Report of the National

2017/2018 Cerebrospinal Meningitis Outbreak Response After Action Review Meeting

13th- 15th August, 2018

NIGERIA

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Executive Summary

Almost similar to the outbreak of 2016/2017 cerebrospinal meningitis (CSM) season, the outbreak started in Zamfara State in Dakko ward of Bakura Local Government Area in 2017/2018 CSM season. About 3,467 suspected cases of CSM were reported from fourteen states across Nigeria, with 303 deaths (CFR=8.7%). Of the reported cases, 883 (25.5%) were laboratory tested; of these 365 (41.3%) were confirmed positive for bacterial meningitis. *Neisseria meningitidis* serotype C (NmC) and *Neisseria meningitidis* serotype X (NmX) accounted for majority of the confirmed cases; 66.3% and 11.5% respectively.

Katsina and Zamfara States accounted for about 71.0% (2,460) of all reported suspected CSM cases. Within the period under review, four LGAs reached the epidemic threshold during the 2017/2018 CSM outbreak season compared with thirty-seven LGAs of the 2016/2017 CSM outbreak season.

The start of the epidemic was in epidemiological week 47 (20^{th} – 26^{th} Nov) 2017 and the National CSM Emergency Operations Centre (EOC) was activated on 4^{th} December 2017 for 2017/2018 outbreak. Epidemics ended at epi week 22, 2018 and declared over on 5^{th} June, 2018. Early set up of EOC ensured quick effective coordination however, most high-risk states partially implemented their CSM preparedness and response plan.

Reactive vaccination with in-country stock of C containing polysaccharide and conjugate vaccines were conducted in 3 wards in Zamfara State and 1 ward in Jigawa State. The country also secured polysaccharide NmC containing vaccine from the International Coordinating Group on Vaccine Provision (ICG) to vaccinate seven wards, four wards and one ward in Zamfara, Katsina and Sokoto States respectively. Medical consumables such as lumbar puncture (LP) kits, pastorex, trans isolate (TI) media, ceftriaxone and intravenous infusion were sent to the affected states (Zamfara, Sokoto, Jigawa, Katsina, Kebbi, Kano, Kaduna, Niger, Plateau, Borno, Yobe, Bauchi and Cross River) in January, 2018.

The purpose of the 2018 National CSM outbreak After Action Review (AAR) meeting was to review the preparedness and outbreak response identifying best practices and challenges and draw lessons for improved response to CSM and other infectious outbreaks. The participating organizations for the CSM AAR included NCDC officers, State Epidemiologists, Disease Surveillance and Notification Officers (DSNOs) from some of the affected States, State immunization officers. There were also representatives from Ministries, Departments and Agencies such as National Primary Health Care Development Agency (NPHCDA), National Youth Service Corp (NYSC) and National Orientation Agency (NOA). Partner representatives from World Health Organisation (WHO), Medecins San Frontieres France (MSFF), University of Maryland Baltimore (UMB), Africa Field Epidemiology Network (AFENET), e-Health Africa, IFAIN/NHA. Over 80 participants were present at the AAR meeting.

The meeting was facilitated using the WHO After Action Review manual. The meeting sessions were conducted using via power point presentations, group discussions and plenary discussions. Participants were grouped into 6 thematic areas namely Coordination, Surveillance, Case management, Risk communication and Social mobilization, Laboratory,

Logistics and Vaccination. Each group identified best practices, challenges and drew up lists of key activities to be carried out. Plenary sessions also incorporated opportunities for questions and answers.

The group discussions on the best practices in the different thematic areas were mostly on, effective coordination and rapid response team (RRT), good partnership and collaboration, timely reporting, effective case management, prompt testing and release of laboratory results. Others include procurement and prepositioning of medicines and health consumables, radio jingles and social media to communicate to the public. Discussions also covered availability of sample collection protocol, sample containers and vacutainers.

As a follow-up to this report, stakeholders' meeting will be held to discuss findings of the AAR review meeting, drive stakeholder buy-in and the implementation of all activities identified will commence by October, 2018.

1.0 Background on Outbreak

Almost similar to the outbreak of 2016/2017 cerebrospinal meningitis (CSM) season, the outbreak started in Zamfara State in Dakko ward of Bakura Local Government Area for 2017/2018 CSM season at the Epi week 47 of 2017. The epidemic peaked in epi week 15 in 2018 before decline and ended at epi week 22 of 2018 (see figure 1). A total of 3,467 suspected cases of CSM were reported from fourteen (14) states across Nigeria, with 303 deaths (CFR=8.7%). Males accounted for 59.8% (2,073) of cases, age group 5-14 years was the most affected with 1,928 (55.6%) cases. Of the reported cases, 883 (25.5%) were laboratory tested; of which 365 (41.3%) were confirmed positive for bacterial meningitis. *Neisseria meningitidis* serotype C (NmC) and *Neisseria meningitidis* serotype X (NmX) accounted for majority of the confirmed cases with 66.3% and 11.5% respectively.

