



PRÉSIDENCE FRANÇAISE UNION EUROPÉENNE

Campagnes de sensibilisation du grand public sur l'utilisation prudente des antibiotiques
Public awareness campaigns on the prudent use of antibiotics

6 et 7 novembre 2008
6th & 7th November 2008



Est-ce que certaines infections bactériennes augmentent avec la diminution des consommations d'antibiotiques ? Données françaises

Is there an increase in some bacterial infections because of a decrease in antimicrobial consumption? French data

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Data sources

- **EPIBAC**
 - network of hospital microbiologists, since 1985
 - objectives : to measure the national incidence of the most frequent, community-acquired, invasive bacterial infections
 - assessment of temporal trends
 - evaluation of the impact of national programs
 - *H. influenzae, S. pneumoniae, S. pyogenes*
(*S. agalactiae, L. monocytogenes, N. meningitidis*)

EPIBAC : Methods (1)

- **Yearly surveillance of selected invasive bacterial infections**
- **Criteria for targeting specific bacteria**
 - **community-acquired infections,**
 - **high lethality,**
 - **availability of prevention measures (1990)**
- **Bacteraemia**
 - **bacteria isolated from at least one blood sample**
 - **duplicates removed**

EPIBAC : Methods (2)

- **Coverage : ratio of admissions in participating hospital wards to the total number of admissions in all French hospital wards (for those treating such infections only)**
- **Completeness of reporting : capture-recapture studies using independant data sources**
- **National incidence estimates :**

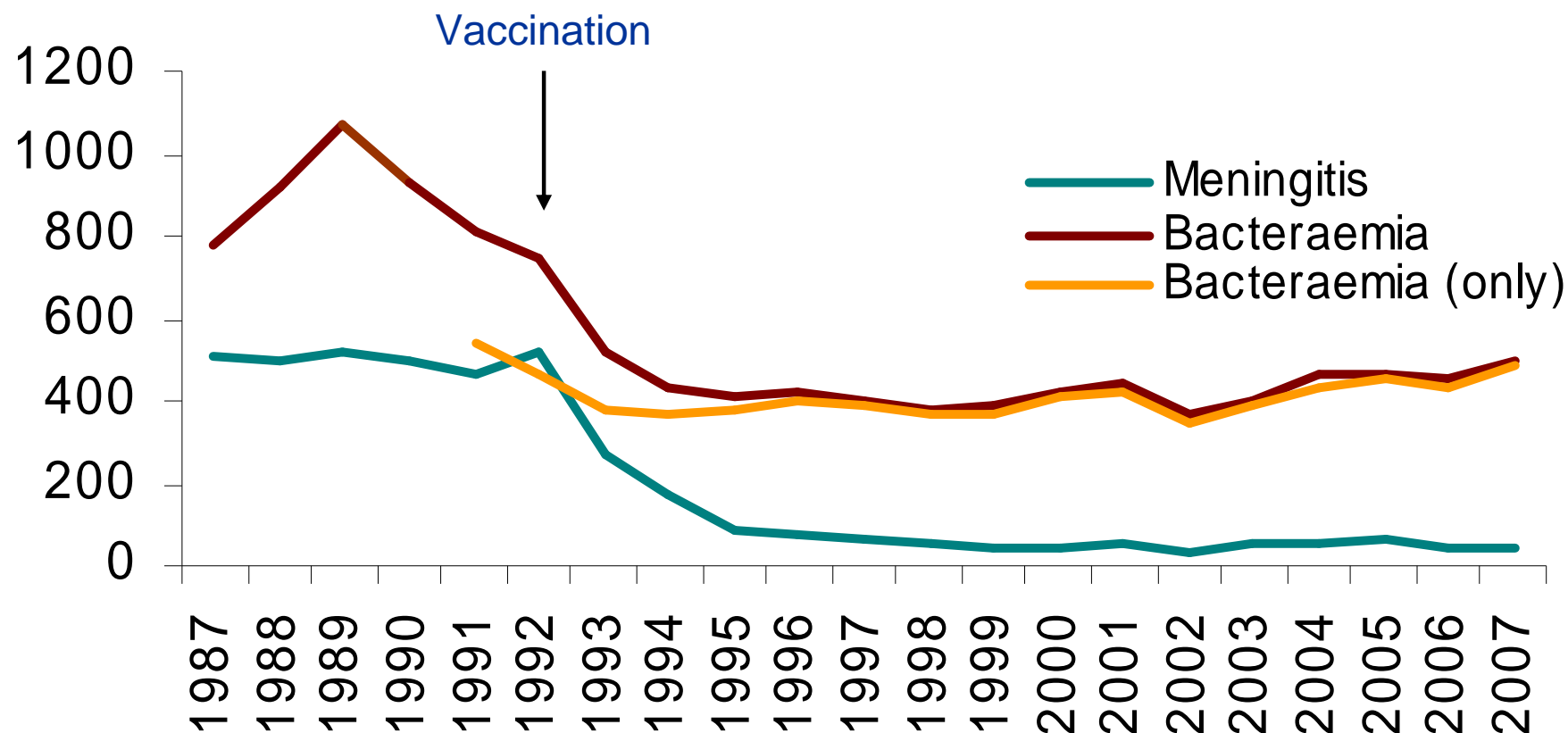
Reported cases (n) / Coverage (%) / Completeness (%)

French population (N)

EPIBAC : 2007 data

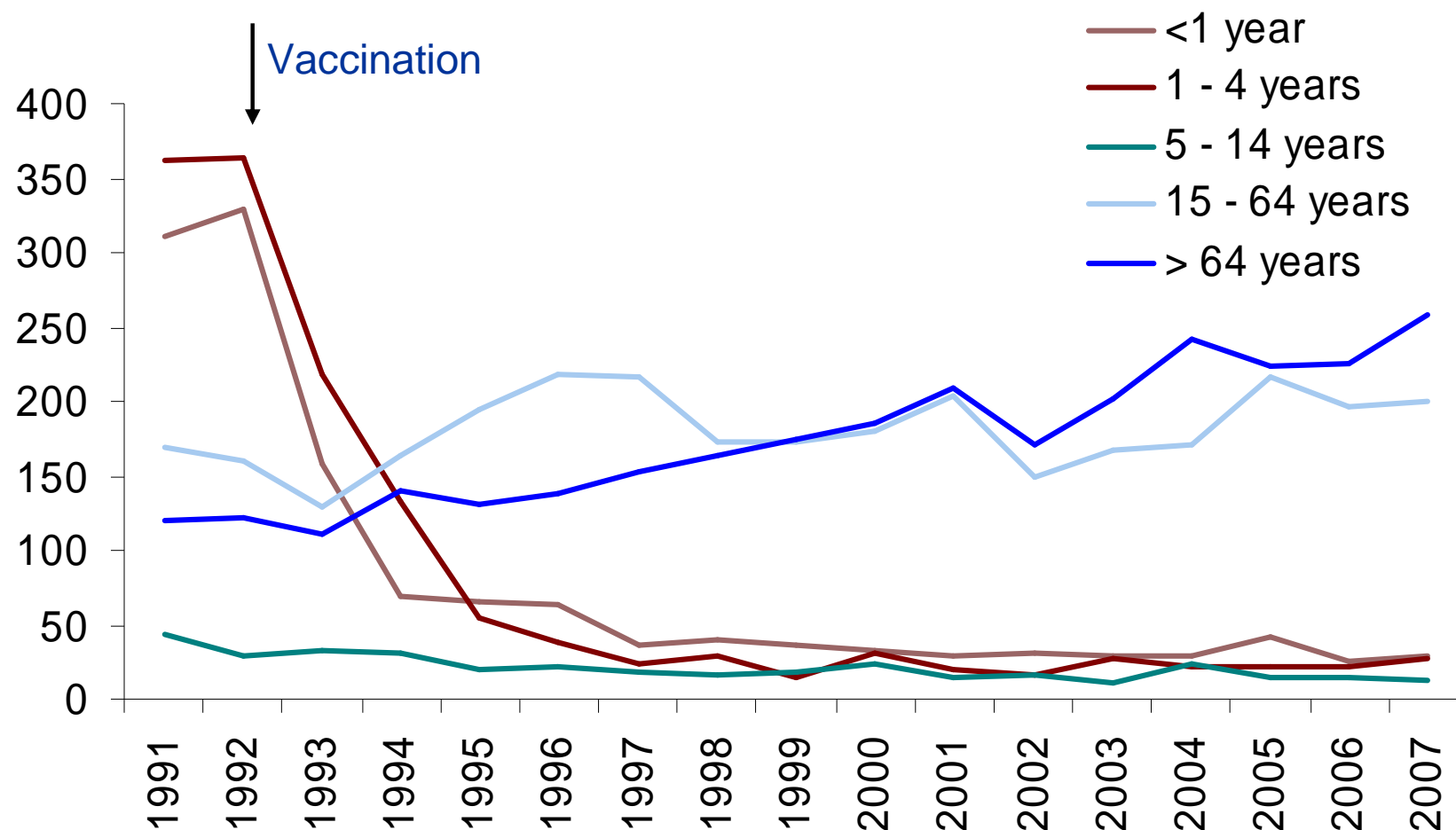
- **300 participating laboratories**
 - 230 general public hospitals
 - 55 teaching public hospitals
 - 15 private hospitals
- **National coverage = 78% of admissions**
- **Completeness of reporting (2000 – 2007) = 80%**

