21ST - 22ND AUGUST 2017

NIGERIA CENTRE FOR DISEASE CONTROL

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Contents

Executive Summary

The 2016/2017 Lassa fever outbreak started in December 2016 and affected 19 States across Nigeria. A total of 788 suspected cases and 117 deaths were reported during the outbreak. Of these, two hundred and sixty-one (261) have been classified as: confirmed (247) or probable (14), with 85 deaths (71 deaths in confirmed and 14 in probable). Case Fatality Rate in confirmed and probable cases was 28.7% and 14.8% for all cases (including probable, confirmed and suspected).

To assess the country's response to the outbreak, an After Action Review (AAR) meeting was conducted by the Nigeria Centre for Disease Control (NCDC) in collaboration with the World Health Organization (WHO). The meeting took place at the Barcelona Hotel Wuse 2 Abuja, FCT, Nigeria from the 21st – 22nd August, 2017 with the opening ceremony graced by the Honorable Minister of State for Health, Dr. Osagie Ehanire.

A total of 100 Lassa fever control stakeholders were in attendance, comprising of state epidemiologists, lead case management physicians from 18 affected states and members of national Lassa fever control steering committee. Also in attendance were representatives from Federal Ministries Agriculture and Environment and partners (US-CDC, University of Maryland, Baltimore (UMB) and African Field Epidemiology Network (AFENET) amongst others.

The goal of the meeting was to review the 2016/2017 Lassa fever outbreak in Nigeria, identify best practices, gaps and lessons learnt, to strengthen subsequent preparedness and response measures. The scope of the meeting covered key technical areas in outbreak response activities: Surveillance, Case Management and Infection Prevention and Control (IPC), Laboratory, Logistics and Risk Communication. Operations and coordination of response activities at the National and State levels were also reviewed, with experience sharing and consensus agreed on areas of divergent views.

The methods adopted included presentations, plenaries, group work and discussions. Participants were grouped into 6 thematic areas namely coordination, surveillance, laboratory, case management / infection prevention and control, logistics and risk communication. Each group worked on best practices, challenges and recommendations. This was followed by plenary sessions with questions and answers.

Discussions on the best practices in the different thematic areas were centered on, effective coordination and Rapid Response Team (RRT), good partnership and collaboration, timely

reporting, effective case management, prompt testing and release of laboratory results, good IPC and safe burial practices, medicine and health consumables storage, use of live TV, radio jingles and social media to communicate to the public, availability of sample collection protocol, PPEs, sample containers and vacutainers

The challenges presented by the groups cut across: lack of funds/logistics, poor coordination, un-availability of some protocols, guidelines and SOPs, poor knowledge of case definition and/or IPC un-availability of health consumables and reagent and limited sensitization. Also observed was the absence of designated surveillance focal officers and lack of knowledge of IDSR in tertiary and private healthcare facilities and inadequate research on the Lassa fever.

Participants recommended the need for dedicated fund/logistics to be made available at all levels to respond promptly and carry out preventive and response activities including conducting regular training on IPC, lead high level advocacy to political stakeholders (Governors' forum, National Council on Health, National Task Force meetings, Chief Medical Directors of tertiary hospitals etc.) to provide funds for research in case management, RDT kit and vaccine development.

Background

Lassa fever is an acute viral zoonotic disease with high virulence. It is one of the viral heamorrhagic fevers (VHF) with incubation period of 2-21 days. LF outbreaks are common and it occurs frequently in different parts of Nigeria. It is associated with high morbidity, mortality, economic and security consequences. Nigeria is an endemic country. The outbreak of this disease is a seasonal public health event in Nigeria, which occurs mostly during the dry season months usually between November to May.

Lassa fever is named after Lassa village in Borno State, north-east Nigeria where it was first discovered in 1969. Caused by an RNA virus, it remains a priority disease for immediate notification by health authorities. Transmission occurs through contact with urine and faeces of the multi-mammate rat, *Mastomys natalensis,* and direct contact with an infected person. Due to similarities in symptoms, it is frequently mistaken for malaria and other febrile illness, until severe symptoms appear. So eradicating malaria may be key to its easy identification.

Though endemic in Nigeria, seasonal outbreaks of Lassa fever have been the observed trend for decades in the drier months of November to May. However, this seasonal pattern appears to be changing as cases have been confirmed every month up to August, 2017 in at least five states. Realizing the high burden of this disease in Nigeria and West Africa where case fatality remains high, it became necessary for authorities such as the Nigeria Center for Disease Control (NCDC) to step up preparedness and response efforts. This necessitated an after-action review of the outbreak.

Epidemiological summary of 2016/2017 Lassa outbreak

The 2016/2017 outbreak season began in Epidemiological Week 49 (5th to 11th December) 2016, when the first case was confirmed in Federal Medical Centre, Abeokuta, Ogun State.

In Week 34 of 2017 (37 weeks after), nineteen (19) states have reported at least one confirmed case. As at 34th week of the outbreak (25th August 2017) a total of 788 suspected cases, 247 confirmed cases, 14 probable cases and 117 deaths had been recorded. Among the 117 deaths, 71 are laboratory confirmed the case fatality rate (CFR) for all was 14.8% and 28.7% confirmed cases.

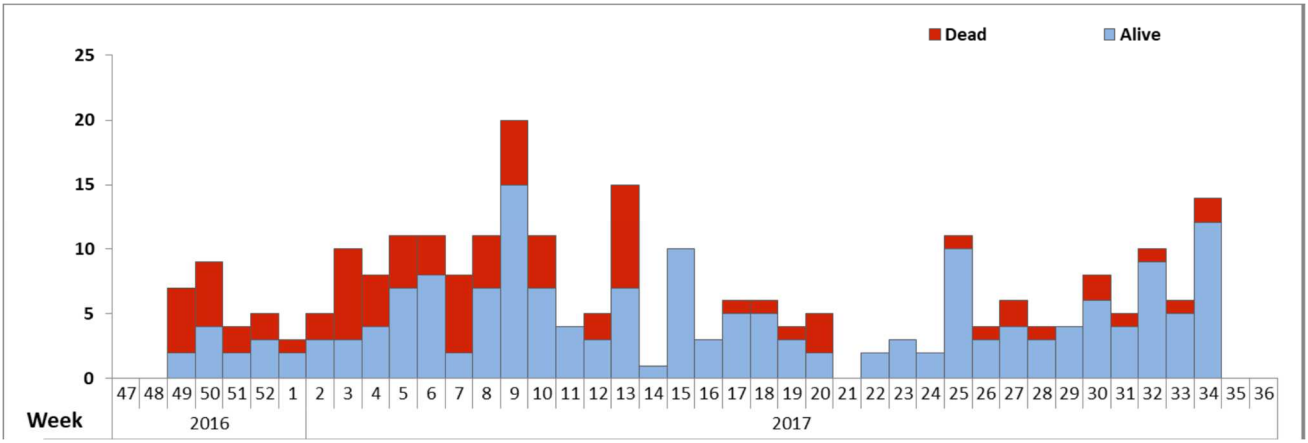

Figure 1. Confirmed and probable cases of Lassa fever by epidemiological week in Nigeria - December 2016 to August 2017. *(Source: Surveillance Department, NCDC)*