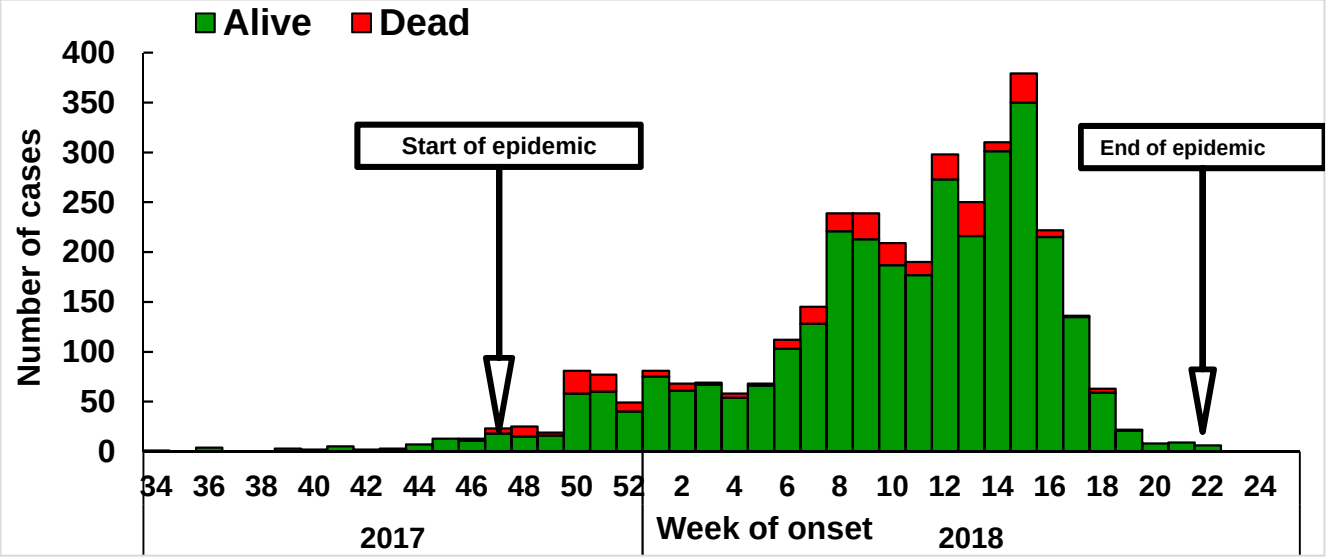

Figure 1: National epidemic curve for the 2017/2018 CSM outbreak

Katsina and Zamfara States accounted for about 71.0% (n=2,460) of all reported cases. Within the period under review, four (4) Local Government Areas (LGAs) reached the epidemic threshold during the 2017/2018 CSM outbreak season compared with thirty-seven (37) LGAs in the 2016/2017 CSM outbreak season. Table 1 below summarizes the outbreak key outcomes.

The start of the epidemic was in Epidemiological week 47, 2017 and the National CSM EOC was activated on 4th December 2017 for 2017/2018 outbreak. The CSM epidemic ended at epi week 22, 2018. Early set up of Emergency Operations Centre (EOC) using the Incident Management System (IMS) ensured quick effective coordination however, most high-risk states partially implemented their CSM preparedness and response plan. Reactive vaccination with in-country stock of C containing polysaccharide and conjugate vaccines were conducted in 3 wards in Zamfara State and 1 ward in Jigawa State: 24th-29th March 2018. Medical consumables such as LP kits, pastorex, TI media, ceftriaxone and intravenous infusion were

sent to the affected states (Zamfara, Sokoto, Jigawa, Katsina, Kebbi, Kano, Kaduna, Niger, Plateau, Borno, Yobe, Bauchi and Cross River) in January, 2018.

Table 1: Summary of the 2017/2018 CSM outbreak by state, CSF collection rate, results and outcome

State	Total cases reported (n)	LGAs reporting cases (n)	LGAs in Alert	CSF Collection Rate (%)	Total Lab confirmed (n)	NmC	NmX	Strep pneumo	Deaths (n)	Case fatality rate (%)
Katsina	1367	34	17	23.8	156	93	25	14	92	6.7
Zamfara	1093	14	11	22.5	70	53	1	5	84	7.7
Sokoto	371	22	6	20.5	47	38	8	1	12	3.2
Jigawa	184	18	3	15.8	17	12	0	0	40	21.7
Kano	106	23	2	26.4	12	8	0	2	25	23.6
Kebbi	95	18	1	77.9	43	26	8	5	4	4.2
Niger	70	4	1	24.3	4	3	0	1	5	7.1
Yobe	65	10	0	61.5	10	4	0	2	16	24.6
Bauchi	30	7	0	46.7	0	0	0	0	13	43.3
Cross River	29	6	0	0.0	0	0	0	0	1	3.4
Borno	27	10	0	74.1	1	0	0	0	2	7.4
Adamawa	23	7	1	43.5	5	5	0	0	9	39.1
Plateau	4	3	0	25.0	0	0	0	0	0	0
Gombe	3	1	0	100.0	0	0	0	0	0	0
Total	**3,467**	**177**	**42**	**25.5**	**365**	**242**	**42**	**30**	**303**	**8.7**

Table 2: Comparison of outcome of CSM outbreaks for the 2016/2017 and 2017/2018

Summary of interventions	2016/2017	2017/2018	Change(%)
Total Cases	14,542	3,467	76.1
Total Deaths	1,166	303	74.0
Case Fatality Rate	8.0%	8.7%	8.8
Samples tested	1339 (9.2%)	883(25.5%)	177.2
Confirmed cases	562 (42%)	365(41.3%)	-
NmC	370 (66%)	242 (66.3%)	-
LGAs ever reached Alert threshold	56	42	25.0
LGAs ever reached Epidemic threshold	37	4	89.2

2.0 Scope and Objective of review

The purpose of the 2017/2018 National CSM outbreak AAR was to review the preparedness and outbreak response identifying best practices and challenges and draw lessons for improved response to CSM and other infectious outbreaks.

Specific Objectives

- To document best practices and identify gaps in the preparedness, prevention, detection, investigation and response to CSM outbreak
- To assess the existing coordination mechanisms and identify areas of enhancement/improvement
- To identify actions for learning to improve future response to CSM and other events
- To develop action plan for addressing the identified gaps

3.0 Methods

The method adopted included power point presentations, group discussions and plenary discussions.

The Power Point Presentations were used to highlight what happened during the outbreak both at the National and at the State level.

The Group Work was done in six groups. Participants were assigned based on their primary areas of involvement during the response. The focus of each group was to identify best practices (strengths), challenges (weaknesses) and recommendations including activities for future action.

The Plenary Presentations was done after the group work and it involved a representative from each group presenting what was done and inputs were made thereafter. There was also a world café session to review each group's work.

The participating organizations in the CSM AAR included NCDC teams, State epidemiologists, DSNOs from some of the affected States, State immunization officers, Partner's representatives from MSFF, UMB, AFENET, e-Health Africa, NOA, IFAIN, NHA, NPHCDA and NYSC.

4.0 Findings

The group discussions on the best practices in the different thematic areas were mostly on, effective coordination and RRT, good partnership and collaboration, timely reporting, effective case management, prompt testing and release of laboratory results, medicines and medical health consumables, radio jingles and social media to communicate to the public, availability of sample collection protocol, sample containers and vacutainers. The six technical groups discussed extensively, and they were all guided by trigger questions.

