Agreement and disagreements from international guidance documents

Evelina Tacconelli
Infectious Diseases
Tuebingen University
Germany

- Bacteria
- Population
- Documents
- Setting
- Countries

Agreement and disagreement

Population / Bacteria

- Hospitalised patients
- Exclusion:
  - Pediatric population
  - Cystic fibrosis
  - Burns

- MDR – Gram negative

Documents

- Guideline
- Expert opinion
- Consensus statement

Setting

- University and not University Hospitals
- Exclusion:
  - long term care facilities
  - community
  - ambulatory

Countries

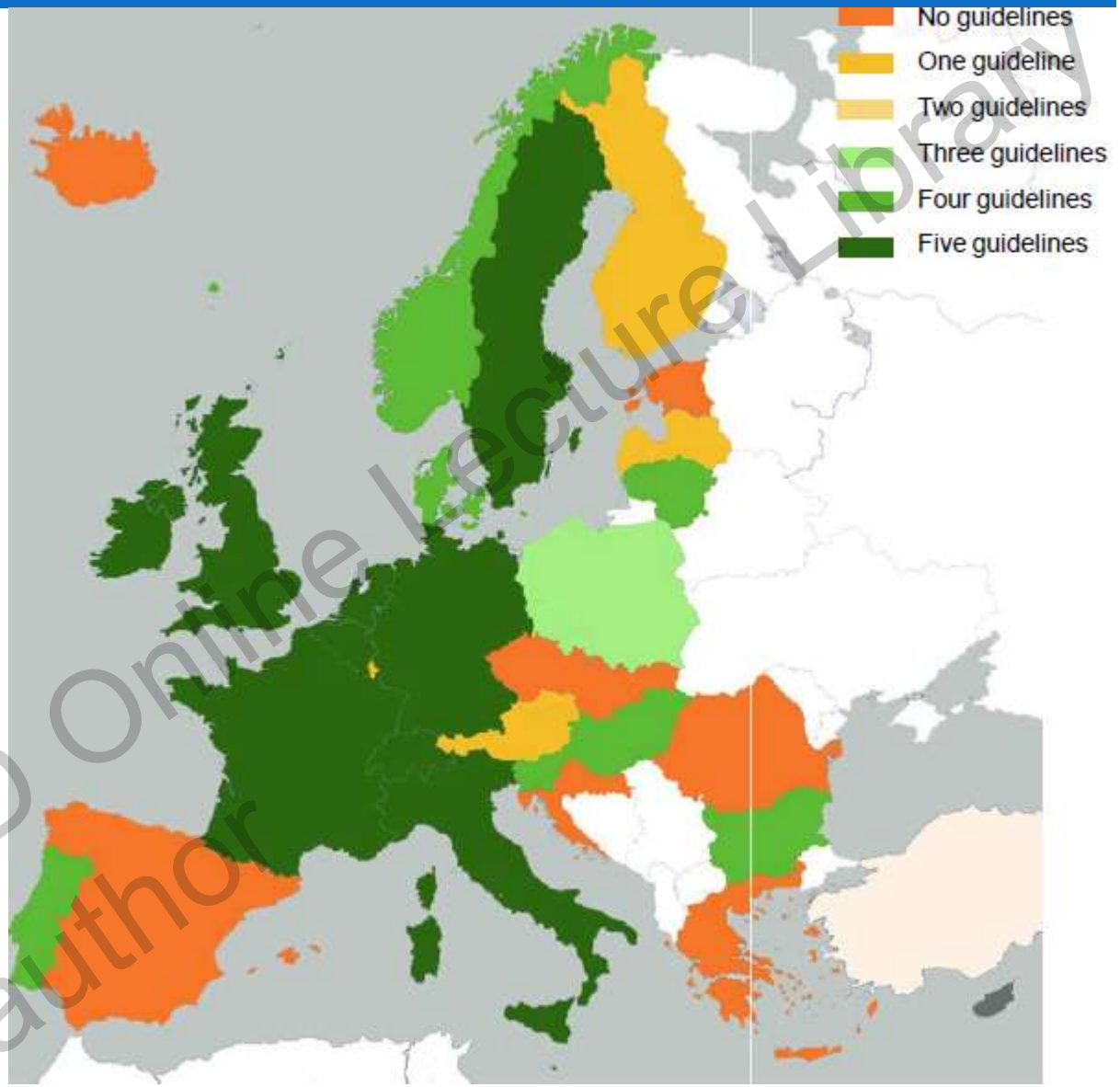
- Inclusion criteria:
  - Everything written in English, German, Spanish, and Italian (sorry)
- Inclusion criteria
  - European countries

Road map

- Census of documents
- Agreement and disagreement
- New evidence after documents' publication
- Areas where research is needed

PROHIBIT

Prevention of Hospital Infections by Intervention & Training



Martin, ECCMID 2011

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PROHIBIT
Prevention of Hospital Infections by Intervention & Training

