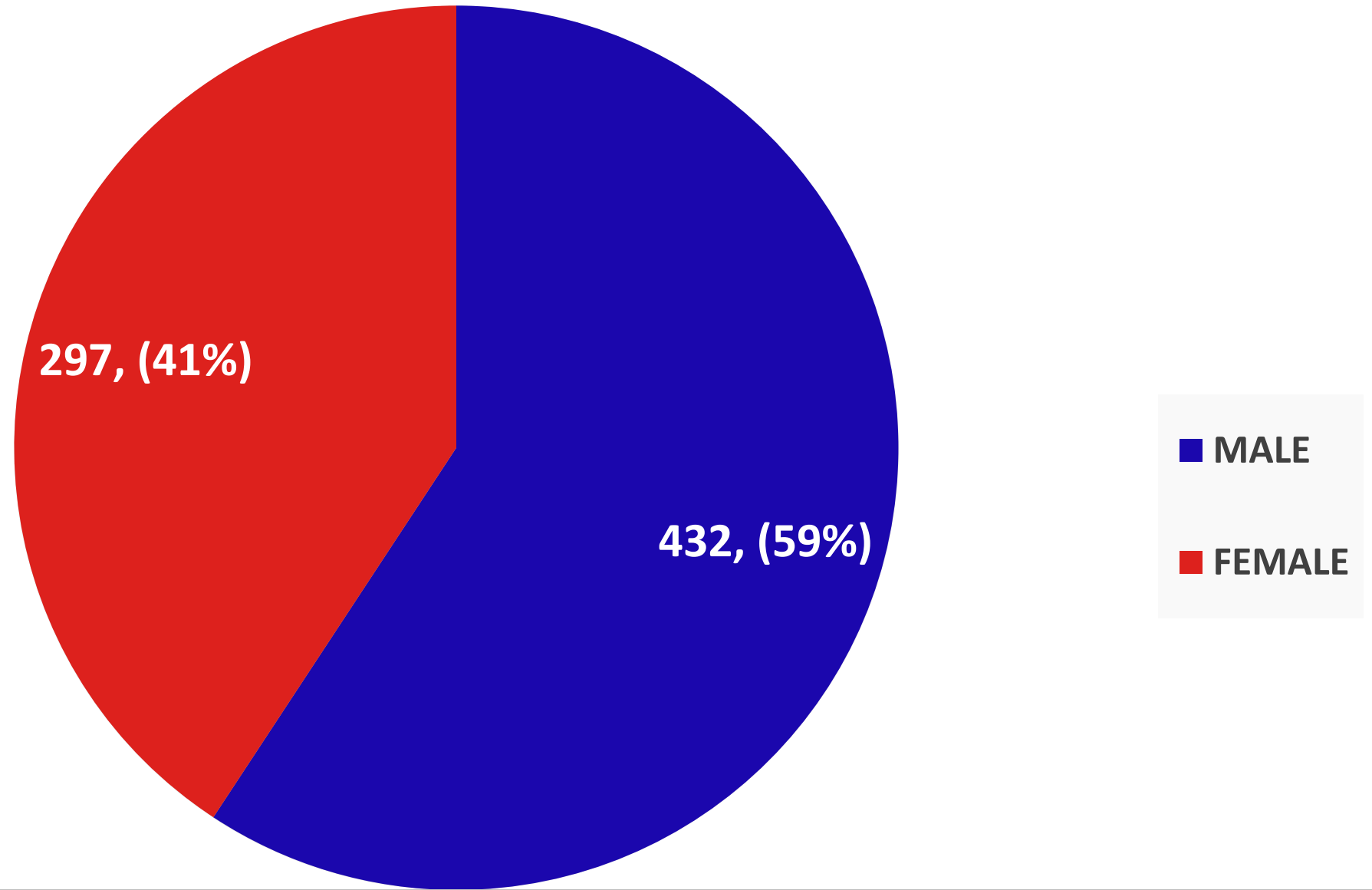
# Map of Nigeria Showing Lassa Fever At Risk States



