

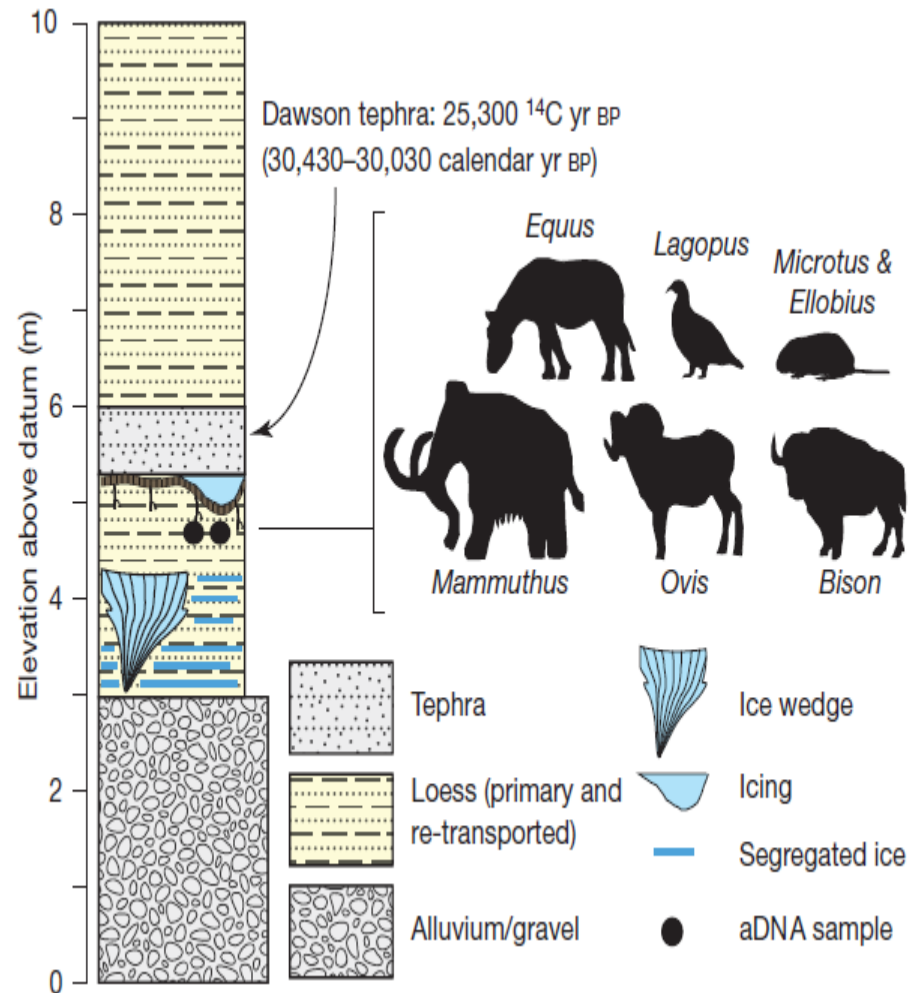
# ANTIBIOTIKARESISTENZEN IM GESUNDHEITSWESEN - ANTIMICROBIAL STEWARDSHIP

Alumni – Vetsuisse Fakultät Bern

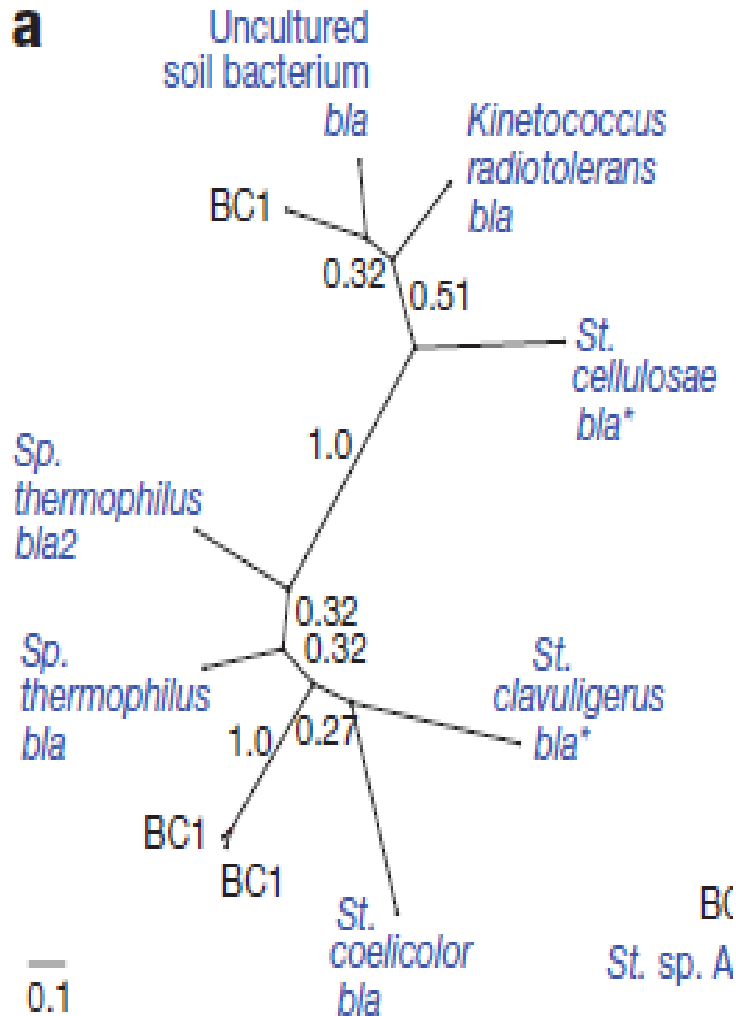
28. April 2016

Dr Rami Sommerstein  
Oberarzt Infektiologie / Spitalhygiene

# ANTIBIOTIKARESISTENZ = MODERNES PHÄNOMEN ?

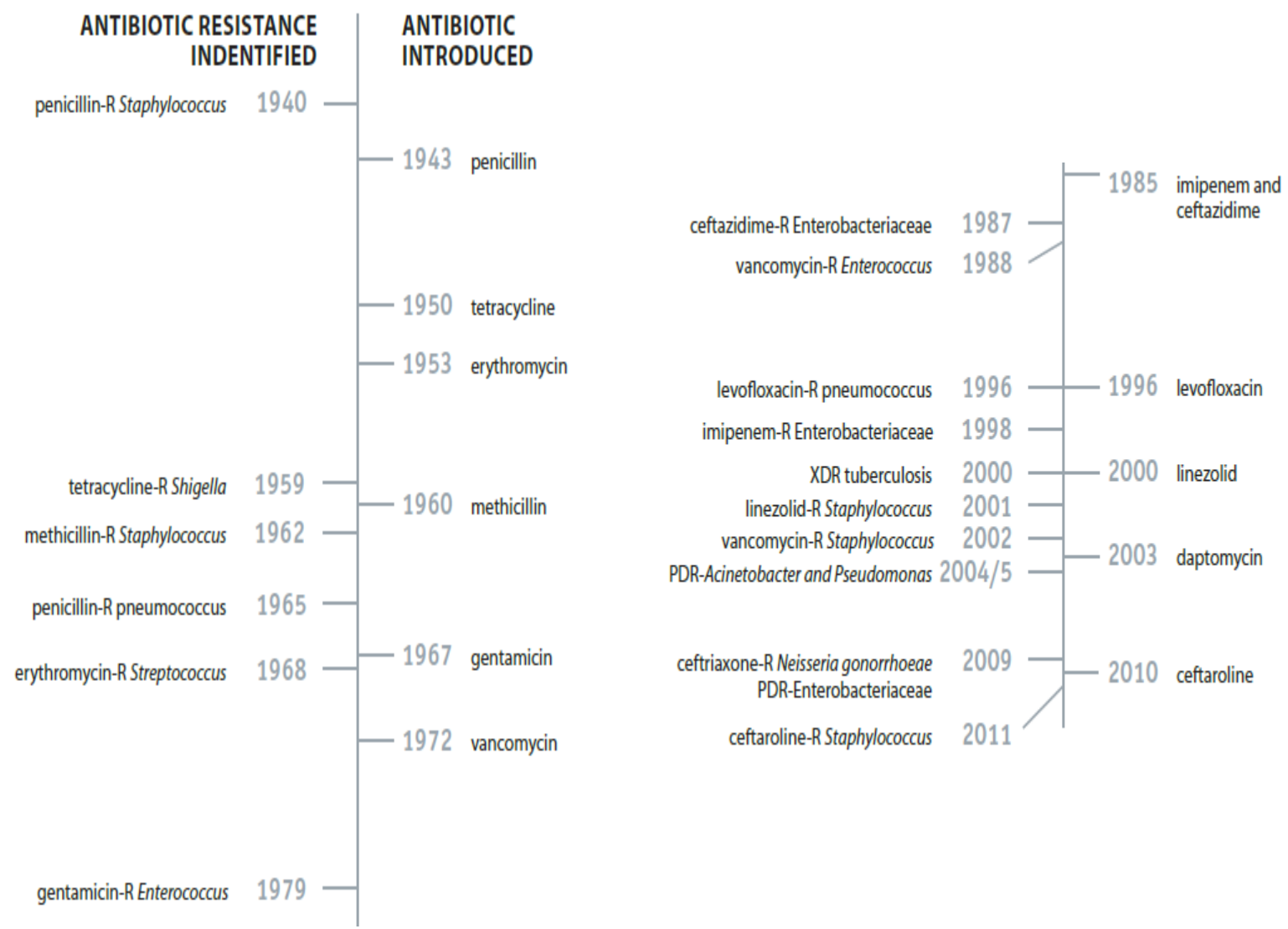


# Genetic diversity of ancient antibiotic resistance elements



*Bla* Beta-Laktamase  
*BC1* Beaver Creek site 1

Dates are based upon early reports of resistance in the literature. In the case of pan drug-resistant (PDR)-*Acinetobacter* and *Pseudomonas*, the date is based upon reports of