

Multiresistente bakterier

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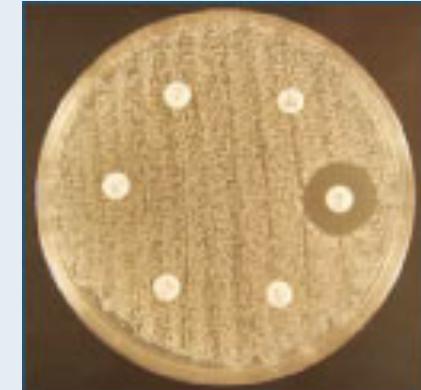


Multi-resistente bakterier

- Bakterier kan være medfødt resistente eller have erhvervet resistens
- Multiresistente bakterier har erhvervet resistens overfor flere grupper af antibiotika

Multi-resistente bakterier

- MRSA (methicillin-resistente *S. aureus*)
- VRE (vancomycin-resistente enterokokker)
- Carbapenemase-producerende Gram-negative
(*Pseudomonas aeruginosa*, *A. baumannii*,
enterobakterier)

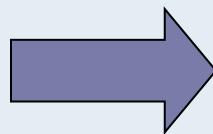


Multiresistente bakterier

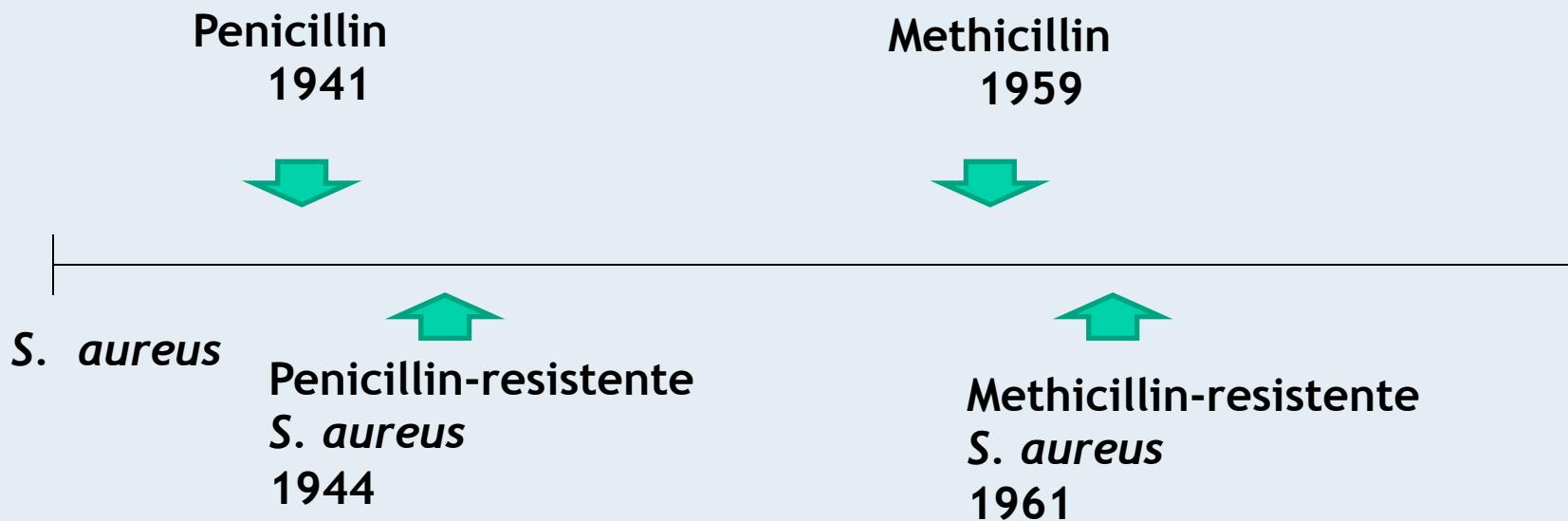
	MRSA	VRE	ESBL	Carba-penemaser
Naturligt habitat	Næse	Tarm	Tarm	Tarm
Bærertilstands-behandling	Ja	Nej	Nej	Nej
Kontakt-smitte	Kontakt-smitte	Kontakt-smitte	Kontakt-smitte	Kontakt-smitte
Alternative antibiotika	Ja	Få	Ja	?

Betydning af multiresistente bakterier

- Begrænsede behandlingsmuligheder
- Øget liggetid
- Øget sygelighed
- Øget dødelighed