EPIBAC : *Haemophilus influenzae*



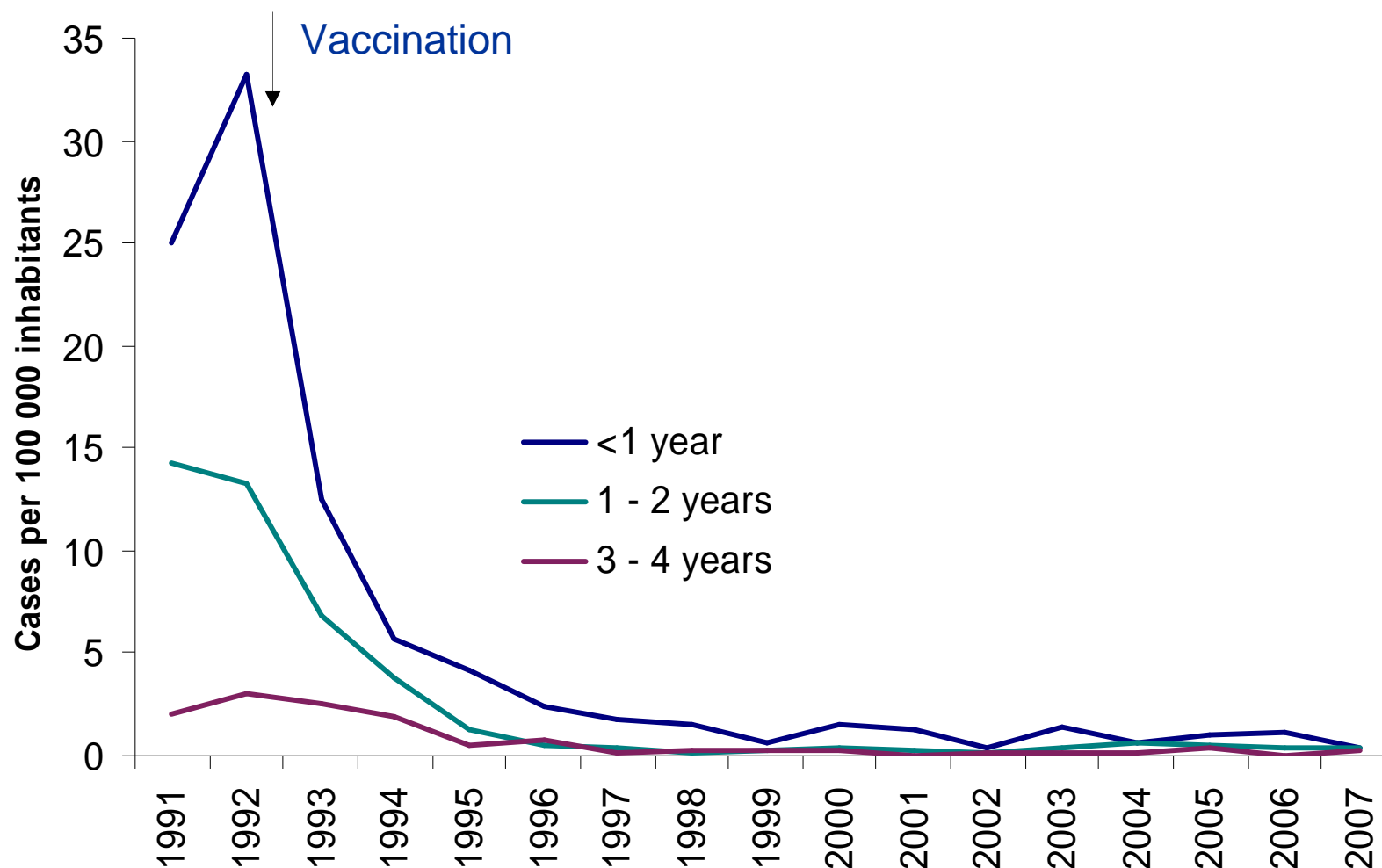
**New case estimates (N), invasive infections,
by type of infection, 1987 – 2007, France**

