

Challenges and possible solutions to improving laboratory confirmation of bacterial meningitis

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Introduction

- Meningitis epidemics in African meningitis belt countries remains a major public health problem.
- Before 2010, *Neisseria meningitidis* group A (NmA), was the main cause (about 90%) of meningitis epidemics.
 - Following the successful introduction of MenAfriVac into the vaccination program, the epidemiology of the disease has changed dramatically in the region. The other serogroups became predominant. The main germs identified in 2021 are: NmC (52.3%); Spn (29.9%); NmX (7.9%); NmW (4.4%) and Hib (2.6%).
- The Framework for the implementation of the Strategy to Defeat Meningitis by 2030 in the WHO African Region was endorsed in August 25, 2021 by Member States and laboratory is one of cornerstone
- The key interventions of the regional framework are: Epidemic prevention and control; Diagnosis and treatment; Disease surveillance and Monitoring and evaluation

Laboratory capacity still challenging despite efforts made during the last two decades.

Laboratory challenges

- **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.
- **Insufficient funding:** Most of the Member States in the African meningitis belt are unable to mobilize adequate local resources to implement meningitis action plans.
- **Insufficient laboratory capacity:** Some laboratories lack capacity to identify new strains of pathogens.
- **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.
- **Lumbar Puncture (LP) practice is weak:** e.g. from January to August 2021 Only 34% of suspected cases had LP.
- **Inefficient data sharing mechanism:** 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 same trends this year from January to August.

Solutions to improving laboratory confirmation of bacterial meningitis

- **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.

- **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.
- **Ensure effective systems for meningitis laboratory confirmation.** Laboratory capacity for diagnostic testing, including molecular characterization and antimicrobial resistance, needs strengthening for effective surveillance.