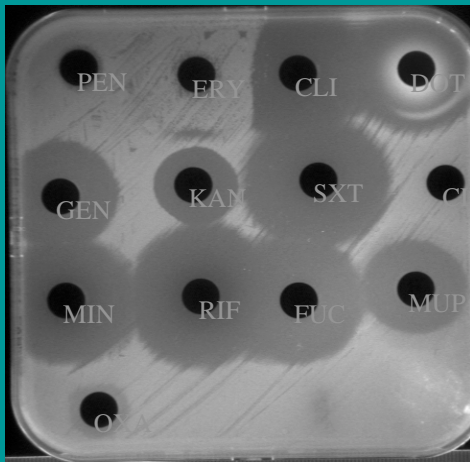


MRSA Control : Belgian policy



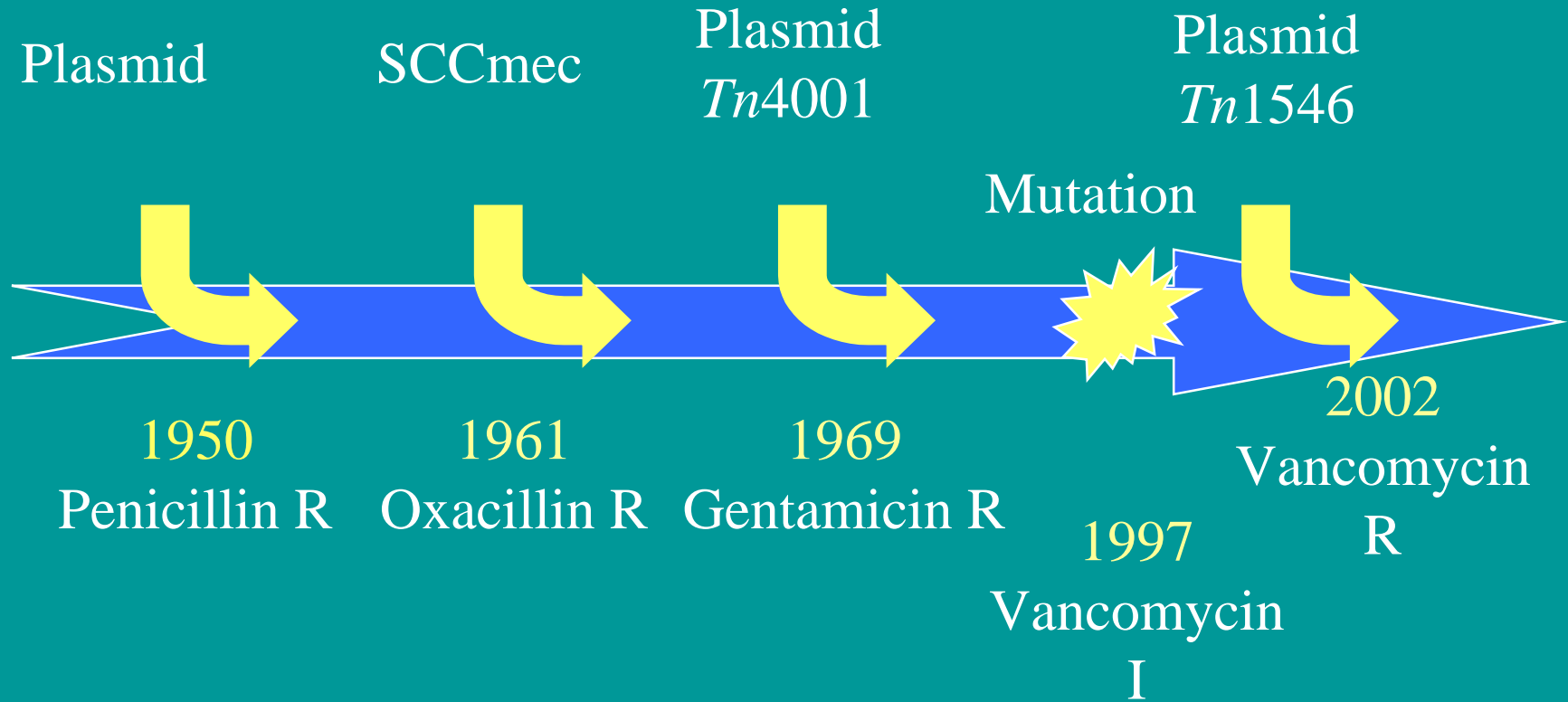
Marc Struelens

Service de microbiologie

& unité d'épidémiologie des maladies infectieuses

Université Libre de Bruxelles

The Ever More Resistant *Staphylococcus aureus*



Vancomycin-resistant *Staphylococcus aureus*: apocalypse now?

Dissemination in Japanese hospitals of strains of *Staphylococcus aureus* heterogeneously resistant to vancomycin

Keiichi Hiramatsu, Nanae Aritaka, Hideaki Hanaki, Shiori Kawasaki, Yasuyuki Hosoda, Satoshi Hori,



MMWRTM

Morbidity and Mortality Weekly Report

Weekly

July 5, 2002 / Vol. 51 / No. 26

***Staphylococcus aureus* Resistant to Vancomycin — United States, 2002**

Staphylococcus aureus is a cause of hospital- and community-acquired infections (1,2). In 1996, the first clinical isolate of *S. aureus* with reduced susceptibility to vancomycin was

appeared infected. VRSA, vancomycin-resistant *Enterococcus faecalis* (VRE), and *Klebsiella oxytoca* also were recovered from a culture of the ulcer. Swab cultures of the patient's healed