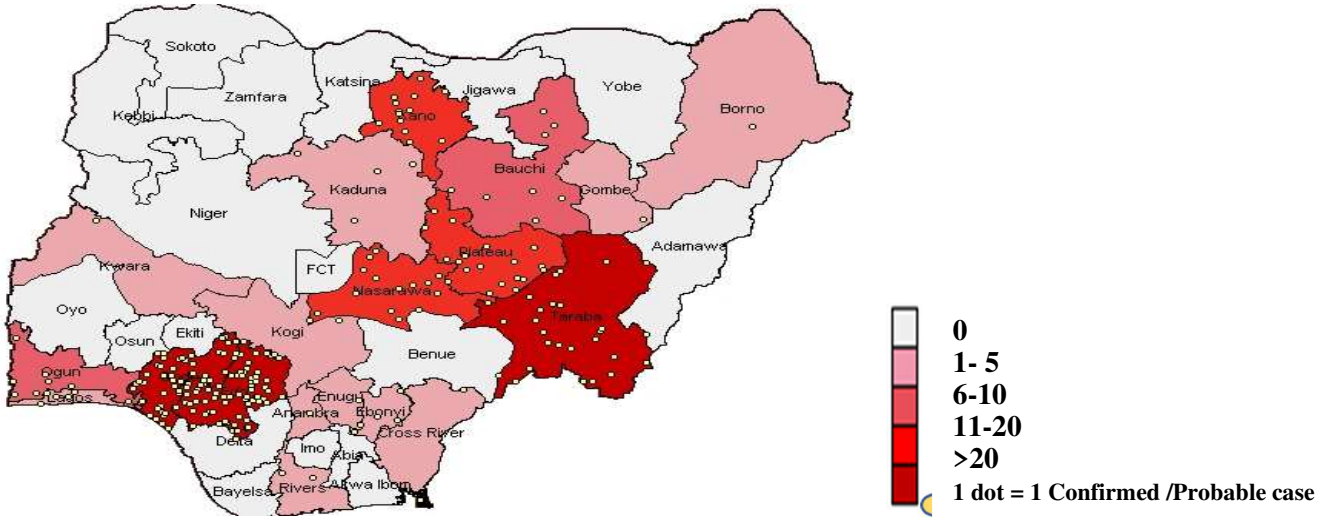

Figure 2. Distribution of Confirmed and Probable Lassa Fever cases in Nigeria as at August 2017. *(Source: Surveillance Department, NCDC)*

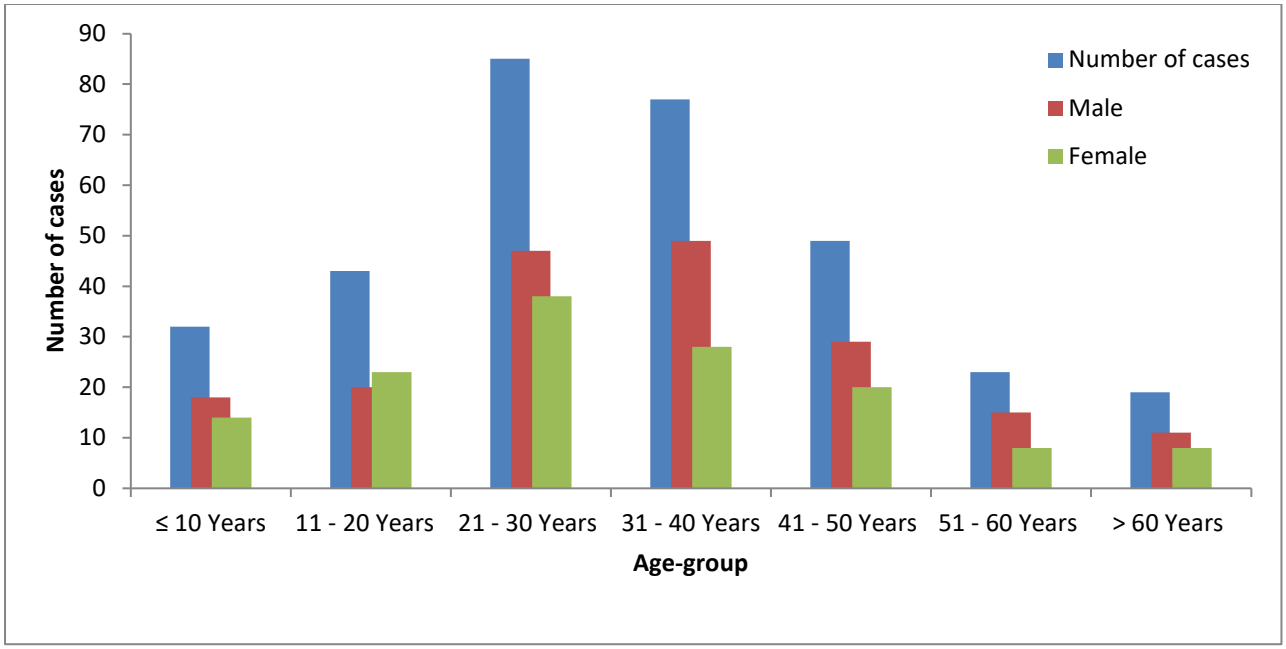

Figure 3: Age and Sex distribution of Lassa Fever cases in Nigeria as at August, 2017*(source VHF MS Platform)*

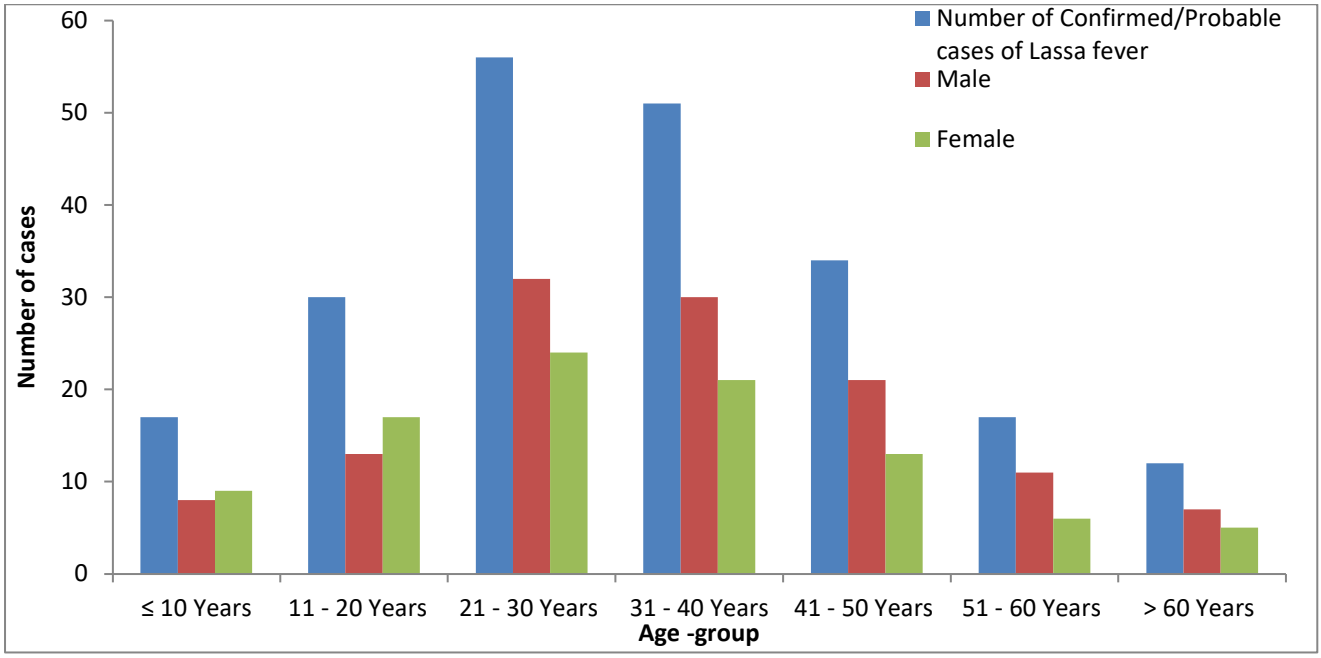

Figure 4: Age and Sex distribution of Confirmed/probable Lassa Fever cases in Nigeria as at August, 2017*(source VHF MS Platform)*

All age groups were affected however, the most affected age-groups were the 21-30 and the 31-40 years. Males (57.3%) were more affected than females among the confirmed and Probable cases likewise in all cases (56.8%). Human to human transmission was established in most of the cases. However, animal to human transmission was suspected in cases recorded in a boarding secondary school in Plateau state, where the Mastomys species rats were identified.

