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Report of the Secretariat

FRAMEWORK FOR THE IMPLEMENTATION OF THE GLOBAL STRATEGY TO DEFEAT MENINGITIS BY 2030 IN THE WHO AFRICAN REGION

EXECUTIVE SUMMARY

1. Meningitis is an inflammation of the membranes that surround the brain and the spinal cord. The disease is transmitted from human to human via large respiratory droplets from the nose and throat of infected persons. Meningitis attack rates are highest among children aged below 15 years. The case fatality rates are usually between 8% and 15% among treated patients, and over 70% among untreated cases. Meningitis can be caused by many different pathogens, but the highest global burden is seen with bacterial meningitis. It could be associated with severe sequelae which include mental retardation, hearing loss and paralysis of the limbs.

2. Before 2010, *Neisseria meningitidis* A (*NmA*) was the leading cause of meningitis epidemics, accounting for almost 90% of outbreaks. With the introduction of the *NmA* conjugate vaccine, MenAfriVac® between 2010 and 2020, more than 325 million people aged between 1 and 29 years have been vaccinated in 24 of the 26 Member States in the African meningitis belt. This has resulted in a significant reduction in the incidence of *NmA* cases and a change in the bacterial profile of meningitis, with a predominance of *Streptococcus pneumoniae* (*S. pneumo*); *Neisseria meningitidis* serogroup X (*NmX*)*; Neisseria meningitidis* serogroup C (*NmC*)*; Neisseria meningitidis* serogroup W (*NmW*) *and Hemophilus influenzae* type b (*Hib*).

3. Despite the significant progress made in combating meningitis over the past 20 years, it remains a major public health challenge globally. Occurrence of meningitis is greatest in the African meningitis belt, an area that extends from Senegal to Ethiopia, with an estimated total population of 500 million in 26 Member States. Since 2010, Member States in the meningitis belt have recorded a yearly average of 24 000 suspected cases including 1800 deaths. The case fatality rate (CRF) ranges from 5% to 14%, with 90% of cases recorded during the epidemic season (January to June).

4. In an effort to control meningitis worldwide, WHO with the contribution of partners has led an inclusive and participative process to develop a Global strategy to defeat meningitis by 2030. The goals of the Global strategy are to: (i) eliminate bacterial meningitis epidemics; (ii) reduce cases and deaths from vaccine-preventable bacterial meningitis; (iii) reduce disability and improve quality of life after meningitis due to any cause. This regional framework was developed to serve as a guiding document for the implementation of the Global strategy in the African Region. The vision of the regional framework is to strive towards an African Region free of meningitis by 2030 and its goals are aligned with those of the Global strategy.

5. The Regional Committee is invited to examine and adopt the actions proposed.

CONTENTS

ABBREVIATIONS

AMR	antimicrobial resistance
BMGF	Bill and Melinda Gates Foundation
CFR	case fatality rate
IDSR	Integrated Disease Surveillance and Response
GBS	group B streptococcus
GPW 13	Thirteenth General Programme of Work, 2019-2023
Hib	*Hemophilus influenzae* type b
MenAfriVac®	*Neisseria meningitidis A* conjugate vaccine
MVP	Meningitis Vaccine Project
Nm	*Neisseria meningitidis*
NmA	*Neisseria meningitidis* serogroup A
NmC	*Neisseria meningitidis* serogroup C
NmW	*Neisseria meningitidis* serogroup W
NmX	*Neisseria meningitidis* serogroup X
PHC	primary health care
SOPs	standard operating procedures
S. pneumo	*Streptococcus pneumoniae*
WHO	World Health Organization

INTRODUCTION

1. Meningitis is an inflammation of the membranes that surround the brain and the spinal cord. The disease is transmitted from human to human via large respiratory droplets from the nose and throat of infected people. The incubation period ranges between two and 10 days. Meningitis attack rates are highest among children aged below 15 years. The CFR ranges from 8% to 15% among treated patients, to over 70% among untreated cases.

