

Briefing Note – 11 April 2017

Nigeria

Meningitis



Need for international assistance	Not required	Low	Moderate	Significant	Major
Expected impact	Very low	Low	Moderate	Significant	Major

Crisis overview

3,959 cases of meningitis, 181 laboratory confirmed, resulting in 438 deaths have been reported as of 5 April. While 19 states have reported outbreaks, 97% of reported cases are in six states: Katsina, Kebbi, Niger, Sokoto, Yobe, and Zamfara. Meningitis serotype C, or NmC, is responsible for 83% of laboratory confirmed cases and is severely under-vaccinated in the affected areas. Additionally, vaccines for NmC is very costly at USD 50 per dose. Both this cost and local health capacity has limited response thus far.

Anticipated scope and scale

Per historical trends, caseloads can be expected to continue rising until the beginning of the rainy season, which is expected to commence in June. While response to the outbreak has intensified, the lethal nature of meningitis (CFR ranges between 5% to 10% if treated) coupled with poor local health capacity and vaccination coverage will increase caseload and fatalities.

Priorities for humanitarian intervention

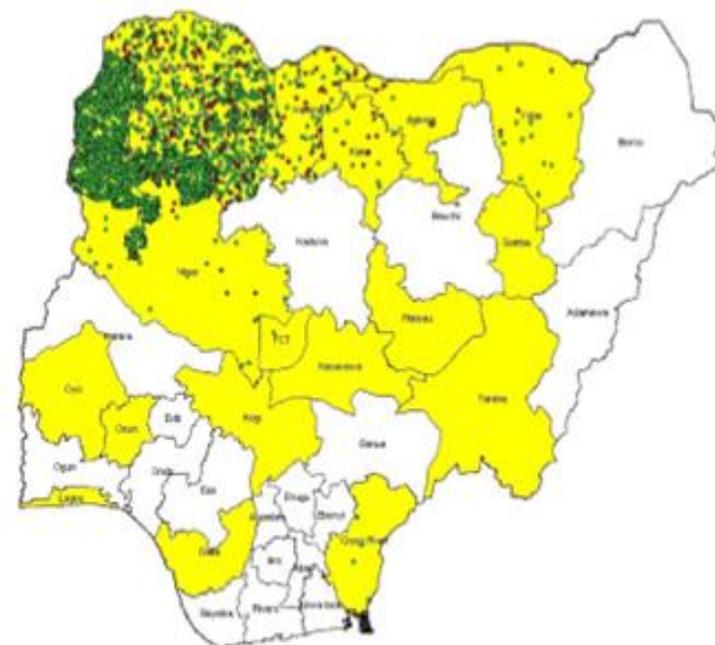
- **Vaccinations:** Critical vaccine shortage reported in affected areas.
- **Information campaigns:** Health education is critical in mitigating its effects and preventing its spread.

Humanitarian constraints

There are serious security concerns in Yobe state, which is affected by the Boko Haram insurgency. To a lesser extent there are security concerns in the northwest, where the generally non-violent Islamic Movement of Nigeria are based. Negative

community attitudes towards vaccinations and vaccination shortages are hampering response efforts.

Meningitis cases and affected states as of 5 April 2017



- Affected: States=19; LGAs=106
- Suspected Cases = 3,959
- Lab-confirmed Cases = 181

Source: National Centre for Disease Control

Limitations

It is probable that there were many unidentified cases in the early stages of the outbreak as well as in states that are receiving less attention. No figure for total affected or by sectors.

Crisis impact

As of 5 April, 3,959 suspected cases of Meningitis have been reported and 438 deaths - an overall case fatality rate (CFR) of 11.1%. This caseload includes 1,172 suspected cases between 1-5 April, 313 in the week ending 1 April, and 755 in the week ending 25 March. The first cases were reported in the week ending December 18, 2016. However, the apparent increase in case numbers is due to an increased response and case-finding in affected areas. 19 states have reported outbreaks, although 97% of reported cases are in Katsina, Kebbi, Niger, Sokoto, Yobe, and Zamfara states ([NCDC 09/04/2017](#)).

The meningitis outbreak crossed the epidemic threshold in Kebbe local government agency (LGA) in Sokoto state in the week ending 5 March ([WHO 05/03/2017](#)). A meningitis epidemic is defined as case rate of 10 reported cases per 100,000 population ([WHO 2015](#)).

The most common strain of the virus in this outbreak is the meningitis serotype C (NmC), for which there is a severe vaccine deficit. NmC accounts for 83% of laboratory confirmed cases as of 5 April ([NCDC 09/04/2017](#)). 500,000 NmC vaccines were available. Over 800,000 NmC vaccine cases had to be imported from the United Kingdom to assist in the response ([BBC 03/04/2017](#)). An estimated 3 million vaccines are needed in Zamfara state alone ([Al Jazeera 01/04/2017](#)). The outbreak is placing considerable strain on northern Nigeria's already limited health system.

