MenAfriNet Holds 2nd Annual Partners Meeting

The second annual MenAfriNet Partners Meeting, held in Niamey, Niger, on October 20–22, 2016, brought together 68 representatives from Burkina Faso, Ethiopia, The Gambia, Mali, Niger, Chad, Togo, the World Health Organization (WHO), the Agence de Médecine Préventive (AMP), the United States Centers for Disease Control and Prevention (CDC), CDC Foundation, the Centre de Recherche Médicale et Sanitaire (CERMES), the National Institute for Communicable Diseases (NICD), the Norwegian Institute for Public Health, the United States Agency for International Development (USAID), the Serum Institute of India, and the University of Nebraska. Participants collaborated to review and update MenAfriNet’s vision, goals, strategy, and operational structure, discuss country challenges, evaluate implementation, consider potential expansion of sites, and review epidemic response efforts in 2015.

During the first day, phase 1 countries—Burkina Faso, Mali, Niger, and Togo—presented overviews of surveillance implementation and annual data. These countries continue to see meningitis cases, primarily caused by *Streptococcus pneumoniae*, *Neisseria meningitidis* serogroup C (NmC), NmX, and NmW. The WHO Intercountry Support Team – West Africa (WHO-IST/WA) also shared a summary of the epidemic situation in the African meningitis belt, including data from 21 countries during weeks 1–29 of 2015.

The second day of the meeting focused on the largest epidemic of NmC on record, occurring in Niger in 2015. A primary meeting objective was to discuss lessons learned from this epidemic and the role of MenAfriNet in future epidemic responses. CDC’s Bacterial Meningitis Laboratory presented the molecular analysis performed on strains from the epidemic and WHO Geneva shared proceedings from the Meeting of Experts convened in October. The consortium agreed that detecting outbreaks at the sub-district level, administering preventative vaccination before reaching the epidemic threshold, improving timeliness of laboratory case confirmation, and having high levels of coordination are critical for a timely and effective epidemic response.

On the final day, Ethiopia and Chad presented results from initial site visits and assessments, while country teams presented on the current meningitis surveillance structure. Each of the MenAfriNet work groups presented on activities and challenges and leaders shared operational goals for the coming year such as establishing a standardized platform for case-based surveillance and improving laboratory case confirmation with real-time polymerase chain reaction (rt-PCR); quality assurance and control; and specimen and data management.

Recommendations from this meeting will guide the future of MenAfriNet surveillance and laboratory activities, as the network focuses on preparedness in the countries at highest risk for NmC epidemics during the 2016 meningitis season.
Agence de Médecine Préventive (AMP), one of three implementing partners of MenAfriNet, coordinates surveillance in Togo, one of the four phase 1 MenAfriNet sites. In June 2014, Togo introduced 13-valent pneumococcal conjugate vaccine (PCV13) into its infant immunization program then conducted a meningococcal A conjugate vaccine (PsA–TT/MACV; MenAfriVac™ Serum Institute of India, Ltd) campaign in November 2014. The PneumoTône project is a multi-year surveillance study aiming to document the impact of PCV13 and PsA–TT on meningitis and pneumonia outcomes among people of all ages in the Tône and Cinkassé districts of northern Togo. During the 2010–2013 surveillance period, baseline incidence and disease burden were assessed in the study districts. AMP will continue surveillance to monitor changes to incidence and burden from 2014 to 2017 following vaccine introduction.

AMP works in partnership with Togo’s Ministry of Health through its national, regional, and district health departments. Surveillance is implemented at both public and private hospitals and is supported by the regional hospital and national reference laboratories. Togo’s University of Lomé professors conduct annual supervisory visits to field sites to help build clinical, laboratory, and radiology capacity at the local level. AMP also collaborates with several European reference laboratories for quality control and genotyping. In spite of challenges, such as an unstable electricity supply and a remote site location, this partnership established high-quality, population-based epidemiological surveillance for suspected bacterial meningitis with systematic etiological testing by conventional techniques and molecular biology. AMP also provides clinicians with accurate laboratory results to guide antibiotic delivery and does PCR testing in addition to conventional laboratory analyses for geographically isolated districts.