4.1 Timeline of outbreak

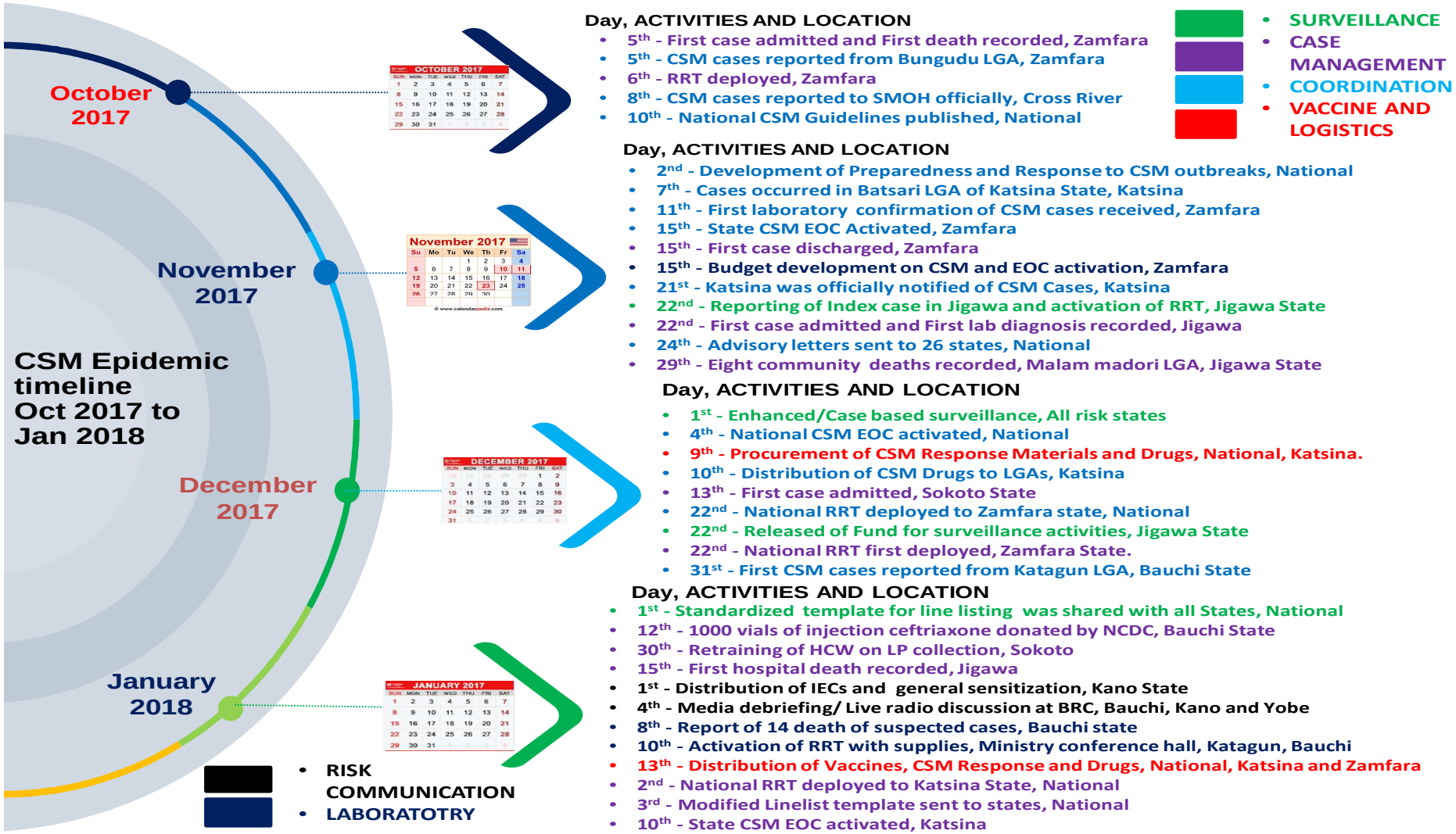

Figure 2: Time line of activities for CSM response from Oct 2017 to Jan 2018

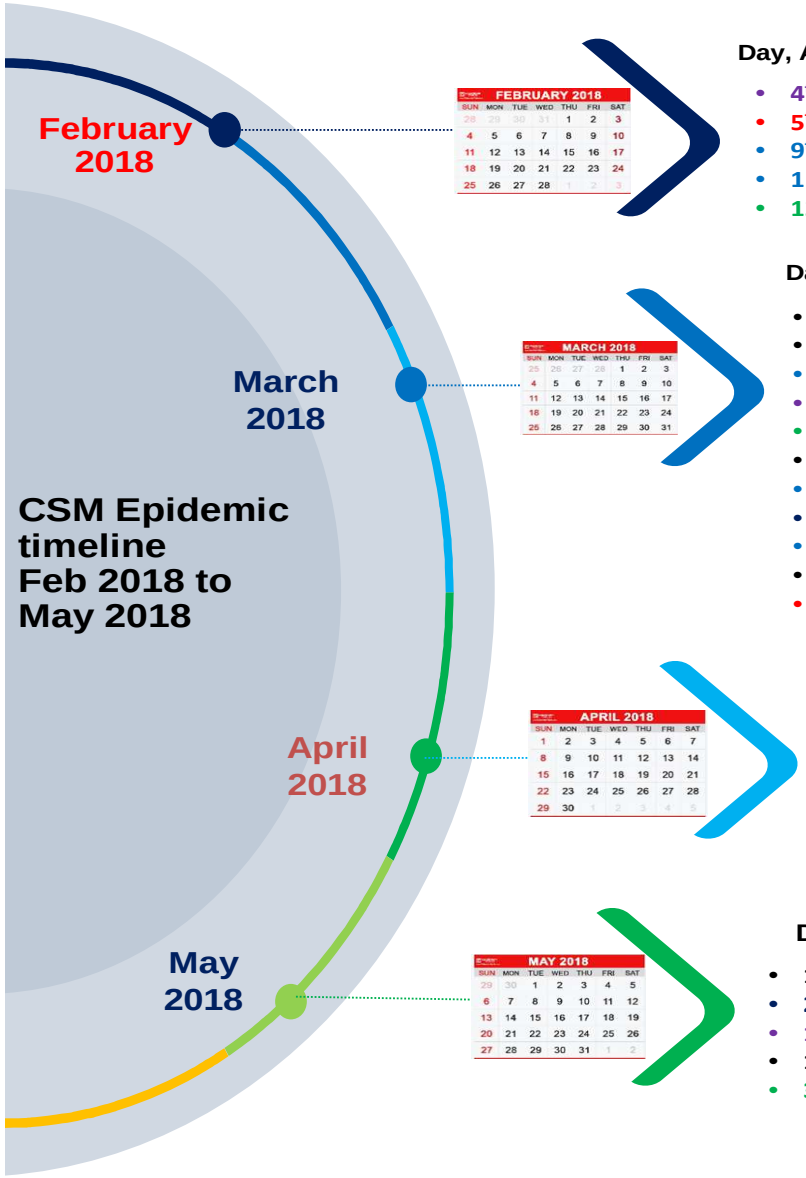

Figure 3: Time line of activities for CSM response from Feb 2018 to May 2018

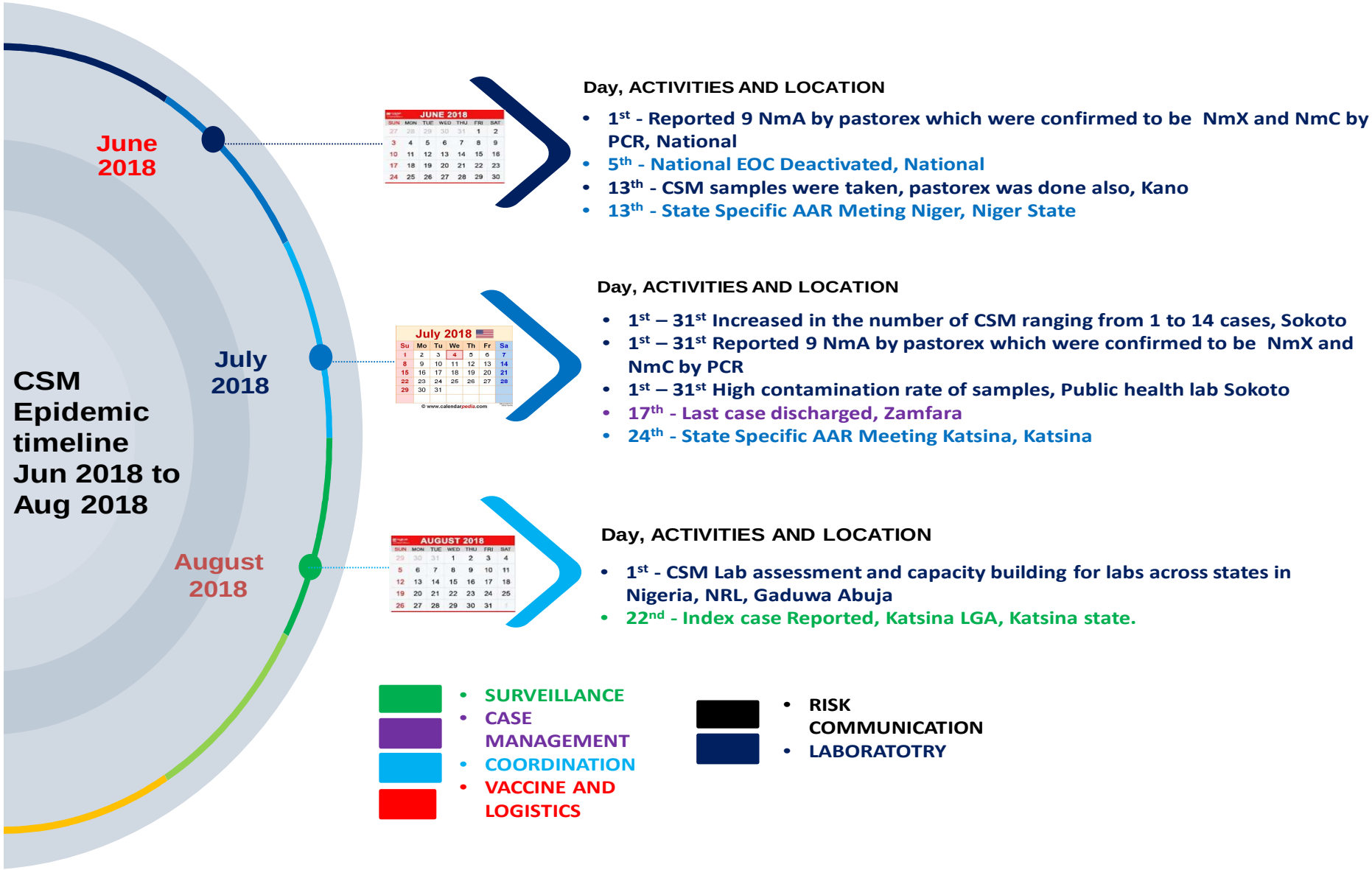

Figure 4: Time line of activities for CSM response from Jun 2018 to Aug 2018

4.2 Coordination Function

Coordination function discussion was centered around what were in place prior to the response as well as identifying the best practices and challenges that occurred during the outbreak as it related to coordination. CSM preparedness and response plan, National CSM guideline and IDSR were in place at the states. Monthly coordination meetings held in all the states and drugs and other medical consumables were prepositioned by the national team, in the states. At the National level, CSM technical Working Group was in place prior to the response.

Katsina and Niger states had EOC in place, while EPR/IDSR Committee were functional in Cross River, Bauchi, Katsina and Zamfara states. Cross border Collaboration was in place with Niger Republic (Katsina and Zamfara States) and also with Cameroon in Cross River state.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Timely activation of EOC (In National, Zamfara and Katsina States)	• Effective coordination • Resource mobilization • Public Awareness through the instrument of EOC via Press briefing/Radio and TV jingles	• Availability of funds for response • Existing relationship with state response holders • Existing RRT at National and in states • Timely notification of outbreak
Existing CSM guidelines and SOPs at National and in all states	• Effective response • Effective case management • On the job training of health care workers	• Guidelines and SOPs developed, produced and distributed to states by National prior to the outbreak season • Functional CSM Technical Working Group at NCDC
Ward Level Response	• Enabled pick up of cases quickly • Easy to reach thresholds for vaccine request	• Lesson Learnt from previous outbreaks
Development of Response Plan at National and in Sokoto and Katsina states	• Stakeholders buy-in • Prepositioning of essential commodities • Identification /designation of treatment centres	• Functional TWG at National and active EPR committees at some state • Lesson Learnt from 2016/2017 CSM Outbreak
Training of Health Care Workers prior to outbreak	• Skilled human resources • Timely detection of cases • Effective case management	• Existing workforce • Availability of training funds
Cross border collaboration	• Timely detection of imported cases • Prevent spread of cases across borders	• Instrumentality of the IHR platform • Leveraged on Existing polio structures