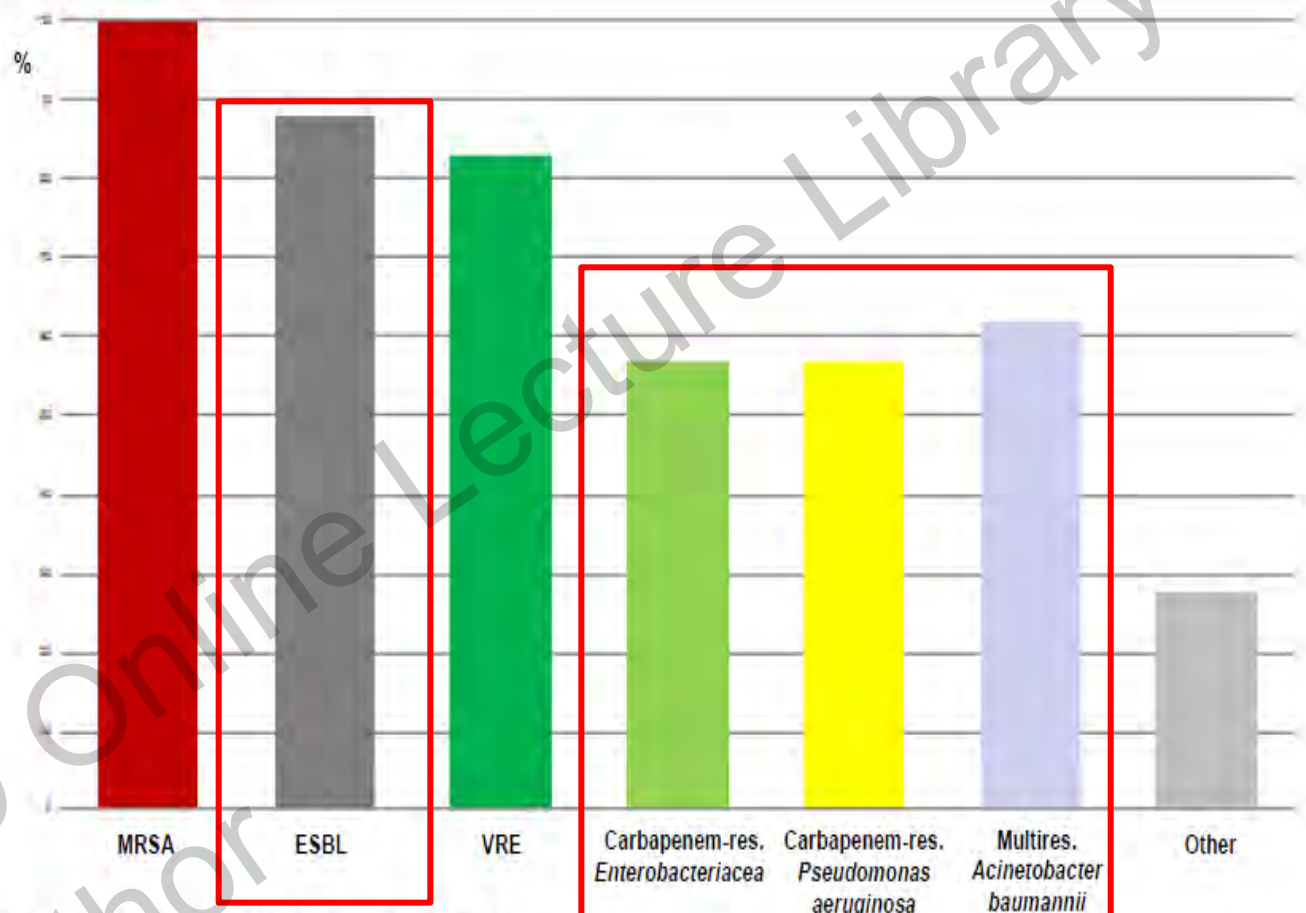

Figure 5: Surveillance of MDRO

Tuesday, Hansen ECCMID 2014

Hansen, ID Week 2012

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SHEA survey

Drees, ICHE 2014

TABLE 1. Contact Isolation Practices for Multidrug-Resistant (MDR) Bacteria, Reported by Society for Healthcare Epidemiology of America Research Network Members

	MRSA	VRE	ESBL-producing bacteria	CRE	MDR[a] *Pseudomonas*	MDR[a] *Acinetobacter*
Isolate patients with this organism (n = 66)	93.9	93.9	74.2	93.9	81.8	84.9
United States (n = 46)	100.0	100.0	87.0	95.7	87.0	89.1
International (n = 20)	80.0	80.0	45.0	90.0	70.0	75.0
Duration of isolation	(n = 62)	(n = 62)	(n = 49)	(n = 62)	(n = 54)	(n = 56)
During active illness	6.5	9.7	8.2	6.5	7.4	7.1
Duration of hospitalization	12.9	11.3	26.5	12.9	27.8	28.6
Until negative surveillance cultures	64.5	50.0	32.7	29.0	35.2	33.9
Indefinitely	11.3	24.2	34.7	43.5	31.5	33.9
How soon cultures may be obtained[b]	(n = 40)	(n = 31)	(n = 16)	(n = 18)	(n = 19)	(n = 19)
After completion of antibiotics	45.0	54.8	37.5	44.4	42.8	42.1
After hospital discharge	15.0	19.4	25.0	22.2	14.3	21.1
<3 months	12.5	19.4	12.5	27.8	28.6	26.3
≥1 year	7.5	6.5	0.0	5.6	0.0	5.3
Isolate readmitted patients	(n = 62)	(n = 62)	(n = 49)	(n = 62)	(n = 54)	(n = 56)
Yes	77.8	74.6	55.6	72.1	53.2	58.1
Allow cohorting (n = 66)	54.5	42.4	21.2	18.1	19.7	21.2
Perform active surveillance in at least one area of hospital (n = 66)	75.8	34.8	18.2	21.2	7.5	15.2