healthcare transmission or outbreaks. Note: penicillin was in limited use prior to widespread population usage in 1943.



# EBOLA ?

Journal of Hospital Infection 89 (2015) 179–185



Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

Journal of Hospital Infection

journal homepage: [www.elsevierhealth.com/journals/jhin](http://www.elsevierhealth.com/journals/jhin)



## Outbreak Artikel 2015

72 Patienten von Erreger betroffen

35 Klinische Infektionen

21 Todesfälle während Hospitalisation

(Mortalität = 60% !)

# ANTIBIOTIKARESISTENZ !

## Large hospital outbreak of KPC-2-producing *Klebsiella pneumoniae*: investigating mortality and the impact of screening for KPC-2 with polymerase chain reaction

T. Ducombe<sup>a,b,\*</sup>, S. Fauchoux<sup>c</sup>, U. Helbig<sup>d</sup>, U.X. Kaisers<sup>e</sup>, B. König<sup>f</sup>,  
A. Knaust<sup>c</sup>, C. Lübbert<sup>g</sup>, I. Möller<sup>d</sup>, A.C. Rodloff<sup>c,f</sup>, B. Schweickert<sup>a</sup>,  
T. Eckmanns<sup>a</sup>

<sup>a</sup>Department for Infectious Disease Epidemiology, Robert Koch Institute, Berlin, Germany

<sup>b</sup>European Programme for Intervention Training, European Centre for Disease Prevention and Control, Stockholm, Sweden

<sup>c</sup>Hospital Hygiene Staff Unit, Leipzig University Hospital, Leipzig, Germany