Øgede sundhedsomkostninger

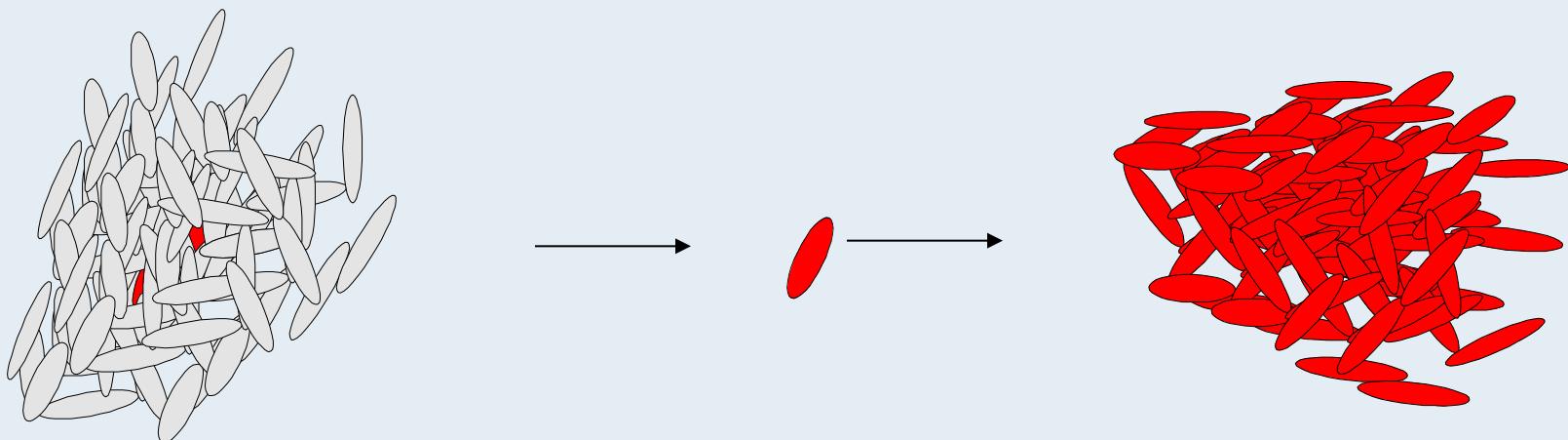


Selektion af resistant population

1/10.000.000 er resistant

Antibiotikabehandling

Resistant population
tager over





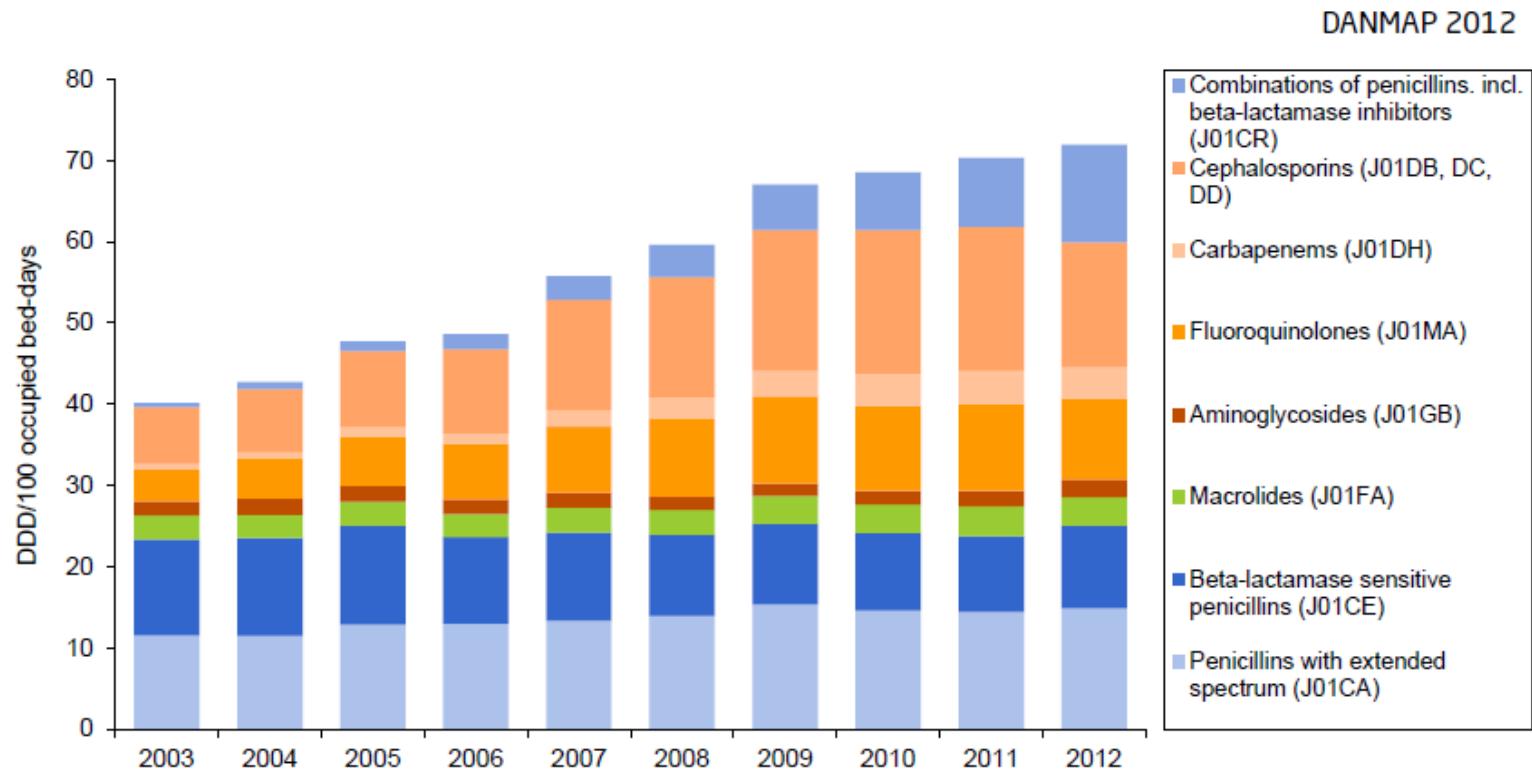
*"The more you use it,
- the faster you lose it"*

Burke JP, Lancet 1995;345:977



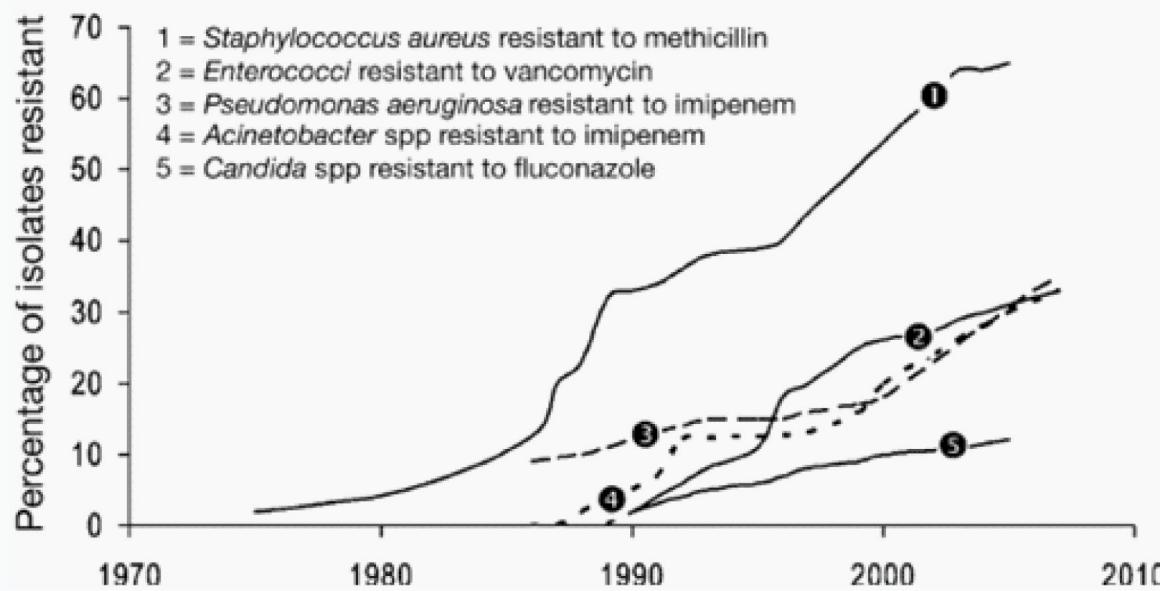
Antibiotika-forbruget i DK

Figure 5.15. Total somatic hospital consumption (DBD) by leading groups of antimicrobial agents (J01), Denmark