The response was essentially at the state level, NCDC provided technical support i.e. on-site support (Ogun, Ondo, Taraba, Nasarawa, Borno and Plateau States) and off-site support to all the affected states. Prior to the outbreak, NCDC prepositioned emergency commodities (Ribavirin, PPEs, etc.) in all the 36 States and FCT in preparation for the Lassa fever outbreak season. The states that exhausted their prepositioned materials were given additional supplies according to their request. The response activities involved:

- Sensitization of health workers
- Training of health workers on infection prevention and control (IPC)
- Community mobilization
- Active case search
- Line listing cases
- Contact tracing and listing
- Referral and transfer of patients to treatment centres
- Mopping up of commodities from non-affected states to affected states in need
- Establishing treatment/isolation centers
- Establishing State emergency preparedness and response (EPR) teams and emergency operation centers (EOCs)

At the national level, the NCDC coordinated all the response activities through the Lassa fever working group (LFWG). The working group in addition to on-site and off-site support to the states, mobilized resources, conduced weekly review meetings, generated and disseminated weekly situation reports to all stakeholders and the websites for the public domain. The coordination activities of the LFWG is anchored on the six pillars of the response activities namely, Coordination, Case Management and IPC, Surveillance, Laboratory, Logistics and Risk Communication.

Objectives and Scope

In order to assess the country's response to the outbreak, an after actions review meeting was organised by the Nigeria Centre for Disease Control (NCDC) in collaboration with the World Health Organization. The aim was to appraise the outbreak response activities, identify gaps, best practices, make recommendations and review preparedness and response plan at national and state levels.

The meeting took place at the Barcelona Hotel Wuse 2 Abuja, FCT, Nigeria from the 21st – 22nd August, 2017 with the opening ceremony was graced by the Honorable Minister of State for Health, Dr. Osagie Ehanire. In attendance, were stakeholders comprising of state epidemiologists and lead case management physicians from 18 affected states and members of the national Lassa fever control working group. Also in attendance were representatives from Federal Ministries Agriculture and Environment and Key partners (US-CDC, University of Maryland, Baltimore (UMB) and African Field Epidemiology Network (AFENET). The goal of the meeting was to review the 2016/2017 Lassa fever outbreak in Nigeria and to strengthen subsequent preparedness and response measures.

Specific objectives:

1. To review the 2016/2017 Lassa fever outbreak and response in affected States in order to identify best practices and challenges
2. To develop recommendations to enhance National and State Preparedness and Response Plans.
3. To strengthen intra-disciplinary collaboration and coordination
4. To review the national and state level preparedness plans to guide improved Lassa Fever outbreak response activities
5. To present the revised National Viral Haemorrhagic Fever (VHF) guidelines for improved response activities

Scope

The scope of the meeting covered the following six key technical areas:

1. ***Coordination***

   This group discussed consensus building, states' ownership and leadership of the response, emergency preparedness and response planning, funding and incident management systems. It also looked at how all resources (governments and partners) are mobilized and organized for efficient outbreak containment. The need for an Emergency Operations Centre (EOC) in all states was emphasized.

2. ***Surveillance***

   This group looked at the implementation of IDSR for Lassa fever, flow and harmonization of disease data (timeliness and completeness) in order to provide reliable information for proper planning and prompt public health actions.

3. ***Case Management and Infection Prevention and Control (IPC)***

   The group covered the use of a standard case definition for case detection in healthcare settings and communities, early commencement of standardized treatment regimens and management of complications. In addition, prevention of spread through adherence to IPC measures and safe burial practices was reiterated.

4. ***Laboratory***

   The group identified the need for standard laboratory support for prompt diagnosis and treatment. There was emphasis on timeliness of results, proper sample collection and transportation as well as provision of standard laboratories for Lassa fever diagnosis in Nigeria.

5. ***Logistics***

   To meet the needs of acquisition, pre-positioning and emergency supply of Ribavirin and other commodities for case management and overall outbreak containment, logistics support was identified as key. New approaches to quantification and forecasting of materials and manpower were highlighted, to enable a fit-for purpose preparedness plan and appropriate responses from Emergency Operation Centers (EOCs) at state and national levels.

6. ***Communication***

   This group looked at risk communication and social mobilization as key tools for advancing public health programmes (including as outbreak preparedness and response) and using appropriate messaging and media for various audiences.

Methods

The methods adopted included plenary presentations, group work and discussions.

The Plenary Presentations were in two forms:

1. ***Topical*** to introduce work done so far in the outbreak response. In addition to the welcome remarks by the CEO NCDC and opening remarks by the Hon. Minister of State for Health, ten other presentations were made to set the tone for each day's work.
2. ***Debriefing*** by each technical group after each day's group work.

Group Work

Six technical working groups were composed. Participants were assigned based on their areas of function and interests. The focus of each group was to identify best practices (strengths), challenges (weaknesses) and recommendations for future actions. Trigger questions were used to facilitate the group discussions (see Annex 1).

Coordination

Best practices:

- Incident management system (IMS) for effective response
- Existence of Rapid Response Team (RRT)
- Existing partnership network and collaboration
- Budget lines for emergency response in place

Challenges:

- Weak political support
- Resource mobilization / funding
- Inadequate outbreak preparedness
- Low motivation of Health workers in outbreak response

Recommendations:

- Conduct risk assessment to inform preparedness plan and enhance advocacy for funding
- States to establish multi-hazard EOCs and incident management system for coordination of outbreak response
- States and LGAs to establish rapid response team (RRT) with appropriate composition of expertise (Refer to IDSR national guidelines pages 166 - 178)
- Federal Ministry of Health/NCDC to conduct high level advocacy to political stakeholders (Governor's forum, NCH, National Task Force meetings etc.)
- States should develop multi-hazard preparedness and response plan
- Health workers should be motivated through incentives such as training opportunities, promotions, special commendations

Surveillance

Best practices:

- ***Case reporting (Timely reporting)***
    - Use of community informants for case reporting
    - Availability of trained personnel (surveillance focal persons)
    - Investigation of rumour cases by rumour management teams
    - Availability of phone numbers of LGA DSNO and State Epidemiologist in health facilities in order to enhance case reporting
    - Use of funds from other sources e.g. 'Save one million lives' programme to support surveillance
    - High coordination (State, LGA teams)
    - Availability of ambulance services to pick up cases

- ***Outbreak investigation (Timely/Effective outbreak investigation)***
    - Availability of skilled and trained personnel
    - State teams involved in contact tracing
    - Good ambulance services (logistics)
    - Capacity building for health care workers
    - Use of funds from other sources e.g. save one million lives to support surveillance
    - Coordination (State, LGA teams)
    - Community involvement