<sup>d</sup>Local Public Health Department, Leipzig, Germany

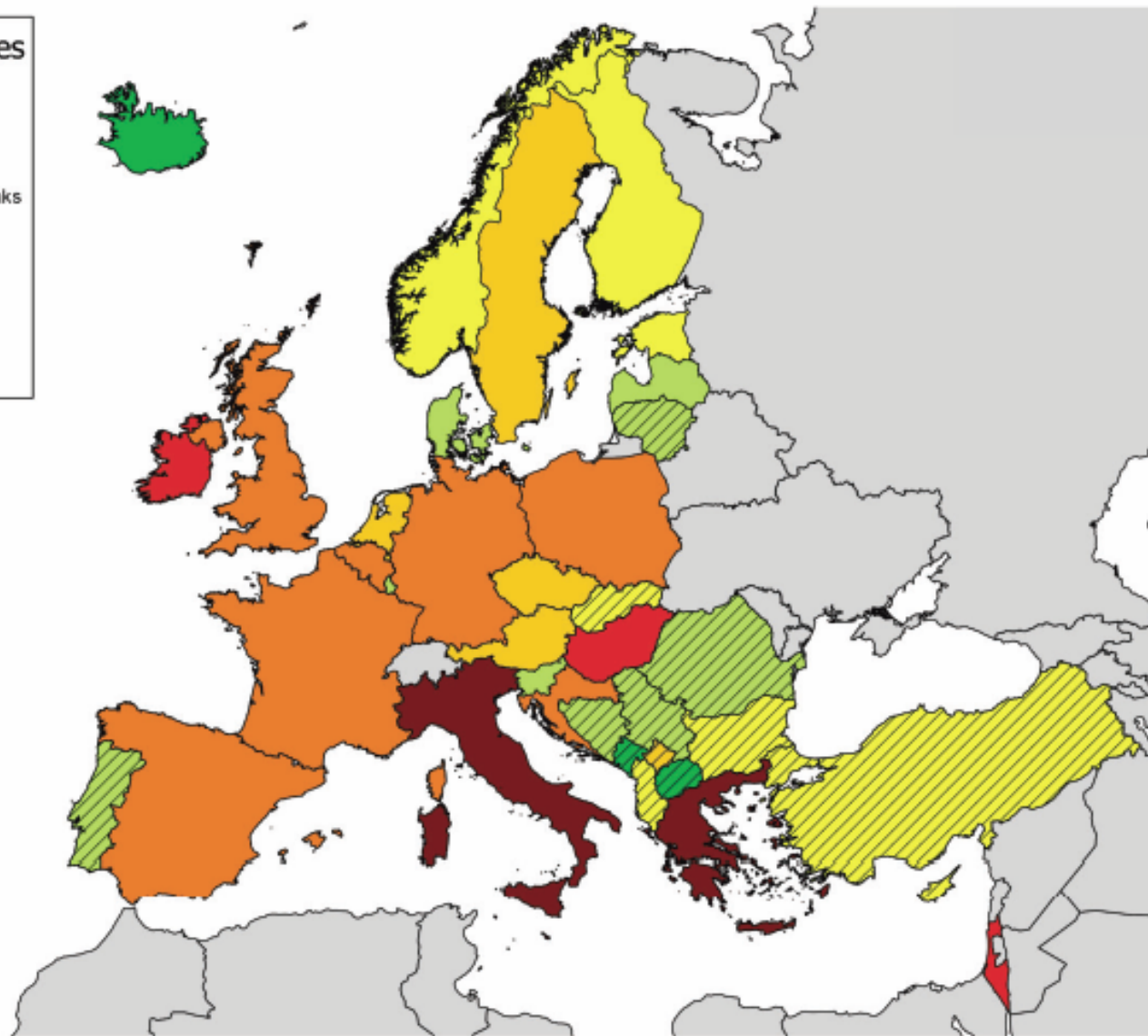
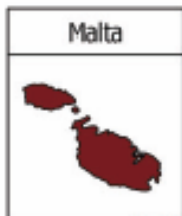
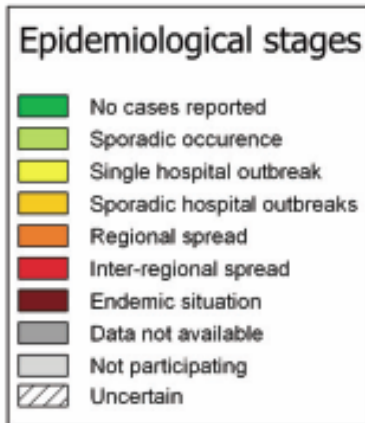
<sup>e</sup>Department of Anaesthesiology and Intensive Care Medicine, Leipzig University Hospital, Leipzig, Germany

<sup>f</sup>Institute for Medical Microbiology and Epidemiology of Infectious Diseases, Leipzig University Hospital, Leipzig, Germany

<sup>g</sup>Division of Infectious Diseases and Tropical Medicine, Department of Gastroenterology and Rheumatology, University Hospital Leipzig, Leipzig, Germany