Antibiotika-resistens i USA

Antimicrobial Resistance for Selected Pathogens over Time



CID 2011

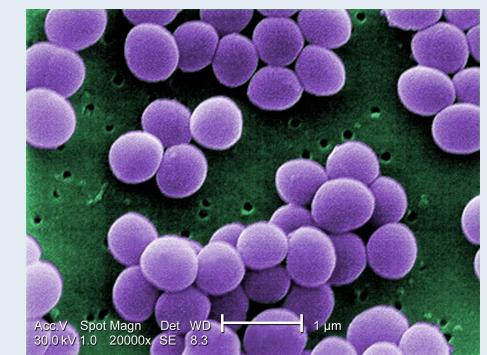
MRSA

Methicillin-resistente *Staphylococcus aureus*

S. aureus

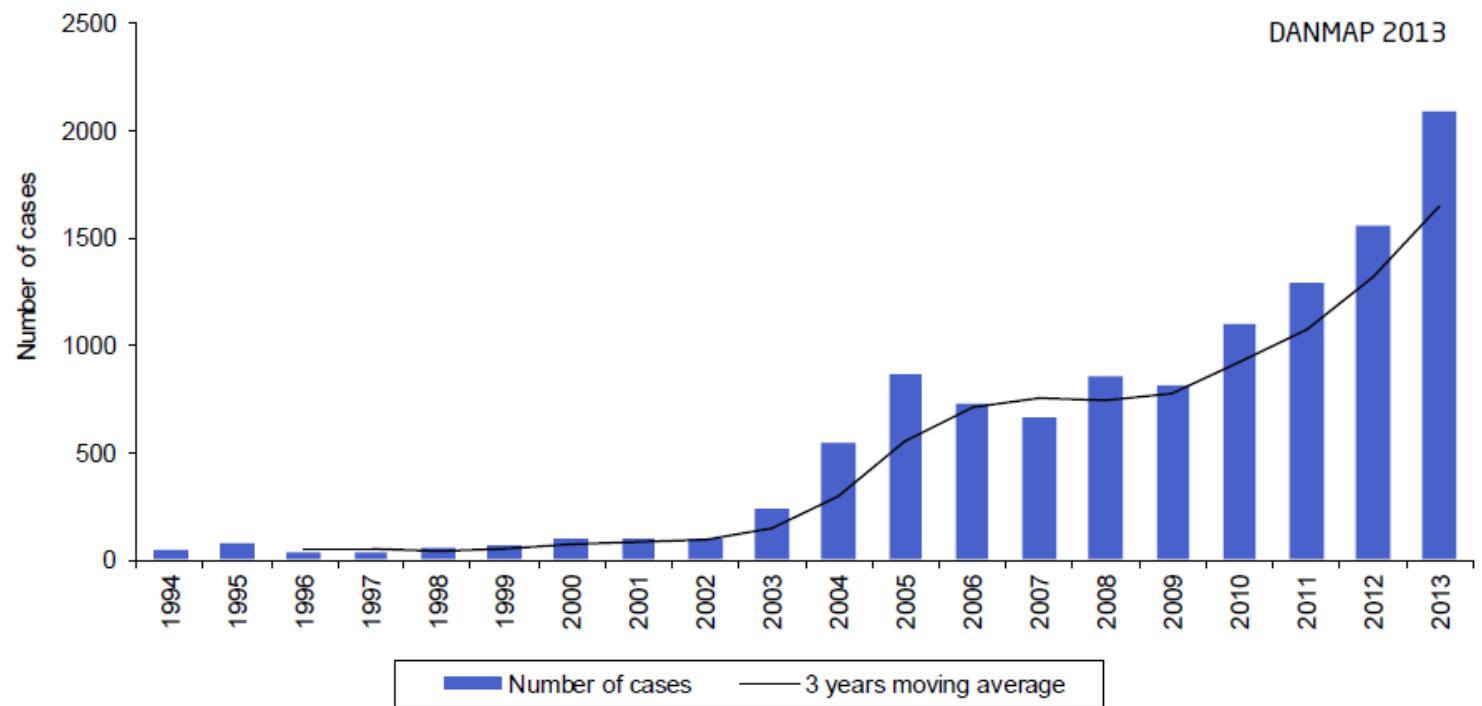
Klinik

- Del af normal hud- og slimhinfeldflora
- Infektioner i hud, knogler, led, hjerteklapper