- ***Implementations of findings from Investigation reports (Coordinated response to the outbreak)***
    - Coordinated command structure
    - Team work and leadership
    - Involvement of LGA chairman and other stakeholders at the community levels
    - Logistic supports
    - Good ambulance services for prompt evacuation, decontamination and safe burial of cases
- ***Data analysis and usage (Use of data to inform decision)***
    - Data analysed at State level
    - Availability of capacity and tools for data analysis
- ***Importance of Surveillance in prevention and control of Lassa fever outbreaks (Outbreak containment of outbreak)***

- Integration of Lassa fever surveillance with other disease surveillances
- Institution of early warning system

Challenges:

- ***Case reporting: Late/Under reporting***
  - Absence of designated surveillance focal officers in some health facilities especially in private facilities
  - Healthcare workers not following the right channels of reporting
  - Refusal of private facility to report cases due to stigmatization
  - Insufficient supportive supervision
- ***Lack of validation and harmonization of data***
  - Limited training and retraining opportunities
  - Insufficient supervision
  - Missing data
- ***Under-diagnosis of cases***
  - Low index of suspicion by health care workers
- ***Outbreak Investigations:***
- ***Poor /Non conclusive outbreak investigation***
  - Inadequate funding
  - Hard to reach areas / terrain
  - Insecurity
  - Inadequate logistics support
  - Low numbers of trained personnel
- ***Implementations of findings from Investigation reports***
- ***Poorly coordinated outbreak response***
  - Poor feedback mechanisms
  - Refusal of private health facilities to accept positive results
  - Non utilization of outbreak report
  - Poor coordination of stakeholders
- ***Poorly coordinated outbreak response***
  - Poor feedback mechanisms
  - Refusal of private health facilities to accept positive results
  - Non utilization of outbreak report
  - Poor coordination among Stakeholders
- ***Data analysis and usage***

- ***Non utilization of data for decision making***
    - At the LGAs and health facilities data not usually analyzed due to limited capacity
    - Limited knowledge of the importance of data analysis for future decision making
    - Poor feedback mechanism
    - Insufficient supervision at all levels
    - Incomplete data
- ***Importance of Surveillance in prevention and control of Lassa fever outbreaks***
- ***Poor containment of outbreak***
    - Paucity of knowledge of the surveillance for Lassa among clinicians
    - Limited capacity to analyze and interpret surveillance data at the facility levels
    - Inadequate contact identification, tracing and monitoring
    - Poor active case search

Recommendations:

- ***Late/Under reporting:*** Designate and train Surveillance focal persons in all health facilities, including tertiary and private facilities and community involvement in disease surveillance by states and LGAs
- ***Lack of validation and harmonization of data:*** Regular review meetings and collaboration between all stakeholders at all levels involved in data management
- ***Poor /Non conclusive outbreak investigation****:* Provision of budgetary allocation and timely release of funds for surveillance activities and training at all levels
- ***Poorly coordinated outbreak response:***
    - NCDC to provide guideline for incident management system to States
    - NCDC to provide regular oversight function of the incident management system for States
    - Health facilities should follow the appropriate channel of communication
- ***Poor Containment of outbreak:***
    - Monthly review meetings of clinicians and surveillance team should be conducted in the State
    - States supported by NCDC to strengthen capacity of focal persons at health facilities and LGA on data management
    - States to strengthen capacity of surveillance team on active case search, contact tracing and monitoring

Case Management and IPC

Best practices:

- **Prompt Testing and results**
  - *Existing protocols for samples transport for testing*
- ***Support from Family Members for Burial Practices***
  - *Community involvement, Safe Burial team (Histopathologist heads the team), Dedicated ambulances for cases of Lassa fever*
- ***Good IPC practices***
  - *Periodic Training, Adequate stock of PPEs, SOPs available, Dedicated Theatres and Equipment for Lassa fever cases*
- **Algorithm for febrile illness to detect Lassa fever (Perceived to be effective but not evidence based)**
  - *Uses other supportive lab investigations besides PCR to detect cases*
  - *Partner support (Reagents and Ribavirin)*
- **Prompt Response**
  - *Cases reported to stakeholders immediately*

Challenges:

- ***No Isolation centre***
  - Delayed release of funds
  - Prolonged period of disuse of isolation centres
- ***Delay getting results***
  - No clear cut transportation protocol for sample transportation
- ***Decisions being made based on clinical experience***
  - Research is capital intensive
  - Not in the purview of some donors
- ***Late Detection***
  - Low index of suspicion, Late Presentation to Hospitals (Patients prefer to go to Patent Medicine Vendors), Only Public hospitals reporting, Late referrals, Other tests not conducted while investigating for Lassa fever, Standard Case definitions emphasises on bleeding (besides fever), thus health care workers only suspicious when there is bleeding
- ***Non adherence to burial practices***
  - Religious practices limiting burial practice adherence
  - No legal backing

Recommendations:

- ***No Holding/Isolation/Treatment Centre***
    - Every health facility should have holding/isolation area for suspected cases.
    - Every state should establish at least one designated treatment Centre with a constituted case management team/IPC team for management of Lassa fever and other VHFs
    - NCDC to establish, equip, and maintain zonal referral centers that have the capacity to serve cluster of states for management of complicated Lassa fever and other VHFs cases
    - Implement dedicated budget line at facility, LGA, state, and national level for management of cases of Lassa fever and other VHFs
- ***Delay getting results to institute prompt management of cases***
    - NCDC to establish, equip and maintain more diagnostic laboratories across the country
    - NCDC to develop standard sample collection protocols to be used in holding areas, treatment centers and referral hospitals
    - State should be responsible for the transportation of samples to the designated laboratories
    - Basic PPEs and sample transportation kits should be prepositioned in all states and treatment centers, initial stock by NCDC and subsequent stocks by states
    - NCDC to develop protocol that guides real time release of laboratory result and identified routes of result dissemination and sharing.
    - Clinicians advised to also use other supportive clinical diagnosis such as urinalysis, FBC, AST and ALT for case detection
- *Limited evidence base for decision making*
    - FMOH/NCDC to prioritize and facilitate research on case management, manufacturing of drugs, RDT kit and vaccine development

IPC Recommendations

- ***Non adherence to burial practices***
    - Risk communication team at state level should sensitize community and train people of major faiths/religious on safe burial practices

- Federal and states to conduct Advocacy to Government to enforce the implementation of existing public health policy that mandates environmental health officers linked with the DSNO to take charge of safe burial practices
- NCDC to disseminate national guidelines to IPC to all states, LGAs and health facilities
- NCDC in collaboration with Ministry of Environment should develop and distribute protocol to address waste management practices in health facilities/treatment centres

Laboratory

The following functions were reviewed by the laboratory team: Sample Collection and transportation, Sample Processing, Infection Prevention and control, Laboratory Inventory, Communication.