Drees, ICHE 2014

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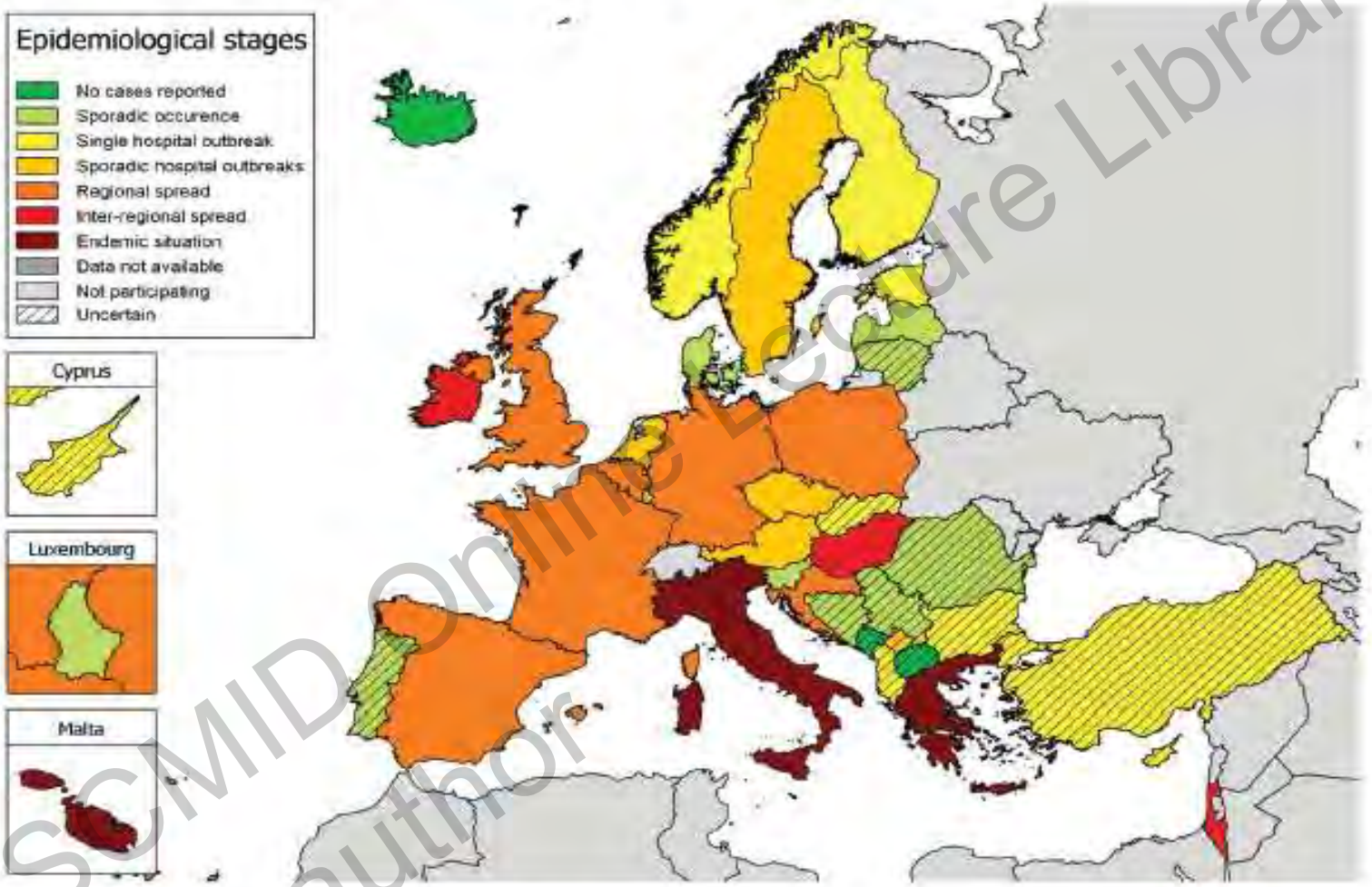
Figure 3 Occurrence of carbapenemase-producing *Enterobacteriaceae* in 38 European countries based on self-assessment by the national experts, March 2013



In some countries, the epidemiological stage might not represent the exact extent of the spread of CPE as it is a subjective judgment by national experts. Results presented here reflect the uncertainty at the time of the survey.

Glasner, Eurosurveillance 2013

Documents

- **ECDC** TECHNICAL REPORT. Risk assessment on the spread of CPE, September 2011
- Guidelines for the Prevention and Control of Multi-drug resistant organisms (MDRO) excluding MRSA in the healthcare setting. **Ireland**, 2012
- Guidance document on MDR-Gram negative from Robert Koch-Institut (RKI). **Germany**, 2012
- Non-prescribing control measures to prevent cross transmission of Carbapenemase-Producing Enterobacteriaceae in acute settings. **Scotland**, 2013
- Addressing rising trends and outbreaks in carbapenemase-producing Enterobacteriaceae, NHS **England**, 2014
- Guidance document on CRE from GEIH, GEMARA de la SEIMC, **Spain** 2014

ESCMID PUBLICATIONS 10.1111/1469-0691.12427

ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

E. Tacconelli[1], M. A. Cataldo[2], S. J. Dancer[3], G. De Angelis[4], M. Falcone[5], U. Frank[6], G. Kahlmeter[7], A. Pan[8,9], N. Petrosillo[2], J. Rodríguez-Baño[10,11,12], N. Singh[13], M. Venditti[5], D. S. Yokoe[14] and B. Cookson[15]