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
Partial implementation of preparedness plan	• Reduced quality of the response • Prolonged the outbreak	• Inadequate funding of plans
Weak/ non-existing EPR committee	• Poor resource mobilization • Weak/poor response	• Low political will
Batched reporting of cases	• Poor coordination • Delayed data evidence for decision making • Weak response	• Incomplete surveillance data for decision making
Delay in making ICG request	• Late commencement of reactive vaccination	• Low CSF collection • Inadequate number of lumbar puncture (LP) kits • Reluctance of health care workers to perform LP
Delayed presentation and referral of cases	• High morbidity • High CFR	• Cultural practice • Long distance between treatment centres • Hard to reach communities • Insecurity

4.3 Surveillance Function

Surveillance function identified availability of human resources (e.g. trained surveillance staffs) at both national and state, reporting tools such as IDSR, Line list and Case Investigation Form (CIF) as being available prior to the response. CSM outbreak State Annual Preparedness and Response Plan was available in eleven high risk states. A functional Rapid Response Team (RRT) was available at the National level as well as in some states. Working with development partners as well as an existing reporting system was also in place.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Availability of Functional indicator and event-based surveillance system at the State and Event Based Surveillance System at the National.	• Timely detection, notification and response of the event.	• Availability of reporting tools (paper and electronic e.g. SORMAS) • Availability of partner's support and competent staffs
Adequate and efficient communication between National and State.	• Improved quality surveillance data • Timely response • Improved ownership of surveillance data and sense of belonging among the surveillance structure	• Existence of an incident command system • Good working relationship between the states and NCDC
Use of weather forecast and Climate products from NiMET to predict, identify and plan for at risk states	• Enabled intensification of plans in at risk states	• Existence of NiMET products (Weather, Climate and Environmental information) • Existence of collaboration between NCDC and NiMET as government agencies
Weekly analysis of surveillance and epidemiology data both at the National and State	• Assisted in monitoring trend • Aided response activities	• Availability of surveillance data • Availability of competent human resources
Periodic (biweekly and weekly) outbreak review meetings held both at the National and States level.	• Created opportunity for effective decision making • Partners support (human, fund, technical, etc.) • Cooperation of partners agencies such as NiMET, NPHCDA, FME, PHS etc.	• Effective leadership structure at the National and some states.
The use of standardized definitions for alert and epidemic threshold for declaration of the beginning and end of the outbreak	• Enables efficient use of resources	• Availability of standard guidelines

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
Inadequate number of dedicated human resources for surveillance activities across all levels	• Delayed reporting	• Irregular supportive supervision • Staff attrition • Low motivation
Lack of dedicated budgetary allocation and/or release in some states	• Low implementation of costed plans	• Low political will
Poor integration of surveillance and laboratory data	• Incomplete linking and harmonization of surveillance and lab data in some states	• Unavailability of harmonized e-surveillance platform.
Lack of adequately trained surveillance staffs in some of the state	• Sub-optimal implementation of surveillance activities	• Lack of capacity building plans • Lack of funds for training
Shortage of data tools for reporting particularly at the state and LGA level	• Delayed reporting/not reporting • Some outbreak/events were missed	• Inadequate funding for tools
Poor utilization of climate reports and services for health events prediction by most health professionals at the state level	• Poor prediction of health events. • Increased prevalence of health event.	• Low availability of NiMET reports/products at the state level. • Inadequate capacity to use the products

4.4 Case Management Function

Prepositioning of some medicines, medical consumables and laboratory supplies at the treatment facilities by NCDC and identifying designated treatment centers for CSM in some states occurred prior to the outbreak. Clinicians high index of suspicion played a key role in diagnosing cases early. This is partly due to the distribution of the updated CSM Case Management Guidelines, which were available at health treatment facilities. Low CSF sample collection was a major challenge.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Dissemination of updated case management guideline to states	• Standardised case management across the states	• Availability of national guidelines • Effective communication • Available technical expertise review national guidelines
Early training and retraining of health personnel	• Ensure effective case management and improved treatment outcome	• Commitment to best practice by the states • Availability of resource persons

Best Practices	Impacts	Enabling Factors
Early deployment of RRT in Zamfara, Jigawa, Katsina, sokoto, Niger States	• Strengthen local case management capacity	• Existing RRT • Availability of logistics
Prepositioning and restocking of drugs and medical supplies	• Early commencement of treatment	• Availability of preparedness plan • Availability of drugs from previous outbreak
Availability of designated treatment centres in the state	• Improved access to care	• Commitment to best practice by the states • Government's commitment

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
Inadequate CSF sample collection	• Low sample for analysis	• Poor attitude of skilled health personnel in sample collection • High workload • Low motivation
Delayed confirmation of cases	• Late diagnosis	• Poor collaboration, communication with state laboratories • Inadequate laboratory infrastructure and equipment • Delay in sample transportation from health facilities to state laboratories
Inadequate skilled human resources	• Work overload • Poor treatment outcome	• Training of inadequate number and cadre of health personnel
Poor logistics support for referred cases	• Delay in accessing healthcare • Ineffective case management	• Low financial support to establish transport services for referred cases • Low involvement of the community in planning transport services for referred cases • Inadequate commitment from policy makers on allocation and release of funds for logistics
Inadequate medical supply for supportive management	• Provision of substandard care	Poor prioritisation of health need
Use of substandard drugs in some states	• Poor treatment outcome • High case fatality and morbidity	Non adherence to treatment protocol

4.5 Risk Communication and Social Mobilization Function

Risk communication identified existence of a risk communication plan by Partners and collaborating agencies as well as in most states to have played a key role during the outbreak. Effective coordination, media engagement, deployment of IEC materials and Jingles were also good practices identified during the outbreak. Major challenge was insufficient human resource (Communication officers) to carry out risk communication activities as planned.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Presence of an effective coordination mechanism	• Joined implementation of activities • Effective utilization and deployment of resources • Strengthening of partnerships • Minimization of wastage • Reduced duplication of efforts	• Existing government policy, partnership and existing structures
Availability of Risk communications plan	• Guided scope of intervention • SMART implementation	• Existing government policy, partnership and existing structures
Availability of resources (Human and Logistics)	• Effective response and coverage	• Existing government policy, partnership and existing structures
Media engagement during the outbreak	• Increased public awareness/education • Increased coverage in short time	• Existing government policy, partnership and existing structures
Deployment of available communications tools (IECs and Jingles)	• Helped to target different audiences	• Existing government policy, partnership and existing structures
Engagement of relevant institutions (religious and traditional rulers)	• Increased awareness at all levels • Mobilization of resources and ownership	• Existing government policy, partnership and existing structures

