Detection of meningococcal clusters by the epidemiologic surveillance system in Poland in 1999-2007

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Background

- Invasive meningococcal disease (IMD) usually occurs sporadically, but can sometimes cause outbreaks, especially when meningococcal strains of group A or C are involved.
- In 2005 the epidemiologic situation of IMD in Poland has changed; the proportion of group C meningococci and incidence in teenagers has increased, which coincided with detection by National Reference Centre for Bacterial Meningitis of hyperinvasive strains of group B (sequence type ST-32) and group C (ST-11) meningococci.
- The aim of this study was to describe the meningococcal outbreaks which occurred in Poland in 1999-2007 and compare their characteristics in periods 1999-2004 and 2005-2007.

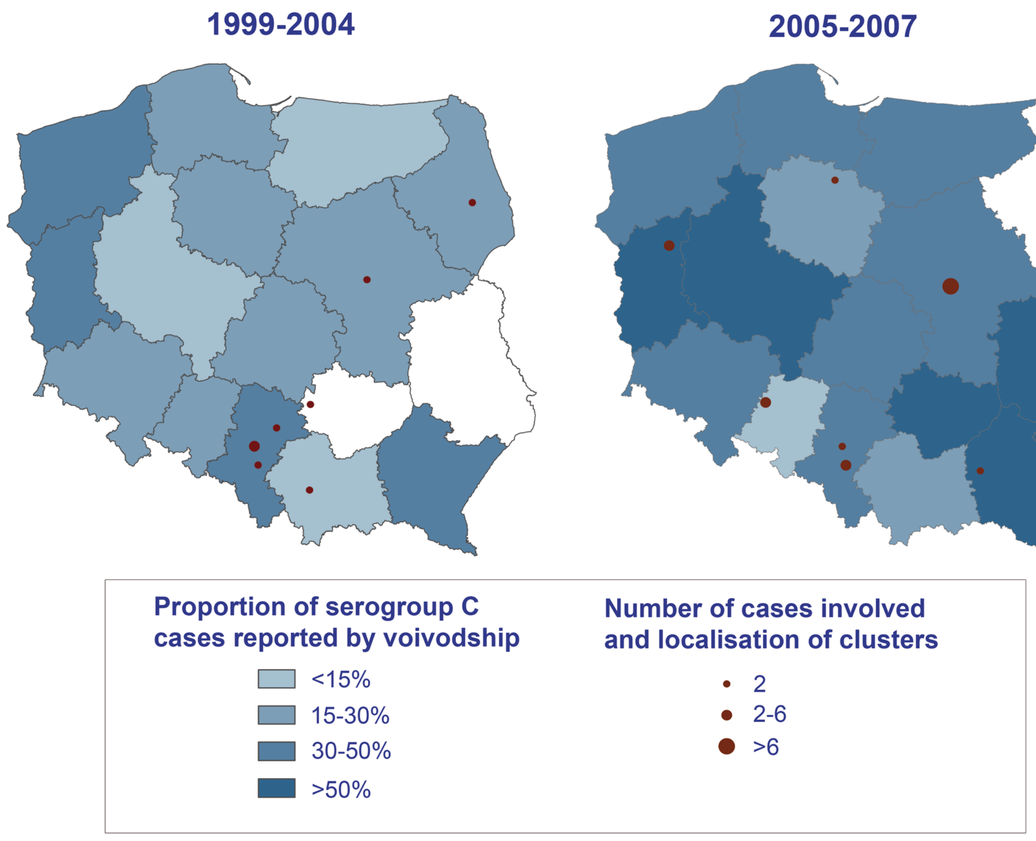
Material and Methods

- A meningococcal cluster was defined as occurrence of at least two cases of probable or confirmed IMD within the same time period, for which close contact was established.
- Routine surveillance case reports for meningococcal meningitis from the period of 1999-2007 were screened for information on household and community clusters.
- Additionally a survey on IMD cluster surveillance was collected from public health departments to supplement information on routinely collected case reports from 2003-2006.

Results

- In 1999-2007 there were 14 IMD clusters reported, involving in total 50 cases.
- The increase in number of group C meningococci cases in 2005-2007 was not uniform in Polish regions (Fig. 1).

Figure 1. Proportion of group C meningococci among serogrouped IMD cases by geographic region, and localization of outbreaks in Poland in 1999-2007.