- Infektioner relateret til fremmedlegemer, CVK, proteser



Nye MRSA-tilfælde i DK

Figure 8.9. Number of MRSA cases, with a three years moving average, Denmark



DANMAP 2013

Epidemiologisk fordeling af nye MRSA

Figure 8.10. Number of MRSA infections according to epidemiological classification, Denmark

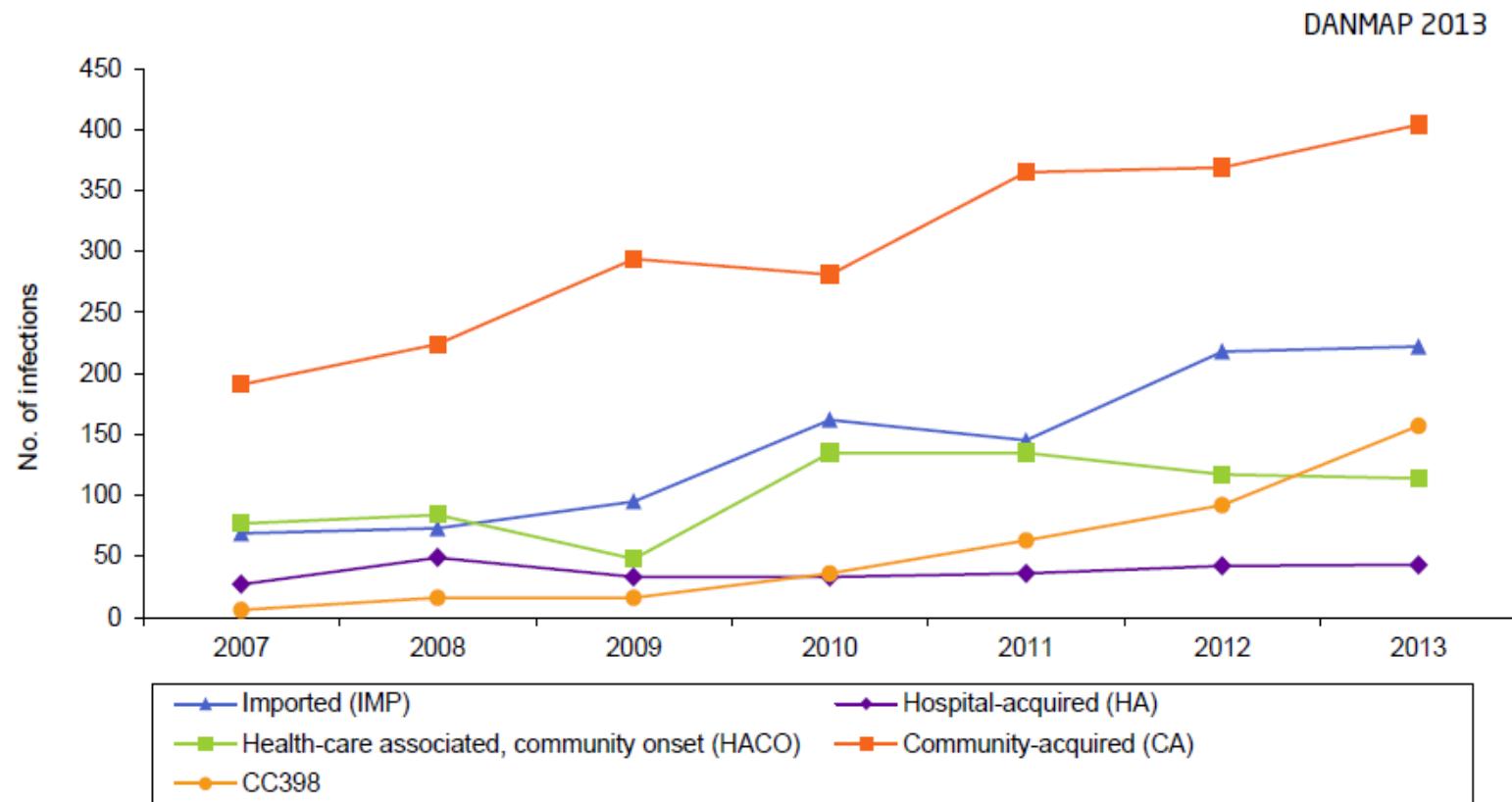
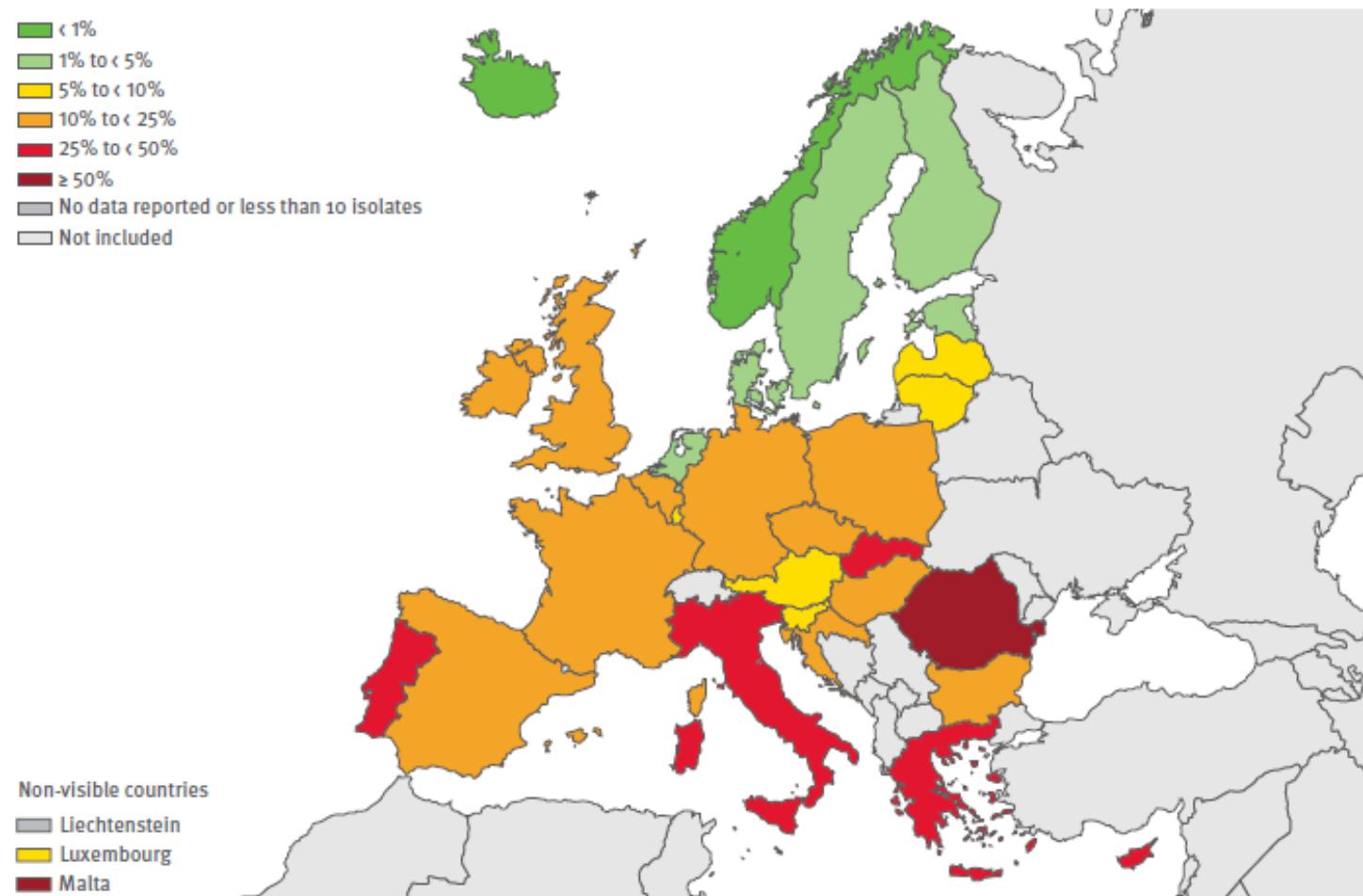