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
Insufficient human resources (communication officers)	• Low coverage of target audience • Poor outcome	• Inadequate budget for recruitment and replacement of workers • Insufficient number of health educators • Unwillingness of some health educators to visit the communities • Poor accommodation for the health education officers in some communities
Inadequate number of appropriate trainings for health education workers	• Mis-information • Poor quality in messages	• Low prioritization of health workers' training
No dedicated budget-line for CSM risk communication activities	• Poor /inappropriate implementation of communication activities	• Other competing demands for health fund
Insufficient communication tools and late deployment	• Poor implementation and outcome	• Low prioritization of risk communication activities
Insufficient resources to translate IECs at state levels into local languages	• Poor implementation and outcome	• Low prioritization of risk communication activities
Low political commitment to implement policies	• Poor implementation and outcome	• Low prioritization of risk communication activities
Low community participation (Religious and cultural belief)	• Poor outcome	• Religious belief and cultural practices • Illiteracy • Insecurity

4.6 Laboratory Function

This function identified prompt reception of samples and analysis as one of their best practice during the outbreak and this was attributed to provision of consumables, reagents and dedicated personnel. The few challenges identified included high contamination rate of culture samples due to low adherence to Standard Operating Procedures (SOPs) for sample collection, transportation and also lack of biosafety cabinet.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Prompt reception of sample and analysis.	• Timely management of patients.	• Availability of consumables, reagents and dedicated personnel

Best Practices	Impacts	Enabling Factors
		for prompt reception of samples and analysis • Availability of NCDC/ WHO guideline and SOP for RDT and Culture. • Pre-positioning of Lab consumables and reagents.
Less than an hour turn around time for preliminary result	• Right application of standard treatment protocol.	• Availability of established communication channel • Availability of trained and dedicated personnel at the pre-analytic and post analytic • Back-up power supply and infrastructural support.
Bio- safety: Vaccination of laboratory staff involved in sample analysis	• Zero case of CSM among laboratory staff.	• Availability of vaccines at no cost to personnel • Provision of guidelines on biosafety to laboratory personnel
Strict Adherence to SOP for sample collection, transportation and analysis.	• Quality samples and quality results.	• Availability of SOPs for all processes. • Prior training conducted by NCDC and other partners. • Pre-positioning of Lab consumables and reagents
Preservation of Isolate for internal quality control	• Reference and confirmation of new isolates	• Availability of storage media, • Protocol and SOP for monitoring and archiving of isolates. • Constant power supply
Sample referral to National Reference lab for further analysis	• Detailed characterization and external quality assurance.	• Existing protocol and SOP provided by NCDC for sample referral • Availability of transport media • Courier service

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
High contamination rate of culture (TI media)	• False negative result.	• Low adherence to SOPs for collection and transportation • Insufficient training of physicians on SOPs for sample collection and handling. • Lack of training of DSNOs on SOPs for sample transportation.
Inadequate numbers of Biosafety cabinet (BSC)	• Increase in contamination and	• Inadequate funding • Low political will

Challenges	Impacts	Limiting Factors
	increased exposure of personnel to infection.	• Limited budget allocation and release for Public Health Laboratory (PHL) services.
Lack of culture facilities in some centres	• Inability to confirm by Culture method	• Poor maintenance of culture for some facilities • Inadequate numbers of trained personnel on culture.
Insufficient LP kits	• Low sample collection and delayed diagnosis	• Low forecasting and quantification • Insufficient prepositioning of LP kits
Inadequate storage facilities for sample and isolates	• Lack of characterization and external quality assurance	• Poor maintenance and lack of back-up supply • No Budget allocation/ release for PHL services.
Prolonged sample transportation beyond the limited time.	• Delayed diagnosis	• Inadequate funding for transportation • Insecurity and hard to reach areas. • Inadequate sample transport mechanism/ plans

4.7 Logistics and Vaccination Function

This function identified inter-sectoral collaboration and timely release of funds for logistics as one of their best practice during the outbreak and this was attributed to early submission and approval of budget line and also partners and government commitment. Some of the challenges identified included non-compliance to vaccination and security challenges.

Best practices, Impacts and Enabling factors

Best Practices	Impacts	Enabling Factors
Inter-sectoral collaboration	• Improved Coordination • Dissemination of information and assigning roles and responsibilities	• Government and partner commitment
Timely Release of Funds for Logistics	• Early Response	• Early Submission and approval of budget line • Political will

Best Practices	Impacts	Enabling Factors
Procurement of CSM Response Materials and Drugs early	• Improved Coverage	• Availability of funds • Partner support
Pull System or standard Version of distribution of Vaccine, Response Materials and drugs	• Availability of drugs and response materials at service delivery point • Improved feed-back Mechanism	• High risk assessment data • Availability of outbreak data • Good distribution plan
Development and deployment of CSM Consumption tool	• Improved utilization and accountability of vaccines, drugs and response materials • Informed prompt decision making	• Presence of expertise • Effective management structure
Monitoring and Supervision of Vaccination team	• Efficient implementation of vaccine program	• Availability of a comprehensive checklist • Good transport system • Knowledge of the program by the supervisor

Challenges, Impacts and Limiting factors

Challenges	Impacts	Limiting Factors
Low uptake of vaccination	• Low vaccination campaign • Herd immunity not achieved	• No felt need • Cultural beliefs • Ignorance
Security Challenges	• Inaccessibility to target areas	• Communal clashes • Kidnapping • Armed banditry and cattle rustling
Poor Waste Management	• Exposure to injuries and infection	• Lack of Incinerators • Poor Implementation of waste management plan
Insufficient Funds	• Delayed response • High mortality and morbidity	• Bureaucracy
Insufficient supply of vaccines and drugs	• Poor coverage of target population	• Lack of laboratory confirmed CSM cases to inform response activities and meet the ICG requirements • Poor line-listing of cases • Influx of clients from non-implementing settlements
Poor AEFI data	• Leads to morbidity	• Concealment by health workers

Challenges	Impacts	Limiting Factors
		• Low knowledge of AEFI by health workers

5.0 Key activities

The following key activities were identified during the AAR from the individual groups and jointly prioritized with points allotted (see annex). However, this weighting at the national level can differ to what each state will prioritise.