Meningitis cases, deaths by state

State	Suspected Cases	Lab confirmed	Deaths	CFR
Katsina	228	34	48	21.1%
Kebbi	72	12	11	15.2%
Niger	94	5	33	35.1%
Sokoto	1,046	47	61	5.8%
Yobe	77	3	11	14.3%
Zamfara	2,337	71	262	11.2%
Others (13 total)	105	9	12	11.4%
Total	3,959	181	438	11.1%

Source: National Centre for Disease Control

Access and response constraints

Community attitudes: There is a high degree of scepticism towards vaccinations in northern Nigeria. For example, in 2003, five states, including Katsina and Niger, boycotted polio vaccines ([Ghinai et al, 08/12/2012](#)). Misperceptions of the importance of routine immunisation, fear, misinformation, and religion are factors influencing attitudes regarding immunisation ([Ophori et al. 06/2014](#)).

Islamic Movement of Nigeria: The Islamic Movement of Nigeria (IMN), based in northern Nigeria, has staged large-scale anti-government protests in the past and has been on the receiving end of harsh government crackdowns. IMN influence has reportedly spread from its base in Kaduna state to Plateau, Niger, Katsina, Kano, Sokoto, and Yobe states ([Vanguard 17/11/2016](#)). They have been known to refuse vaccinations in the past, and are popularly supported in the region ([The Guardian 18/05/2016](#)).

Boko Haram: Yobe state, which has recorded 77 cases and 11 deaths to meningitis, is subject to frequent Boko Haram attacks and has areas of limited humanitarian access in the north. Counterinsurgency response was taking place as recently as March ([UNICEF 28/02/2017](#)).

Vulnerable groups affected

Children aged between 5 and 14 account for 52% of the cases, or 2,059 in total ([NCDC 09/04/2017](#)). This age range had the highest CFR and caseload in the outbreak in 2015 ([Chow et al. 07/07/2016](#)).

Aggravating factors

Dry Season: Meningitis occurs during the dry season from December to June. It often occurs in epidemic waves of two to three years, where caseloads drop during the wet season. Epidemic cycles occur every eight to 12 years ([Meningitis Vaccine Project 04/2017](#)).

Age: The incidence of meningitis is highest in young children and the elderly ([Adriani, Brouwer & van de Beek 02/2015](#)).

Meningitis serotype C strain (NmC): The proportion of the meningitis serotype C strain in the total number of meningitis cases has grown considerably as mass vaccination efforts have led to the near disappearance of meningitis A epidemics ([WHO 11/2015](#)). Meningitis serotype C is particularly deadly due to the low vaccination coverage for the disease.

The vaccine is particularly costly at an estimated USD 50 per vaccine dose (BBC 03/04/2017). This is considerably more than the USD 0.5 cost for the meningitis serotype A vaccine that has been widely disseminated (Reuters 22/11/2010). The cost of vaccines has already limited response capacity at a local level (BBC 03/04/2017).

Health system: Northern Nigeria has poor health coverage relative to the rest of the country. For instance, in 2010, the northwest had 59.8% DPT vaccine coverage, compared to the 67.7% national average (Ministry of Health, 05/2011). The lack of health coverage is particularly severe in the case of meningitis: if left untreated, it has a fatality rate of 50% (WHO 11/2015).

Northern Nigeria has some of the lowest immunisation rates in the world and thousands of children die annually due to vaccine-preventable diseases. The percentage of fully immunised infants, according to the 2003 National Immunization Schedule, was 1.6% in Zamfara state, 1.5% in Yobe, and 8.3% in Katsina (Ophori et al. 06/2014).

Food security: weakens the immune system, increasing the risk of meningitis (CDC 2017; Cook and Jeng 2009). In Katsina there are an estimated 405,000 people experiencing Crisis (IPC Phase 3) food security outcomes from March to May: 152,000 in Kebbi, 95,500 in Niger, 173,000 in Sokoto, and 147,000 in Zamfara. In Yobe state 538,000 are in Crisis (IPC Phase 3) and 88,000 in Emergency (IPC Phase 4) (Food Security Cluster 17/03/2017).

Population density: Meningitis spreads more easily to those living close together. Katsina state has a population density of 312 people per square kilometre, Kebbi has 126/km², Niger has 75/km², Sokoto has 201/km², Yobe has 72/km², and Zamfara has 116/km². These compare with the estimated general Nigerian population density of 211 people per square kilometre (Worldometers 11/04/2017).

WASH access: Improved water source access and hygiene practices are low in the affected states (UNICEF 02/2015).

Contextual information

Symptoms

The most common symptoms of meningitis are: stiff neck, fever, vomiting, headaches, photosensitivity, nausea, and confusion. Learning disabilities, hearing loss, or brain damage occurs in 10 to 20% of survivors. Even if there is an early diagnosis and adequate treatment, 5 to 10% of patients die within one to two days after symptoms (WHO 11/2015). The average incubation period is 4 days, but can range between two and 10 (WHO 2015).