Epidemiologic importance of MRSA

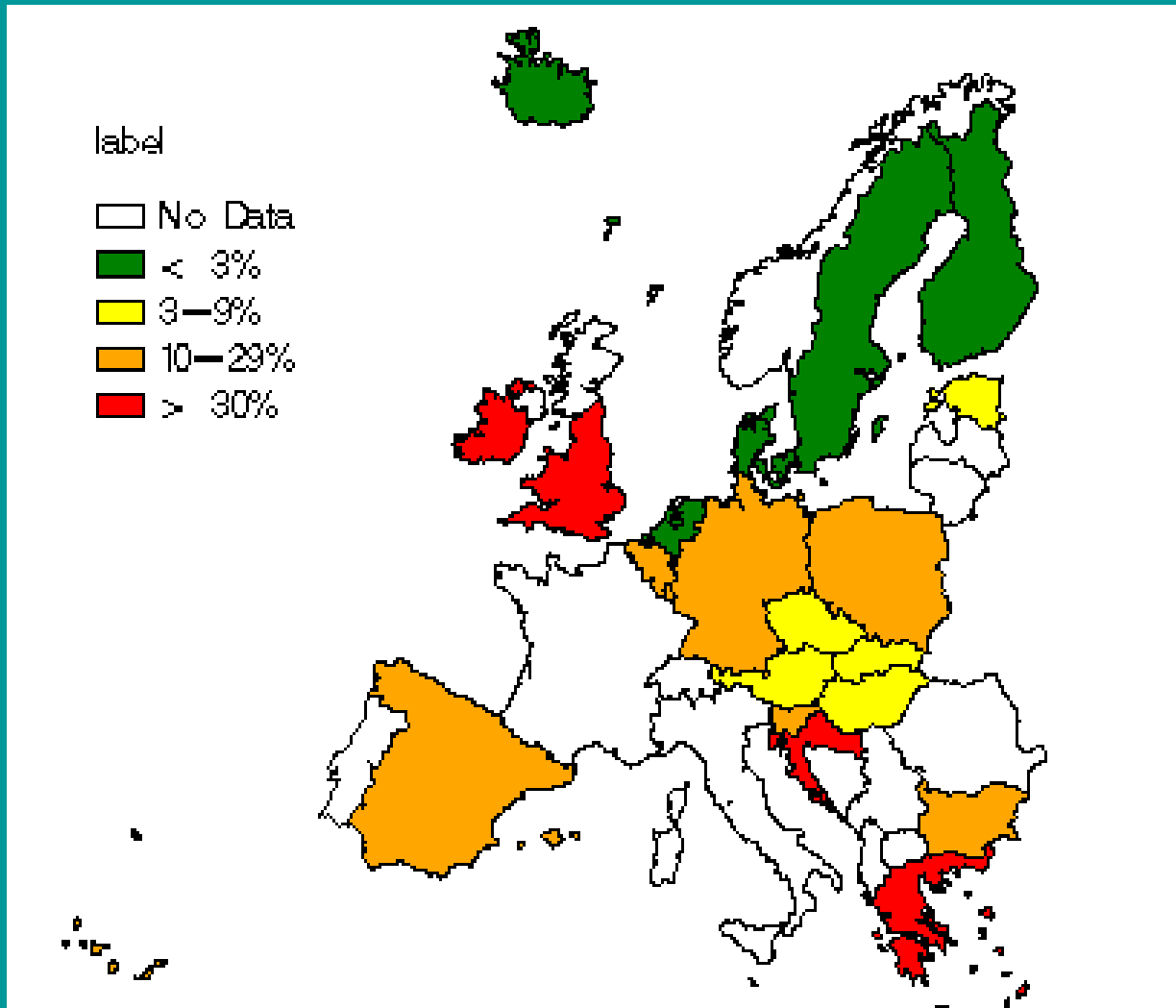
- Increased morbidity, mortality & cost
- Epidemic MRSA “adds” to overall nosocomial infection rate.
- Suboptimal outcome of vancomycin treatment
- Emergence of vancomycin-intermediate (1997) and vancomycin-resistant (2002) *S.aureus*
- Clonal variation in genomic island allotype : variation in fitness & virulence.
- Emergence of community acquired , hyper-virulent MRSA worldwide : meticillin resistance island *SCCmec* type IV
- Few controlled trials on efficacy of control measures.

Cost-benefit of controlling endemic MRSA in an ICU

Chaix *JAMA* 1999; 282:1745

- **Setting:**
 - 26-bed medical ICU in French univ.hospital
 - 4% MRSA carriage on admission
 - Mean cost of MRSA infection \$ 9 275 (8.5 extra-ICU days)
- **Study:** matched case-control (n=27 MRSA infections)
- **Intervention**
 - screening of carriers, isolation precautions
 - Cost (screening & precautions): \$ 340-1 480 /patient
- **Conclusion:** Cost-beneficial strategy for MRSA prevalence 1-6 % if transmission decreased by > 14 %