Figure 3.23. *Staphylococcus aureus*. Percentage (%) of invasive isolates resistant to meticillin (MRSA), by country, EU/EEA countries, 2013



VRE

Vancomycin-resistente enterokokker

Enterokokker

- Del af normalflora (fra tarm)
- Relativ apatogen; giver især sygdom hos svækkede, ptt med iv-devices og dræn
- Naturlig resistente overfor en række antibiotika (kinoloner, cefalosporiner)
- Smitte: kontaktsmitte

VRE

- Vancomycin (glykopeptid-) resistens erhverves via mobile genetiske elementer
- som kan spredes klonalt og horisontalt

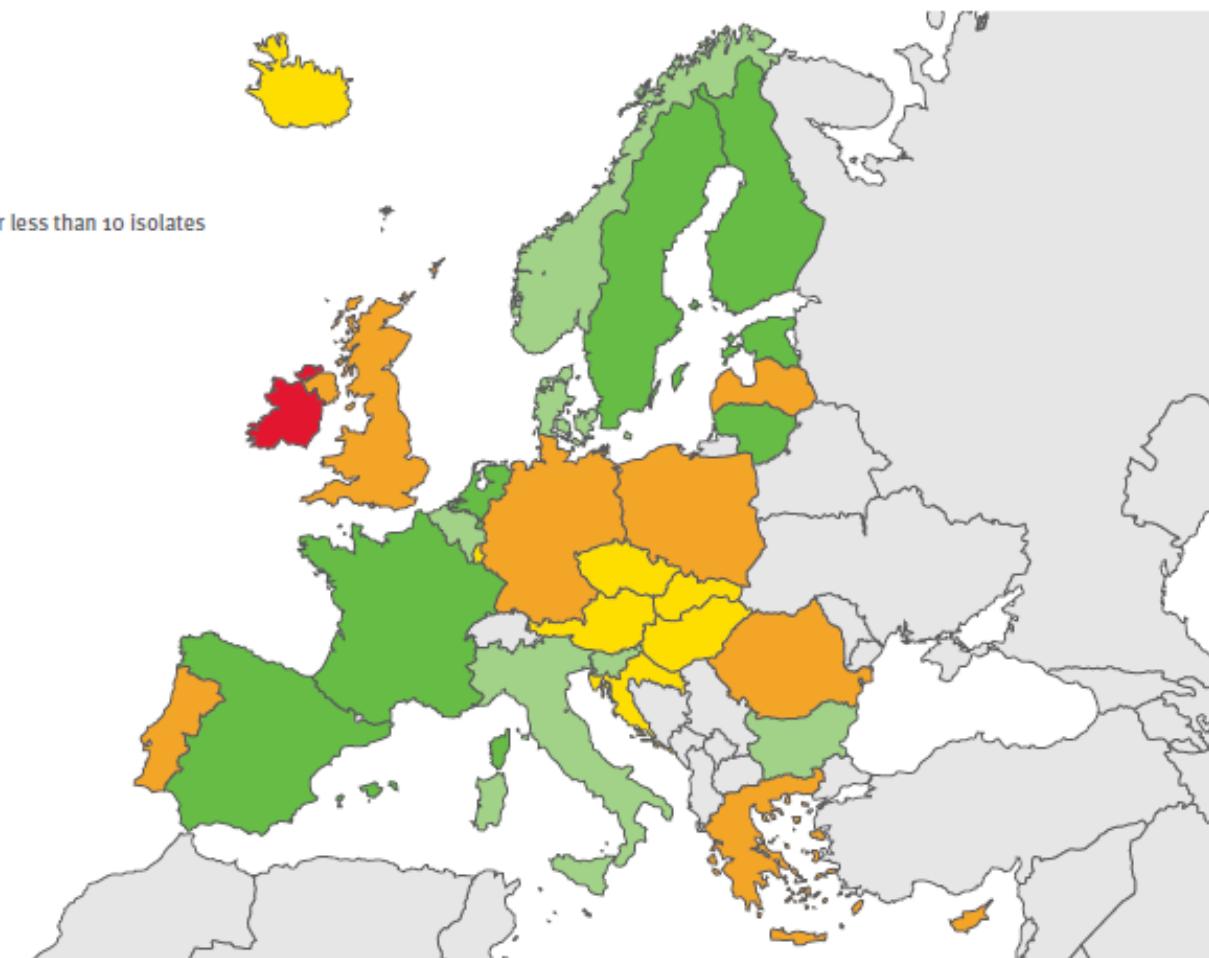
PROBLEMER

- Svært at behandle infektioner
- Ingen bærertilstandsbehandling

Figure 3.25. *Enterococcus faecium*. Percentage (%) of invasive isolates resistant to vancomycin, by country, EU/EEA countries, 2013

- < 1%
- 1% to < 5%
- 5% to < 10%
- 10% to < 25%
- 25% to < 50%
- ≥ 50%
- No data reported or less than 10 isolates
- Not included

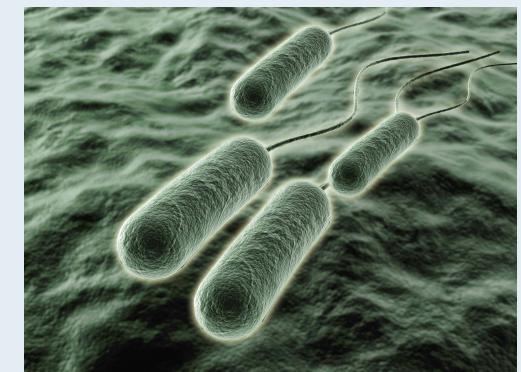
Non-visible countries
■ Liechtenstein
■ Luxembourg
■ Malta



Carbapenemaser

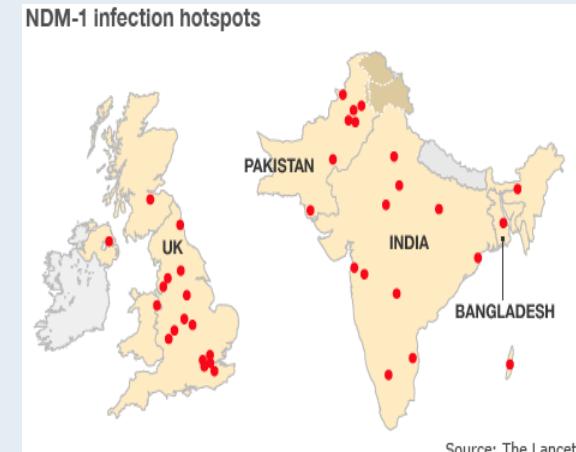
Carbapenemaser

- Enzymer der spalter næsten alle penicilliner, cephalosporiner og carbapenemer (meropenem, ertapenem, doripenem, imipenem)
- Ses hos *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, enterobakterier
- Har ikke nedsat fitness
- Pan-resistente isolater rapporteres i stigende omfang

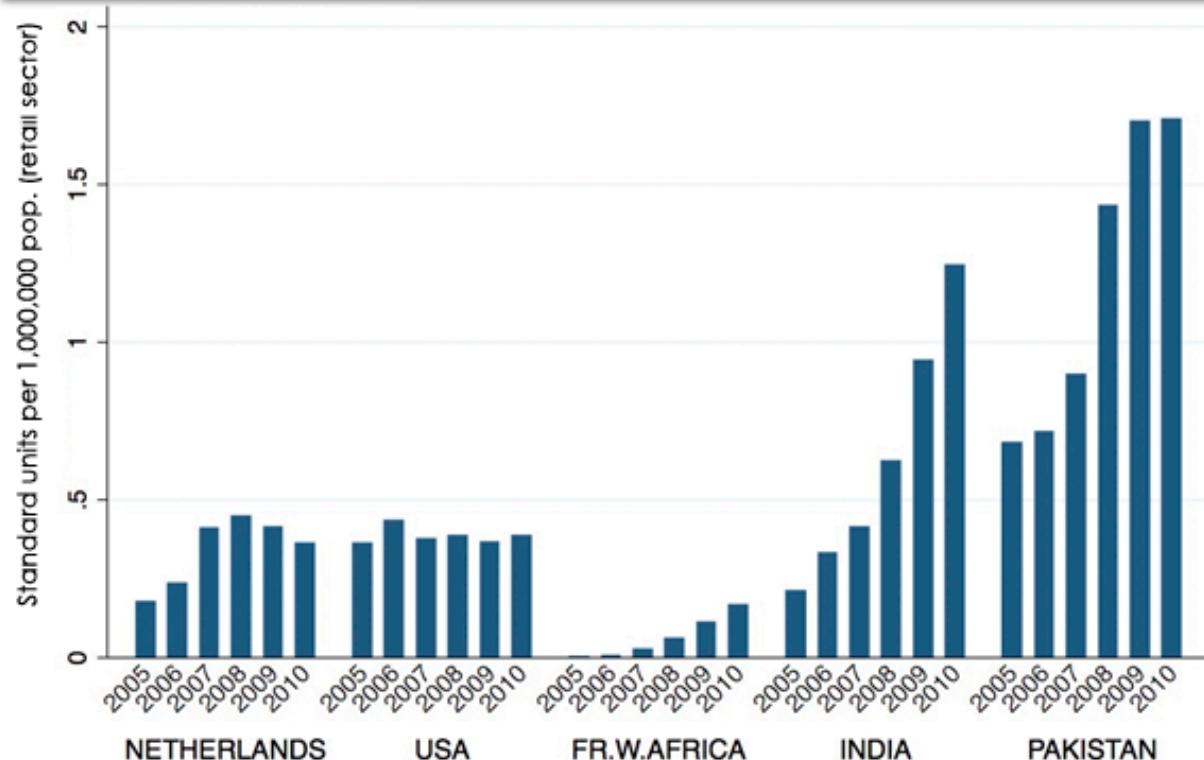


NDM

- New Delhi Metallo-betalactamase
- Resistens kan overføres (via plasmider) mellem forskellige bakterier
- Kan være resistent overfor alle kendte antibiotika
- 1. danske tilfælde i Århus 2010



Retail sales of carbapenem antibiotics to treat Gram-negative bacteria are increasing rapidly in India and Pakistan



Source: Based on data obtained under license from IMS Health MIDAS™(January 2005 - December 2010). IMS Health Incorporated. All Rights Reserved.