Coordination

1. Develop national and state specific costed CSM Emergency preparedness plan
2. Establish/Reactivate State and LGA EPR Committees
3. Organize a two-day cross border meeting prior to the epidemic season
4. Conduct high level advocacy to stake holders on release of Emergency Response Funds and appropriate use
5. Update ward level population database and share with the National
6. Resource mobilization
7. Organize three-day training on ICG Request, CSF Collection and use of surveillance tools for reporting
8. Conduct a one-day stakeholder buy-in meeting for the EPR Plan
9. Print and distribute CSM guidelines to LGAs and Health facilities

Surveillance

1. Plan and conduct advocacy visit to all commissioners of health of all high-risk states to address dedicated budget line for surveillance activities.
2. Train and retrain all surveillance staff in at-risk states to detect, notify and response to CSM occurrence.
3. Continuously monitor atmospheric product to support the forecast or prediction of CSM outbreak
4. Deploy SORMAS and BLIS to the remaining high-risk states
5. Conduct sensitization of Clinicians/Health workers on the use of national CSM SOPs and other CSM guidelines
6. Print and distribute IDSR reporting tools to all high-risk states

Case Management

1. Conduct a 3 day-training for 3 health personnel (emergency personnel) in designated facility in the 3rd quarter of the year
2. Establish/reactivate RRT in meningitis belt states/LGAs
3. Designate health facilities for CSM management
4. Conduct advocacy to management on the importance of medical supplies for supportive care for CSM
5. Conduct training on identification and reporting on AEFI
6. Conduct quarterly meeting between case management team and inter-pillar
7. Disseminated updated hard copies case management guideline to all identified treatment facilities
8. Conduct advocacy visit to the policy makers on importance of referral logistic

Risk communication and Social Mobilization

1. Conduct advocacy to sensitize policy makers and mobilize resources
2. Conduct public awareness campaign (Road show)
3. Development of risk communication plan and budget
4. Production of communication tools
5. Training for health communication workers but at the state and LGA level
6. Media engagement
7. Carry out Community engagement
8. Training of town announcers
9. Carry out Radio /TV programmes
10. Conduct compound meeting to educate women on outbreak

Laboratory

1. Training and retraining of state laboratory staff on CSF analysis, (10-20 *medical lab scientist per states).*
2. Training and retraining of clinicians on proper aseptic CSF samples collection and safe inoculation into TI media.

3. Budget development and implementation to address laboratory needs.
4. Training of medical laboratory scientist on quality management system (Bio safety and Bio security).
5. Training of DSNOs on how to transport CSM samples either vented or unvented TI/ plain bottles to the lab in optimal time.
6. Develop/ Revise site specific SOP for sample transportation.
7. Develop a plan for regular supply of sheep blood through the state veterinary service.
8. Enrolment of all states CSM health laboratories in EQA for CSM pathogens.
9. Training of Lab scientists on shipment of aliquots.
10. Identify a referral Laboratory and sign an MOU with capacity for processing CSM samples.

Logistics and Vaccination

1. Procurement of CSM drugs, response materials and Vaccine.
2. Prepositioning of drugs and CSM Response Materials.
3. Conduct a two-day TOT workshop for state logistics team on waste management.
4. Conduct one-day training of Health Workers on AEFI management, documentation and reporting.
5. Development of Inventory Management tool and training of staff on inventory management.
6. Conduct one-day advocacy visit to SSG and HCOCH on the need for increase in the funds allocated to respond to CSM outbreak.
7. Conduct 3-day stakeholders' meeting with security agencies and traditional leaders on security challenges.
8. Conduct one-day sensitization meeting for Religious and traditional leaders on CSM vaccination acceptance.

6.0 Next steps

The following will be carried out:

1. Organize stakeholders meeting to discuss findings of the AAR review meeting for stakeholder buy in.
2. Begin implementation of all activities identified.

7.0 Conclusions

The outbreak of meningitis in Nigeria began in Epi week 47, 2017 and was controlled in Epi week 22, 2018. Following the outbreak, NCDC conducted a National AAR which provided an opportunity for those involved in the response to identify strengths and weaknesses and identified ways to improve the preparedness and response in future outbreaks.

8.0 Annexes

Annex 1: Post AAR action plan

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
1. Procurement of CSM drugs, response materials and Vaccines	NPHCDA/NCDC/SMOH	October 2018	+++	++	26	Vaccines & logistics
2. Conduct advocacy visit to all commissioners of health of all high-risk states to address dedicated budget line for surveillance activities.	NCDC and other Shareholders	October, 2018	+++	+	24	Surveillance & epidemiology
3. Develop national and state specific costed CSM Emergency preparedness plan	-Director Public Health at the State level -Team lead CSM TWG	30th September 2018	+++	++	21	Coordination
4. Conduct a 3-day training for 3 health personnel (emergency personnel) in designated facility in the 3rd quarter of the year	SMOH	3rd Sept 2018	+++	++	20	Case management
5. To carry out public education and mass mobilization	State health educator	October-December 2018	+++	+	19	Risk communication & social mobilisation
6. Advocacy to sensitize policy makers and mobilize resources	State health educators	August, 2018	+++	+	19	Risk communication & social mobilisation

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
7. Training and retraining of lab staff on CSF analysis, (10-20 *medical lab scientist per states.)*	National Reference Laboratory	15th October, 2018	+++	++	18	Laboratory
8. Train and retrain all surveillance staffs in at-risk states to detect, notify and respond to CSM occurrence.	-States -NCDC and Partners	October, 2018	+++	+	14	Surveillance & epidemiology
9. Budget development and implementation to address laboratory needs	-State Lab / EOC / SMOH	15th September 2018	++	+++	13	Laboratory
10. Training and retraining of clinicians on proper aseptic CSF sample collection and safe inoculation into TI media	-State PHEOC level/ SMOH	1st November, 2018	+++	+	13	Laboratory
11. Development of risk communication plan and budget	-State health educators	Early September 2018	+++	+	12	Risk communication & social mobilisation
12. Establish/reactivate RRT in meningitis belt states/LGAs	-Epidemiology unit of SMOH	24th Sept 2018	+++	++	10	Case management
13. Establish/Reactivate State and LGA EPR Committees	-Director Public Health at the State level	30th September 2018	+++	++	9	Coordination
14. Designate Health facilities for CSM management	- Hospital management board	3rd Sept 2018	+++	+	9	Case management
15. Organize a two-day cross border meeting prior to the epidemic season	-IHR focal point NCDC	30th October 2018	+++	++	7	Coordination