2. Meningitis can be caused by many different pathogens which include bacteria, viruses, and fungi, but the highest global burden stems from bacterial meningitis. The predominant pathogens are *Neisseria meningitidis* (*Nm*), *S. Pneumo*, *Hib* and *group B streptococcus* (GBS).[1] Meningococcal meningitis disease is characterized by high fatality and high frequency. More than 10% of patients develop severe sequelae,[2] including mental retardation, hearing loss and paralysis of the limbs.

3. Despite the significant progress made in combating meningitis over the past 20 years, it remains a major public health challenge globally.[2] An estimated 8.5 million new cases of meningitis and 463 000 deaths were reported globally in 2019,[3] with 22 414 new cases and 1261 deaths in the African meningitis belt.[4] Occurrence of meningitis is greatest in the African meningitis belt.[5]

4. An initiative led by WHO resulted in a call in 2017 for a global vision to defeat meningitis by 2030. The global road map on defeating meningitis by 2030 was endorsed by the Seventy-third World Health Assembly. The African regional framework for defeating meningitis by 2030 whose vision is to strive "towards an African Region free of meningitis by 2030", is aligned with the WHO Thirteenth General Programme of Work, 2019–2023 (GPW 13) and the global road map, whose visionary goals are to: (i) eliminate bacterial meningitis epidemics; (ii) reduce cases and deaths from vaccine-preventable bacterial meningitis; and (iii) reduce disability and improve quality of life after meningitis due to any cause.

5. This regional framework will contribute to the achievement of the WHO GPW 13 outcomes and the United Nations Sustainable Development Goal 3.

CURRENT SITUATION

6. Bacterial meningitis remains a major global public health challenge with over 1.2 million cases occurring each year. The incidence and case fatality rates for bacterial meningitis vary by region, country, pathogen, and age group.[6] African meningitis belt Member States have recorded a yearly average of 24 000 suspected cases including 1800 deaths, with a CFR ranging from 5% to 14% since 2010.[7] In 2020, Member States in the African meningitis belt reported[8] 19 552 new

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1 Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2017 (GBD 2017) Results. Seattle, Unites States Institute for Health Metrics and Evaluation 2018 [Available from: http://ghdx.healthdata.org/gbd-results-tool.

2 WHO. Meningococcal meningitis (https://www.who.int/news-room/fact-sheets/detail/meningococcal-meningitis, accessed on 9 January 2020)

3 Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019 (GBD 2019). (http://www.healthdata.org/gbd/2019)

4 World Health Organization, 6 April 2018. Epidemic meningitis control in countries of the African meningitis belt, 2017. Weekly epidemiological record, 93rd YEAR 14, 2018, 93, 173–184.

5 The African meningitis belt countries are: Benin, Burkina Faso, Burundi, Cameroon, Chad, Central African Republic, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, South Sudan, Sudan, United Republic of Tanzania, Togo and Uganda.

6 Centers for Disease Control and Prevention (2020). Meningitis. (https://www.cdc.gov/meningitis/lab-manual/chpt01-intro.html)

7 WHO/IVD. Meningitis risk assessment. December 2020

cases and 885 deaths and the predominant pathogens were *S. pneumo* (50%), *Hib* (15%), *NmX* (14%), *NmC* (4%) and *NmW* (2.8%) and no case of *NmA* was recorded.

7. Surveillance, laboratory confirmation, case management and vaccination are key pillars in meningitis control and are being improved in the affected Member States of the African meningitis belt. For example, the meningococcal conjugate vaccine, also referred to as MenAfriVac®, has been introduced in the African meningitis belt since 2010, through mass vaccination campaigns and later in routine immunization programmes.[9]

8. By December 2020, MenAfriVac® had been rolled out in 24[10] of the 26 Member States in the African meningitis belt. Over 325 million persons at highest risk aged between one and 29 years have been vaccinated since December 2010. Additionally, MenAfriVac® was introduced into routine immunization programmes in 11 Member States in the African meningitis belt[11] from July 2016.