# Laboratory surveillance of lassa fever, ISTH, 2011-2016



# Sex Distribution of Lassa Fever Cases 2011-2016

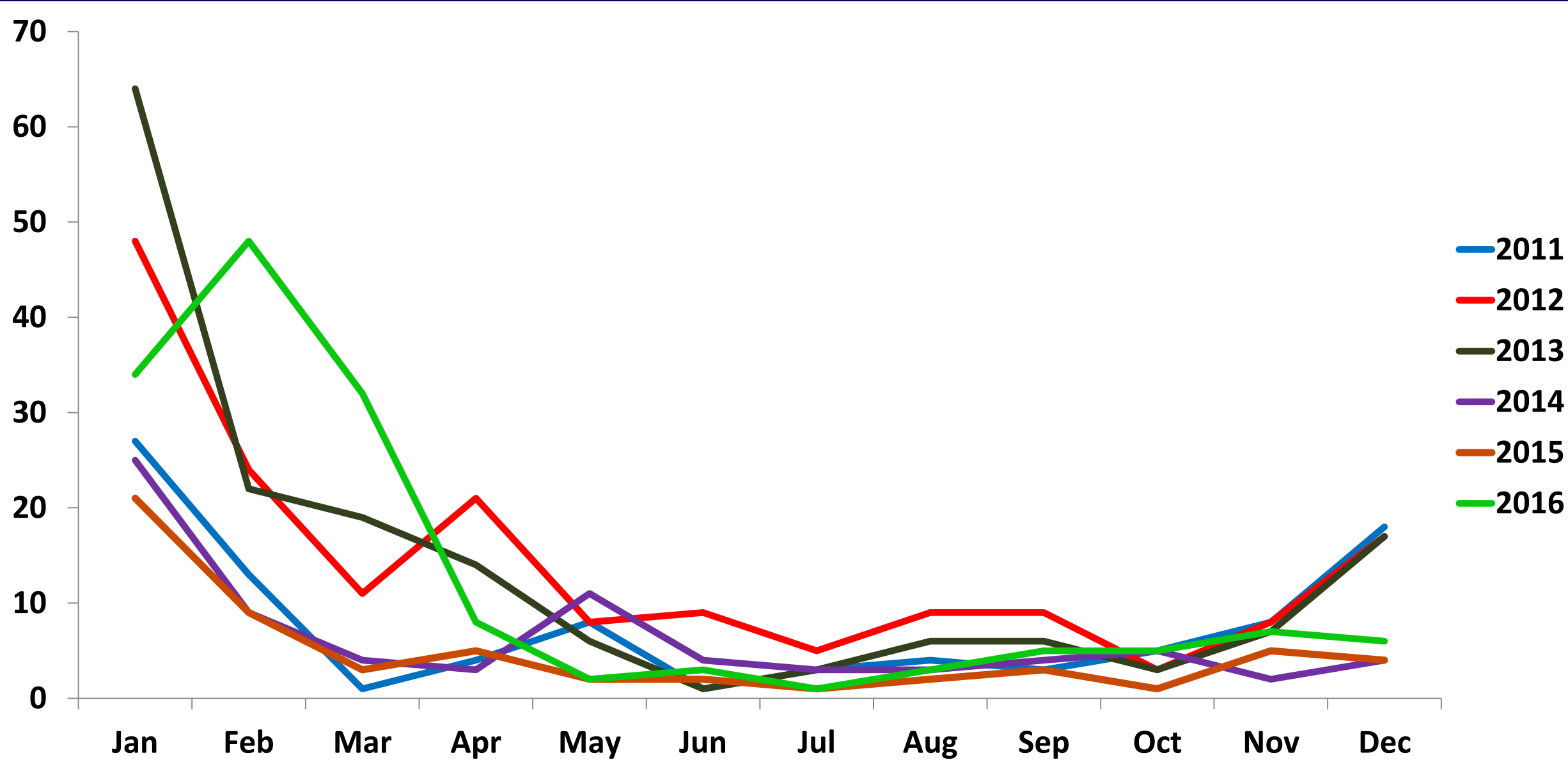


# Lassa fever laboratory surveillance ISTH 2016

State	No. of samples	No. positive
Edo	821	44
Ondo	139	27
Bauchi	108	21
Ebonyi	79	15
Nasarawa	50	8
Delta	46	1
Taraba	24	3
FCT	23	0
Plateau	21	1
Kogi	18	2
Anambra	14	1
Akwa Ibom	12	0
Kaduna	12	1
Oyo	8	0
Imo	8	1
Ekiti	8	1
Cross Rivers	7	1
Benue	7	1
Rivers	6	0
Enugu	6	0
Lagos	4	0
Osun	4	0
Bayesa	2	0
Niger	2	0
Zamfara	1	0
Adamawa	1	0
<b>Total</b>	<b>1441</b>	<b>132</b>



# Seasonal trend of Lassa fever 2011 – 2016



# Health Worker Deaths From Lassa Fever in Nigeria, 1969-2016

- **Jos 1969**                      **2 Nurses and a Laboratory staff**
- **Jos 1969**                      **1 Doctor**
- **Onitsha 1972**                **1 Doctor, 1 Nurse**
- **Ekpoma 1989**                **2 Doctor brothers**
- **Imo State 1989**            **3 Doctors, including a Surgeon**
- **Lafia 1993**                    **2 Nurses, 2 Laboratory staff**
- **Ebonyi 2005**                **5 Nurses**
- **Irrua (ISTH) 2007**        **1 Doctor**

# Health Worker Deaths From Lassa Fever in Nigeria, 1969-2016

- **FMOH, Abuja 2007**      **1 Doctor**
- **Abakaliki 2008**      **2 Doctors**
- **Benin City 2008**      **1 Doctor**
- **Yola FMC 2011**      **1 Doctor**
- **Abakaliki 2012**      **1 Doctor, 1 Nurse**
- **Jos 2012**      **1 Matron**
- **Rivers 2013**      **1 Matron**
- **Rivers 2016**      **1 Doctor**