Proportion MRSA in *S. aureus* bacteremia : EARSS 2001



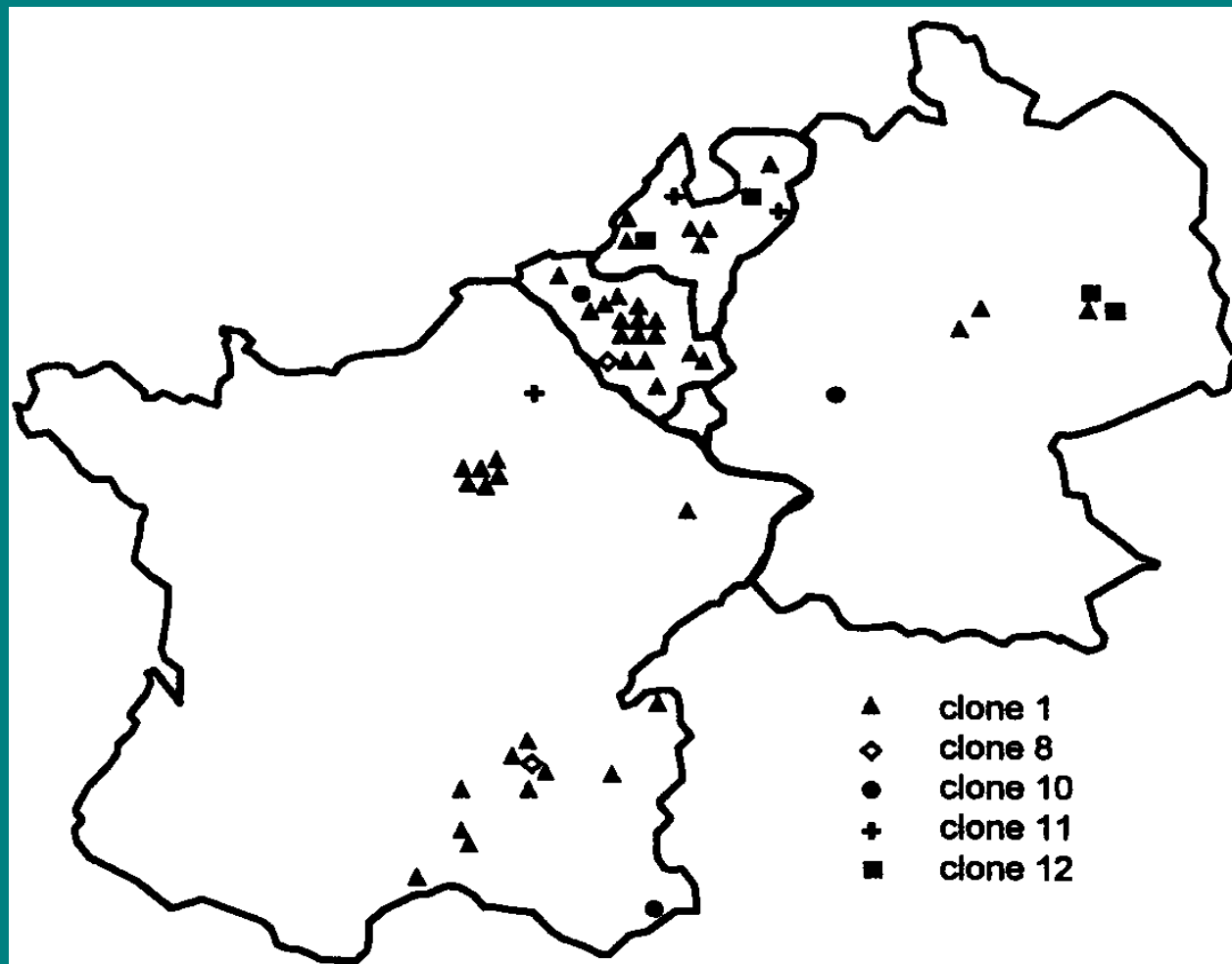
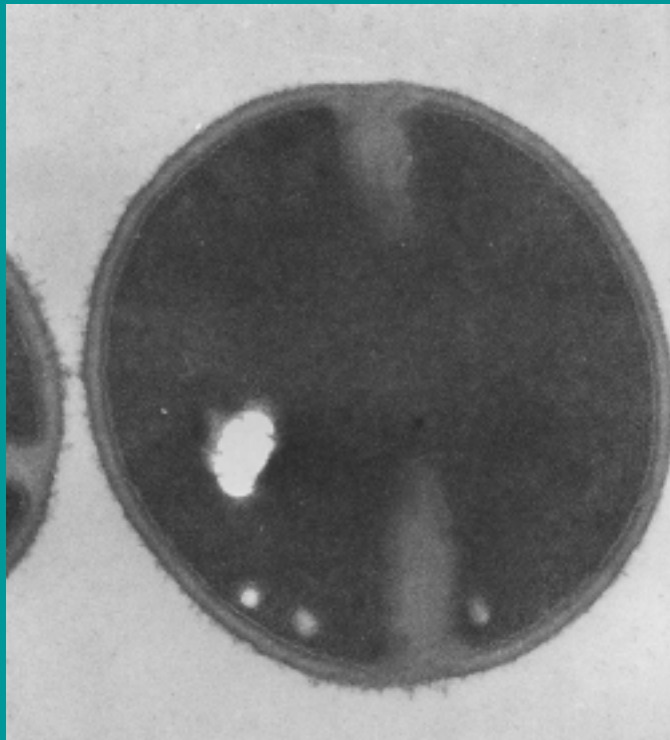


Figure 2 Map of Belgium, France, Germany and The Netherlands, indicating the area of dissemination of international epidemic MRSA clones.

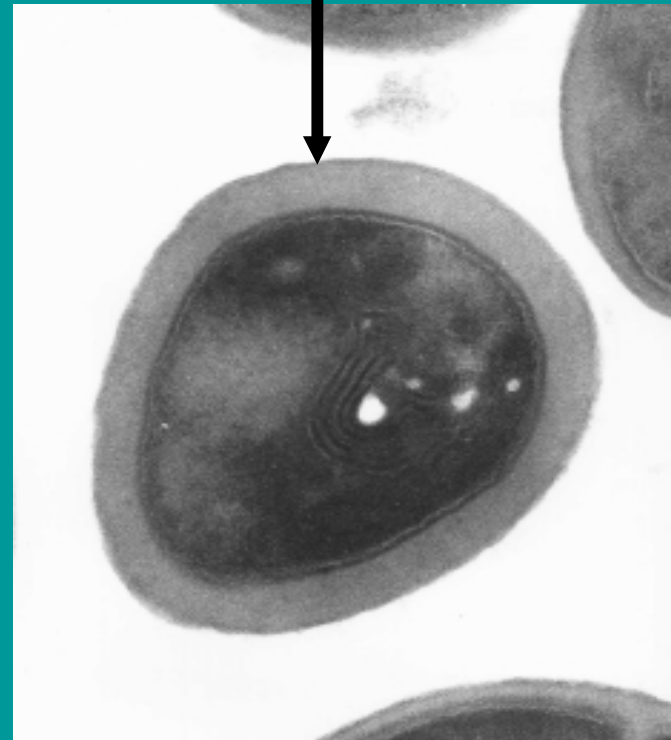
Emergence of GISA in Belgian hospital

Electron microscopy of VISA strain

(X 60.000 magnification)



