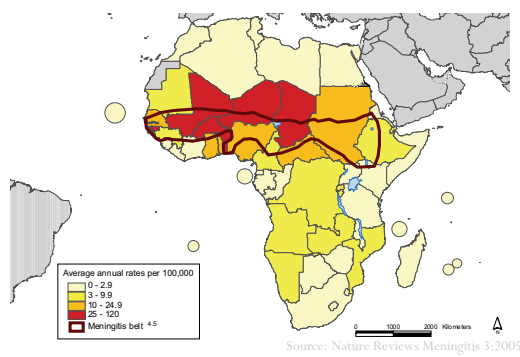


Implementation of Standard Operating Procedures for enhanced meningitis surveillance in 13 countries of the African meningitis belt from 2003 to 2008

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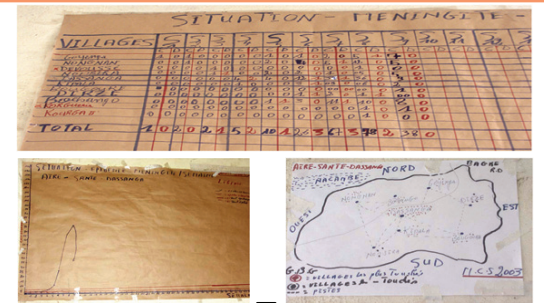
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African meningitis belt



Background

- Despite intense implementation of control measures, epidemic meningococcal meningitis continues to be a challenging public health threat in the African meningitis belt.
- In 1996 a devastating group A meningitis epidemic caused more than 250 000 cases and 25 000 deaths.
- The emergence of *Neisseria meningitidis* serogroups W135 and X has added complexity to the control of epidemic meningitis.
- In addition, impact of the introduction of a new MenA conjugate vaccine requires close monitoring.



Enhanced surveillance (epid./lab)

Early detection for Efficient vaccination

Meningitis surveillance in the belt

- Early detection = weekly attack rates
- Identification of the target population = Attack rates by age groups
- Identification of causal germs = confirmation + serogrouping

Objective

- The goal of enhanced surveillance is to rapidly detect the emergence of meningitis epidemics and to identify the causative pathogens in order to undertake appropriate control measures.
- Harmonization of country-specific data to obtain more accurate information on meningitis cases, deaths, and bacteriological isolates was needed.
- Therefore, Standard Operating Procedures were developed in 2001–2002 to codify and enhance meningitis surveillance in 13 African countries (Benin, Burkina Faso, Cameroon, Central African Republic, Cote d'Ivoire, Ethiopia, Ghana, Mali, Niger, Nigeria, RD Congo, Chad, and Togo).

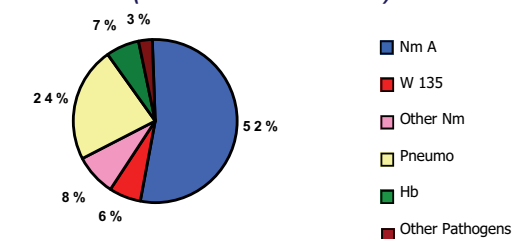
Methods

- Standard case definitions, intervention thresholds, and data collection tools were developed for surveillance officers, enabling them to use the same methods to detect and notify cases.
- Laboratory standards were developed for basic diagnostic tests (Gram stain, antigen detection) at the district level, and more specialized tests at national reference laboratories (culture, antibiotic sensitivity, PCR) and WHO collaborating centers (typing, sequencing).
- A system for analyzing, interpreting, and presenting epidemiologic and laboratory data was developed. In addition, a weekly epidemiological bulletin was produced and widely distributed.

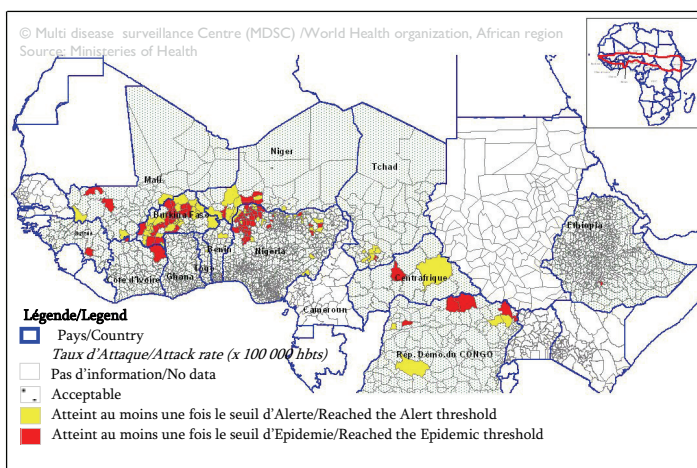
Results

- From 2003 to 2008 (week 26) 187 503 meningitis cases and 20 073 deaths (CFR of 10.7%) were reported. 401 alert districts and 338 epidemic districts were mapped.
- From 2004 to 2008 Burkina Faso and Niger were the most affected among the 13 countries under enhanced meningitis surveillance.
- Average annual attack rate for Burkina Faso was 93 cases per 100 000 population, ranging from 26.7 in 2005 (non-epidemic year) to 187.4 in 2007 (the most severe epidemic year since 1996).
- The average attack rate in Niger was 21.6 cases per 100 000 population, ranging from 7.8 in 2007 to 34.4 in 2006.
- Analysis of weekly district data showed that epidemic waves usually start between weeks 4-6, peak at about week 13-14, and end about weeks 22-24.