9. Before 2010, *NmA* accounted for almost 90% of meningitis epidemics.[12] The introduction of MenAfriVac® resulted in a significant reduction in the incidence of *NmA* cases and a change in the bacterial profile of meningitis, with a predominance of meningococcal serogroups C, W, X and *S. pneumo*.[13]

10. MenAfriVac® reduced the incidence of confirmed group A disease by more than 99%.[14] However, major epidemics due to *NmC* have been recorded since 2013 in Burkina Faso, Chad, Mali, Niger, and Nigeria. Studies show that the predominance of *NmC* is not a replacement of *NmA,*[15,16] hence the expectation that the introduction of a pentavalent conjugate vaccine ACWXY would further reduce meningitis cases and deaths due to *Nm*.

11. Despite the reduction in the incidence of meningitis cases and epidemics, Member States in the African meningitis belt have recorded a yearly average of 24 000 suspected cases and 1800 deaths.[17] It was noted that 90% of cases and all epidemics occurred during the epidemic season (January to June) with a peak in March and April each year.[18]

12. Significant efforts have been made to strengthen meningitis surveillance. From 2002 to the end of 2020, twenty-four of the 26 Member States in the African meningitis belt joined the Enhanced Surveillance Network, while from 2010 to the end of 2020, fourteen Member States in

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8 World Health Organization Regional Office for Africa (December 2020). Meningitis weekly bulletin. Retrieved from https://www.who.int/emergencies/diseases/meningitis/epidemiological/en/

9 WHO. Weekly epidemiological record, 20 February 2015, no. 8, 2015, 90, 57–68. Available in http://www.who.int/wer

10 Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Mali, Mauritania, Niger, Nigeria, Senegal, South Sudan, Sudan, Togo and Uganda

11 Burkina Faso, Central African Republic, Chad, Côte d'Ivoire, Eritrea, Gambia, Ghana, Mali, Niger, Nigeria and Sudan

12 Meningococcal conjugate serogroup A vaccine so-called MenAfriVac® has been introduced since 2010 in the African meningitis belts countries (WHO. Meningococcal meningitis. (https://www.who.int/immunization/diseases/meningitis/en/)

13 WHO/AFRO. Meningitis epidemic risk assessment in the African meningitis belt countries in 2020. 2019

14 CL Trotter, C Lingani, K Fernandez, LV Cooper, A Bita, C Tevi-Benissan, .JM Stuart. The impact of MenAfriVac® in nine countries of the African meningitis belt, 2010-2015: an analysis of surveillance data. Lancet Infectious disease, volume 17, issue 8, p867-872, August 01, 2017 DOI: (https://doi.org/10.1016/S1473-3099(17)30301-8)

15 Preparedness for outbreaks of meningococcal meningitis due to *Neisseria meningitidis* serogroup C in Africa: recommendations from a WHO expert consultation. Geneva, World Health Organization, 2015 (https://www.who.int/wer/2015/wer9047.pdf).

16 Continuing risk of meningitis due to *Neisseria meningitidis* serogroup C in Africa: revised recommendations from a WHO expert consultation, October 2017. Geneva, World Health Organization, 2017 (https://apps.who.int/iris/bitstream/handle/10665/259233/WER9241.pdf).

17 WHO/IVD. Meningitis risk assessment. December 2019

18 Lingani et al. Meningococcal Meningitis Surveillance in the African Meningitis Belt, 2004-2013.Clin Infect Dis 2015;61(Suppl 5): S410-15.

the belt implemented meningitis case-based surveillance.[19] Standard operating procedures (SOPs) for surveillance of meningitis, preparedness and response to meningitis outbreaks were developed in 2018, disseminated and are currently being implemented.

13. WHO provided technical support for laboratory activities to Member States in the African meningitis belt. However, there is need to address challenges related to sample transportation from subnational levels to national reference laboratories. Moreover, molecular characterization needs to be improved by strengthening linkages with global and regional laboratory networks. In addition, national external quality assessment programmes need to be enhanced for monitoring the performance of bacteriology laboratories.