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Nedsat meropenem-følsomhed hos *K. pneumoniae* i Europa

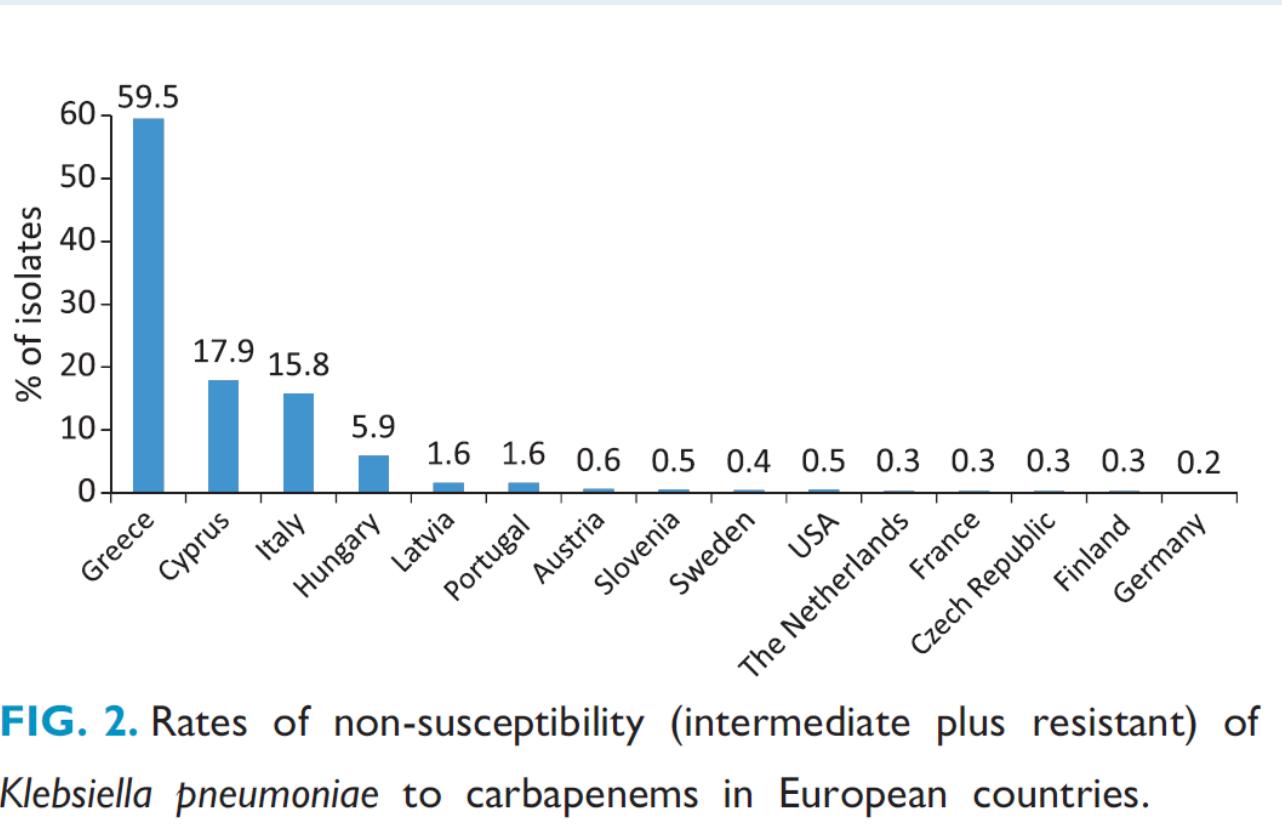
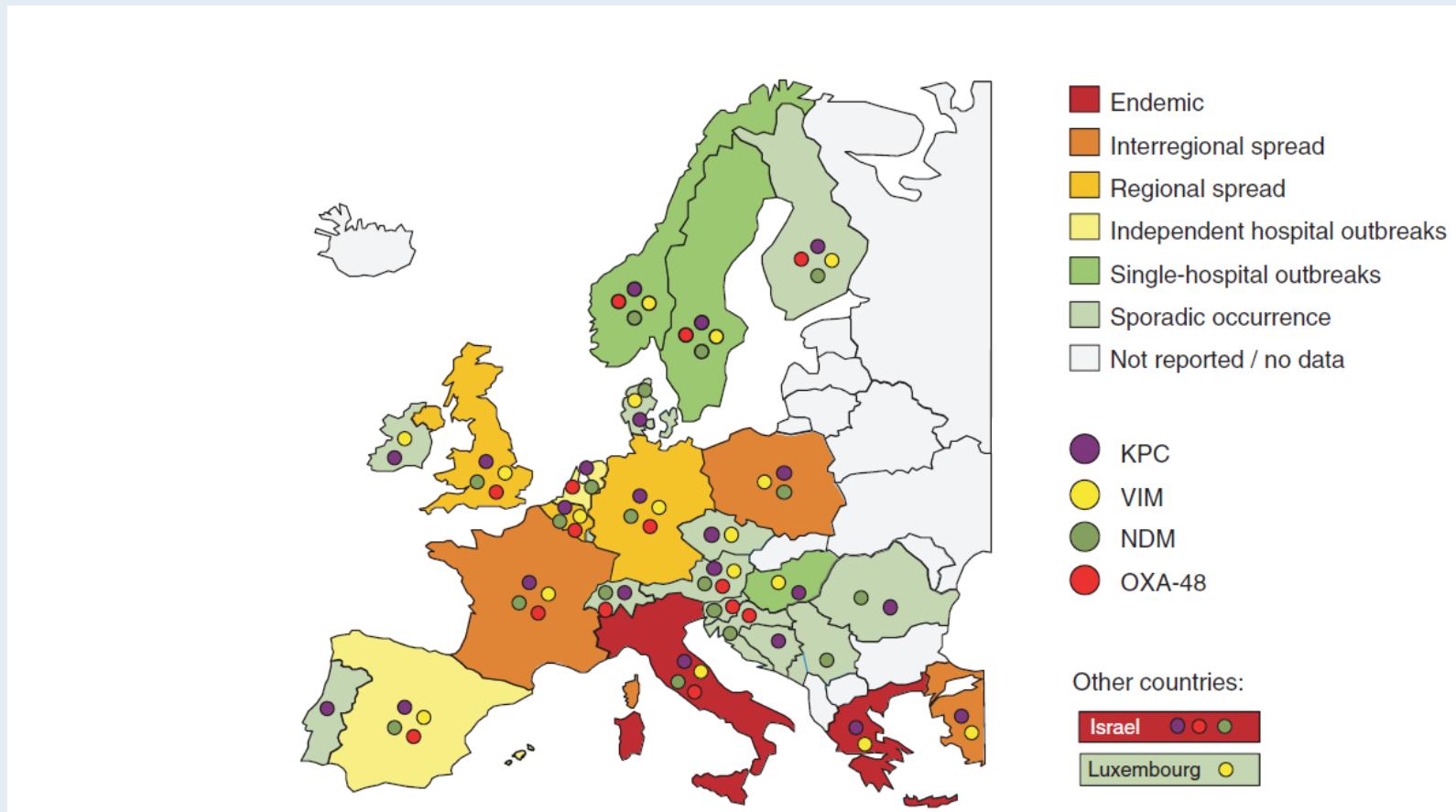


FIG. 2. Rates of non-susceptibility (intermediate plus resistant) of *Klebsiella pneumoniae* to carbapenems in European countries.