Best practices:

- **Sample collection and transportation**
  - Decentralisation of sample collection using LGA RRTs
  - Availability of functional RRT; Rivers, Kaduna etc.
  - Partnership with WHO in transportation of samples using Courier-Plateau/Bauchi
  - Availability of triple packing for sample transportation -Kaduna
  - Presence of a laboratory focal person in RRT
  - Availability of PPEs, sample containers, Vacutainers
  - Multidisciplinary composition of RRTs/ good team work
  - Partnership with immunisation unit for access to Ice packs
  - IPC training for Laboratory Personnel
  - Availability of sample collection protocol

- ***Sample processing***
  - Availability of skilled manpower
  - Processing of other VHFs-LUTH, Abuja reference Lab
  - Adherence to National sample rejection /acceptance criteria
  - Availability of 4 laboratories with capacity to process VHF samples
  - Communication of the test results via SMS within 24 hours
  - Internal quality control
- ***Infection prevention and control (IPC)***
  - Availability of PPE

- Adherence to IPC measures during sample collection
- Functional P2 facilities
- Availability of glove box for inactivation of samples
- Proper waste management by autoclave/incineration
- IPC training for staff
- Practice of decontamination
- Availability of safety and biosecurity manual
- Existence of IPC committees at the treatment centres

- ***Laboratory inventory***
  - Prepositioning of Lassa fever supplies
  - Use of CRRIF (combined request requisition inventory and receipt form)
  - Bin card
- ***Communication***
  - Communication of results in real time via text messages and emails
  - Availability of communication guideline
  - Data electronically backed up

<u>Challenges:</u>

- ***Sample Collection and transportation***
  - High cost of transportation/courier services & no service on weekends/public holidays
  - Lack of triple packing in most States
  - Forms included into the triple packing equipment
  - Inadequate sample volume/ Loss of sample integrity
  - Reluctance of health care workers to collect blood samples
  - Use of recycled sample containers
  - Insufficient numbers of PPEs
  - Lack of a harmonised logistic plan for sample transportation
  - Incompletely filled laboratory forms
  - Batching of samples
- ***Sample processing***
  - Availability of only 2 functional laboratories with capacity to process samples
  - Inadequate supply of reagents/ consumables
  - Different testing platforms for different laboratory
  - Inadequate storage facilities for samples/consumables
  - Inadequate power supply

- Limited external quality assurance (EQA)
- Limited equipment maintenance
- Laboratory not functional for 24 hours
- Batching of samples

Infection Prevention and control

- Non-functional autoclave
- Limited number of biohazard bags
- None compliance to access restriction
- Lack of bio-containment equipment
- Inadequate path for work flow
- Biosecurity measures: no dedicated storage for samples

- ***Laboratory inventory***
  - Unavailability/Stock out of reagents & consumables
  - No budget line for consumables
  - No dedicated or trained inventory personnel
  - Supply of wrong/substandard equipment
- ***Laboratory communication***
  - Poor laboratory information system management –Real time reporting
  - Non-adherence to communication guidelines
  - No/ poor internet communication

Recommendations:

- ***Sample collection and transportation***
  - NCDC should establish a national VHF sample transportation logistic framework by partnering with courier services with provision of triple packing and develop the terms of reference (TOR) for partnership
  - NCDC should share protocol and policy for sample management with stakeholders and health facilities
  - All stakeholders should plan and preposition adequate PPE and other logistics to encourage prompt collection and handling of samples
  - Training and re-training of appropriate health workers by NCDC and States.
- ***Sample processing***
  - NCDC to liaise with State government and re-activate non-functioning VHF laboratories with reagents, consumables, equipment, training and re-training of personnel

- NCDC to establish a sustainable supply chain system for reagents and consumables to all the VHF laboratories
- NCDC to develop and standardize a uniform testing platform for equipment, reagents and consumable across the VHF testing laboratories (for Quality Control and Quality Assurance purpose)
- NCDC to establish at least one functional VHF laboratory in each geo-political zone
- NCDC to develop a plan for equipment maintenance and replacement; contract with manufacturers and/or bio- medical engineers
- NCDC to consider including private laboratories with capacity for VHF diagnosis in the network
- NCDC to provide backup power system across VHF testing laboratories
- States and other stakeholders (management of testing laboratory institution) provide adequate space and freezers for sample and reagent storage
- Laboratory personnel should be motivated to provide essential services round the clock by management of testing laboratories

- ***Infection Prevention and Control***
  - NCDC to provide standard autoclaves, biohazard bags, bio-containment equipment and dedicated VHF sample storage freezers
  - Testing Laboratory institutions to provide adequate biosecurity and biosafety measures and delineate work flow path
  - Management of testing laboratories/NCDC to promote strict compliance to all IPC policies and guidelines
- ***Laboratory inventory***
  - NCDC to support capacity building of personnel on laboratory inventory management in VHF laboratories
  - Testing Laboratory institutions to provide adequate budget line for reagents and consumables
  - Testing Laboratory institution management to ensure procurement specification (equipment, reagents and consumables)

Logistics

Best practices:

- ***Storage of medicines and health consumables in States Central Stores***
    - Availability of essential drugs programs and storage facilities within the states and LGA levels
    - Existing integrated supply chain management system in few states that store medicines and health commodities in essential medicines store
- ***Volunteering of health workers during outbreaks (Human resources)***
    - Apt sensitization and training of health workers.

Challenges:

- ***Lack of cohesive logistics Technical Working Group (TWG)***
    - Vertical programs at different levels of government
    - Personal interests and different funding source
    - Different political and professional affiliations
- ***There are inadequate logistics and supply chain management information systems at all levels of care.***
    - VHF supplies have not been enshrined into the logistics management coordinating unit and logistics management information system at all levels
    - Deficient technical know-how
    - Inadequate sub-systems integration including supplies for outbreak responses
    - Limited protocols for supply chain management in diseases outbreak in the state
    - Supply chain systems not decentralized to the LGAs
- **Insufficient needs assessment undertaken to develop a contingency plan**
    - Poor data collection and collation
    - Inadequate utilization of data for forecasting needs
    - Inadequate budgeting at different levels
- ***Insufficient and substandard PPEs***
    - Inadequate quality control and poor funding from government
    - Insufficient commitment to disease response activities by government at all levels
    - National SOPs not shared with all donors to guide supply and purchases
- ***Insufficient number of dedicated vehicles for distributing medicines, supplies and commodities from state stores to health facilities and end users in the community***
    - Vehicular maintenance is not adequately funded/supported
    - Dedicated vehicles for distribution of medicines is not highly prioritized in States

- Few states have adequate dedicated budget line for this activity
- Financial constraints and competing priorities

- **State over dependence on the Federal Government and International Partners' medicines and health commodities required for outbreak response**
  - Low political will in some states and LGAs.
  - Not looking inward and not exploring other domestic funds to address outbreak responses.
  - States are not yet taking full ownership of disease outbreak response and the pace on building on the gains of partners' support seem slow.