Tacconelli, CMI 2014

Study design

- 50 outbreak investigations
- 21 interrupted-time-series
- 13 before-after
- 2 prospective surveys

Countries

- 38 Europe
- 23 North America
- 15 Asia
- 6 South America
- 4 Australia

Wards

- 21 Whole hospital
- 52 ICUs
- 13 Medical / Surgical wards

Study period years

- 1981-99: 15
- 2000-05: 21
- 2006-11: 50

Countries producing the evidence (up to Dec 2012)

Tacconelli, CMI 2014

- ESBL-Enterobacteriaceae (n = 54)
- MDR Acinetobacter baumannii (n = 33)
- MDR Pseudomonas aeruginosa (n = 14)
- MDR Klebsiella pneumoniae (n = 12)
- Burkholderia cepacia/Stenotrophomonas maltophilia (n = 9)

Target MDR-GN

Tacconelli, CMI 2014

- ≥ 3 antibiotic classes
  - Acinetobacter (44%)
  - Pseudomonas (35%)
  - Enterobacteriaceae (35%)
- 14 definitions for Acinetobacter
- 18 definitions for Pseudomonas
- 22 definitions for Enterobacteriaceae

Disagreement or excess of fantasy?

Drees, ICHE 2014

Mean number of intervention (SD): 7 (2.9)

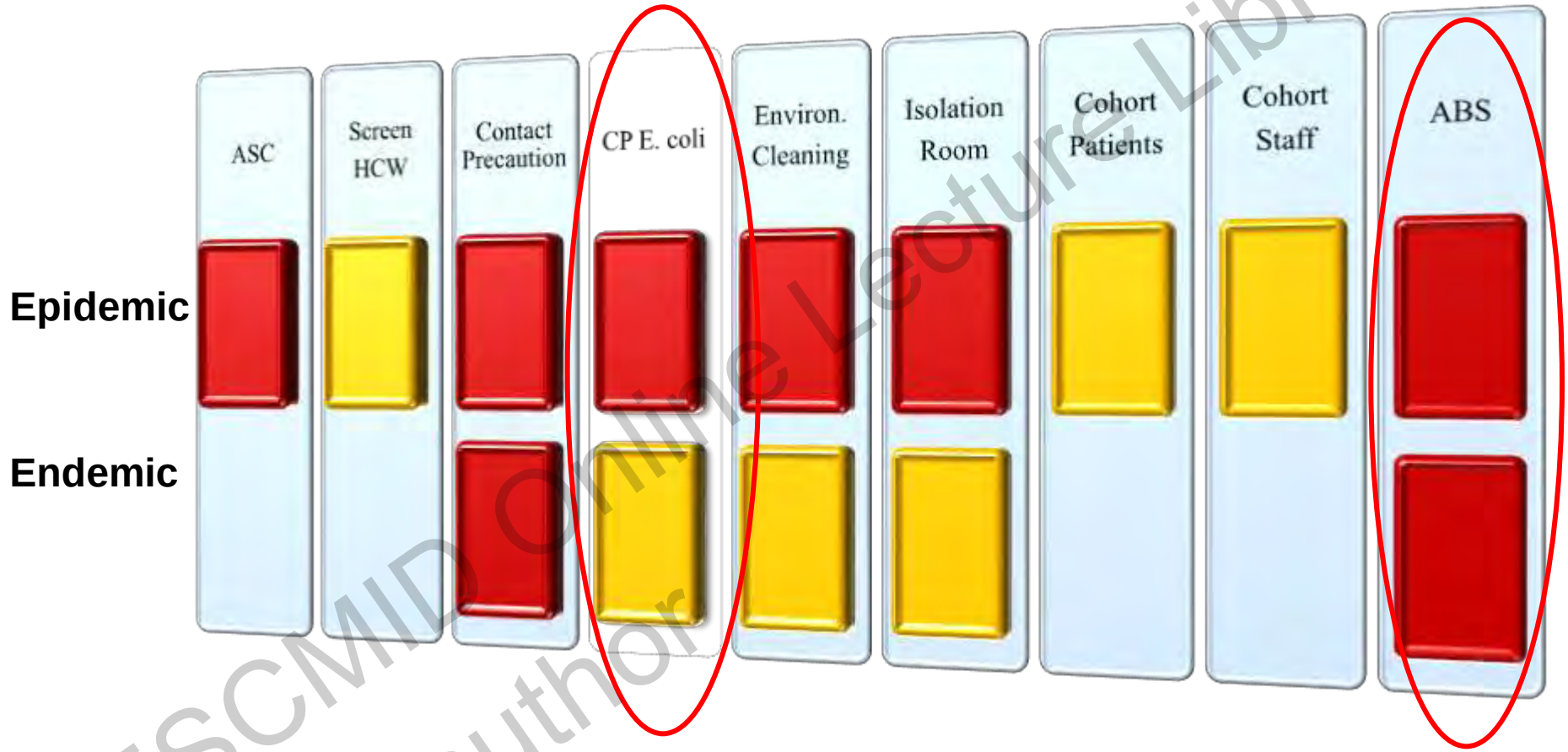
67% effective

Contact precaution	66 (76.7%)
Hand hygiene	56 (65%)
Enviromental cleaning	54 (63%)
Room isolation	43 (50%)
Education	40 (46.5%)
ASC	36 (41.8%)
Cohort patients	29 (33.7%)
ATBS	28 (32.5%)
Cohort staff	20 (23.2%)
HCWs screening	18 (21%)
Pre-emptive isolation	9 (10.4%)