EPIBAC : *Haemophilus influenzae*



**New case estimates (N), invasive infections,
by age, 1991 – 2007, France**

EPIBAC : *Haemophilus influenzae*

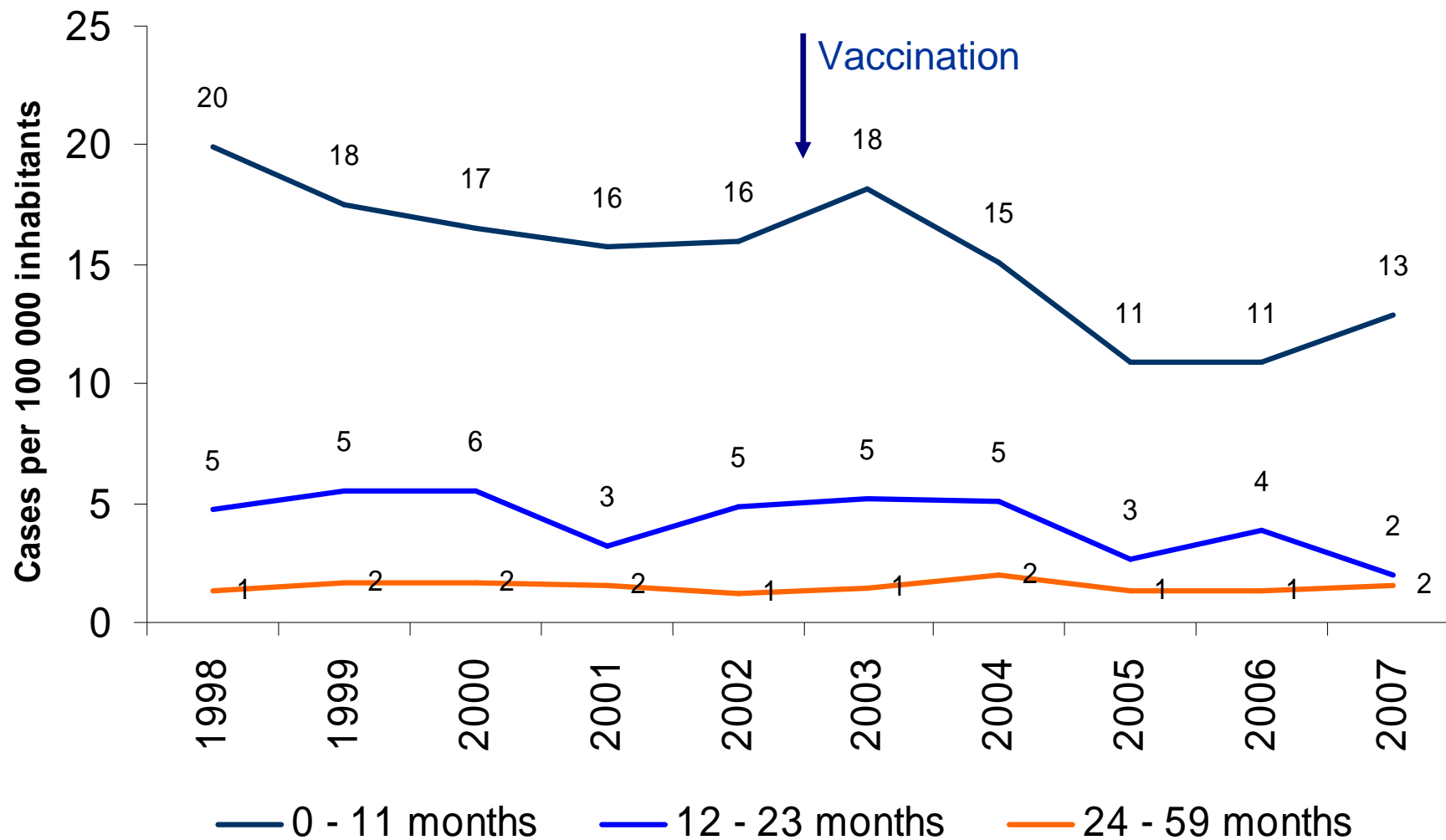


Incidence of meningitis among infants < 5 years, 1991 – 2007, France

EPIBAC : *Haemophilus influenzae*

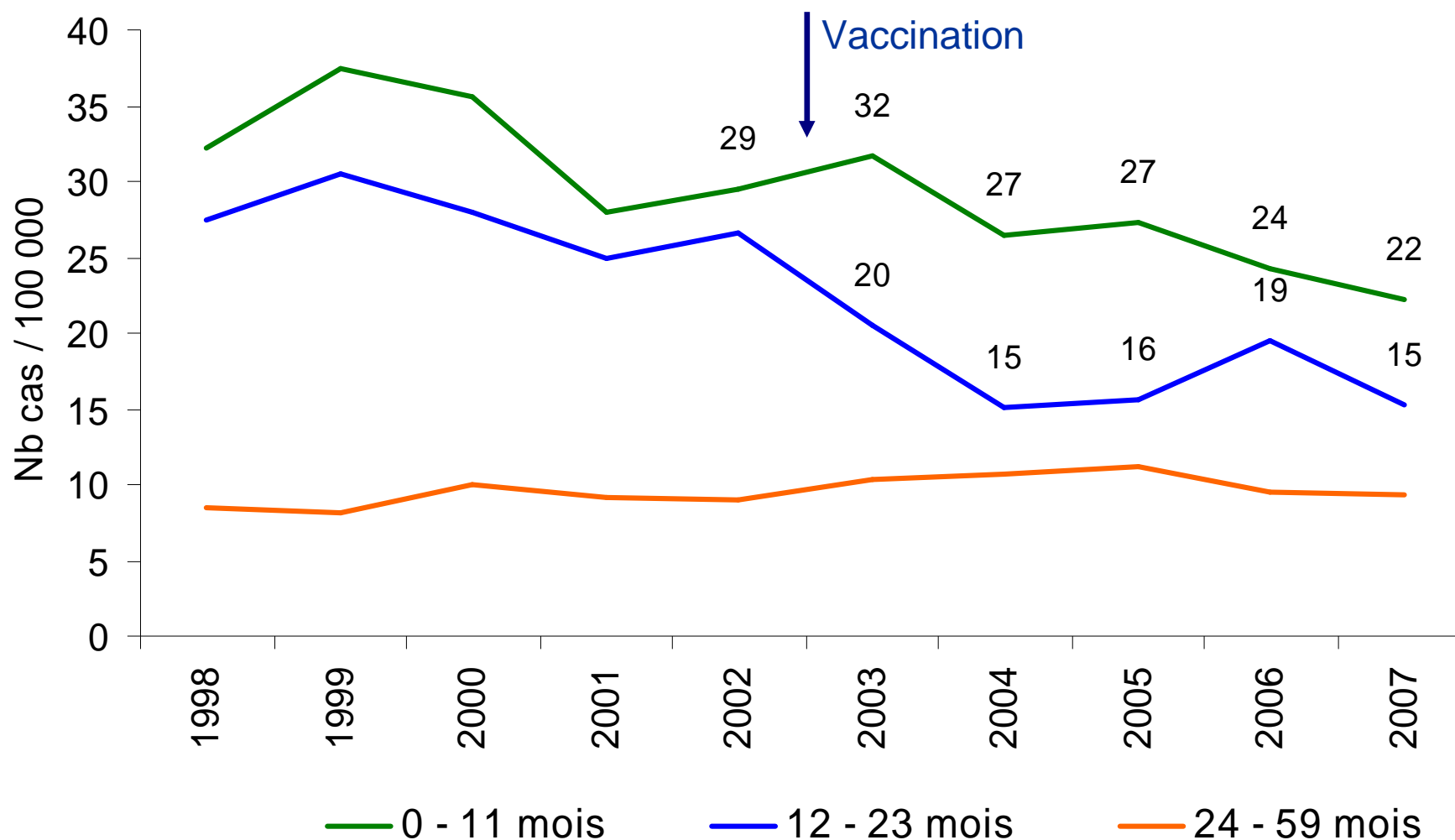
- **Invasive infections**
 - among infants, a sustained decrease in incidence since the early 90's (introduction of vaccination)
 - among elderly, an increase in the number of new cases since the 90's, probably related to a change in the demographic structure of the population
- **No evidence for an increase in invasive infections related to the decrease in antimicrobial consumption**

EPIBAC : *Streptococcus pneumoniae*



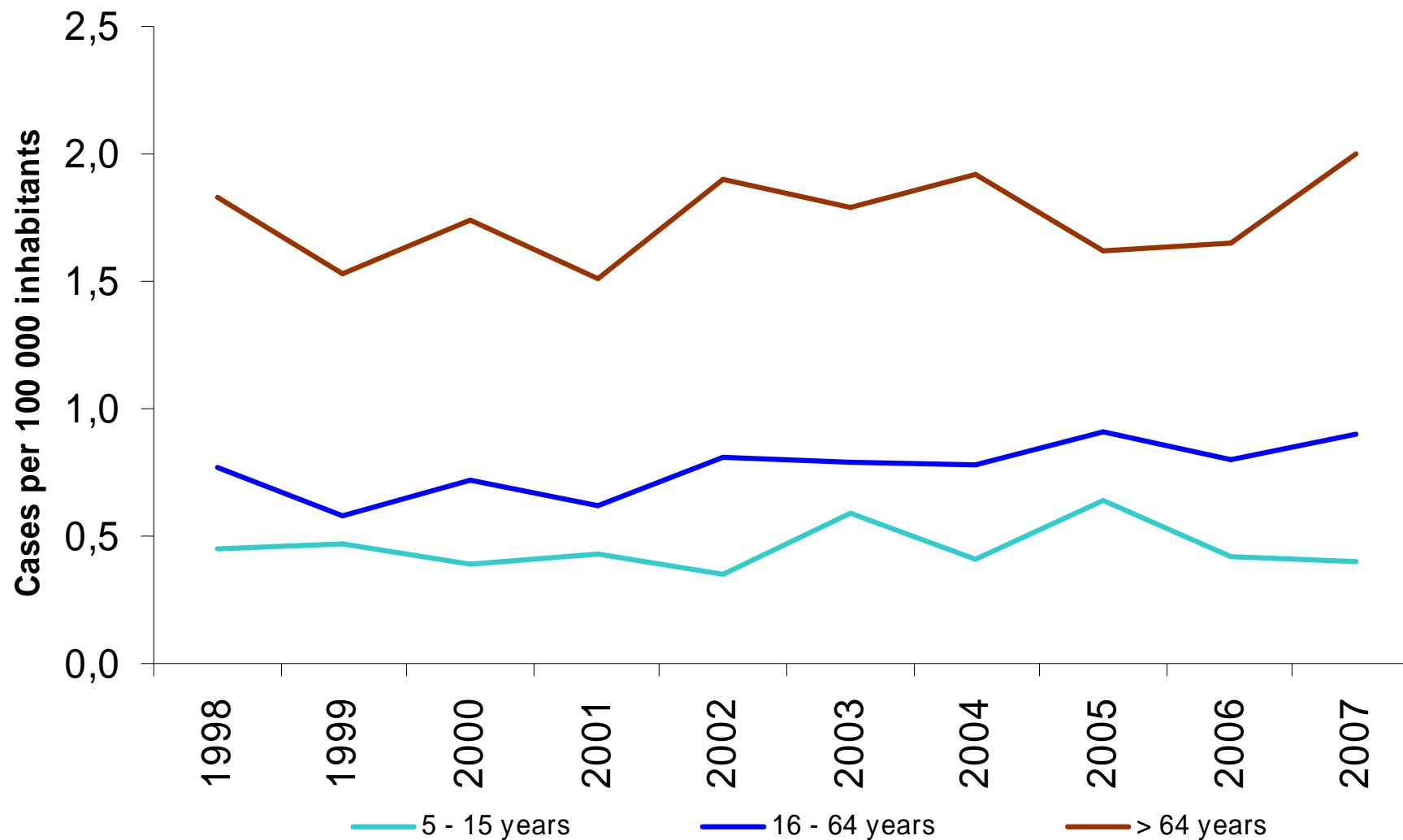
Incidence of meningitis among infants < 5 years, 1998 – 2007, France (corrected for coverage and completeness of reporting)

EPIBAC : *Streptococcus pneumoniae*



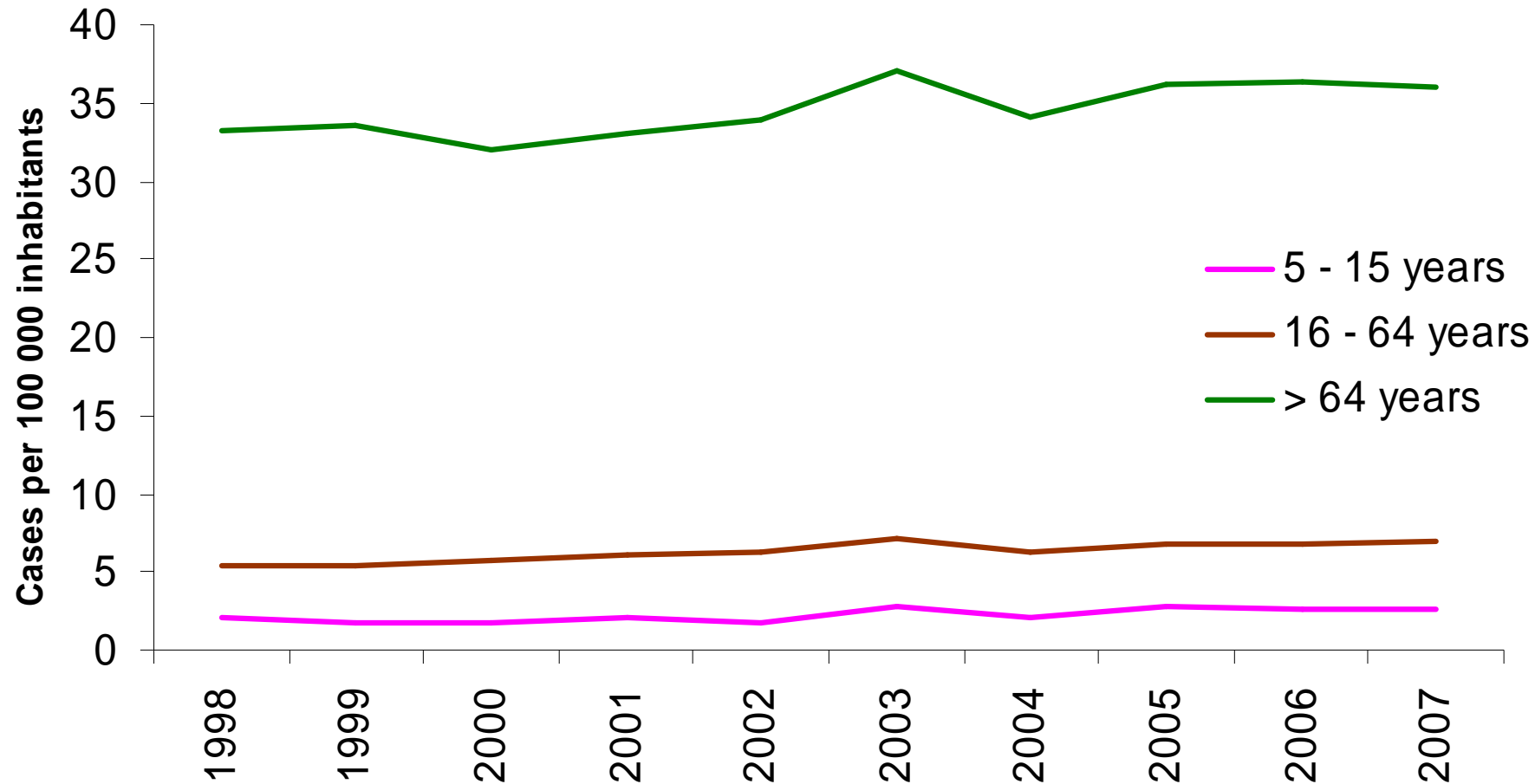
Incidence of bacteraemia among infants < 5 years, 1998 – 2007, France (corrected for coverage and completeness of reporting)