Recommendations

- States to integrate Logistics and Operational Support Working Group into Emergency Preparedness and Response (EPR) team - Director of Public Heath, Director of pharmaceutical services and State Epidemiologist
- The logistics and operational support working group should establish Inventory and Logistics Information Management System and support procurement process for medicines, consumable and commodities for disease outbreak preparedness and response
- Carry out a Logistics needs assessment and forecasting by RRT members in every state
- States supported by NCDC to train and retrain RRT, LGA teams and Health Facility teams on inventory management and supplies for outbreak responses
- States should dedicate funds for procurement of equipment, infrastructures, materials, medicines, consumables and vehicles for outbreak response
- States should develop a contingency plan with business continuity plan

Risk Communications and Social Mobilization

Best Practices:

- Training and retraining of health communicators in some states (pre, during and post disease outbreak)
- Leveraged on routine immunization activities
- Used jingles, Live TV and Radio programmes (in local dialect) to communicate to the public
- Offer of free slots by media houses as part of corporate social responsibilities
- Social mobilization working group in some states (created because of immunization activities)
- Involvement of relevant stakeholders and community influencers in communication activities e.g. Religious leaders, Youth leaders, Traditional leaders etc.
- Leveraged on existing structures for polio in states

Challenges:

Health workers:

- ***Fear (inadequate knowledge of IPC materials and strategies)***
    - The level of virulence and mode of transmission, diagnostic dilemma
- ***Inadequate/ gaps in knowledge of Lassa fever and insufficient hands-on-experience***
    - Insufficient training and retraining of healthcare workers
- ***Inadequate IEC materials***
    - Inadequate funds for production of IEC materials targeted at healthcare workers

Community

- ***Lack/inadequate of communication Plan***
    - Low prioritization of Risk Communication as an important pillar of disease control
    - Poor motivation for Lassa fever risk communication activities
    - Inadequate involvement of communication focal person in Lassa Fever communication activities
- ***Poor interface between the community healthcare worker and the community***
    - Non-functional Ward Development Committees and Facility Health committees
- ***Resistance/Denial by the community***
    - Socio-cultural issues affecting safe burial practices in some communities)
    - Stigma and discrimination

Leadership:

- ***Low or insufficient government commitment***
  - Unsuccessful advocacy to the leadership by health workers
  - Bureaucracy and challenges in the legislative process
  - Limited funding for communication activities

Recommendations:

- ***Fear (inadequate knowledge of IPC materials and strategies)***
  - States to lead sensitization of healthcare workers on universal precautions through adequate training that provide hands-on experience, as well as adequate provision of resources for universal precaution in health facilities
  - SOPs on universal precautions should be placed in strategic locations within health facilities by Treatment Centre Management Team
- ***Inadequate/ gaps in knowledge on Lassa fever and inadequate practical experience***
  - States supported by NCDC to train of healthcare workers on how to appropriately wear and remove PPEs.
  - Each Treatment Centre should be supported by the SMOH to have an IPC committee to ensure best practices in IPC.
- ***Inadequate IEC materials***
  - States to identify and engage with partners and social agents to develop comprehensive IEC materials
- ***Inadequate communication plan***
  - The state epidemiologist should identify and meet relevant stakeholders to form a committee to develop a risk communication plan. (e.g. MDAs, health educators, etc.) in the community for effective risk communications.
  - LGA health team to establish a social mobilization working group committee responsible for risk communication at the L.G.A level.
  - State educators to provide regular content/activity review on their Lassa fever programs with the National working group.
- ***Poor interface between the community healthcare worker and the community***
  - State epidemiologist to coordinate meetings to improve synergy between health educators, healthcare workers and community leaders to establish appropriate messages to be communicated to the community.
  - States and LGAs to sensitize the community to report every case of fever to the health facility

- ***Resistance/Denial by the community***
    - NCDC and States to develop multi-hazard communication approach to reduce resistance/denial of massages, this should include community leaders at all levels.
    - Balanced health messages that provide hope and reduce fear.
- ***Insufficient government commitment***
    - High level advocacy to the government/leadership of the state (including class A traditional ruler in a state, NCDC, FMOH initiated by stakeholders in infectious diseases in the state, Nigerian Governors Forum)
- ***Lack of strong advocacy to the leadership by health workers***
    - Using evidence based (fact sheets, data generated from within and photographs) to advocate to the leadership
- **Inadequate funding for communication activities**
    - Advocate to Government to ensure release of budget earmarked for risk communication activities
    - Social mobilization working group to leverage on partners' support and other influential personalities.
- ***Legislative obstacles and bureaucracy***
    - Advocate to lawmakers to streamline the legislative processes for funding and promoting risk communication activities.
    - Personalizing message content to leadership

Conclusion

Lassa fever is endemic in Nigeria and occurs all year round with high morbidity and mortality rates thus the need to review the threshold and advocate for declaration of Lassa fever as a disease of international importance.

The Lassa fever after action review meeting provided ample opportunity for relevant stakeholders to share experiences, identify best practices, gaps and lessons learnt so as to strengthen subsequent preparedness and response measures.

The AAR meeting was adjudged successful with 89% of participants recommending the use the AAR methodology for other health emergency response.

Summary of group recommendations

1. Establishment of EOC and IMS at states and maintain functional State rapid response team (RRT)
2. Develop multi-hazard preparedness and response plan by the states
3. The NCDC in collaboration with State Ministries of Health should carry out health workers' sensitization and training on IDSR, epidemiology, clinical presentations of Lassa fever with a view to enable them have a high index of suspicion.
4. States should intensify community sensitization and social mobilization geared towards improving environmental sanitation, personal hygiene and restriction of unhygienic food processing and storage.
5. States, FMOH and NCDC should designate and train surveillance focal persons in all health facilities especially tertiary health facilities.
6. NCDC through the States should ensure that case definitions are made available to all health facilities.
7. Have in place a dedicated surveillance budget line at State and LGA levels
8. NCDC through the office of the State Epidemiologist should establish proper linkage of treatment facilities with Surveillance Unit
9. NCDC should establish one functional regional laboratory in each Geo-political zone
10. NCDC through the Laboratory Unit should ensure that External Quality Assurance (EQA) are done periodically to enhance standardization of testing procedure
11. NCDC should have a policy in place for all States to have a designated functional VHF treatment Centres
12. Forecasting and prepositioning of LF commodities by States
13. NCDC to facilitate the conduct of research on drivers of Lassa fever
14. Adherence to IPC measures – Treatment centres
15. Standardization of treatment protocol

Next steps

- Disseminate presentations and draft Communique to participants - 25th August - by LFWG 2017
- Finalize and submit report to Honorable Minister of Health (HMH) – 4th September 2017 - by National Coordinator/Chief Executive Officer
- Review the VHF form by the Lassa fever working groups and other stakeholders (State Epidemiologist) – 30th September 2017 – by LFWG
- Develop good logistics for sample transport system - October 2017 – Logistic sub group, LFWG
- Continue off- site support in affected states and provide on-site support when needed LFWG
- Print and disseminate Lassa fever guidelines and SOP to relevant stakeholders (States, LGAs and health facilities) - 15th September 2017 NCDC
- Produce and disseminate the report of meeting to all States and FCT - 6th Sept 2017 - LFWG
- Finalize the National Lassa fever workplan and share with relevant departments at NCDC for implementation - 30th September 2017: LFWG
- Monitor status of preparedness in some selected priority states by the members of the LFWG October - November 2017: - LFWG
- Follow up on quarterly basis the implementation of the recommendations made during the AAR meeting at National and state levels, including at the treatment centres and testing laboratories: November 2017- LFWG

Annexes

Annex 1: Agenda

2016/2017 LASSA FEVER OUTBREAK AFTER ACTION REVIEW AND PREPAREDNESS MEETING		
August 21st - 22nd, 2017		
Barcelona Hotel, Wuse 2, Abuja		
Meeting Objectives	• The **Goal** of this meeting is to review the 2016/2017 Lassa Fever outbreak in Nigeria and to strengthen preparedness and response measures **Specific objectives** of the meeting are: 6. To review the 2016/2017 Lassa fever outbreak and response in affected States in order to identify best practices and challenges 7. To develop recommendations to enhance National and State Preparedness and Response Plan. 8. To strengthen intra-disciplinary collaboration and coordination 9. To review the National and State level preparedness plan for improved Lassa Fever outbreak response activities **10.** To present the revised National VHF guidelines for improved response activities	
DAY ONE: 21st August, 2017		
Time	**Activity**	**Responsible Person(s)**
SESSION ONE: INTRODUCTION TO LASSA FEVER		
8:00 - 8:45 am	Registration Of Participants	ALL
8:45 - 9:00 am	Introduction of Participants	
9:00 - 9:10 am	Welcome Remarks	CEO, NCDC - Dr. Chikwe Ihekweazu
9:10 - 9:30 am	Partners' Remarks	Representatives of WHO, CDC, AFENET, UMB , UNICEF
9:30 - 9:45 am	Opening Remarks	HMH, Prof. Isaac Adewole