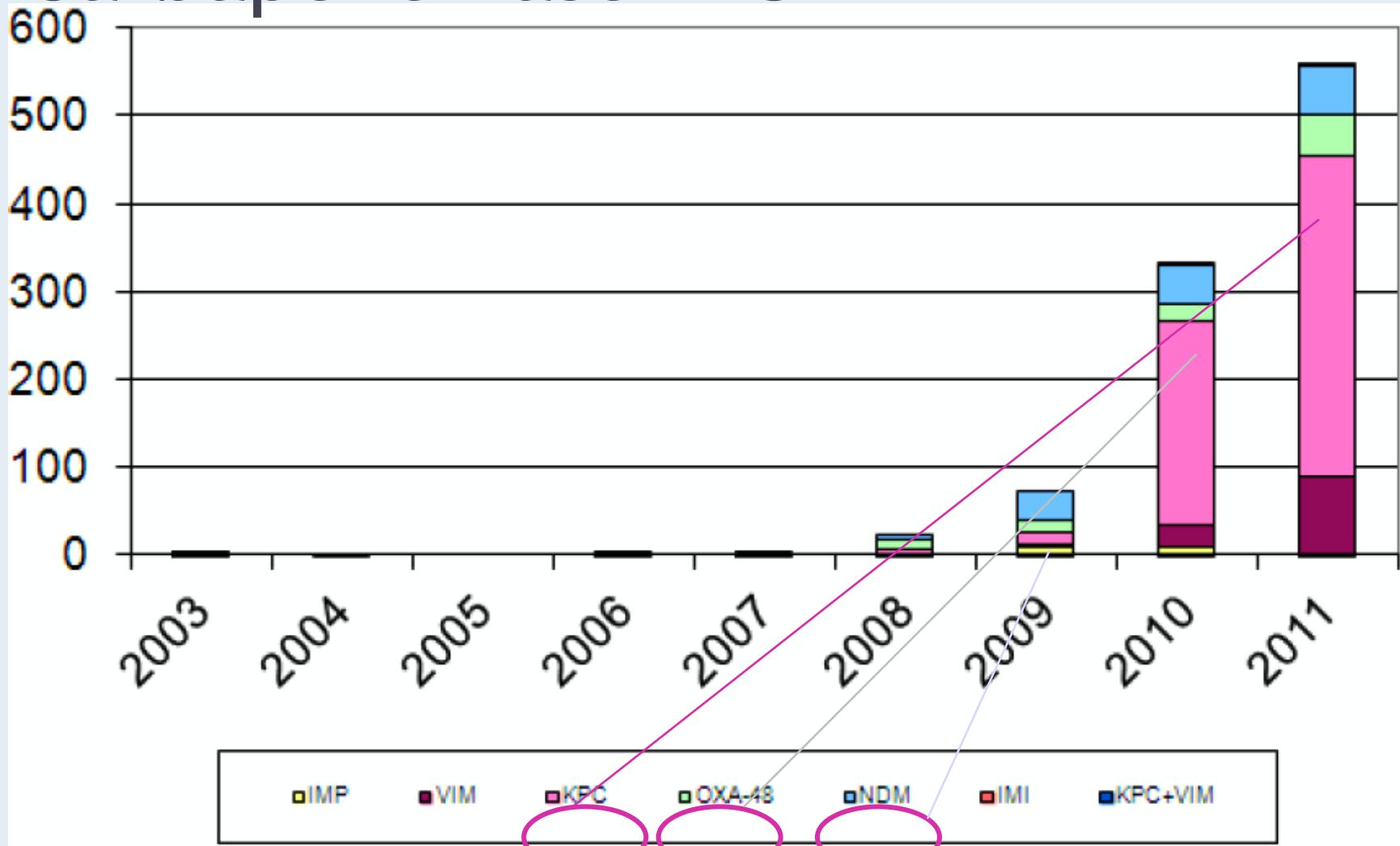
Canton et al. CMI, 2012

Carbapenemaser i Europa

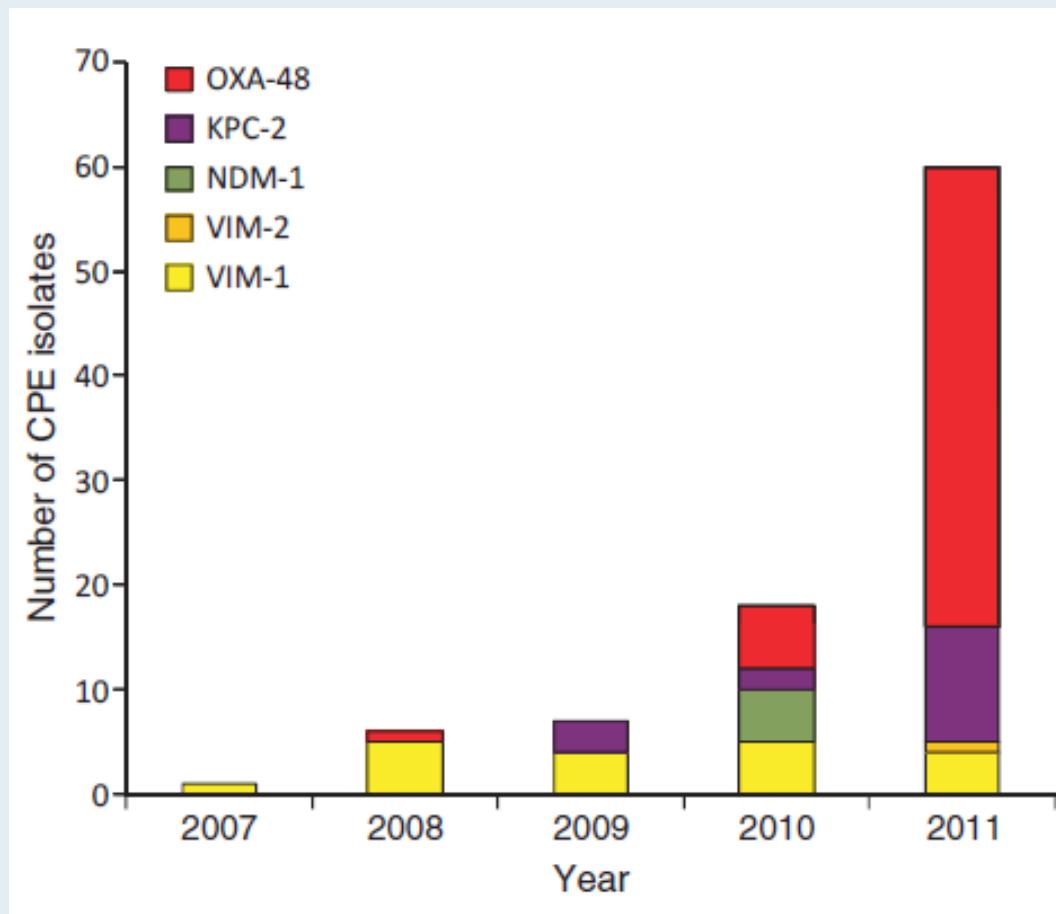


Canton et al. CMI, 2012