EPIBAC : *Streptococcus pneumoniae*



**Incidence of meningitis among persons > 5 years,
1998 – 2007, France** (corrected for coverage and completeness of reporting)

EPIBAC : *Streptococcus pneumoniae*

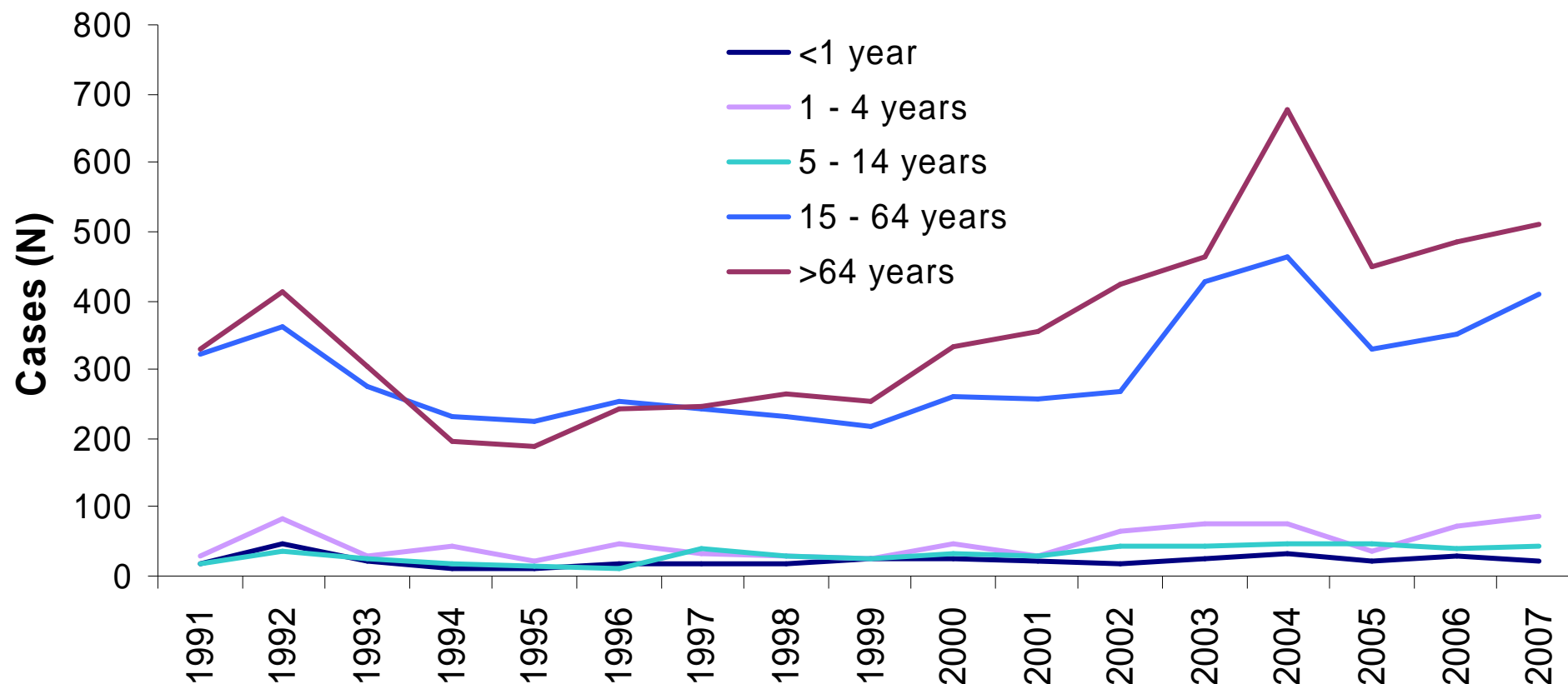


**Incidence of bacteraemia among persons > 5 years,
1998 – 2007, France** (corrected for coverage and completeness of reporting)

EPIBAC : *Streptococcus pneumoniae*

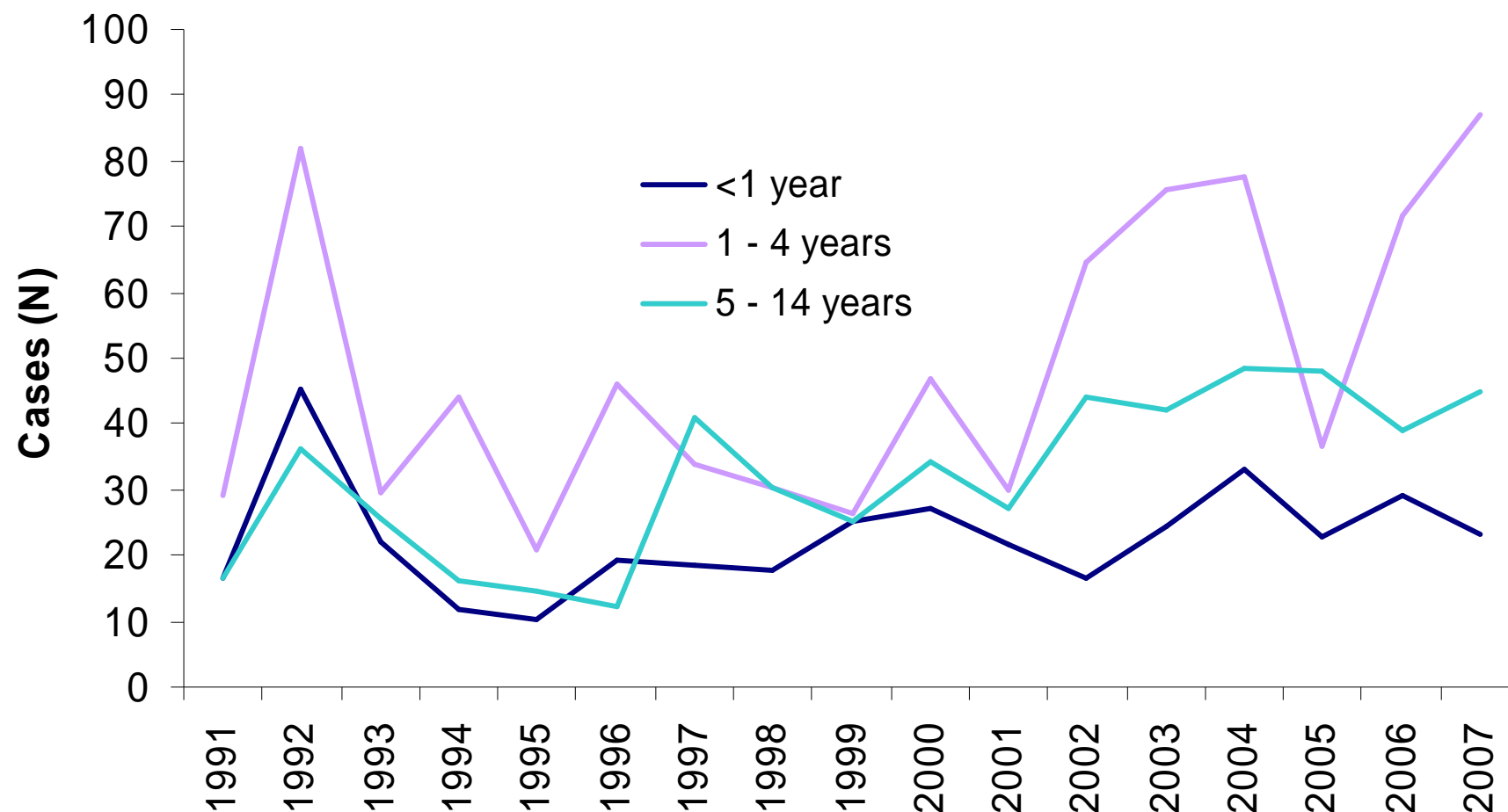
- **Incidence of invasive infections**
 - stable from 2006 (10.1 p.100 000) to 2007 (10.2 p. 100 000) (p=0,7)
 - stable for meningitis or bacteraemia, in all age classes
- Among infants < 2 years old, a decreasing trend is observed for meningitis since 2003 (after introducing PCV7)
- No evidence for an increase in invasive infections related to the decrease in antimicrobial consumption

EPIBAC : *Streptococcus pyogenes* (A)



**New case estimates (N), invasive infections,
by age, 1991 – 2007, France** (corrected for coverage)

EPIBAC : *Streptococcus pyogenes* (A)



New case estimates (N), invasive infections, by age, from 0 to 14 years, 1991 – 2007, France (corrected for coverage)

EPIBAC : *Streptococcus pyogenes* (A)

- **Since the end of the 90's : a increasing trend in the number of new cases of invasive infections. However:**
 - **observed in other European countries** [Lamagni TL et al. *Eurosurveillance* 2005]
 - **started before the national plan for a rational use of antibiotics**
 - **not specific of lower classes of age (infants)**
 - **related to particular strains with greater invasive capacity?**
- **Most recent trends (since 2000) : incidence of *Streptococcus pyogenes* invasive infections from 2005 to 2007 similar to those observed from 2000 to 2004 (1.6 cases p. 100 000) (p=0.5)**
 - **this is observed among all classes of age**
- **No evidence for an increase in invasive infections related to the decrease in antimicrobial consumption**

Conclusion

- **Temporal trends, by age and type of infection, at national level, for the most frequent community-acquired infections**
- **No evidence for an increase in invasive bacterial infections related to the decrease in antimicrobial consumption in France**
 - for *H. influenzae*, *S. pneumoniae*, *S. pyogenes* (A)
 - also for *S. agalactiae* (B), *N. meningitidis* (data not shown)
- **Questions**
 - what as the evidence for suspecting an increase in invasive bacterial infections, associated with a better antimicrobial use?
 - what studies should be implemented for analysing trends in other, less frequent bacterial infections?