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
16. Conduct Advocacy to management on the importance of medical supplies for supportive care for CSM.	-SMOH (Epid unit)	10th Sept, 2018	+++	++	7	Case management
17. Training of medical laboratory scientist on quality management system (Bio safety and Bio security)	-National Reference Laboratory	25th October, 2018	+++	+	7	Laboratory
18. Prepositioning of drugs and CSM Response Materials	-State Logistician	October 2018	+++	+	7	Vaccines & logistics
19. Conduct high level advocacy to stake holders on release of Emergency response funds and appropriate use	-SE, DPH, and Commissioner of Health at States and NCDC-CEO at National	30th September 2018	+++	+	7	Coordination
20. Continuously monitor atmospheric product to support the forecast or prediction of CSM outbreak	-NiMET	October onwards	++	++	6	Surveillance & epidemiology
21. Training of DSNOs on how to transport CSM samples either vented or unvented TI/ plain bottles to the lab in optimal time	-State PHEOC level/ NCDC	1st November, 2018	+++	+	6	Laboratory
22. Conduct a two day TOT workshop for state logistics team on waste management	-Director/SIO	October 2018	+++	++	6	Vaccines & logistics

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
23. Conduct one day training of Health Workers on AEFI management, documentation and reporting	-SIO	October 2018	++	++	5	Vaccines & logistics
24. Update ward level population database and share with the National	-State Epidemiologist and State DSNOs	31st August 2018	++	+	4	Coordination
25. Conduct training on identification and reporting on AEFI promoters.	-SMOH (State immunization unit	17th September, 2018	++	++	4	Case management
26. Development of Inventory Management tool and training of staff on inventory management	-State Logistician	October 2018	+++	++	4	Vaccines & logistics
27. Develop a plan for regular supply of sheep blood through the state veterinary service	-State Lab/ SMOH/ Veterinary service	15th October, 2018	++	++	3	Laboratory
28. Develop/ Revise site specific S.O.P for sample transportation	-National Reference Laboratory	1st October, 2018	+	+++	3	Laboratory
29. Deploy SORMAS and BLIS to the remaining high-risk states	-NCDC and implementing partners.	November, 2018	++	++	3	Surveillance & epidemiology
30. Disseminated update hard copies case management guideline to all identified treatment facilities	-SMOH (State immunization unit	10th September, 2018	+	+	3	Case management
31. Conduct Sensitization of Clinicians/Health workers	-State -NCDC and Partners.	October, 2018	+++	++	3	Surveillance & epidemiology

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
on the Used of CSM SOPs and other CSM guidelines						
32. Production of communication tools	-Health educators/Information officer	Mid-September 2018	+++	+++	3	Risk communication & social mobilisation
33. Conduct quarterly meeting between case management team and interpillar	-SMOH	3rd October, 2018	+	+	3	Case management
34. Enrolment of all states CSM health laboratories in EQA for CSM pathogens	-National Reference Laboratory	30th October, 2018	++	+++	3	Laboratory
35. Conduct advocacy visit to the policy makers on importance of referral logistic	-SMOH (Epid unit)	3rd September, 2018	++	++	2	Case management
36. Conduct one day advocacy visit to SSG and HCOCH on the need for increase in the funds allocated to respond to CSM outbreak	-ES/SPHCMB/SMOH	August 2018	++	+	2	Vaccines & logistics
37. Conduct 3 days stakeholders' meeting with security agencies and traditional leaders on security challenges	-National and State	September 2018	++	+++	2	Vaccines & logistics
38. Training of Lab scientist on shipment of aliquots/ Isolated to NRL for	-National Reference Laboratory	20th October, 2018	+++	+	2	Laboratory

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
molecular testing and characterisation						
39. Training for health communication workers but at the state and LGA level- (The objective is to develop capacity)	-State health educators	August, 2018	++	+++	2	Risk communication & social mobilisation
40. Conduct Media engagement to orientate media practitioners	-State health educators and State PRO	Regularly	+++	++	2	Risk communication & social mobilisation
41. Community dialogue	-State health educators and social mobilization community	Continuous	+++	+	2	Risk communication & social mobilisation
42. Conduct Training of town announcers	-State health educator	1st September 2018	++	++	2	Risk communication & social mobilisation
43. Print and distribute IDSR reporting tools to all high-risk states	-NCDC and States	December, 2018	+++	++	2	Surveillance & epidemiology
44. Radio/TV programmes	-PRO and State health educator	November/December 2018	+++	+	1	Risk communication & social mobilisation
45. Conduct compound meeting to educate women on outbreaks	-State health educator	October/ December 2018	+++	+	1	Risk communication & social mobilisation
46. Identify a referral Laboratory and sign an MOU with capacity for processing CSM samples	-PHEOC/ State Ministry of Health	10th November 2018	+++	+++	1	Laboratory
47. Conduct a one-day stakeholder Buy in meeting for the EPR Plan	-Director Public Health and State Epidemiologist at the state -NC/CEO NCDC	30th September 2018	+++	++	1	Coordination

Activities	Focal Person	Deadline	Impact	Difficulty	Priority	Pillar
48. Print and Distribute CSM guidelines to LGAs and Health facilities	-NC/CEO NCDC	5th October 2018	++	+	1	Coordination
49. Organize three-day training on ICG Request, CSF Collection and use of surveillance tools for reporting	-Director Public Health at the State level -State Epidemiologist	5th October 2018	+++	++	1	Coordination
50. Conduct one day sensitization meeting for Religious and traditional leaders on CSM vaccination acceptance	-State Educator	September 2018	+++	+	1	Vaccines & logistics

Annex 3: Pictures

Figure 5: The CEO, Dr. Chikwe Ihekweazu giving the opening remarks on 13th August, 2018

Figure 6: The representative of the Executive Director, NPHCDA giving his goodwill message at the AARM on 13th August, 2018

Figure 7: Group work by participants during the meeting

Figure 8: Plenary session during the meeting