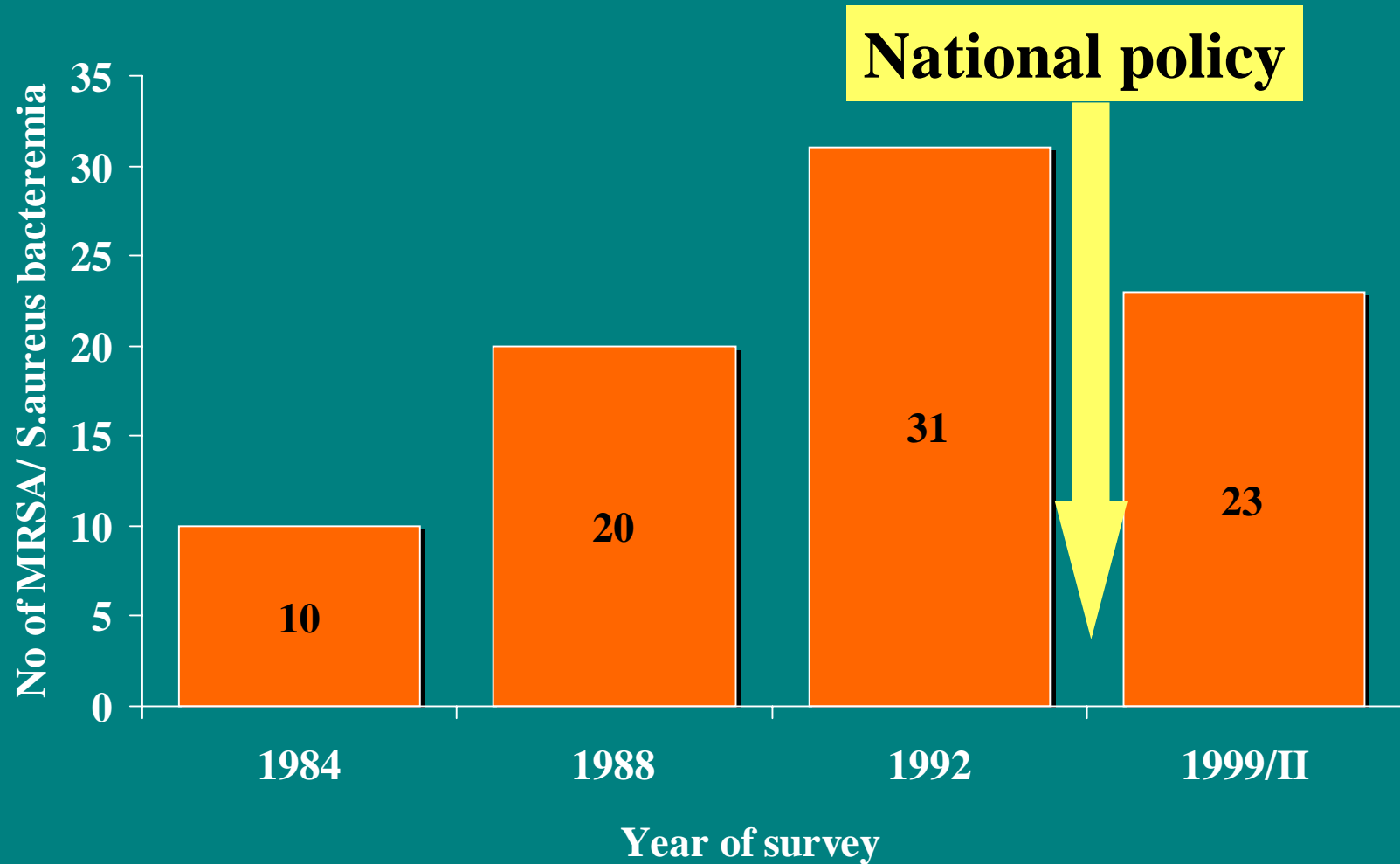
ATCC29213



P1V44 strain

Denis J Antimicrob Chemother 2002;50:383

Mean meticillin resistance of *S.aureus* National bacteremia surveys in Belgium, 1984-1999