9:45 - 9:50 am	Objectives of the meeting	Mrs Elsie Ilori DD (Surveillance/ Team Lead LFWG)
10:00 - 10:15 am	"Unanswered Questions on Lassa fever "	Prof Oyewale Tomori Chairman, Lassa fever Control Committee
10:15 - 10:30 am	National Report - Findings from 2016/2017 Lassa Fever outbreak in Nigeria	Mrs Elsie Ilori DD (Surveillance/ Team Lead LFWG)
10:30 - 10:45 am	Surveillance: Need For Case Based Surveillance for Lassa Fever Control in Nigeria: The use of VHF_MS	Dr. Winifred Ukponu - UMB
10:45 - 11: 00 am	Laboratory: Challenges in Transportation of Laboratory Samples in Nigeria	Ms Chioma Dan Nwafor - NCDC/AFENET
11: 00 - 11:15 am	Discussion - Questions and Answers (Session one)	
11: 15 - 11:30 am	**Break Tea/Coffee**	All
11:30 am - 2:30 pm	**SESSION TWO: GROUP WORK 1: STATE REVIEW OF LASSA FEVER 2016/2017 OUTBREAK**	
11:30 am- 2:30 pm	Participants divided into 6 Working Groups Discussions on 2016/2017 outbreak focusing of thematic areas	Anne Fortin and Daniel Yota
2:30 -3:30 pm	**Lunch Break & Video Clip**	
3:30 -4:30 pm	Plenary: presentation by each group	Anne Fortin
4::30 - 5:00 pm	Discussion - Questions and Answers	ALL
5:00 -5:15 pm	**WRAP UP and CLOSING**	
5: 15 - 5: 30 pm	**Break Tea/Coffee**	
	DAY TWO: 22nd August, 2017	
Time	**Activity**	**Responsible Person(s)**
SESSION THREE: LASSA FEVER TECHNICAL RESPONSE AREAS		
8.30 -8:45 am	Recap of Day 1	Rapporteur
8:45-9:00 am	Role of Communication and Social Mobilization in the Control of Lassa fever	Mr Chimezie Anueyiagu
9:00-9:15 am	Lassa Fever Case Management -New Perspective to complicated Lassa fever Management	Dr Ephraim Ogbaini-Emovoh-ILFRC, ISTH
9:15 - 9:30 am	Environmental Health Practices: A veritable tool for Lassa Fever Prevention and Control	Mr. Gbetsere Aghogho, Fed. Min. of Environment

9:30 - 9:45 am	Strategic Plan for the control of Lassa Fever from Agricultural perspective	Dr. Nma Okoli, Fed. Min. of Agriculture
9:45 - 10:00 am	Presentation of revised Lassa Fever Guideline	Mr. Womi Eteng - NCDC
10:00 -10:15 am	Logistics: Needs, Forecast and Mapping of States for improved coordination	Pharm. Gbenga Joseph - NCDC
10:15 - 10:30 am	Presentation of Lassa Fever Preparedness Checklist & Rank Scoring System	Dr. William Nwachukwu - NCDC
10:30 -10: 45 am	Discussion - Questions and Answers	
10:45-11:15 am	**Break Tea/Coffee**	
11:15am -2:30 pm	**SESSION FOUR** **GROUP WORK 2: PREPAREDNESS WORK PLAN**	
11:15 am- 2:30 pm	Group work: preparedness work plan on the Improvement of Lassa fever Response in the following thematic areas • Coordination and Operations • Surveillance and data management, • Case Management and Infection prevention and control (IPC), • Laboratory diagnosis, • Logistics • Risk Communication and social mobilization	Anne Fortin and Daniel Yota
2:30 - 3:30 pm	**Lunch Break & Video Clip**	
3:30 - 4:30 pm	Plenary Presentation: Group Works on Technical Area Plans	Anne Fortin
4:30 - 5:00 pm	Discussion - Questions and Answers	All
5:00 5:30 pm	Presentation of Recommendations with Action points and time lines	LFWG
	Break Tea/Coffee	
16:30 pm	**Closing**	**ALL**

Annex 2: Technical Working Groups

Thematic area	State Epidemiologist	Case Management Physician	NCDC Staff/Partners	Facilitators	Members of LF Steering Committee
Case management/Infection prevention control	Gombe Rivers Plateau	Edo Kogi Ondo	Dr. Sola Aruna, Dr. Obi Ejezie	Dr Ukponu, Dr Mutbam	Prof Akpede, Dr. Daniel Iya, Dr. Ephriam Oganini-Emonoh
Laboratory	Taraba Borno Kaduna	Plateau Enugu Bauchi	Mrs Rehab	Mrs Mba, Ms Chioma Dan-Nwafor	Prof Oyewale Tomori, Dr Salu, Dr Oboro
Risk communication and social mobilisation	Enugu Bauchi Nasarawa	Lagos Borno Ebonyi	, Gbetsere Aghogho	Dr Ibrahim Mamadu, Mr Chimezie Anueyiagu	
Surveillance	Ebonyi Edo Lagos	Anambra Kano Cross River	Sebastian Yennan, Judith Onyeneke, Dr. Nma Okoli	Mr. Yashe, Dr. Luka	Prof Zuberu Iliyasu, Prof Oyewale Tomori
Logistics	Anambra Cross River Kogi	Nasarawa Ogun Taraba	Mrs.Chibuzo Eneh	Mr Gbenga Joseph, Dr Ipadola	
Coordination	Ogun Kano Ondo	Gombe Rivers Kaduna	Dr. Olaolu Aderinola	Mrs Ilori, Mr Womi Eteng, Dr. Saleh	

Annex 3: Technical Area trigger questions

A. Trigger questions

1. Coordination.

a. How effective was your State level Epidemic Preparedness and response committees prior to the outbreak
b. Highlight preparedness activities carried out in your State before the current outbreak?
c. How did the risk assessment contribute to a timely activation of the Incident Management System or response plan and declaration of the emergency?
d. During the management of the outbreak, how effective was the coordination of response actions at all levels?
e. How effective was decision making and operational communication between strategic (senior management), operational (EOC/IMS) and tactical (field) levels?
f. Were there sufficient resources available for the response and how was the financial management coordinated?
g. Were existing preparedness and response plans for this outbreak effective in identifying actions, making decisions and communicating information?
h. How effective were the operations of the public health emergency operations centre (EOC)?

2. Surveillance

a. Functionality of Lassa fever surveillance system in the facillty/state
i. What is expected
ii. What happened
iii. Why**?**
b. Risk communication: How was risk for Lassa fever communicated?
i. What is expected
ii. What happened
iii. Why?
c. Data analysis and usage: Was the epidemiological data analysed?
i. If yes, how was the epidemiological data analysed and used to enable a response? Why?
ii. If no, why?
iii. What are the important of analysing the data?
d. Importance of Surveillance in prevention and control of Lassa fever outbreaks:

i. How did you know that the Lassa fever outbreak had ended in your State?
ii. How did the surveillance system detected the end of the outbreak?
iii. What actions taken enabled an efficient and timely detection of Lassa fever outbreak?
iv. What challenges were encountered in detecting Lassa fever outbreak?
v. How were surveillance activities adapted or reinforced through the course of the response?