- **Tuberkulose:** 450 000 Fälle von “Multidrug” resistente Tbc / Jahr  
“Extensively Drug” resistente Tbc in bisher 92 Länder
  - **Malaria:** Resistenz gegenüber 1. Generations Medikamente endemisch  
Artemisin Resistenzen auf dem Vormarsch
  - **Bakterien:** Proportion der antibiotischen Resistenz in Erregern von HWI,  
Pneumonie, Blutstrominfektionen nehmen weltweit zu
  - **Nosokomiale Infektionen:**  
Hoher Anteil verursacht durch methicillin-resistente *Staphylococcus aureus* oder “multidrug” resistente Gram-negative Bakterien
  - **Gonorrhoea:** Therapieversagen gegenüber 3. Generations Cephalosporinen  
in 10 Ländern. Keine Impfungen oder neue Medikamente sind in  
Entwicklung.
  - **Folge:** Schlechter klinischer Outcome, Zusatzbelastung für das  
Gesundheitswesen
-

# Hauptsorge: Carbapenemase-bildende Enterobacteriaceae





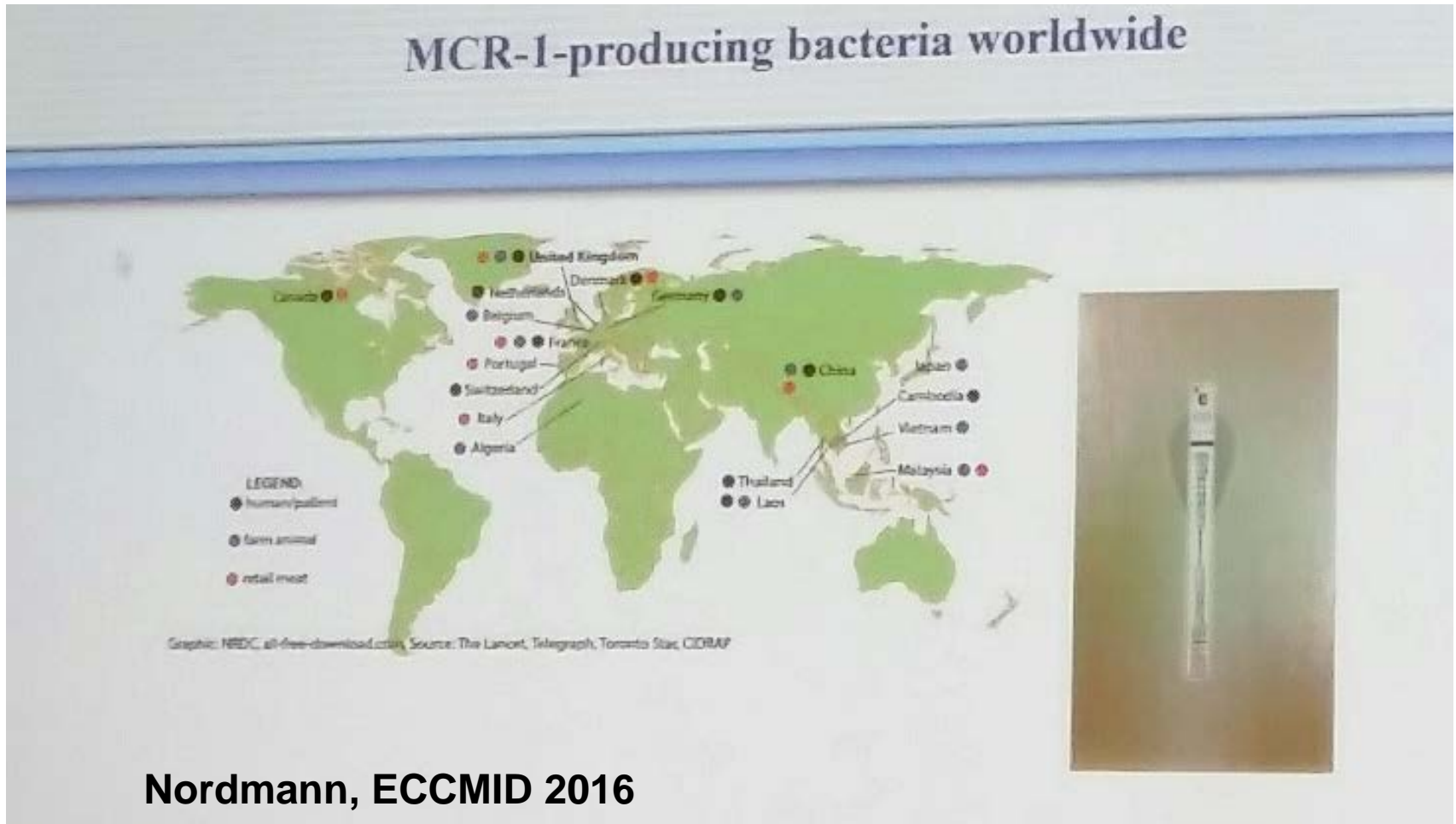
# EINE RESISTENZ KOMMT SELTEN ALLEINE ..