Interventions

Tacconelli, CMI 2014

Hand Hygiene: strong recommendation



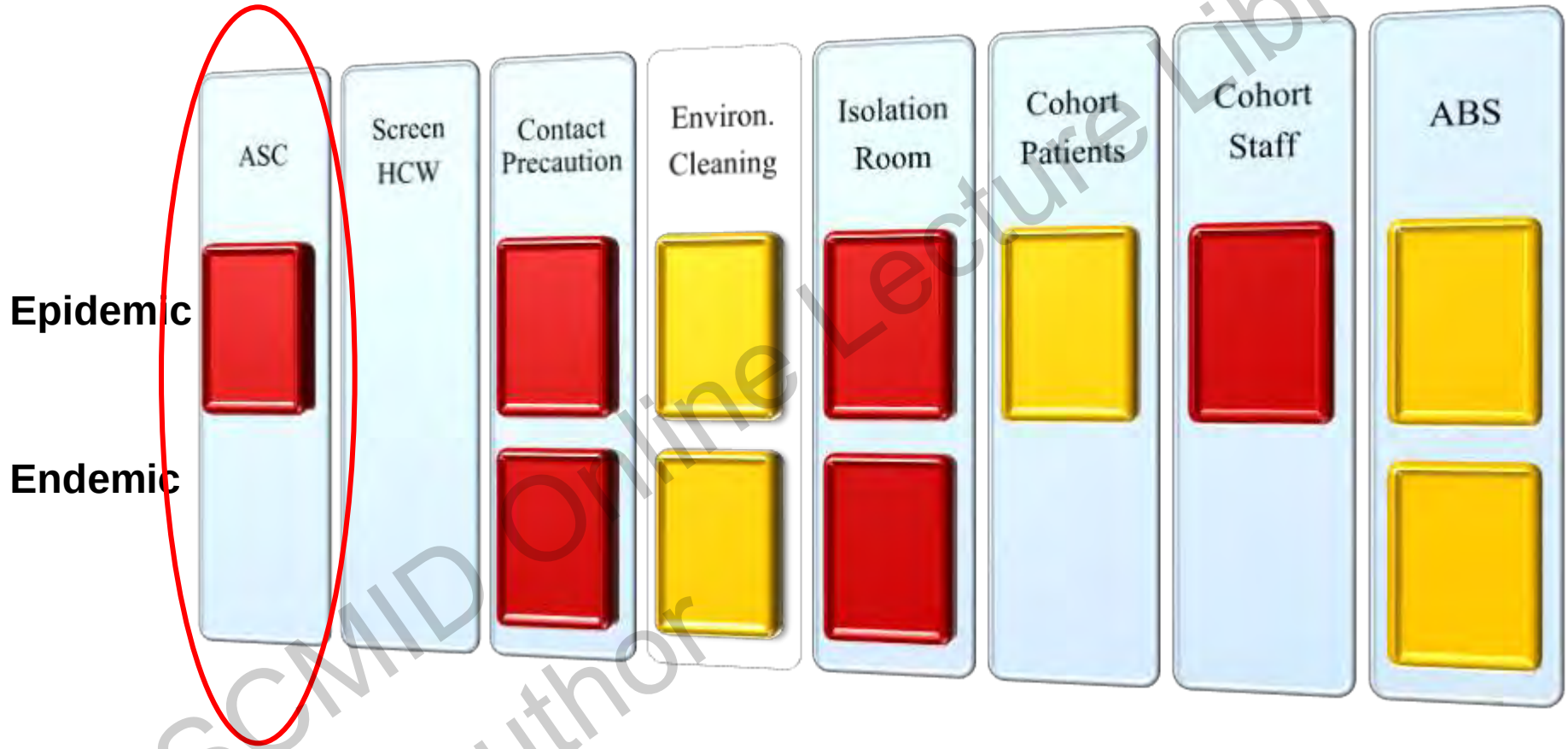
ESBL+Enterobacteriaceae

Tacconelli, CMI 2014

- **ESBL alone is not always considered reason for isolation**
  - **SHEA Survey**
    - 30% not isolate for ESBL
    - 48% isolate +/- other resistance pattern
  - **Germany**: important concomitant pattern of resistance (fluoroquinolone / carbapenems)
  - **England:** focus on ESBL-AmpC strains