3. Case management and infection prevention and control

a. What should have happened?

i. What case definitions have been used?
ii. What are the existing procedures for case management and fatality management for Lassa Fever?
iii. What is the strategy and process for patient identification, referral and transport?
iv. What are the existing procedures for infection prevention and control of health care workers? For community?

b. What happened

i. What was the strategy used in this outbreak for patient identification and referral? Was it efficient?
ii. How were cases managed during this outbreak?
iii. What infection prevention and control measures were implemented? Were they effective in preventing infection in the isolation/treatment units or in the community?
iv. How were fatalities managed? Was it effective and adapted to prevent infection in healthcare settings and in the communities?
v. What was the role of the public sector and/or other stakeholders in case management? How were the roles managed to ensure they complemented each other?
vi. How was the treatment/case management financed? Was it free for patients?

c. Strengths

i. What actions taken enabled the management of cases or fatalities?
ii. What actions taken resulted in a better performance in preventing infection among Health Care Workers or in the community?

d. Weakness

i. What challenges were encountered in the management of cases/fatalities?
ii. What challenges were encountered in implementing IPC measures in healthcare setting or in the community?

Laboratory

e. *What happens*

i. What was the process for laboratory confirmation during this LF outbreak?
ii. Are there guidelines, protocols and SOPs for VHF laboratory?
iii. How are LF samples collected and transported?
iv. How is LF laboratory confirmation conducted and communicated to clients/surveillance services?
v. Is there an inventory system for VHF consumables and reagents?
vi. Does the laboratory have support of partners?

f. *Sample collection and transportation: What is the process for sample collection and transport?*

i. Is there availability of:
ii. National guidelines for sample management (packaging and transportation)
iii. Sample acceptance and rejection criteria policies
iv. Sample management SOPs
v. Packaging equipment
vi. Are samples batched or transported immediately
vii. How are samples transported
viii. Who bears the cost of sample transportation?

g. *Sample collection and transportation: Does the lab experience problems with specimens from State/ health facilities due to:*

i. Incomplete request form
ii. Inadequate container
iii. Inadequate volume of specimen
iv. Improper package
v. Delay in receipt
vi. Transportation

h. *Sample processing*

i. Are there functional labs with capacity to confirm VHF
ii. Are there testing SOPs/Job aids
iii. Is there availability of functional equipment
iv. Are there availability of Lassa fever rapid test kits
v. Are there availability of reagents
vi. Are there trained staff for sample processing
vii. Is the staff number adequate to undertake the required work

viii. Are samples batched or processed immediately
ix. What is the average turnaround time(TAT) for VHF laboratory result
x. Does this lab regularly meet its targeted TAT
xi. What factors influence the lab TAT (Stock out of Reagents, High workload, Equipment Breakdown etc)
xii. Are there internal and external quality control measures in place
xiii. Are all results validated by relevant authorities before release

i. *Infection Prevention and Control*

i. Is the laboratory BSL 3
ii. Are staff trained on VHF IPC
iii. Are there avalability of safety SOPS and manual
iv. How are VHF waste managed after sample processing (sample disposal)
v. How are samples stored after processing
vi. Are there biosecurity measures in place

j. *Laboratory inventory*

i. Is there an inventory system for consumables and reagents?
ii. Is there a system for accurately forecasting needs for consumables and reagents

k. *Communication*

i. How are original VHF lab observations/results recorded?(electronic database and worksheet)
ii. Is there a laboratory data entry staff?
iii. Is there a system to back up VHF lab data in this laboratory(electronic or paper-based system)
iv. Is the laboratory part of surveillance network
v. Is there a designated laboratory personnel to collate and send report?
vi. To whom are lab results sent to
vii. How does the lab communicate with clients
viii. How often are results sent

l. *Actions for improvement*

i. What challenges were encountered in confirming and verifying the laboratory diagnosis?
ii. What is required for the laboratory to operate more efficiently?
iii. Do you have support of partners?

4. ***Logistics***

What should have happened

a. What is the operational coordination mechanism within the Ministry of health for logistics and support operation during outbreak?
b. How is coordination with different levels of the Ministry supposed to happen including at the field level as related to logistics and operation support?
c. What is the strategy and process for needs assessment, Procurement and distribution
d. What are the existing mechanisms for multi-sectorial coordination of resources? How should they be activated?
e. What are existing mechanisms for coordinating international and national partners' donation of suppliers (UN, NGOs, NGO, etc)?
f. What are the resources available for cases management

- *What Happened*

a. Were the existing contingency/response plans for this emergency effective in identifying actions, making decision and communicating information
b. Were the necessary equipment/material/resources for case management, fatalities management and personal protection available
c. Were there sufficient resources available for the response and how was the financial management coordinated
d. What was the process for scaling-up HR, material and funding needs during the emergency? Did they meet the operational needs?
e. How did resource sharing take place during the emergency? Was it effective? Did it enable an effective role of the health sector?
f. How Medicines, PPEs, Health commodities have been supplied, stored and transported?
g. How waste management was ensured during the vaccination campaign?
h. Which partners were involved and what was their role?

5. Risk communication

a. What was the process for developing a specific plan for risk communication and for clearing and delivering public/media communication during the emergency? and how was it implemented at community level and how were communities mobilized?
b. When did implementation of Risk Communication activities start?
c. How many Risk communication experts do you have?
d. How many trainings sessions were conducted during the outbreak?

e. How effective was public communication for building trust among public opinion and in managing emerging public concerns?
f. Do you have a Social Mobilization Working Group and how is it constituted
g. What languages were used to communicate with the public?
h. Who was communicated to, with what messages and how was communication enabled?
i. Were partners involved in risk communication activities?
j. Were the media (traditional) involved in risk communication?
k. What other mediums was used for communication?
l. How was risk communication adapted and monitored for effectiveness throughout the emergency?
m. Did this allow a timely and effective management of rumours and misinformation?
n. How were rumors recorded?

Annex 4: Result of AAR meeting evaluation

A total of 47 participants completed the AAR evaluation form.

Section 1 – Q1. To what extent did the AAR achieve its objectives?

98% (46/47) participants answered 4 or 5 for achievement by AAR to enable participants to develop recommendations to enhance National and State Preparedness and Response Plan

Over 80% participants answered 4 or 5 for achievement of other objectives:

- to review 2016/2017 Lassa fever outbreak and response in affected States and to identify best practices and challenges
- to contribute to strengthen intra-disciplinary collaboration and coordination between health actors involved in Lassa fever emergency response
- to contribute to review the National and State level preparedness plan for improve Lassa fever response activities
- to contribute to present the revised National VHF guidelines for improved response activities.

Section 2 - **Q2. To what extent is the AAR methodology effective to achieve objectives?**

Profile of participants quoted lowest with 69% participants answering 4 or 5. Other aspect of methodology (presentation, group working, plenary and number of participants) ranked respectively 93%, 87%, 81% and 77%.

23 participants provided written comments on methodology. Most frequently mentioned were regarding duration of activity (could be longer), profile of participants (could include State Health Educator, SDSNOs, Community leaders and survivors) and States participation (could be more place for States participation).

Globally, 89% of participants would use the AAR methodology for other emerge