Transmission

Meningitis can be transmitted from person-to-person through respiratory or throat secretions from a carrier. Sneezing, coughing, kissing, or living in close quarters facilitates the spread. It is believed that 10 to 20% of people carry *Neisseria meningitidis*, a bacterium that causes meningitis, at any given time. It can be higher in epidemic situations (WHO 11/2015). Meningitis can also be transmitted by food (WHO 12/2015).

Treatment

Meningitis should be viewed as a medical emergency. A patient should be admitted to a health centre as quickly as possible (WHO 11/2015). A range of antibiotics, including ampicillin, ceftriaxone, chloramphenicol, and penicillin can be used in treatment. Ceftriaxone is the most ideal drug for areas with limited health infrastructure and resources (Dickinson et al. 08/03/2015).

Health education, information dissemination, chemoprophylaxis, and vaccine use are effective measures to prevent outbreaks at a population level. (Dickinson et al. 08/03/2015).

Response capacity

Local and national response

The Nigerian Centre for Disease Control is taking the overall lead for coordinating the response, with support from the World Health Organization (WHO). Rapid response teams are training local staff on case management (WHO 24/03/2017).

A mass vaccination exercise took place in Zamfara state on 6 April that targeted 300,000 people (NCDC 07/04/2017). 500,000 meningitis serotype C vaccines were available. (BBC 03/04/2017).

Notably, the governor of the worst affected state, Zamfara, has claimed that meningitis is a "punishment from God" (Premium Times 04/04/2017).

The humanitarian crisis in the northeast that includes response to Famine (IPC Phase 5) food security conditions is consuming the bulk of Nigeria's resources (Food Security Cluster 17/03/2017). The efforts of international agencies are also focussed on the northeast.

International Response

WHO, eHealth Africa, Rotary International, Médecins Sans Frontières, and the Vaccine Alliance are providing support to control the outbreak (WHO 24/03/2017).

Information gaps and needs

More cases have been found as more resources have been devoted to case-finding. This suggests that there were many unidentified cases in the early stages of the outbreak.

It is probable that states that are receiving less attention have unreported cases.

There is no figure for the total amount of people affected by the outbreak. No evidence has yet been provided on how this may affect livelihoods and other sectors for those affected.

Impact on the local health system has not been directly measured.

Lessons learned

- This is the largest outbreak in Nigeria since 2009, where there were over 56,000 cases (Lingani et al, 11/2015). These were of the meningitis 'A' (NmA) strain, which then triggered a mass vaccination campaign. In 2010, there were over 11 million NmA vaccines delivered to meningitis affected countries. NmA outbreaks have reduced drastically since 2010 (WHO 2016).
- One study suggested that there were 6,329 probable cases of meningitis in 2015 in Kebbi and Sokoto states, of which 4,771 cases were meningitis serotype C. The study added that malaria co-infection was recorded in 21% of cases. The study believed that the response using ACWY vaccine would limit future outbreaks and the vaccines would last for two years (Chow et al. 07/07/2016).
- The recommended policy of treating suspected cases in resource-limited settings is a five-day course of ceftriaxone. Treatment in hospitals should be limited to more severe cases (Dickinson et al. 08/03/2015).
- Plain, polysaccharide vaccines for meningitis serotype C are considered safe and have been used successfully for over 30 years (Dickinson et al. 08/03/2015).
- A rapid diagnostic test has been developed by Institut Pasteur in Paris, which was made for trial in Abidjan in 2016. It requires less cerebrospinal fluid than other testing (WHO 2015).

Key characteristics

Key indicators	Katsina	Kebbi	Niger	Sokoto	Yobe	Zamfara
Total population	7,558,000	4,630,000	5,715,000	5,219,000	3,275,000	4,627,000
Population Density	312/km ²	126/km ²	75/km ²	201/km ²	72/km ²	116/km ²
State capital	Katsina	Birin Kebbi	Minna	Sokoto	Damaturu	Gusau
Percentage using improved water sources (2007)	42.8%	19.9%	61.1%	29.3%	30.9%	53.1%
Health facilities (2014)	1,497	412	1,585	713	495	719
Approx. people per health facility	5,049	11,238	3,066	7,320	6,617	6,435
Food insecurity (IPC Phase 3 or more)	405,000	152,000	95,500	173,000	626,000	147,000
Literacy rates (adult, 2008)	29.6%	55.8%	46.4%	48.6%	39.6%	70.7%
Percentage of households using kerosene for lighting source	68.5%	72.8%	66.1%	74.6%	57.8%	88.5%
Percentage of households using mains electricity for lighting source	15.4%	20.4%	23.7%	16.9%	14.9%	7.5%

Sources: Food Security Cluster, Nigeria Data Portal, Makinde et al., 2014

Map of affected area

Meningitis cases and affected states as of 5 April 2017