Disagreement

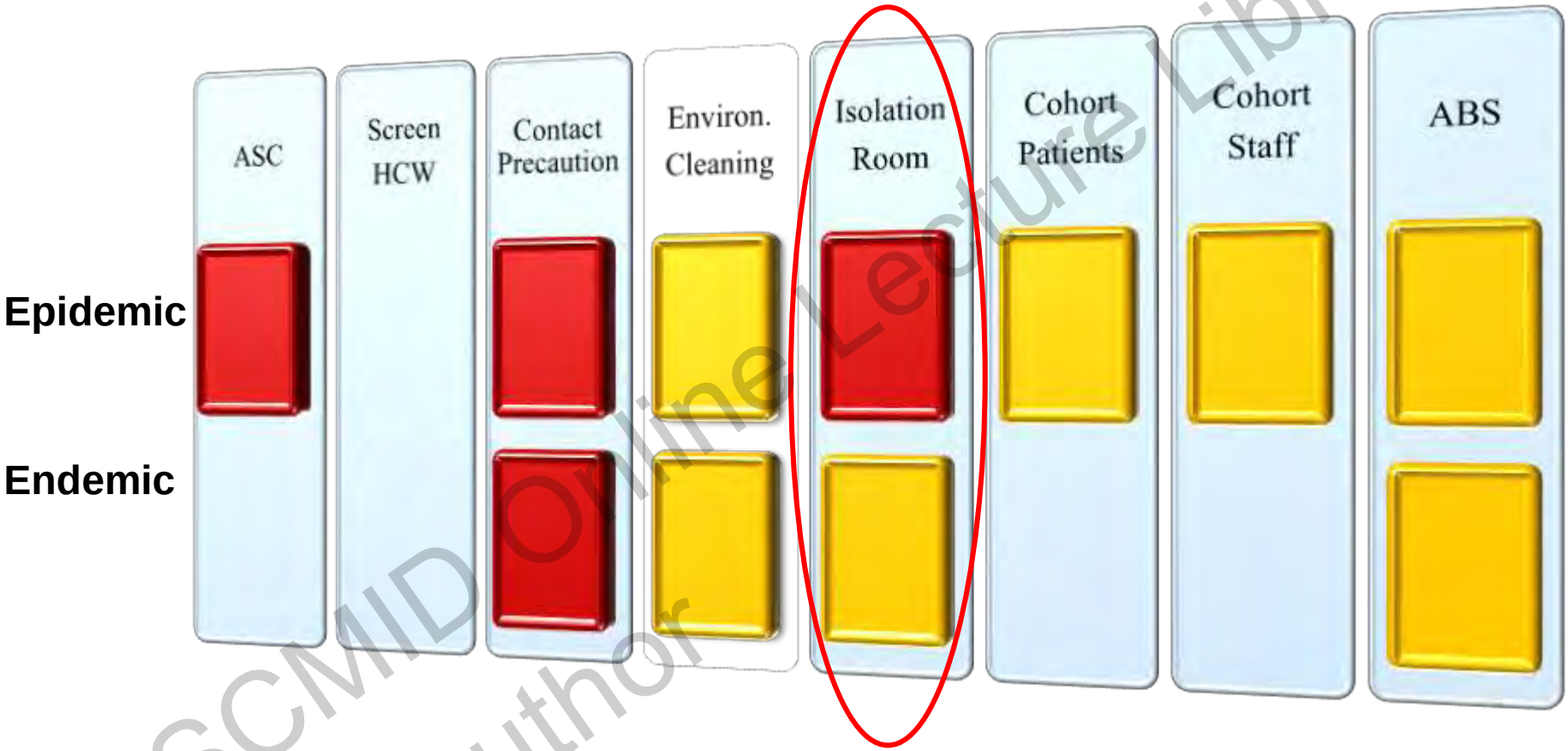
Hand Hygiene: strong recommendation



MDR-K. pneumoniae

Tacconelli, CMI 2014

Hand Hygiene: strong recommendation



MDR-P. aeruginosa

Tacconelli, CMI 2014

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

Guidelines for the Prevention and Control of **Multi-drug resistant organisms (MDRO)** excluding MRSA in the healthcare setting

The Lewisham Isolation Prioritisation Scoring System (LIPS)

Criteria	Classification	Score	Comment
ACDP category*	2	5	
	3	10	
	4	40	
Route	Air-borne	15	
	Droplet	10	
	Contact	5	Includes faecal-oral transmission
	Blood-borne	0	
Evidence of transmission	Published	10	
	Consensus or likelihood	5	
	No consensus or likelihood	0	
	No evidence	-10	
Significant resistance	Yes	5	Eg MRSA,VRE,MDR-GNB
	No	0	
High susceptibility of other patients with serious consequences of infection	Yes	10	Specific for various infection and patient populations
	No	0	
Prevalence	Sporadic	0	
	Endemic	-5	This reflects the burden of infection in the hospital and cohort measures may be more applicable.
	Epidemic	-5	See above
Dispersal	High risk	10	This includes diarrhoea, projectile vomiting, coughing, infected patients, confused wandering patients
	Medium risk	5	
	Low risk	0	
Total score			

*Advisory Committee on Dangerous Pathogens (ACDP); Extended spectrum β-lactamases (ESBL); Methicillin-resistant Staphylococcus aureus (MRSA); Vancomycin-resistant enterococci (VRE); Multi-drug-resistant Gram-negative bacilli (MDR-GNB)