ISSUES AND CHALLENGES

14. **Lack of risk assessment models:** There is no meningitis risk assessment simulation tool to effectively help predict the occurrence, scale and pathogens that could cause future outbreaks.

15. **Inadequate sample transportation systems:** In most Member States in the African meningitis belt, the capacity to test for meningitis at subnational level is quasi inexistent. Therefore, there is a need to transport samples from subnational to regional or national levels. This affects the quality of the samples to be tested.

16. **Insufficient funding:** Most of the Member States in the African meningitis belt are unable to mobilize adequate local resources to implement meningitis action plans. Very few Member States[20] in the African meningitis belt comply with resolution AFR/RC58/R2 adopted in 2008 that urged Member States to strengthen public health laboratories at all levels of the health care system.

17. **Limited access to affected communities:** Security challenges and civil strife in the Sahel in West Africa and in East and in Central Africa hamper meningitis surveillance and response activities in hard-to-reach areas.

18. **Insufficient laboratory capacity:** Some laboratories lack capacity to identify new strains of pathogens. Additionally, Member States in the African meningitis belt are required to send to WHO collaborating centres for external quality control, at least 10% of the samples tested in local laboratories. However, only five Member States in the African meningitis belt[21] comply with this requirement instituted to monitor laboratory performance.

19. **Difficulties in clearing laboratory supplies:** Cerebrospinal fluid sample collection kits, transport media, reagents and laboratory commodities and other supplies, are essential. Most of these indispensable commodities are imported from abroad. Repeated and lengthy delays in clearing these items from customs prolong interventions and hence impede efforts to improve laboratory confirmation.

20. **Lack of care for meningitis survivors:** There is no system in place for identifying sequelae caused by meningitis. Furthermore, there is lack of support for patients who develop them.

21. **Inefficient data sharing mechanism:** Despite improvement of meningitis surveillance, timely data sharing from Member States in the African meningitis belt to WHO remains a

[19] Burkina Faso, Benin, Cameroun, Chad, Côte d'Ivoire, Ethiopia, Gambia, Ghana, Mali, Niger, Nigeria, Senegal, Soudan and Togo.
[20] Burkina Faso, Niger, Togo and Benin
[21] Burkina Faso, Niger, Ghana, Mali and Chad

challenge. The current data sharing timeliness is under 80% in some Member States of the African meningitis belt. There is also a low level of completeness of laboratory confirmation data. In 2020, the WHO meningitis bulletin week 49-53 indicated that 12 out of 26 meningitis belt Member States did not share laboratory results.[22]

22. **Inadequate planning:** Lack of planning affects the ability to respond effectively to outbreaks should they occur. For the 2021 meningitis epidemic season, only 10 Member States in the meningitis belt have a meningitis preparedness and response plan.[23] This shows that countries are not investing in planning.

23. **Negative impact of the COVID-19 pandemic on meningitis prevention and control**: The COVID-19 pandemic has had a detrimental effect on meningitis surveillance, outbreak response and MenAfriVac® introduction in routine immunization. There was a decline in meningitis control activities such as outbreak investigations, laboratory confirmation and vaccination in 2020. Of the three countries[24] that planned to introduce MenAfriVac® into routine immunization, only Eritrea completed this activity.

VISION, GOALS, OBJECTIVES, TARGETS AND MILESTONES

24. Vision

Towards an African Region free of meningitis by 2030

25. Goals

(a) To eliminate bacterial meningitis epidemics
(b) To reduce cases and deaths from vaccine-preventable bacterial meningitis
(c) To reduce disability and improve quality of life after meningitis.

26. Objectives

(a) To strengthen meningitis prevention, surveillance and epidemic control.
(b) To improve capacity for meningitis laboratory confirmation at all levels.
(c) To provide effective treatment and care for people affected by meningitis.
(d) To promote advocacy and engagement towards an Africa free of meningitis.

27. Targets

By the end of 2030:

(a) Eliminate bacterial meningitis epidemics.
(b) Reduce the number of bacterial meningitis cases by at least 50% of cases recorded in 2020.
(c) Reduce the case fatality rate for meningitis to less than 5%.
(d) Establish and implement strategies for support and care to people affected by meningitis.