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Acknowledgements

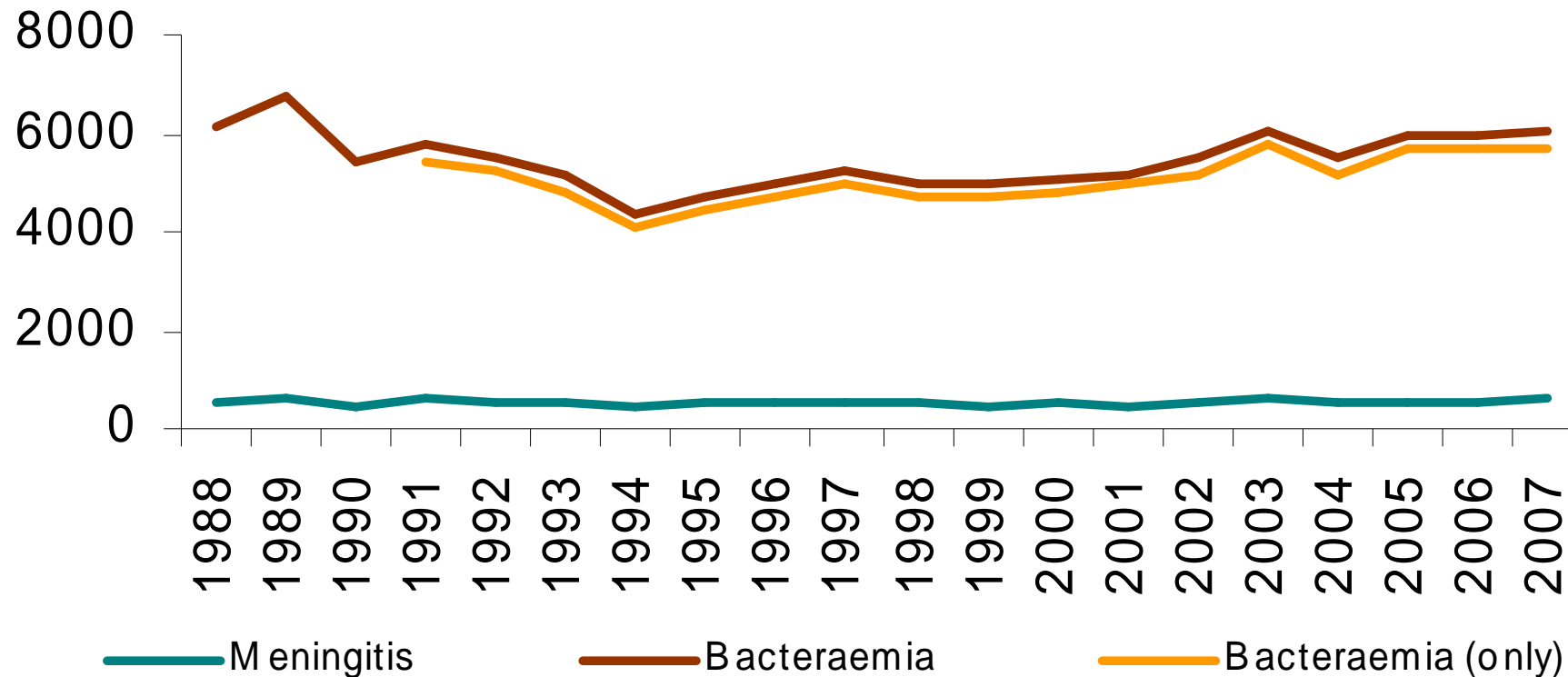
- InVS : S. Georges, A. Lepoutre, I. Parent, D. Levy-Bruhl, JC. Desenclos
- EPIBAC participating laboratories
- CNR Méningocoques
- all physicians and microbiologists who reported cases

EPIBAC : bacterial species

Bacterial species		Cases (N)		Incidence p. 100 000
		Corrected for coverage	Corrected for completeness	
<i>H. influenzae</i>	Meningitis	47	58	0.09
	Bacteraemia (only)	437	547	0.89
<i>S. pneumoniae</i>	Meningitis	529	662	1.07
	Bacteraemia (only)	5 671	7 089	11.52
<i>S. pyogenes</i>	Meningitis	15	19	0.03
	Bacteraemia (only)	961	1 202	1.95
<i>S. agalactiae</i>	Meningitis	122	153	0.25
	Bacteraemia (only)	1 777	2 221	3.61
<i>L. monocytogenes</i>	Meningitis	48	60	0.10
	Bacteraemia (only)	184	230	0.37
<i>N. meningitidis</i>	Meningitis	339	424	0.69
	Bacteraemia (only)	198	247	0.40