Lewisham isolation Priorisation Scoring system

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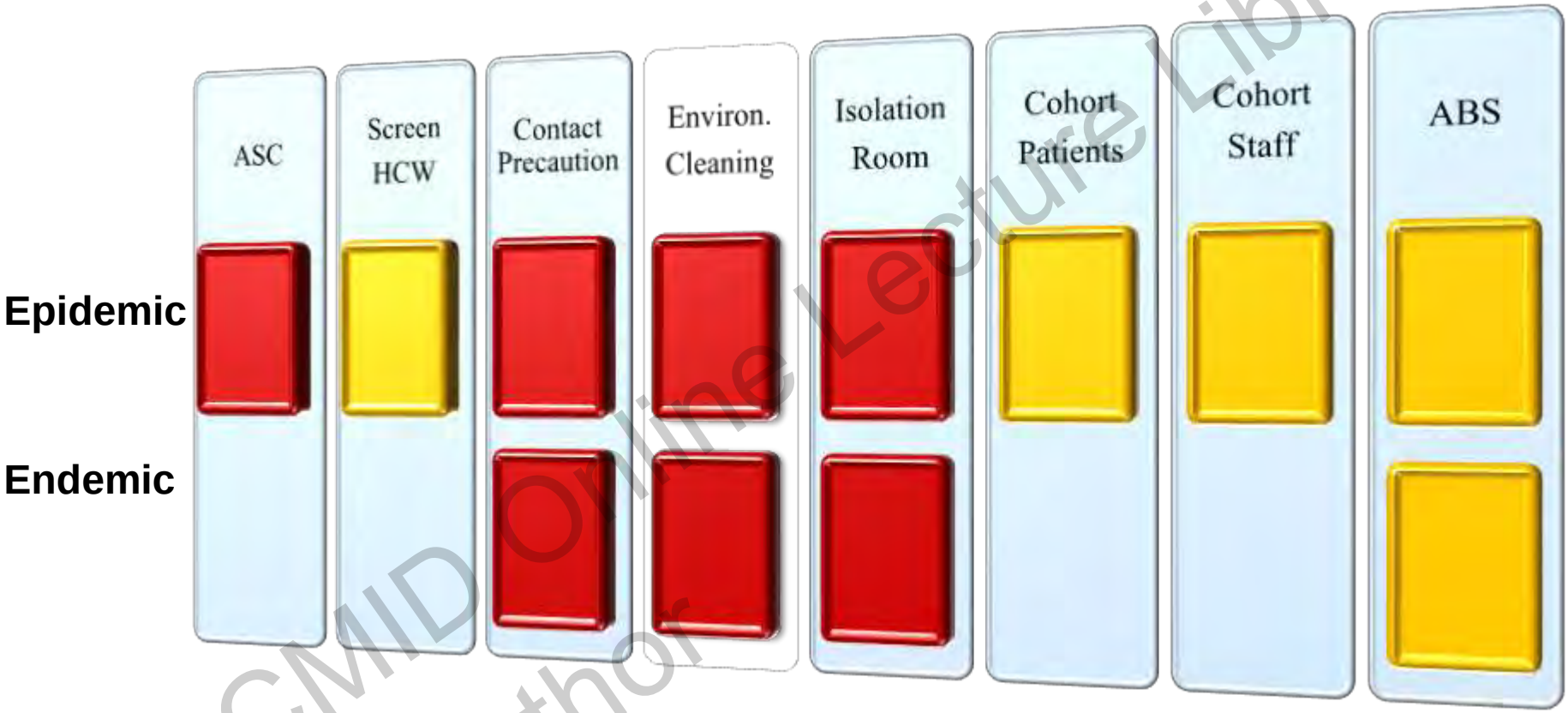
Hand Hygiene: strong recommendation



MDR- A.baumannii

Tacconelli, CMI 2014

Non-prescribing control measures to prevent cross transmission of Carbapenemase-Producing Enterobacteriaceae in acute settings

June 2013

NHS National Services Scotland

1.2.1. Who to screen

High risk patients:

1. **All inter-hospital transfers from healthcare facilities abroad or patients with a history of admission to a hospital abroad in the last 12 months (including holiday dialysis patients)**
2. **Patients with a known history of infection or colonisation with CPE in the last 12 months**

Patients falling into the categories above **must be** isolated in a single room, preferably with en-suite facilities, and screened on admission.

If positive, the patient(s) must be screened weekly thereafter until the ICD, in conjunction with clinical colleagues, is satisfied that there is no further risk of cross transmission.

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Non-prescribing control measures to prevent cross transmission of Carbapenemase-Producing Enterobacteriaceae in acute settings

June 2013

NHS National Services Scotland

Where CPE colonisation/infection IS identified

- In high risk clinical areas e.g. ICU, renal units, transplant units, haematology and oncology and infectious disease wards,
    - The identification of a new patient case with CPE **will require weekly screening of all patients in the unit** while any patient remains positive for CPE.
- In other clinical areas e.g. general medical/surgical wards
    - The identification of a new patient case with CPE will require **all patient contacts to be screened for CPE** e.g. those who have shared / sharing the same bay / room.

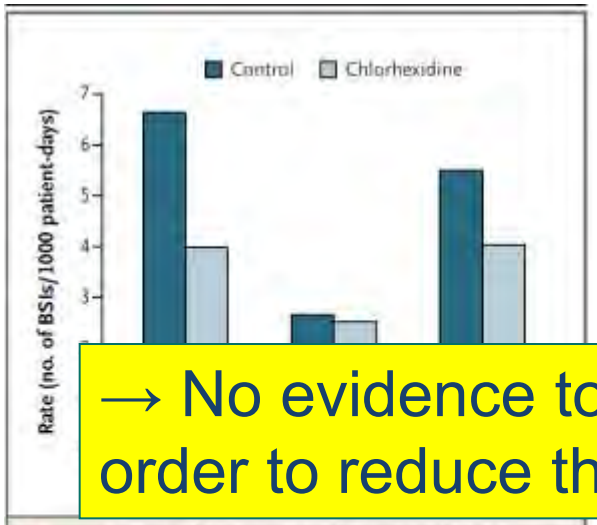


Figure 2. **Rates of Primary Bloodstream Infections According to the Type of Hospital Unit.**
Incidence rates of hospital-acquired primary bloodstream infections are shown among units using daily bathing with either chlorhexidine-impregnated washcloths or nonantimicrobial washcloths (control). BMT denotes bone marrow transplantation unit, MICU medical intensive care unit, and SICU surgical intensive care unit.