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[22] World Health Organization Regional Office for Africa (December 2020). Meningitis weekly bulletin. (https://www.who.int/emergencies/diseases/meningitis/epidemiological/en/)
[23] Benin, Cameroon, Chad, Côte d'Ivoire, Eritrea, Ghana, Mali, Niger, , Togo, and United Republic of Tanzania.
[24] Benin, Togo and Guinea

28. **Milestones**

By the end of 2023

(a) MenAfriVac® is introduced in routine immunization in at least 16 Member States in the African meningitis belt;

(b) Guidelines and training modules on surveillance, preparedness and response to bacterial meningitis epidemics are updated, disseminated and implemented in all Member States;

(c) More than 80% of priority Member States have a meningitis strategic plan and monitoring framework.

By the end of 2025

(a) MenAfriVac® is introduced in routine immunization in at least 18 Member States of the African meningitis belt;

(b) 100% of priority Member States have a meningitis strategic plan and monitoring framework.

By the end of 2027

(a) *Hib* and *S. pneumo* vaccines included in routine immunization in all Member States;

(b) Meningitis risk communication strategies integrated into national plans in all priority Member States;

(c) Quality and affordable meningitis diagnostic tests available in all Member States.

By the end of 2028

(a) A system of community-based identification of sequelae and disabilities, and referral for assessment and care established in at least 60% of priority Member States;

(b) Vaccination against *Nm* serogroups ACWY/ACWXY introduced in routine immunization in at least 10 Member States in the African meningitis belt with a target coverage of 60%;

(c) 50% of all priority Member States have a high-quality system for identification and follow up of patients who suffer from meningitis-related sequelae.

By the end of 2030

(a) A system of community-based identification of sequelae and disabilities, and referral for assessment and care established in at least 80% of priority Member States;

(b) Vaccination against *Nm* serogroups ACWY/ACWXY introduced in routine immunization in all Member States in the African meningitis belt with a target coverage of 90%;

(c) Guidelines on detection, monitoring and management of sequelae after meningitis implemented in all priority Member States;

(d) 80% of priority Member States have a high-quality system for identification and follow-up of patients who suffer from meningitis-related sequelae.

GUIDING PRINCIPLES

29. The guiding principles that underpin the framework are:

(a) **Government ownership, leadership and accountability:** Member States should demonstrate leadership, ownership and ensure effective coordination of all stakeholders.

(b) **Community engagement and participation:** Community engagement to strengthen support and care for persons affected by meningitis is key.

(c) **Partnership and intersectoral collaboration:** Collaboration is essential between a broad range of partners from various sectors including health, social welfare, communication, research, academia and manufacturers.

(d) **Domestic financing:** Member States should ensure efficient mobilization of domestic and external resources to eliminate meningitis epidemics and reduce disabilities caused by meningitis.

(e) **Gender and equity:** The implementation of this framework should be centred around equitable access to services for all, including women, children, internally displaced persons, refugees and migrants.

(f) **Human rights:** All meningitis prevention and control interventions should be based on the promotion of human rights in accessing prevention and care services.

(g) **Evidence-based interventions:** Evidence-based policies, services and interventions will provide the basis for the implementation of this framework.

PRIORITY INTERVENTIONS AND ACTIONS

Epidemic prevention and control

30. **Achieve and maintain high immunization coverage.** Member States at risk of meningitis epidemics should introduce vaccines against *Nm, S. pneumo*, and *Hib,* and maintain high immunization coverage.

31. **Introduce effective and affordable new vaccines, including *Nm, S. pneumo and Hib.*** Priority Member States should introduce new, affordable and effective vaccines such as the pentavalent (ACWXY) conjugate vaccine which is in late-stage development. Improve access and inclusion of new generation and affordable vaccines to prevent meningitis and ensure elimination of bacterial meningitis.

