



# **Epidemic meningitis surveillance in the African meningitis belt**

*Deciding on the most appropriate approach*



**World Health  
Organization**

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## Acronyms

AFRO	African Regional Office of WHO
CSF	cerebrospinal fluid
HCC	health-care centre
<i>Hib</i>	<i>Haemophilus influenza b</i>
HQ	Headquarters (WHO)
IDSR	integrated disease surveillance and response
IST-West	Inter-country Support Team for West Africa
LP	lumbar puncture
MoH	ministry of health
NGO	nongovernmental organization
<i>Nm</i>	<i>Neisseria meningitidis</i>
PBM	paediatric bacterial meningitis
PCR	polymerase chain reaction
RL	reference laboratory
SOP	standard operating procedure
<i>Sp</i>	<i>Streptococcus pneumoniae</i>
WHO	World Health Organization

## Preliminary note

Two terms used throughout the document need to be clarified to avoid confusion: “enhanced epidemic surveillance” and “case-based surveillance”.

Enhanced epidemic surveillance refers to a specific meningitis surveillance strategy that was developed in the early 2000s for the African meningitis belt, which spans from Senegal and the Gambia to Ethiopia. It has some unique characteristics within the broader approach of integrated disease surveillance and response (IDSR), and is the baseline surveillance strategy for meningitis in the belt. A population-based approach, enhanced epidemic surveillance uses aggregated data counts to compute weekly incidences at the district level, with epidemic investigation and containment measures launched accordingly. In this type of surveillance, laboratory confirmation is required only for the first cases when an epidemic is suspected, mainly to identify the pathogen responsible for the outbreak.

Case-based surveillance collects information at the individual level on each suspected case, and documents these cases thoroughly from both an epidemiological and a microbiological perspective. A characteristic of this type of surveillance is that it allows epidemiological and microbiological information to be linked. The term “case” implies a focus on information “at the case level”, rather than an antonym to “population-based” surveillance. Case-based surveillance can be conducted in a context of population-based surveillance; that is, involving a defined population with a denominator from which cases come and rates can be calculated. Depending on its modalities of implementation, case-based surveillance can provide population-based information (e.g. meningitis rates per district) and individual data (e.g. vaccination status for the *Neisseria meningitidis* A conjugate vaccine).

## Introduction

### Rationale

Surveillance primarily enables relevant information to be continuously disseminated and applied to disease prevention and control, to avert deaths and disabilities through appropriate public health interventions. Until recently, surveillance for meningitis was synonymous with assessing the case burden and incidence trends of the disease (in terms of time, place and people), and with launching and evaluating measures for investigation and control (1-3).

In 2010, the *Neisseria meningitidis* (Nm) A conjugate vaccine was introduced on a large scale in the African meningitis belt. It is expected that this vaccination programme will substantially modify the epidemiology of the disease in the region.<sup>1</sup> In addition to conferring long-term protection, the safe and highly immunogenic Nm A conjugate vaccine decreases carriage rates in immunized populations, and provides herd immunity (4, 5); hence, the occurrence of both epidemic and non-epidemic Nm A meningitis should drop significantly. However, it is also likely that new serogroups of meningitis or new pathogens will emerge as prevailing causes of meningitis, and that the patterns and dynamics of meningitis outbreaks will change (6).

These probable epidemiological shifts will have consequences for surveillance and response strategies, and for case management. The introduction of a new vaccine also requires quantification of its effectiveness and epidemiological impact. Taken together, these elements impose new challenges for surveillance systems, and create a need for such systems to adapt in order to remain relevant, accurate and efficient.

Within the World Health Organization (WHO), the Inter-country Support Team for West Africa (IST-West) of the African Regional Office of WHO (AFRO) and the WHO Headquarters (HQ) are working closely with the ministries of health (MoHs) and their partners to monitor those changes, and to assess the impact of the mass vaccination campaigns on meningitis transmission and trends. WHO and the MoHs also partner to upgrade surveillance systems, to ensure that accurate and relevant epidemiological and microbiological information is generated.

### Baseline surveillance approach and associated information gaps

Enhanced epidemic surveillance has been implemented since 2002, and is the baseline surveillance strategy that prevails in the African meningitis belt. It has been associated with significant public

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