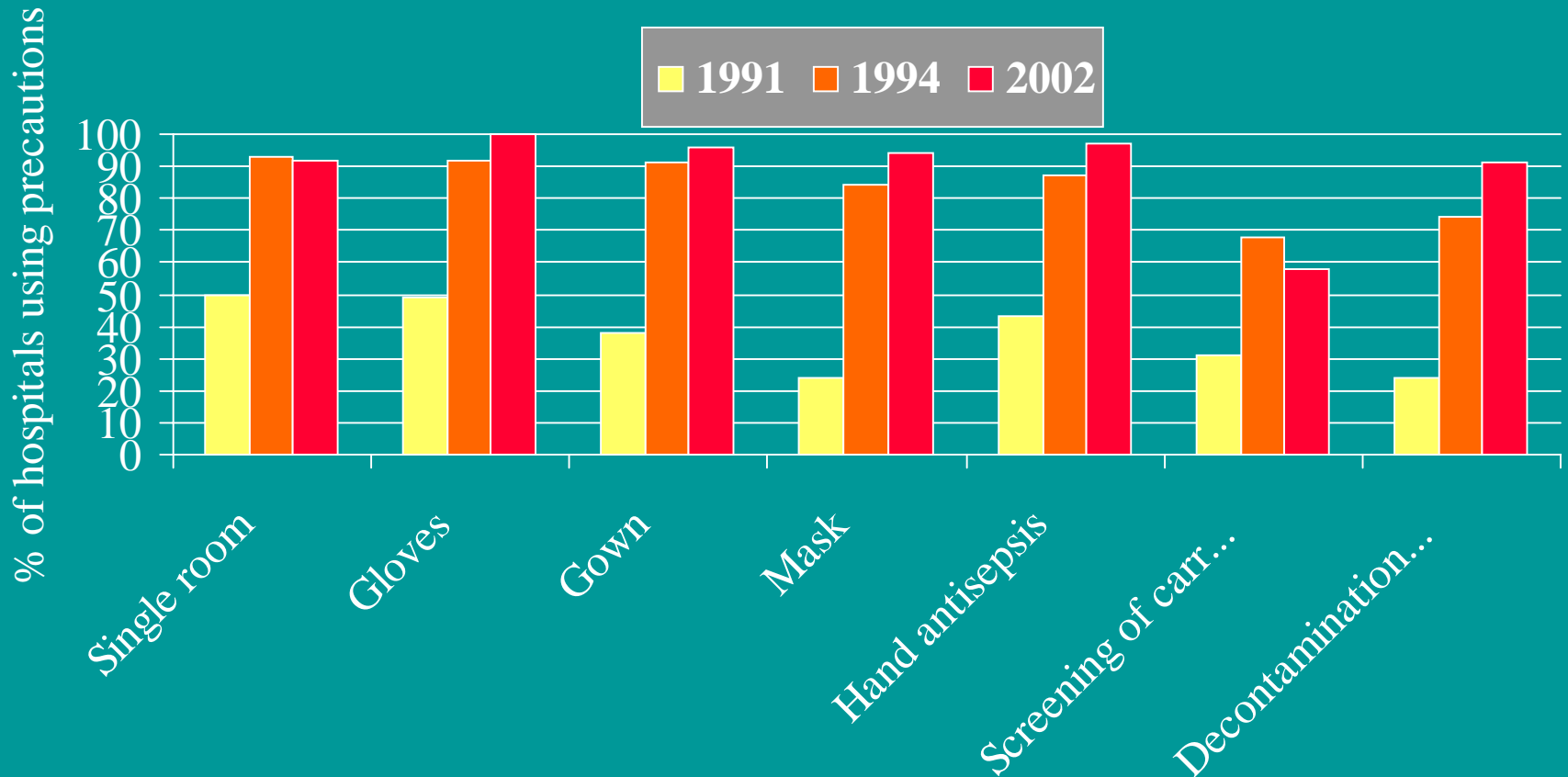
Reference Staphylococci Lab ULB & ISP-WIV /GDEPIH-GOSPIZ MRSA programme

Guidelines for the control and prevention of transmission of MRSA in Belgian hospitals

GDEPIH-GOSPIZ Consensus Conference; Higher Council for Health, 1993
Acta Clinica Belgica 1994;49:63

- Local evaluation of the clinical importance & epidemiology of MRSA
- Identification & elimination of the MRSA reservoir
- Patient isolation and barrier precautions
 - Isolation of known carriers and transferred patients.
 - Individual room preferred, or cohorting.
 - Gloves, gown, mask; alcohol-based hand disinfection
- Removal of linen and waste as ‘contaminated’
- Communication within and between healthcare institutions

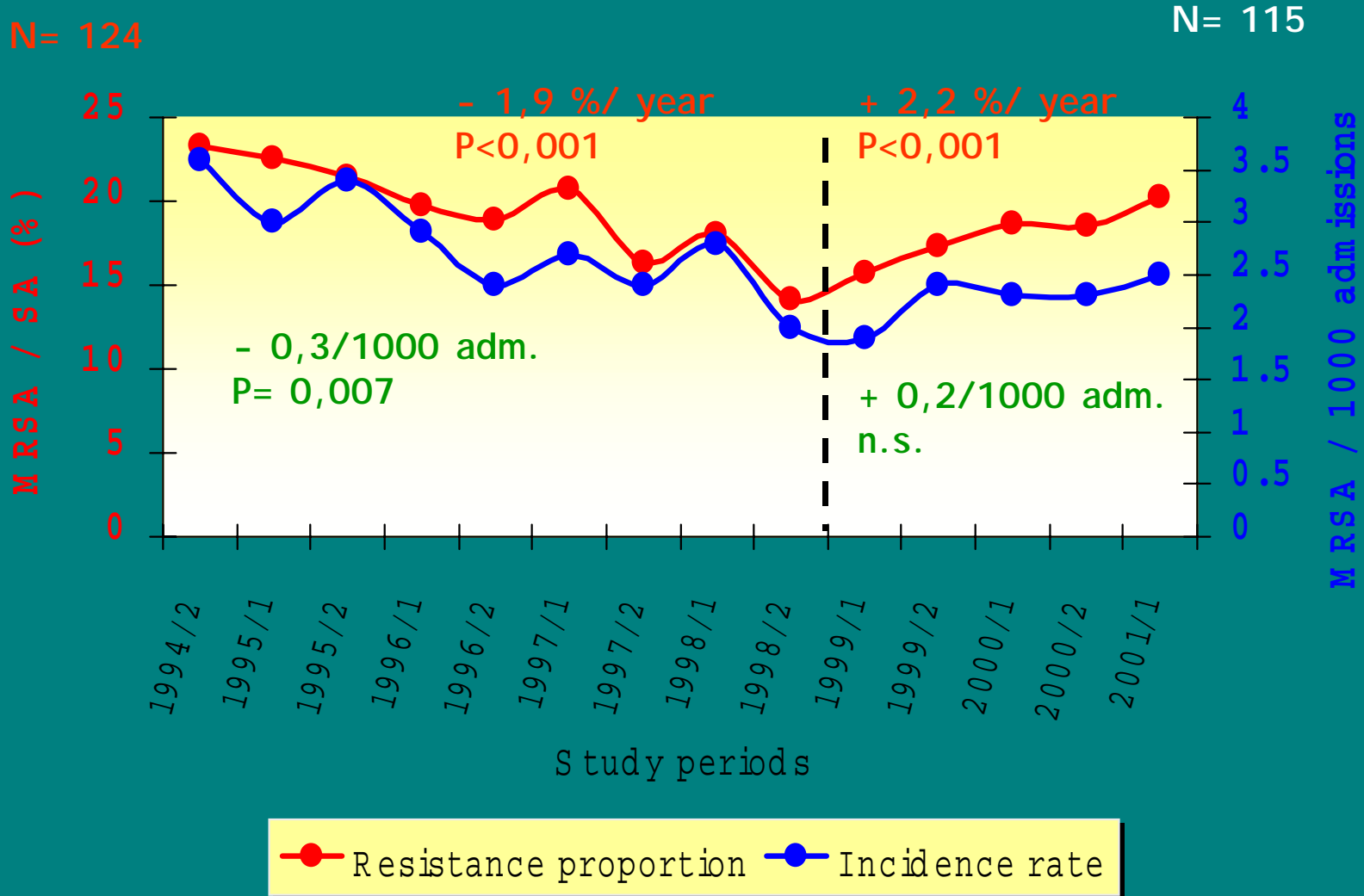
Adoption of national MRSA 1994 recommendation, Belgian hospitals policy changes, 1991-2002