	UK (n=37)		Chennai (n=44)		Haryana (n=26)	
	MIC <sub>50</sub> ; MIC <sub>90</sub> (mg/L)	Proportion susceptible*	MIC <sub>50</sub> ; MIC <sub>90</sub> (mg/L)	Proportion susceptible*	MIC <sub>50</sub> ; MIC <sub>90</sub> (mg/L)	Proportion susceptible*
Imipenem	32; 128	0%	64; 128	0%	32; 128	0%
Meropenem	32; 32	3%	32; >32	3%	>32; >32	3%
Piperacillin-tazobactam	>64; >64	0%	>64; >64	0%	>64; >64	0%
Cefotaxime	>256; >256	0%	>256; >256	0%	>256; >256	0%
Ceftazidime	>256; >256	0%	>256; >256	0%	>256; >256	0%
Cefpirome	>64; >64	0%	>64; >64	0%	>64; >64	0%
Aztreonam	>64; >64	11%	>64; >64	0%	>64; >64	8%
Ciprofloxacin	>8; >8	8%	>8; >8	8%	>8; >8	8%
Gentamicin	>32; >32	3%	>32; >32	3%	>32; >32	3%
Tobramycin	>32; >32	0%	>32; >32	0%	>32; >32	0%
Amikacin	>64; >64	0%	>64; >64	0%	>64; >64	0%
Minocycline	16; >32	0%	32; >32	0%	8; 16	0%
Tigecycline	1; 4	64%	4; 8	56%	1; 2	67%
Colistin	0.5; 8	89%†	1; 32	94%†	1; 2	100%†

MIC=minimum inhibitory concentration. \*Susceptibility defined by British Society for Antimicrobial Chemotherapy and European Committee on Antimicrobial Susceptibility Testing breakpoints; doxycycline breakpoints were used for minocycline. †Colistin-resistant UK isolates were one isolate of *Morganella morganii* and one *Providencia* sp (both intrinsically-resistant species), also one *Klebsiella pneumoniae* and one *Enterobacter* sp.

**Table: Antibiotic susceptibilities for NDM-1-positive Enterobacteriaceae isolated in the UK and north (Chennai) and south India (Haryana)**