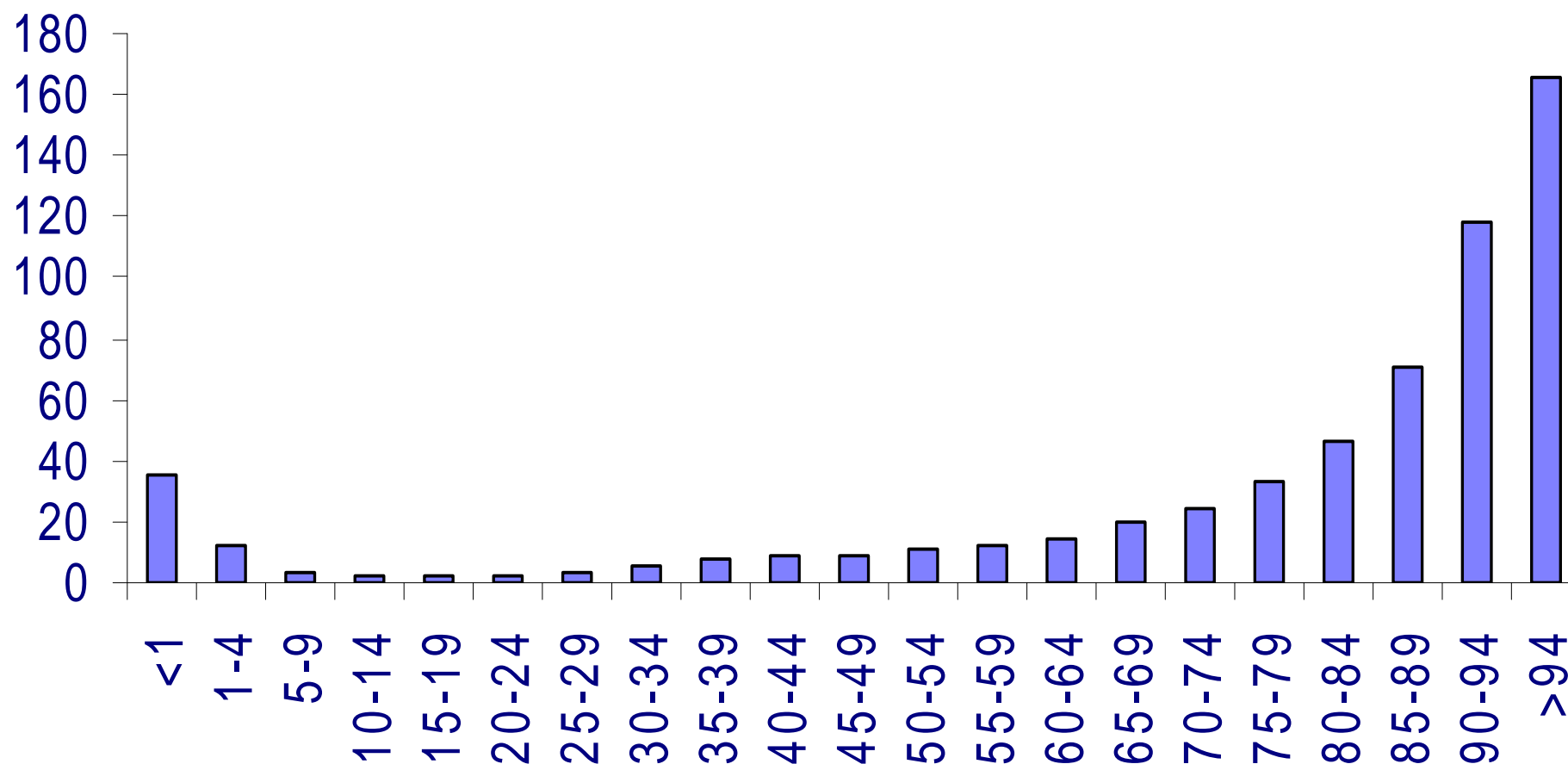
EPIBAC data, 2006, France

EPIBAC : *Streptococcus pneumoniae*



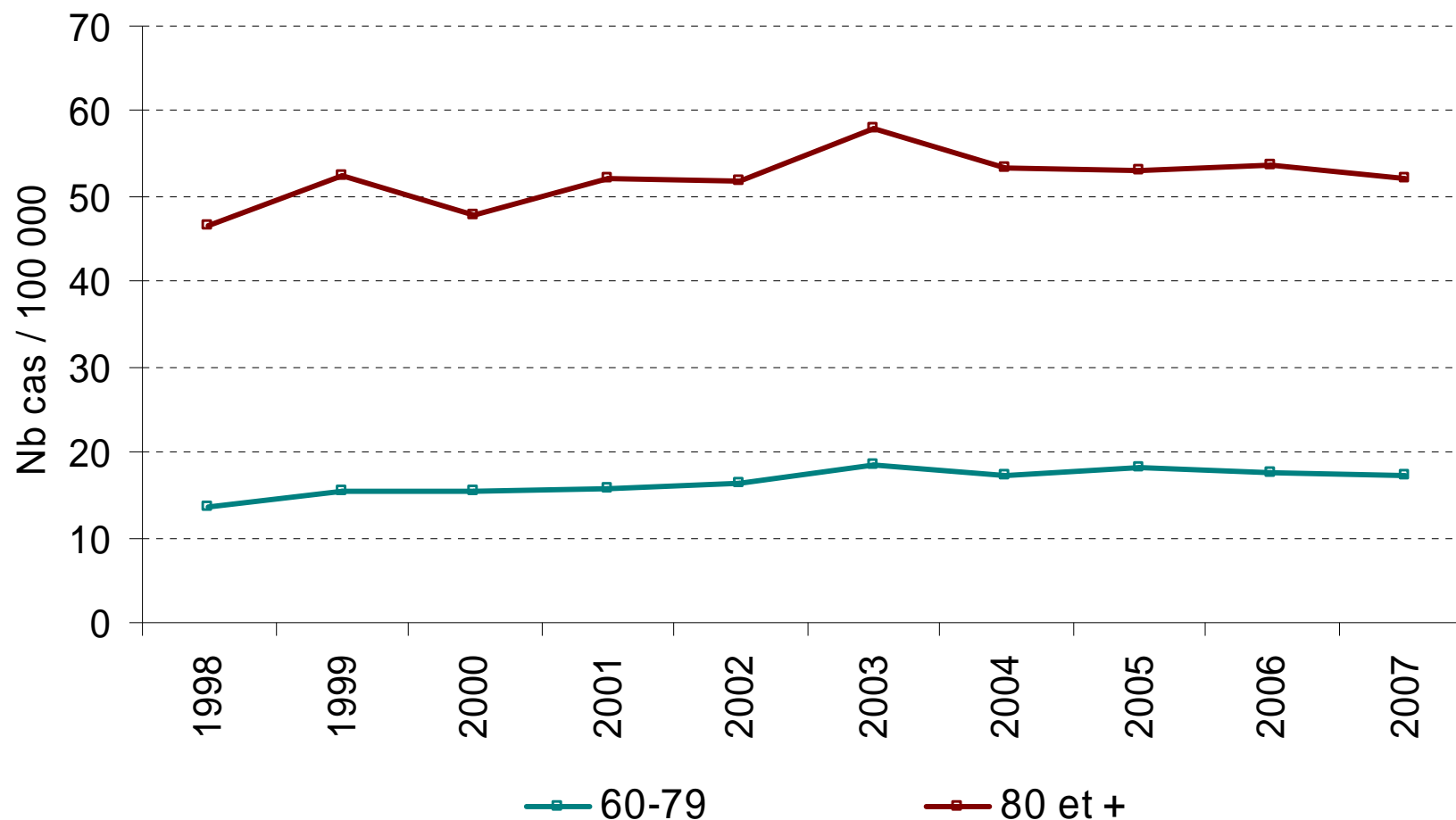
**New case estimates (N), invasive infections,
by type of infection, 1987 – 2007, France**

EPIBAC : *Streptococcus pneumoniae*



**Incidence of invasive infections, by class of age,
2007, France**

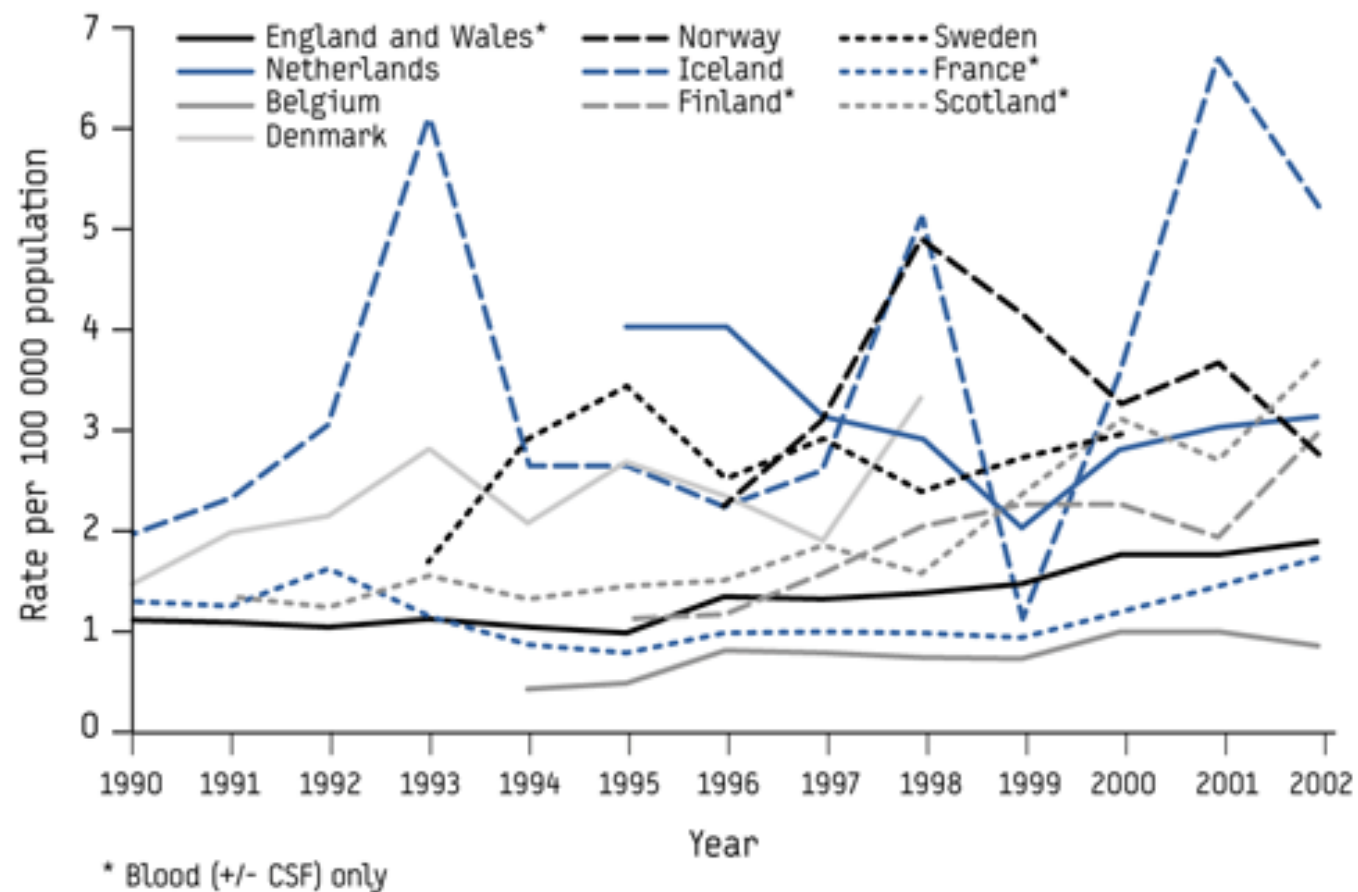
EPIBAC : *Streptococcus pneumoniae*



Incidence of invasive infections among persons > 60 years, 1998 – 2007, France (corrected for coverage and completeness of reporting)