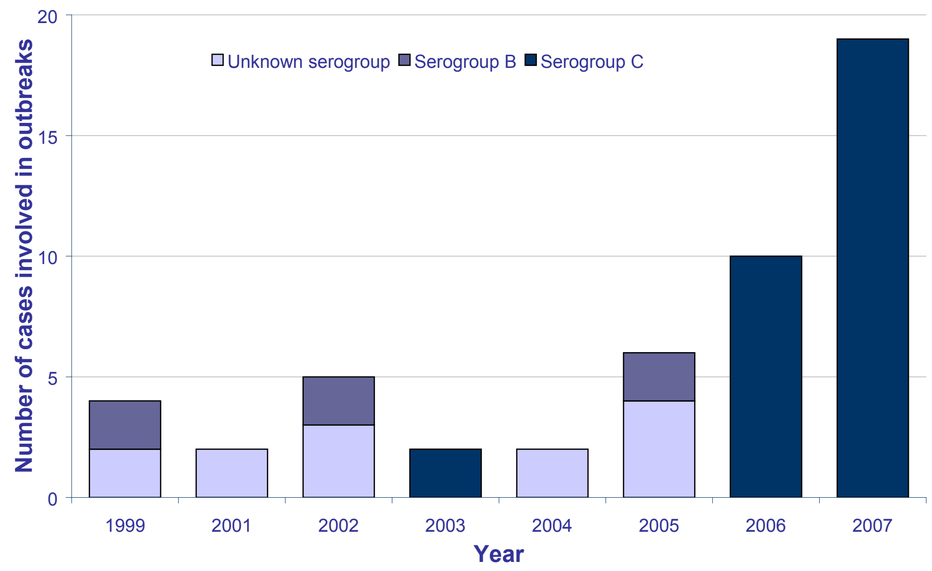
- In 1999-2004 only small household clusters were recorded, mostly involving meningitis cases (Table).
- In 2005-2006 large community and orgnization-based outbreaks occurred caused by serogroup C meningococci.

Table. Characteristics of meningococcal outbreaks recorded in Poland in 1999-2007.

CLUSTER CHARACTERISTIC	1999-2004	2005-2007
Number of clusters	7	7
Total number of cases	15	35
Overall attack rate	0.49	0.25
Number of primary cases	4	2
Number of co-primary cases	7	27
Number of secondary cases	4	6
Chemoprophylaxis administered	1	5
Number of fatal cases	0	2
Serogroup		
B	2	1
C	1	4
Most prevalent clinical syndrome		
Meningitis	5	0
Septicaemia	2	7

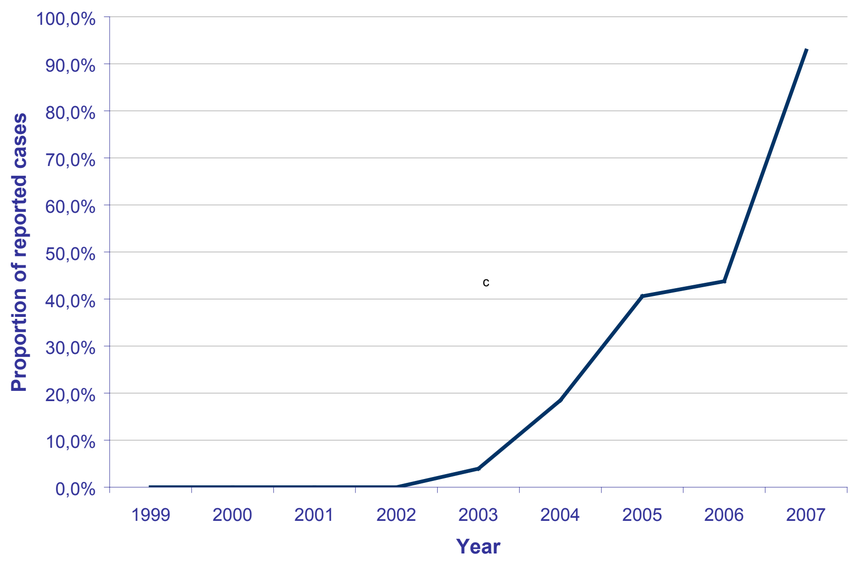
- The causal serogroup was changing in the studied period (Fig. 2).

Figure 2. Number of cases involved in outbreaks by serogroup, Poland, 1999-2007.



- In the studied period chemoprophylaxis was increasingly used to prevent secondary cases in close contacts of IMD cases (Fig. 3).

Figure 3. Proportion of cases, in which appropriate chemoprophylaxis was administered to close contacts, Poland, 1999-2007.



Conclusions

- Detection of meningococcal clusters was limited in the Polish surveillance system before 2005, when only meningococcal meningitis was covered by routine surveillance.
- Large clusters in 2005-2007 were recently linked to epidemic clones of serogroup C *N. meningitidis*.
- More attention has to be paid to control measures undertaken in each case and laboratory investigation of epidemiological links between IMD cases.