National surveillance of nosocomial MRSA infections in Belgium

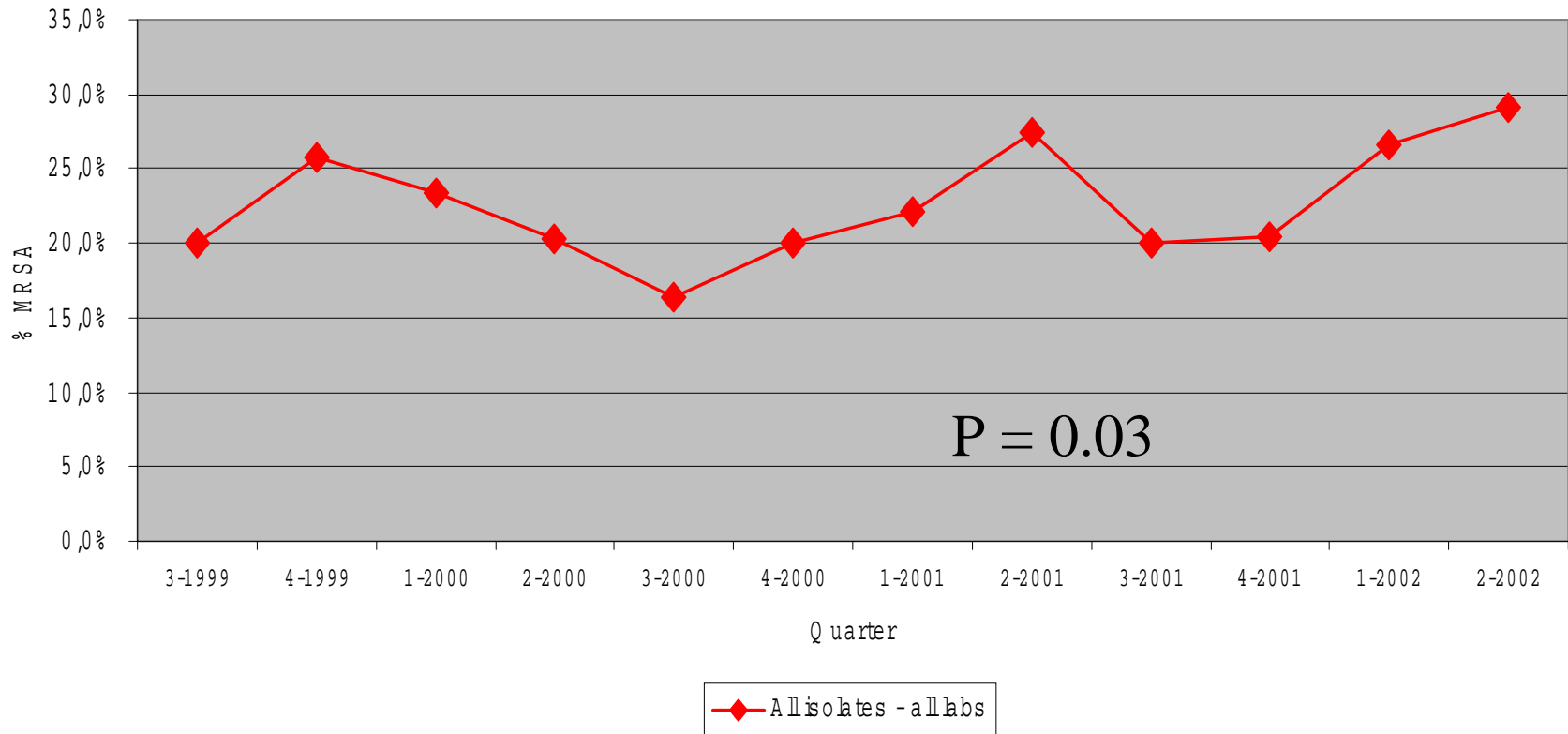
- Network of voluntary participants by 157 (79 %) Belgian hospitals: coordinated by GDEPIH-GOSPIZ; ISP; ULB-Ref Lab for staphylococci
- Since 1992: Bi-annual analysis of MRSA strains : molecular typing to track regional epidemics and antibiotic resistance
- Since 1994: Semi-annual report on prevalence and incidence for monitoring infection control measures
- Since 1999: Continuous bacteremia surveillance (EARSS)

Semestrial prevalence and nosocomial incidence of MRSA, all participants, 1994-2001