# Current Situation in Nigeria (Week 34, 2017)

- 54 suspected cases of Lassa fever and 5 Laboratory confirmed and two deaths (CFR, 3.70%)
- Reported from 7 LGAs and 5 States;
- Cross River –1, Edo –34, Kwara –15, Ondo –3 and Plateau –1 in week 34, 2017
- Laboratory results were five positives for Lassa fever (Edo – 2, & Ondo -3)
- 26 suspected cases with 4 Laboratory confirmed reported from 3 States at the same period in 2016

# Current Lassa fever Outbreak in Nigeria, Weeks 1 – 34

Year	No of Suspected Cases	Lab Confirmation	Deaths (CFR)	No of States
2017	486	109	60 (12.4%)	26
2016	816	80	92 (11.3%)	28

# Public Health Measures

- Investigation and active case search ongoing in affected States with coordination of response activities by the NCDC, State Ministries of Health with support from partners
- Enhanced surveillance is ongoing in all affected states
- Contact tracing is in areas with active outbreak
- The line listing of cases reported across all the states
- Lassa fever treatment centers established in affected states to support case management

# Way Forward

- Lassa Fever should be considered in febrile patients returning from Lassa fever endemic areas
- Health Care Workers seeing a patient suspected of Lassa fever should immediately contact Local and National experts for advice and to arrange for Laboratory Testing
- Health Workers caring for lassa fever cases should employ extra infection control measures
- Laboratory workers should be trained
- Samples should be processed in equipped labs under maximum biological containment conditions



**Thank you for Listening**