**AMP in Action**

AMP contributed critical laboratory and data management resources for the MenAfriNet response to the NmC outbreak in Niger. AMP was able to rapidly activate their mobile laboratories (LaboMobil®) to reduce stress on the local laboratory staff and supplies. Additionally, an AMP data manager deployed to provide and organize quality data during the outbreak.

**Contact:** Jennifer Moisi
MenAfriNet Responds to Serogroup C Outbreak in Niger

As a result of enhanced case-based surveillance, Niger detected increasing numbers of confirmed NmC cases in March 2015 in the MenAfriNet-supported health district of Dogon-Doutchi. Sub-district attack rates exceeded the WHO epidemic threshold. Niger alerted partners at the MenAfriNet Surveillance and Data Management Workshop in Ouagadougou, Burkina Faso (March 2015). The Niger Ministry of Health declared an outbreak of NmC on April 1, 2015, and formally requested MenAfriNet assistance on April 3. This was the first outbreak in a MenAfriNet phase 1 site that has implemented case-based surveillance. MenAfriNet teams from WHO, CDC, AMP, and the Burkina Faso Ministry of Health, which included 15 people from 5 countries, deployed to assist with the country’s response.

MenAfriNet provided funding for 13 short-term national staff to aid in surge capacity for epidemiologic and laboratory support. Resources, including the LaboMobil®, were also provided to assist in conducting outbreak investigations, analyze surveillance data to inform vaccination planning, and enhance laboratory capacity for confirmatory testing and production of rapid diagnostic tests.

The outbreak continued to accelerate throughout the month of April, peaking in May with 2,182 suspected meningitis cases in just one week. The outbreak resulted in 8,500 cases and 573 deaths as of June 30, 2015. Out of the 44 districts in Niger, 13 were affected by the outbreak with the capital district of Niamey suffering the most, with 5,267 cases. MenAfriNet assistance was extensive with approximately 400 days of person-time in-country during the declared outbreak, with continuous MenAfriNet presence from April 9, 2015 to July 3, 2015.

This NmC epidemic in Niger emphasized the critical need for MenAfriNet to continue strengthening case-based surveillance across the meningitis belt to monitor non-NmA meningitis. In fact, at an October 2015 WHO-sponsored meeting of experts in Geneva, it was determined that using case-based surveillance guidelines, developed and implemented with MenAfriNet support, and continuing to build laboratory capacity for rapid case confirmation should be implemented to improve epidemic preparedness. Additionally, experts recommended research to study carriage, the impact of ACWY meningococcal conjugate vaccine, to look at NmC modelling and replacement, and examine environmental factors predictive of disease – studies that are currently being led or are under development by MenAfriNet and its partners.

Contact: Sarah Meyer, CDC Lead for the MenAfriNet Surveillance and Outbreak Work Group and MenAfriNet focal-point for Niger
In Niger, Centre de Recherche Médicale et Sanitaire (CERMES) houses the National Reference Laboratory for MenAfriNet, as designated by the Ministry of Health. Laboratory scientists at CERMES were previously trained by CDC’s Bacterial Meningitis Laboratory and demonstrated proficiency for using real-time PCR (rt-PCR) to detect bacterial meningitis pathogens. As a MenAfriNet partner, CERMES requested to implement direct, rt-PCR technology into routine testing. This technology allows for rt-PCR testing of clinical specimens without performing nucleic acid extraction, saving substantial costs and person time. CDC staff visited CERMES in December 2014 to train the laboratory scientists on the direct rt-PCR procedure. During the 2015 NmC epidemic, direct rt-PCR was a critical tool that allowed staff to test more than 5,000 specimens in less than 3 months, which is 20 times more than the average number of specimens tested each year from 2012 to 2014. Since direct rt-PCR provides rapid results, investigators discovered that the early cases of meningitis in this outbreak were caused by NmW. However, later cases, representing about three out of every four confirmed cases, were actually caused by NmC. The rapid and reliable results and the well-trained, dedicated staff of CERMES were critical in informing a mass vaccination campaign.

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