32. **Develop evidence-based policy on *Nm, S. pneumo, Hib* and *GBS* vaccination.** Member States should develop and implement appropriate vaccination strategies to improve vaccine uptake and ultimately increase protection among the population.

33. **Develop and implement context-specific strategies to prevent GBS infection in infants.** Member States should develop strategies for prevention and management of *GBS* infection in infants.

34. **Develop and improve strategies for epidemic prevention and response.** Member States are urged to develop and promote the use of the AFRO guidance tools which include the SOPs for surveillance, prevention and control of meningitis outbreaks in Africa.

Diagnosis and treatment

35. **Improve diagnosis of meningitis at all levels of care,** through the development and dissemination of regionally specific testing requirements and tools for each level of the health system and according to the required decision-making level, evaluation of the role of blood sampling in diagnosing meningitis, and increase in the timely collection and testing of diagnostic lumbar punctures (LPs), blood and other specimen samples. Transportation systems of samples from collection points to reference laboratories should be strengthened.

36. **Develop and enable access to diagnostic assays for all levels of care.** It is necessary for Member States to have high laboratory capacity for pathogen confirmation with adequate infrastructures, equipment and trained laboratory personnel. The use of novel rapid diagnostic assays that are highly performing, affordable and deliver accurate and quick results is important.

37. **Develop and implement a context-specific strategy for group B streptococcus (GBS)**. Member States should establish the status of GBS disease, develop policies and strategies for prevention and control which include diagnosis, treatment and care with a focus on women and infants.

38. **Provide appropriate context-specific strategies to reduce sequelae, deaths and antimicrobial resistance (AMR).** Protocols for meningitis case management using the appropriate antibiotics and adjunctive therapy should be updated and disseminated to all health facilities at all levels. This should be complemented by the prepositioning of drugs and other case management commodities, especially during the epidemic season as well as implementation of an antimicrobial stewardship programme.

39. **Increase availability and access to appropriate care and support for people affected by meningitis.** Member States are urged to conduct a comprehensive assessment of the existing services and support systems available for people with disabilities, including those with meningitis sequelae and for families/care providers. This should be followed by the development and implementation of a capacity building programme which includes appropriate training on timely identification and management of disability and bereavement for health care professionals and community workers.

Disease surveillance

40. **Ensure effective systems for surveillance of meningitis.** Member States need to explore the possibility of promoting electronic Integrated Disease Surveillance and Response (eIDSR) to facilitate rapid transmission of data. Meningitis-enhanced and case-based surveillance included in IDSR should be strengthened in all Member States. Laboratory capacity for diagnostic testing, including molecular characterization and antimicrobial resistance, needs strengthening for effective surveillance. Partnership with WHO collaborating centres and reference laboratories is essential to establish a global genome network for meningitis pathogens.

41. **Develop and implement surveys and studies to establish the burden of sequelae.** There is a need for Member States to establish and strengthen policies and services for assessing sequelae, treatment, rehabilitation and follow-up, including those in communities.

Advocacy and engagement

42. **Ensure commitment and engagement of partners and policy-makers.** Member States should work with all stakeholders to undertake baseline needs assessment on meningitis and its impact, create national action plans that address gaps and are aligned with the regional framework, and which take into consideration the impact of the COVID-19 pandemic.

43. **Ensure awareness and sensitization among all populations about meningitis.** Member States should undertake integrated communication that increases population awareness of the risk of meningitis. World Meningitis Day and the International Day of Persons with Disabilities are among opportunities to raise awareness and sensitize populations about the causes and effects of meningitis.

44. **Maintain high vaccine confidence.** There is need to develop risk and crisis communication strategies to address issues of access, acceptance and generation of demand for vaccines. This should be complemented by risk and crisis communication plans for new and existing vaccines including the COVID-19 vaccine to address potential inaccurate communication of adverse events.

Monitoring and evaluation

45. **Ensure monitoring and evaluation**. WHO AFRO will develop monitoring and evaluation tools and report every two years to the Regional Committee on the implementation of the regional framework.

ACTIONS PROPOSED

46. The Regional Committee is invited to examine and adopt the actions proposed.