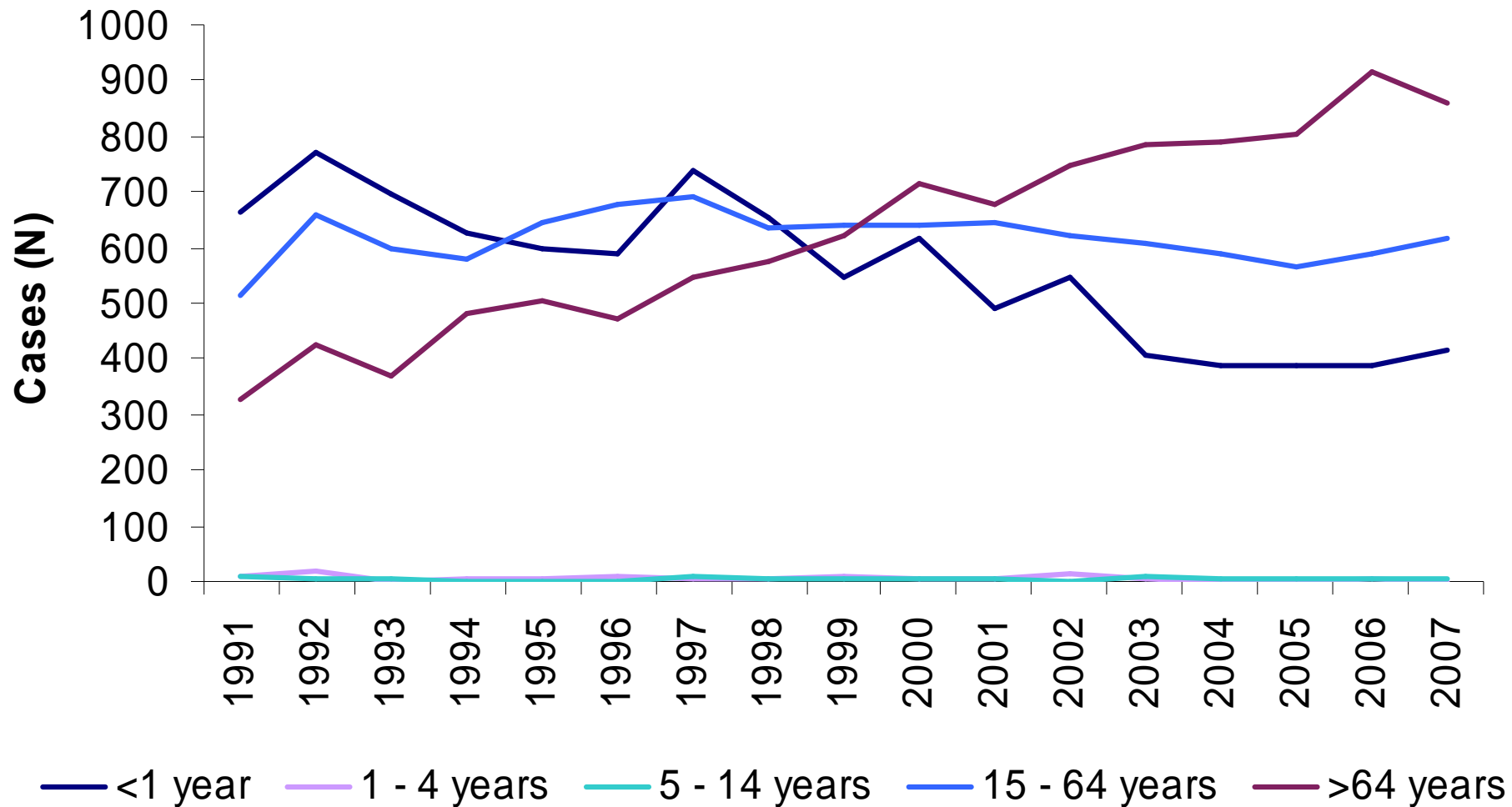
FIGURE 1

Country-specific annual rates of invasive group A streptococcal infection, 1990-2002



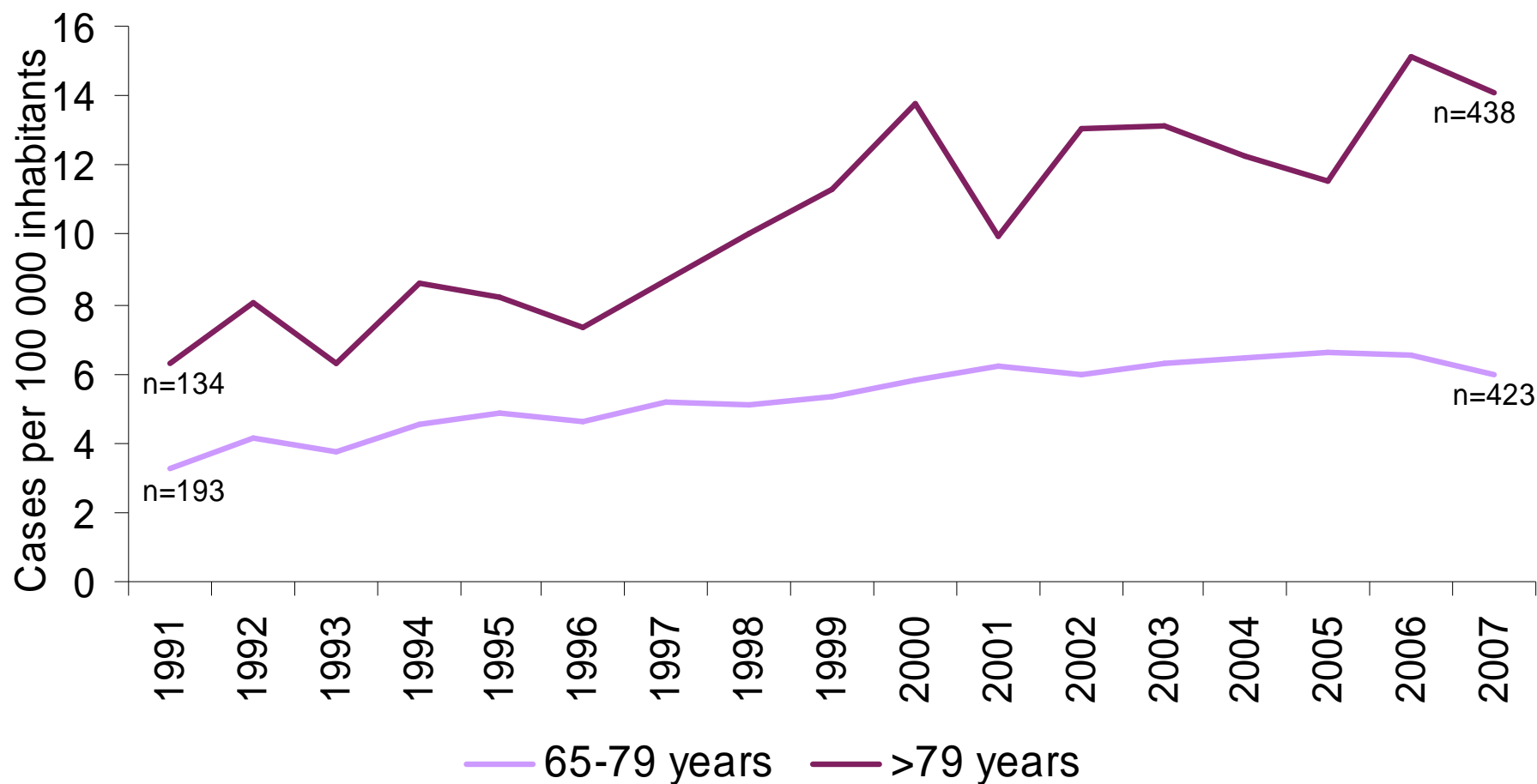
Lamagni TL et al. Euroroundup: The epidemiology of severe *Streptococcus pyogenes* associated disease in Europe. *Eurosurveillance* 2005; 10(9). <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=563>

EPIBAC : *Streptococcus agalactiae* (B)



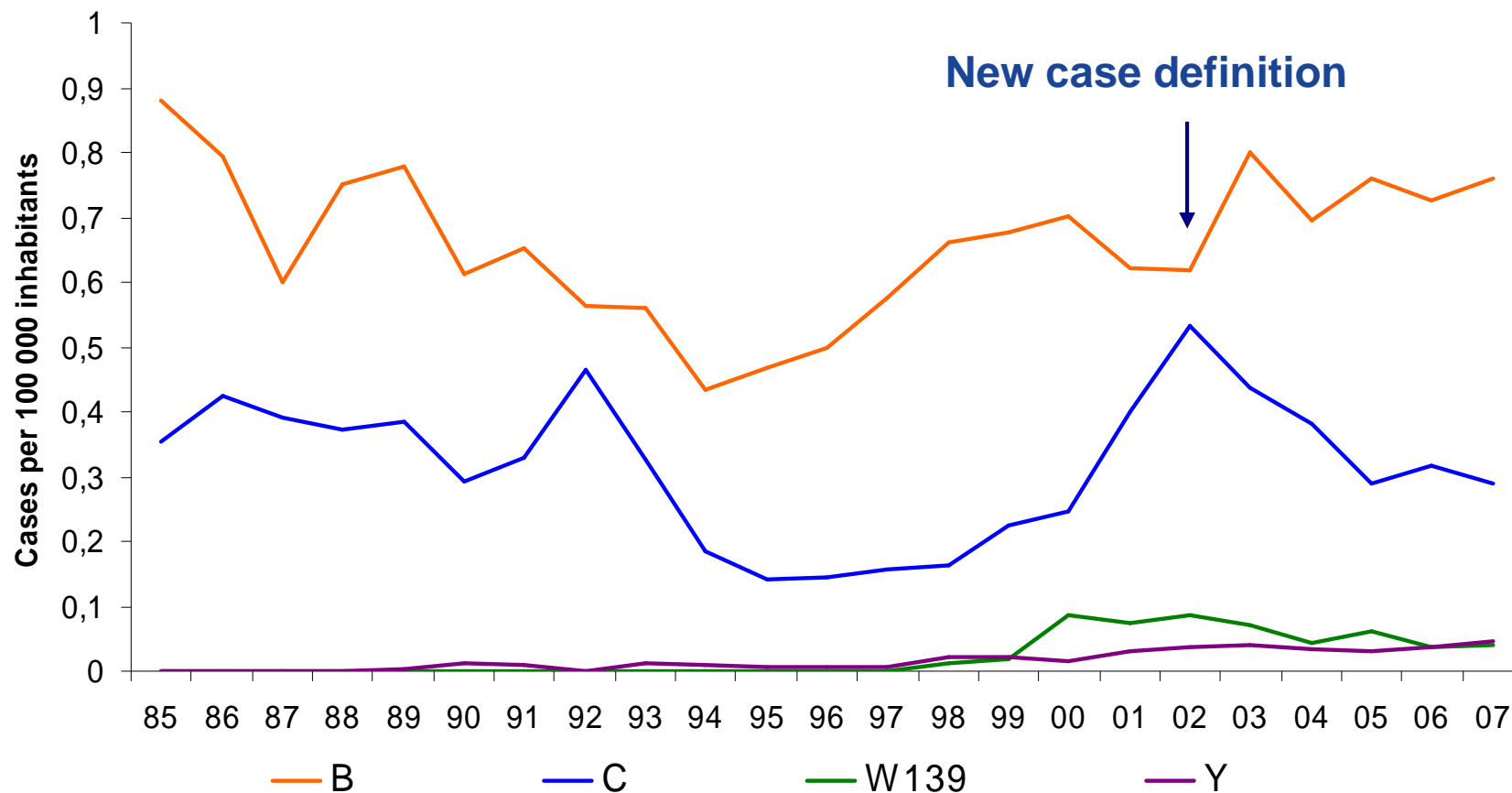
**New case estimates, invasive infections,
by age, 1991 – 2007, France** (corrected for coverage)