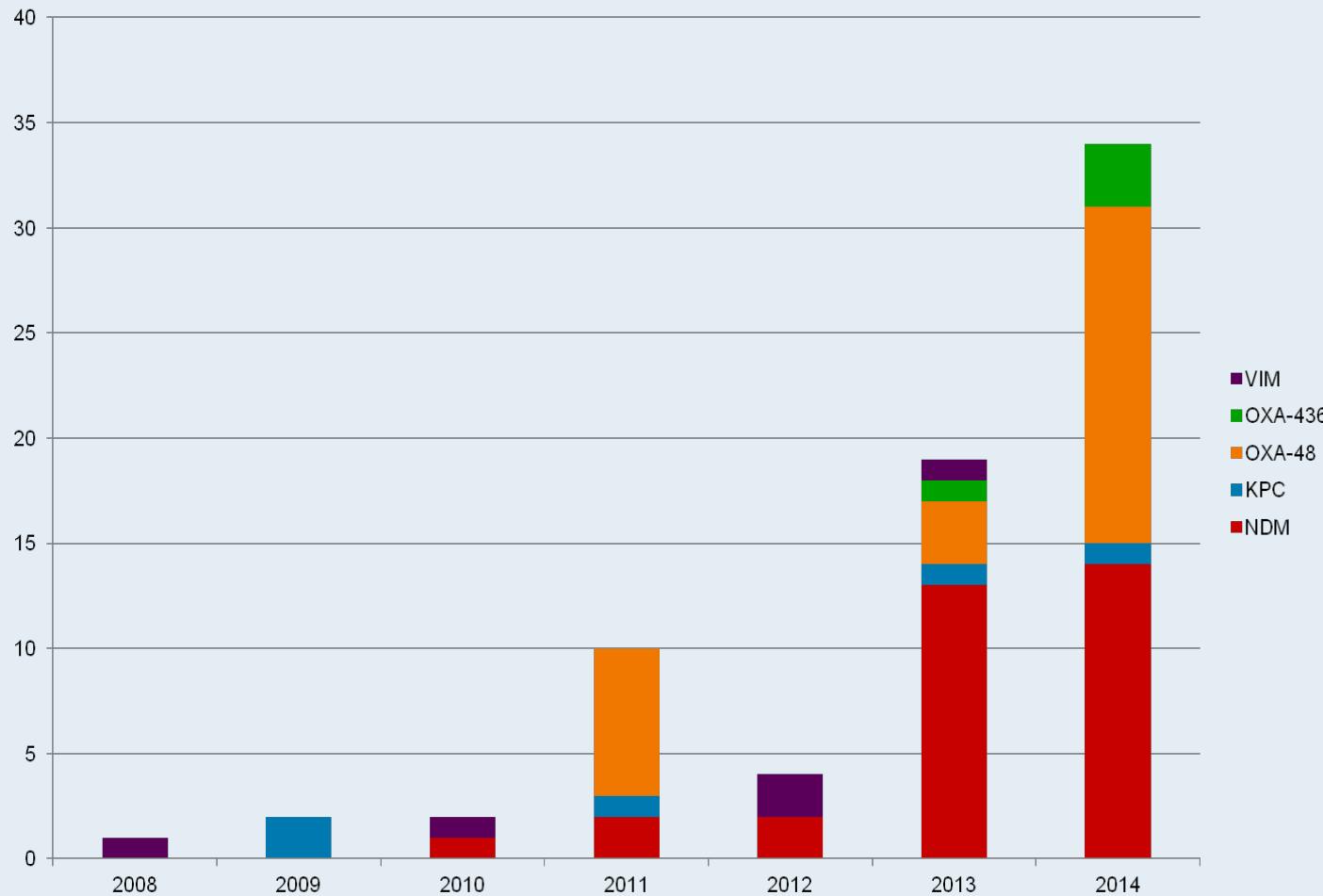
Carbapenemaser i UK



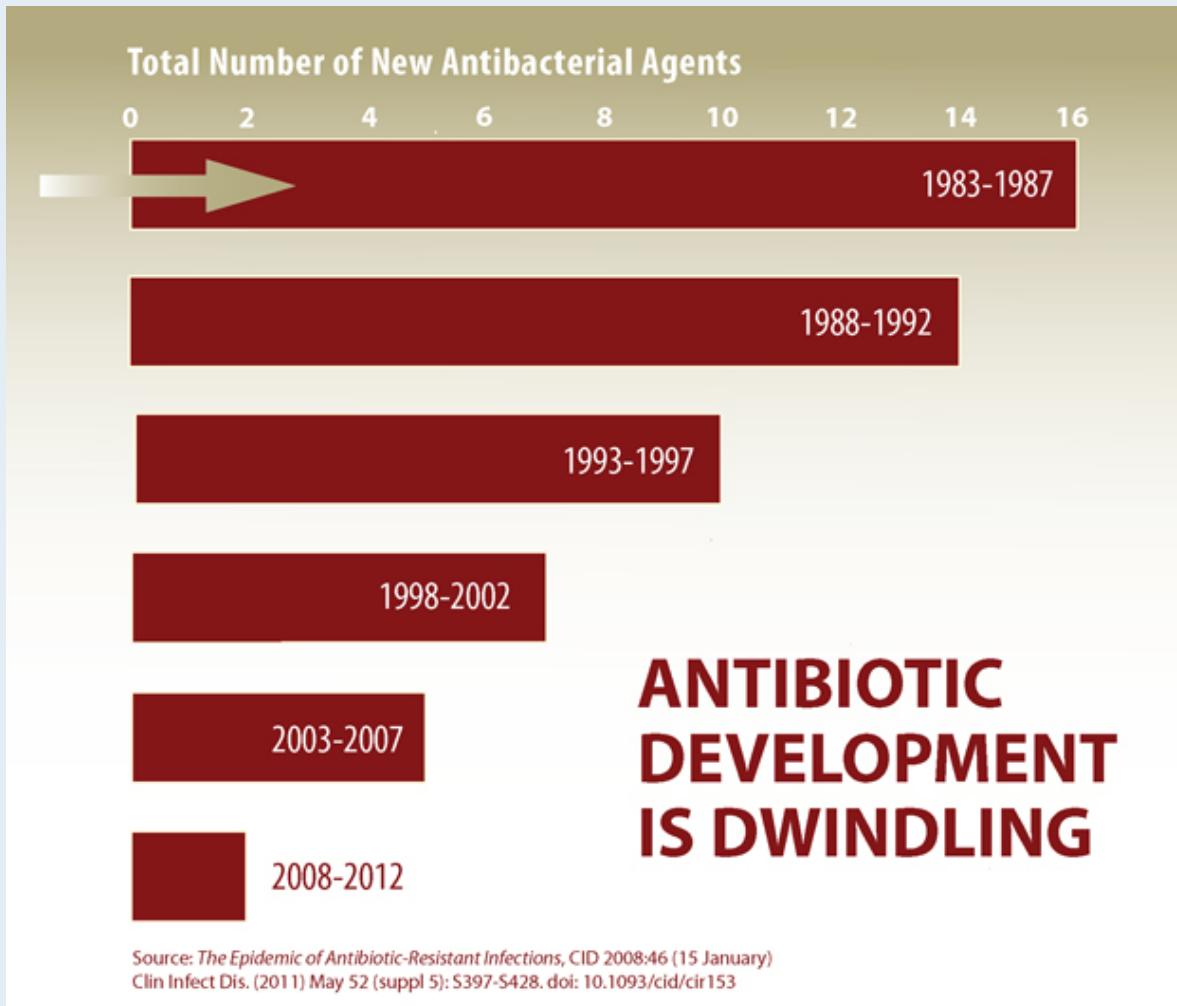
Udviklingen i Belgien



Carbapenemaser i DK



Bad bugs, no drugs





Nature strikes back!