E A R S S - B e l g i u m

Percent M R S A 07/1999 - 06/2002

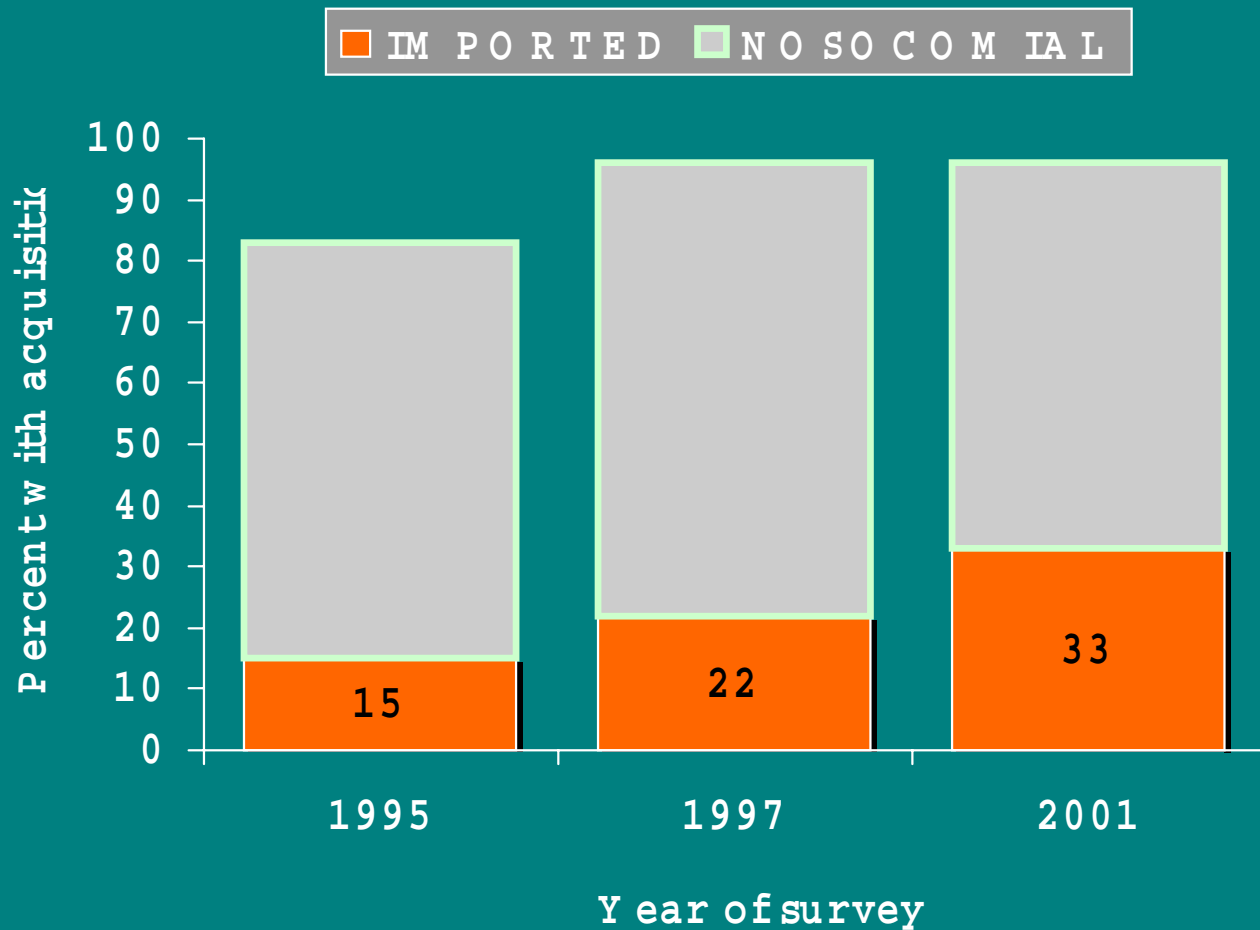


ISP / ULB MRSA Lab Ref; Hendrickx, Denis et al, unpublished.

Rapport incidence noso/importés



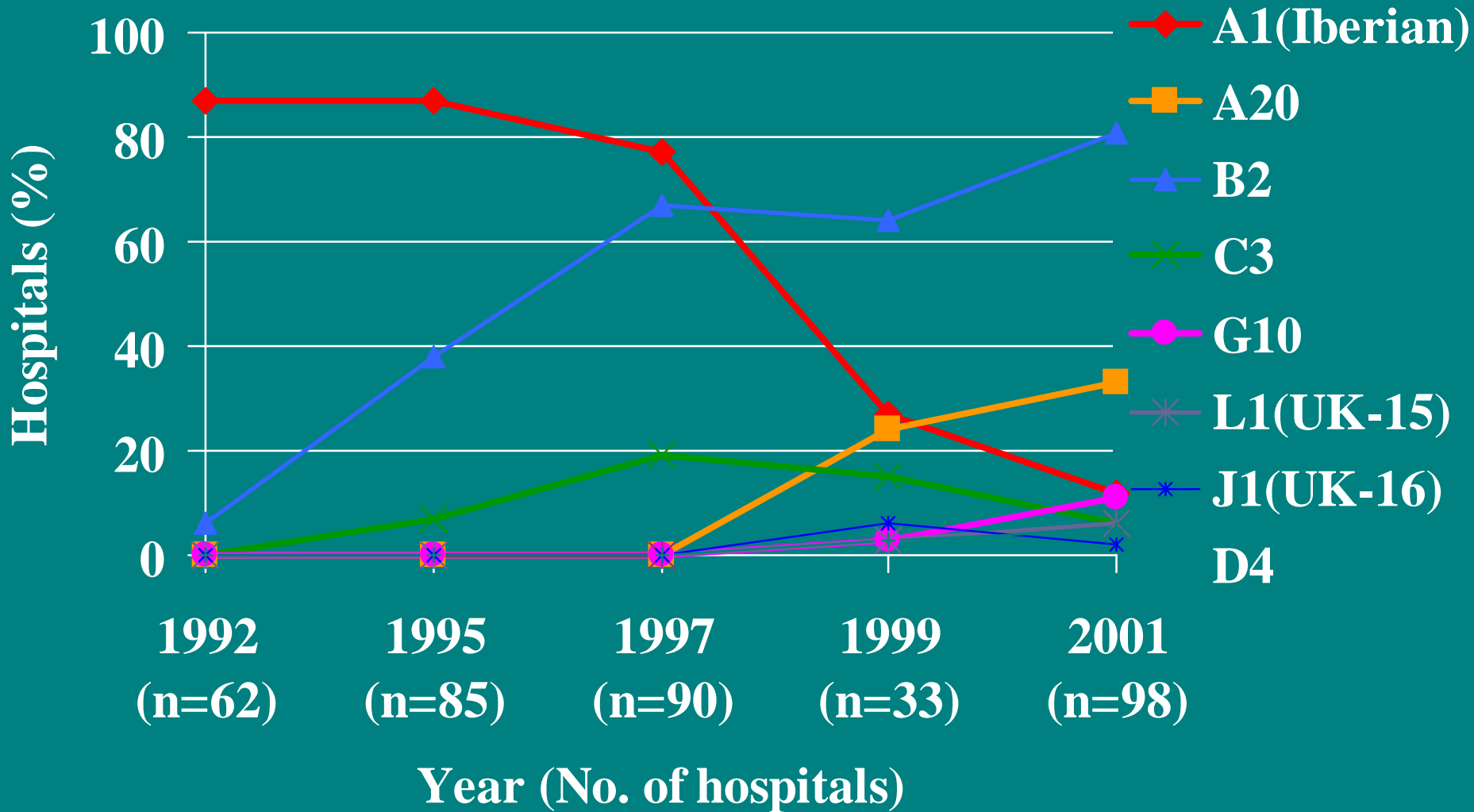
Proportion of Nosocomial vs imported MRSA, National surveys in Belgium, 1995-2001