# THIS IS THE END .. ! (?)



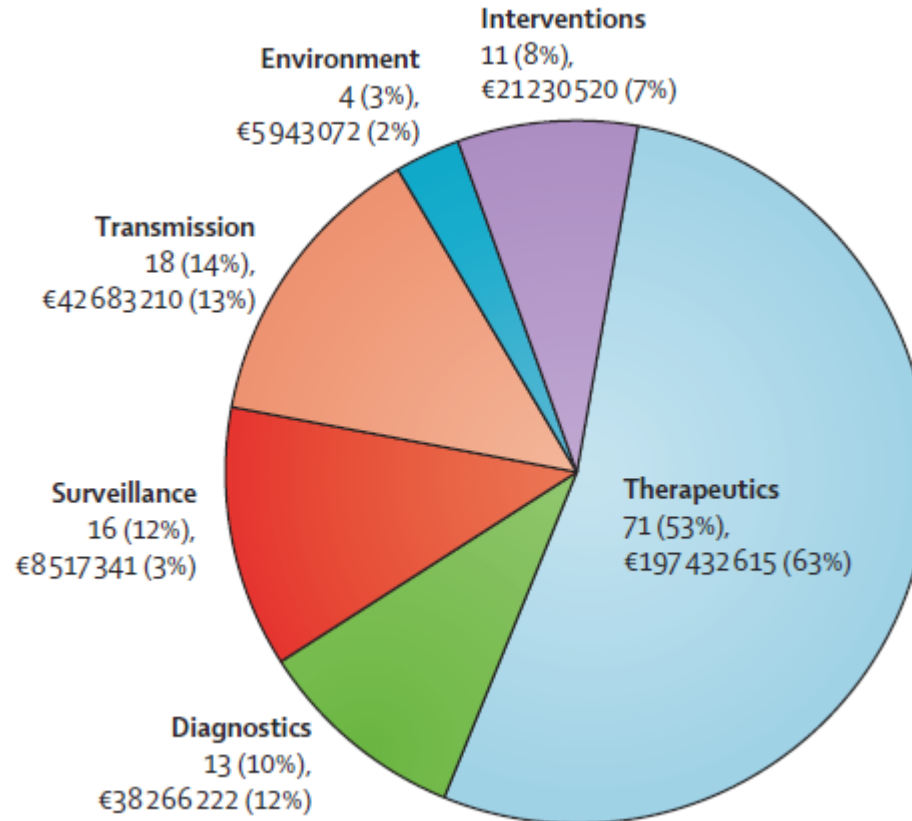
Nordmann, ECCMID 2016

No treatment

Colistin

Liu et al, Lancet ID 2016

# MONEY, MONEY, MONEY ...



Antibacterial resistance projects funded at the European Union level between 2007 and 2013 by priority topic with total funding

# ANTIMICROBIAL STEWARDSHIP



Implementing an Antibiotic Stewardship Program:  
Guidelines by the Infectious Diseases Society of America  
and the Society for Healthcare Epidemiology of America

Vorschlag zu koordinierten Interventionen (28 Punkte)

- > Geeigneter Gebrauch von Antibiotika
- > Optimale Indikation, Regime, Dosierung, Dauer,  
Applikationsart

# SITUATION INSELSPITAL STEWARDSHIP

**Breitspektrum Antibiotika“Lizenz”**

**Weiterbildungen**

**Richtlinien**

ja

**“Streamlining” / Deeskalation**

**Dosis Optimierung**

**IV zu PO Konversion**

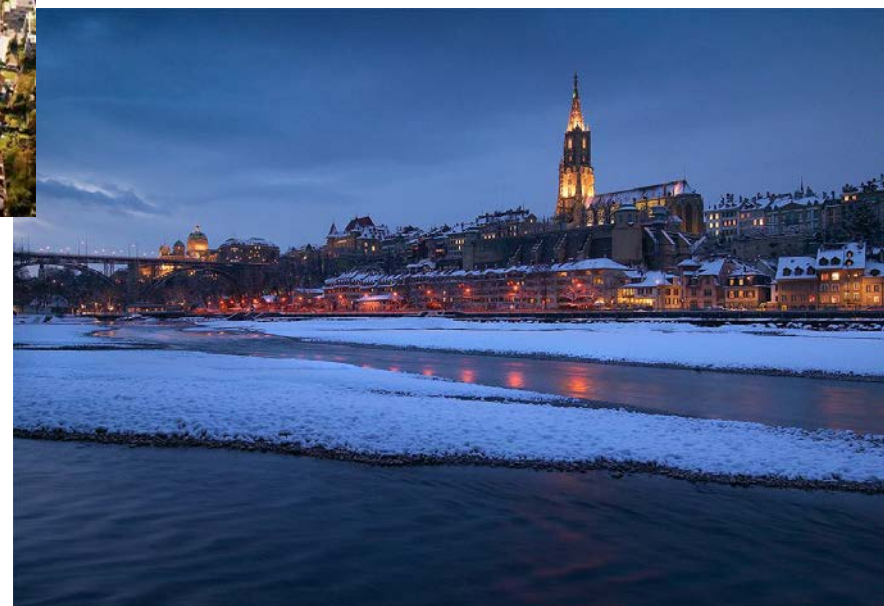
+/-

**Mögliche Massnahmen (ungenügende Datenlage)**

**Antibiotika Zyklisierung**

**Kombinationstherapie**

nein



**Besten Dank !**

---