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SUPPLEMENT ARTICLE

Country Data for Action: The MenAfriNet Experience in Strengthening Meningitis Surveillance in Africa

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Epidemic meningitis has posed a recurrent threat for more than a century for the approximately 430 million people living in the 26 countries in the sub-Saharan region of Africa known as the "meningitis belt." This population experiences high rates of endemic meningitis, annual seasonal outbreaks, and explosive epidemics occurring every 5–12 years. Hope to eliminate this devastating public health threat came in the form of a novel meningococcal serogroup A conjugate vaccine (MACV [MenAfriVac]) developed by the Meningitis Vaccine Project (MVP; available at: http://www.meningvax.org) specifically for use in the meningitis belt and priced at less than $1.00 per dose [1]. Licensed in 2009, MACV was subsequently prequalified by the World Health Organization (WHO) on the basis of its safety and immunogenicity data but without phase 3 efficacy studies. Starting in 2010, MACV was rolled out across the meningitis belt via mass campaigns to vaccinate all persons 1–29 years of age. By the end of 2018, >300 million people in 22 African countries had been immunized with MACV [2]. The vaccine has been a remarkable public health success, effectively eliminating serogroup A meningitis epidemics in sub-Saharan Africa [3].

Recognizing the need for rigorous postrollout surveillance and research to demonstrate the direct and indirect effectiveness of MACV beyond the conclusion of the MVP [4–6], the Bill and Melinda Gates Foundation awarded a grant in October 2013 to establish the MenAfriNet Consortium (available at: http://www.menafrinet.org). MenAfriNet is an international consortium led and implemented by the African Ministries of Health, the Agence de Médecine Préventive, the Centers for Disease Control and Prevention (CDC), and the WHO, with support and collaboration from other international and nongovernmental organizations. By implementing a surveillance and research platform in 5 African meningitis belt countries (Burkina Faso, Chad, Mali, Niger, and Togo), MenAfriNet aimed to strengthen case-based meningitis surveillance, assess changes in meningitis epidemiology and MACV impact, and inform vaccine policy and development. This supplement aims to summarize the work conducted in the first 5 years of MenAfriNet, including regional and country perspectives on the MenAfriNet strategy of reinforcing case-based surveillance, updates on bacterial meningitis epidemiology and MACV impact, examples of research that leveraged the MenAfriNet platform, and future directions toward defeating epidemic meningitis in the African meningitis belt.

MenAfriNet took an innovative approach to vaccine evaluation by strengthening existing country-level meningitis surveillance systems and laboratory capacity to gather high quality case-level data and leveraged this surveillance platform to answer critical research questions about vaccine effectiveness [7–10]. The MenAfriNet approach has focused on country ownership of activities, planning, and budgeting and has made significant progress toward stronger, sustainable public health surveillance systems in Burkina Faso, Chad, Mali, Niger, and Togo [7, 11–14]. Secondarily, MenAfriNet has had a positive impact on other countries in the region, including Benin, Ghana, Guinea, and Nigeria, through the distribution of MenAfriNet-developed surveillance and laboratory tools and protocols, as well as regional trainings and technical assistance provided by consortium members [10].

A number of articles in this supplement present evidence of MACV's substantial and ongoing impact on meningococcal serogroup A disease and progress toward elimination of serogroup A epidemics in the meningitis belt [14–16]. To date, MenAfriNet data have directly informed numerous public health actions, including policies for the use of MACV to protect new birth cohorts through introduction into routine immunization programs and catch-up campaigns, the detection and response to epidemics due to new emerging strains of

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non-A meningococcal serogroups, and the development and use of new vaccines [17–22].

Now at the conclusion of 5 years of experience with the MenAfriNet platform, this supplement was organized as a forum to share the achievements and lessons learned implementing the MenAfriNet strategy to strengthen national systems of surveillance in Africa. Contents include an overview of project implementation and impact in the 5 MenAfriNet countries, reports on epidemiologic issues from each of the project countries, specific research projects that provide insights into the evolving epidemiology of non-A serogroup meningitis and pneumococcal disease in these countries, and a look toward the future goal of eliminating meningitis in the region. These achievements and lessons, combined with a current examination of regional meningitis epidemiology and ongoing monitoring of the impact of existing vaccine programs, will inform the development of new vaccines and strategies to help realize the dream of an Africa free of epidemic meningitis [18, 23].

Notes

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Consortium Members

Members of the MenAfriNet Advisory Board and Steering Committee are as follows: David Stephens, Brian Greenwood, Marie-Pierre Preziosi, Dominique Caugant, Samba Sow, F. Marc Laforce, Tumani Corrah, Richard Mihigo, Jason Mwenda, Jennifer Moisi, Haoua Tall, Brad Gessner, Rana Hajjeh, Ryan Novak, Peter Dull, and Catherine Zilber.

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