Reference Staphylococci Lab ULB & ISP-WIV /GDEPIH-GOSPIZ MRSA programme

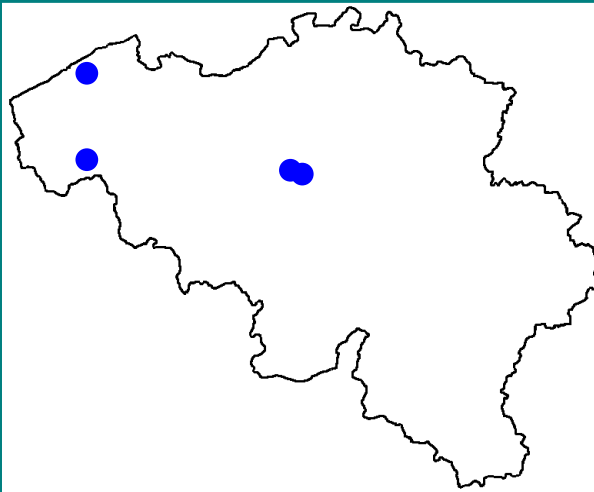
National Surveillance by PFGE Typing

MRSA Surveys, Belgium, 1992-2001

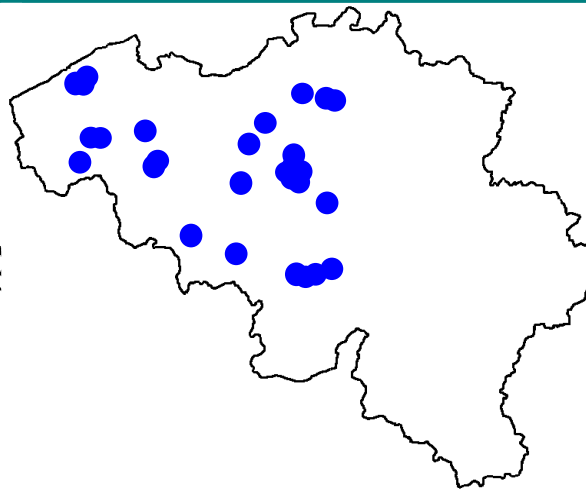


Evolution of the geographical distribution of epidemic MRSA clone B2 in Belgian hospitals

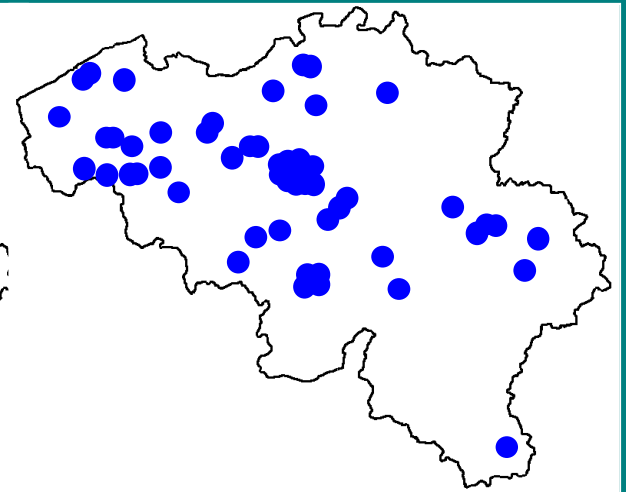
1992



1995

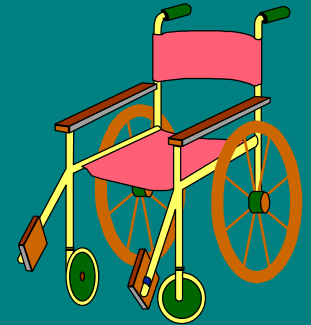


1997



Epidemiology of MRSA in Flemish Nursing Homes

Hoefnagels-Schuermans *ICHE* 2002;23:546



- Cross-sectional survey of 17 nursing homes in Flanders, 1997:
- 4.9 % prevalence of MRSA carriage
- PFGE: predominance of clone B2 (77 % of total; epidemic in 5 institutions) and clone C3

Why a recrudescence of MRSA ?

- Emergence and introduction of new (more ?) epidemic clones
- Increased reservoir of chronically-ill, elderly carriers
- Nursing home reservoirs ?
- Community reservoirs ?
- Faltering screening efforts ? Cost containment, adverse effects
- Adherence to policy by healthcare workers ??
- Increased patient turnover and transfer
- Shortage of skilled nursing personnel
- Increased antibiotic pressure

What should we do to curb MRSA ?

- Continued surveillance in hospitals
- Improved MRSA detection methods (CMD)
- Antibiotic policy : antibiotic management team (2002)
- Improved communication among health care workers
- Epidemiologic surveys in nursing homes and the community
- Update of national guidelines (2003)
- Promotion of hand hygiene
- Multi Center Trials of control strategies (6th FP)

A lot has been done ... but much more is needed !

Acknowledgements

- **ULB**

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- **GDEPIH-GOSPIZ**

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