EPIBAC : *Streptococcus agalactiae* (B)



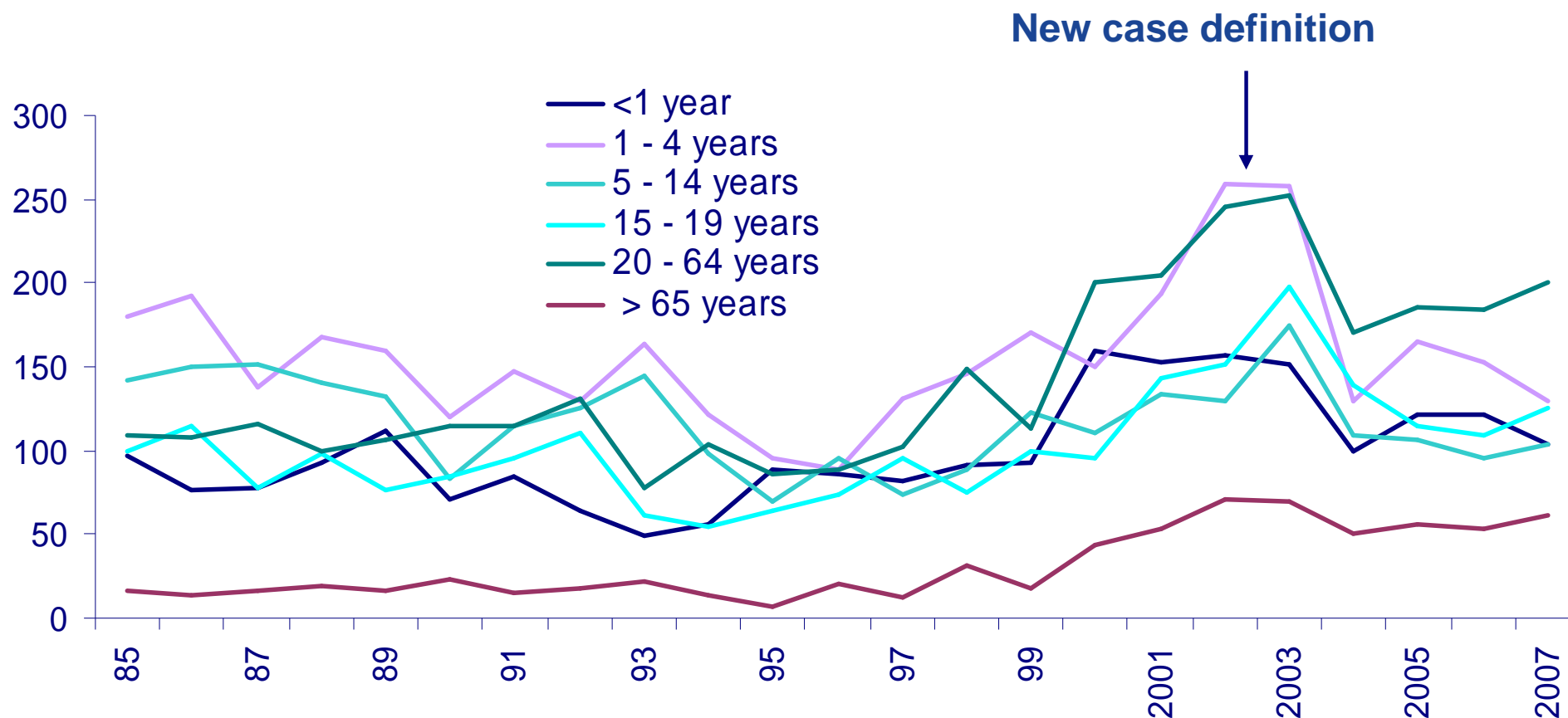
Incidence of invasive infections among persons > 65 years, 1991 – 2007, France (corrected for coverage)

DO, CNR : *Neisseria meningitidis*



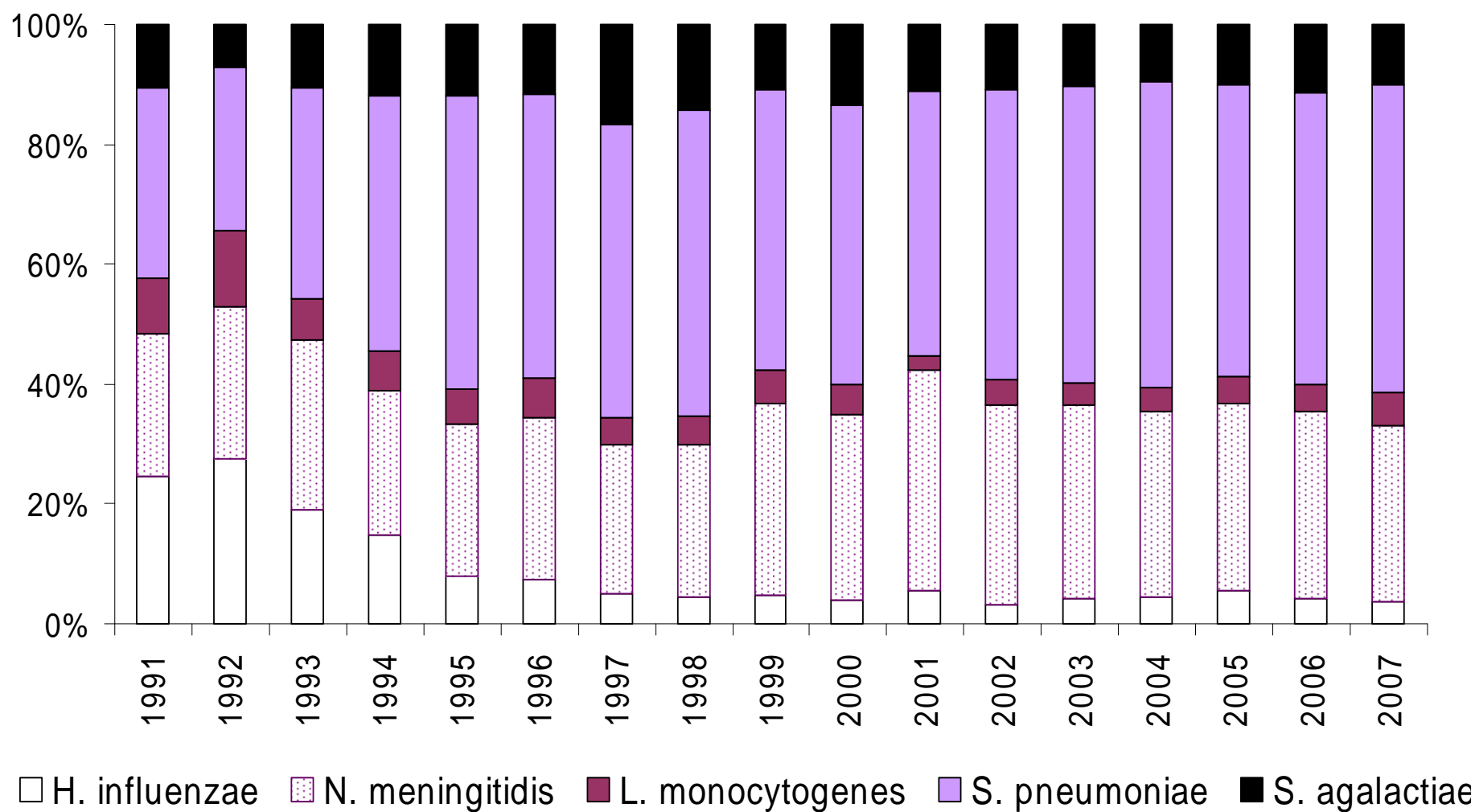
Incidence of *N. meningitidis* invasive infections, by serogroup, 1985 – 2007, France (corrected for completeness)

DO, CNR : *Neisseria meningitidis*



New cases of *N. meningitidis* invasive infections, by age, 1985 – 2007, France

Bacteria responsible for meningitis



EPIBAC data, 1991 – 2007, France