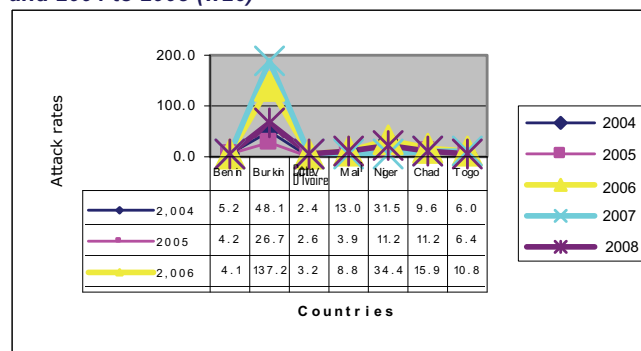
Distribution of CSF isolates from meningitis belt countries (2003 to 2008—week 26)



Map of alert and epidemic districts in the African meningitis belt for weeks 1–26 in 2008

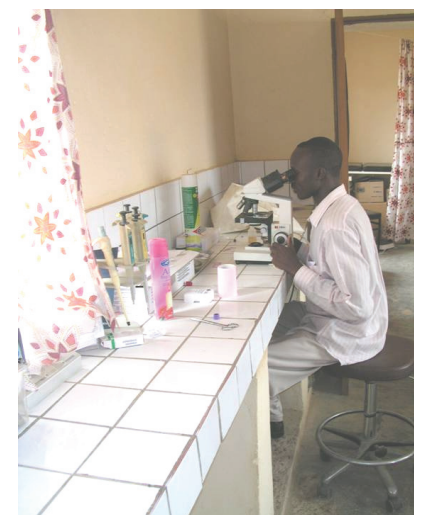


Meningitis annual attack rates (cases per 100 000 inhabitants) Benin, Burkina, Cote d'Ivoire, Mali, Niger, Chad, Togo and 2004 to 2008 (w26)

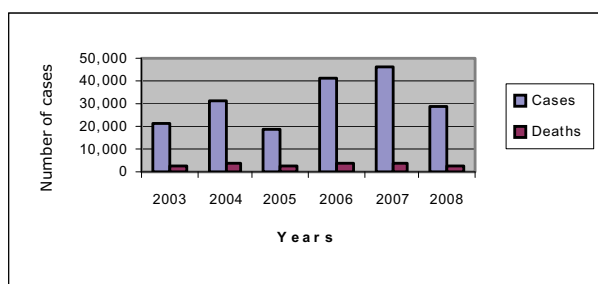


Improvement of samples collection & lab involvement

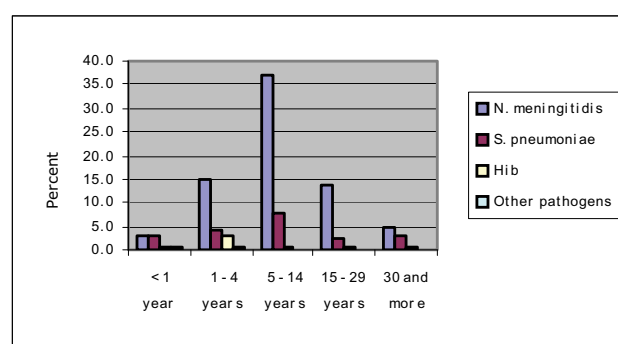
Before the implementation of enhanced meningitis surveillance in Africa few CSF samples were properly analyzed. Often the decision to undertake mass immunization campaigns was taken on the basis of few bacteriologic data. Thousands of CSF samples are now collected and properly analyzed. Between 2003 and 2008, a total of 20 669 CSF specimens were collected from the countries under enhanced surveillance system.



Distribution of meningitis cases and deaths in meningitis belt countries from 2003 to 2008 (w26)



Distribution of meningitis by CSF isolates and age group (651 positive cases from Burkina Faso, Mali, Niger, and Togo in 2007)



Conclusions

- Enhanced surveillance in meningitis belt countries has dramatically improved the quality of surveillance data, and particularly the laboratory identification of causative agents.
- These data now form an important starting point to measure the impact of the introduction of a MenA conjugate vaccine on disease incidence and distribution of Nm groups in the African meningitis belt.

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