Daily bathing with **2% chlorhexidine** has been used as one component of successful bundled interventions used to control outbreaks of CRKP in long-term acute care hospitals and ICUs.

→ No evidence to recommend chlorexdine bathing in order to reduce the spread of MDR-GN bacteria

due to GNB.

Huang et al. did not specifically assess Gram-negative bloodstream infection risk .

Chlorhexidine bathing

Evans HL, et al. Arch Surg 2010
Munoz-Price LS, et al. lCHE 2010
Climo M, et al. NEJM 2013
Huang SS, et al. NEJM, 2013

Intestinal decolonisation

- **ESBL colonisation**
  - 6 CT
  - 1 RCT

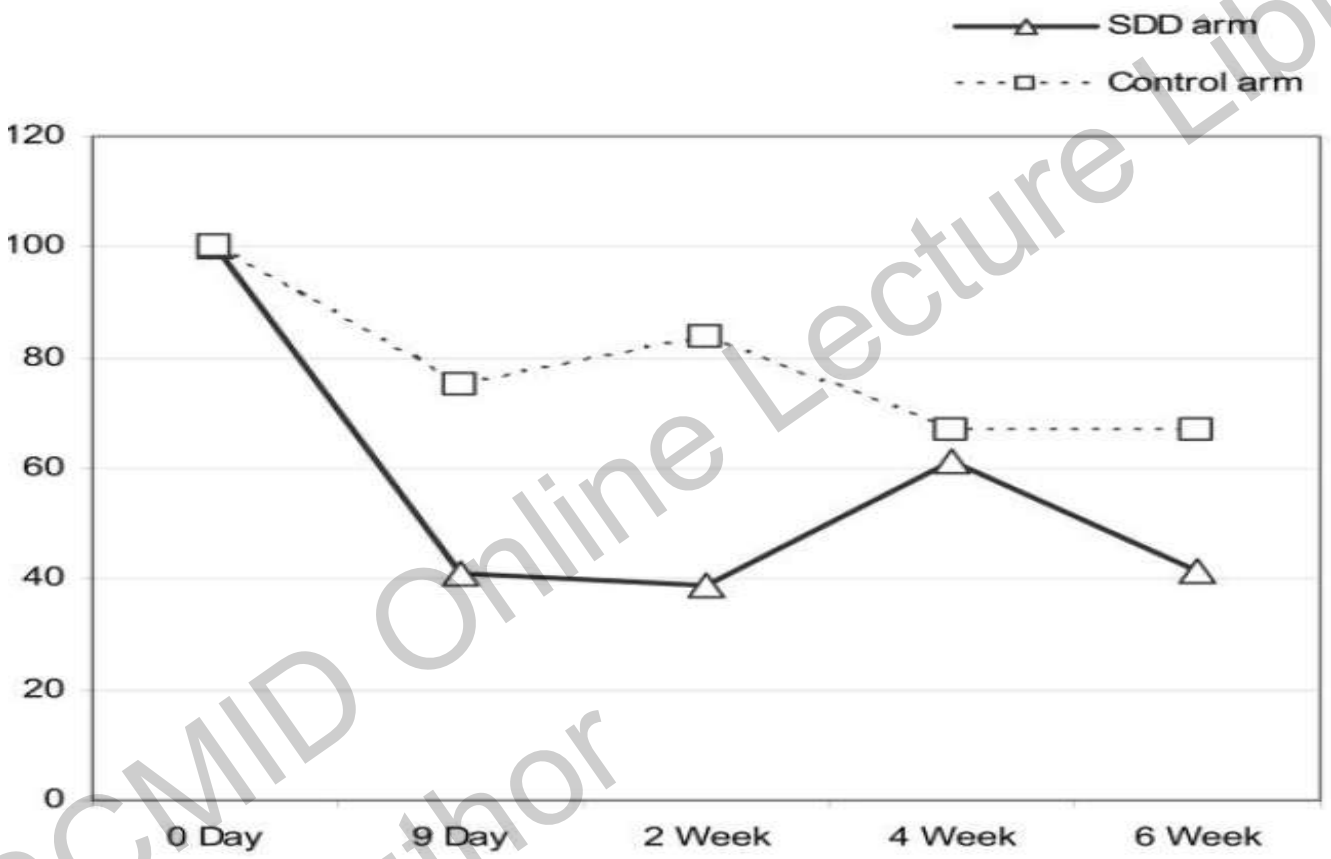
    Huttner, JAC 2013

→ No evidence to recommend intestinal decolonisation in order to reduce the spread of ESBL+ bacteria

- **CRKP decolonisation**
  - 1 RCT oral gentamicin / polymyxin E

    Saidel-Odes, ICHE 2012
  - 1 CS oral gentamicin

    Tascini, AAC 2014



Eradication of CR-KP Carriage

Saidel-Odes, ICHE 2012

TABLE 1 Patient characteristics and clinical outcomes for decontaminated patients versus persistent carriers

Characteristic	Value for: Decontaminated patients ($n = 34$)	Persistent carriers ($n = 16$)	P value
No. (%) male	23 (68)	12 (75)	0.843
Mean age, yr, ± SD	66 ± 11	59 ± 15	0.141
No. (%) of ICU patients	2 (6)	8 (50)	0.001

→ No evidence to recommend intestinal decolonisation in order to reduce the spread of CR-KP

[a] In the 6-month follow-up period.

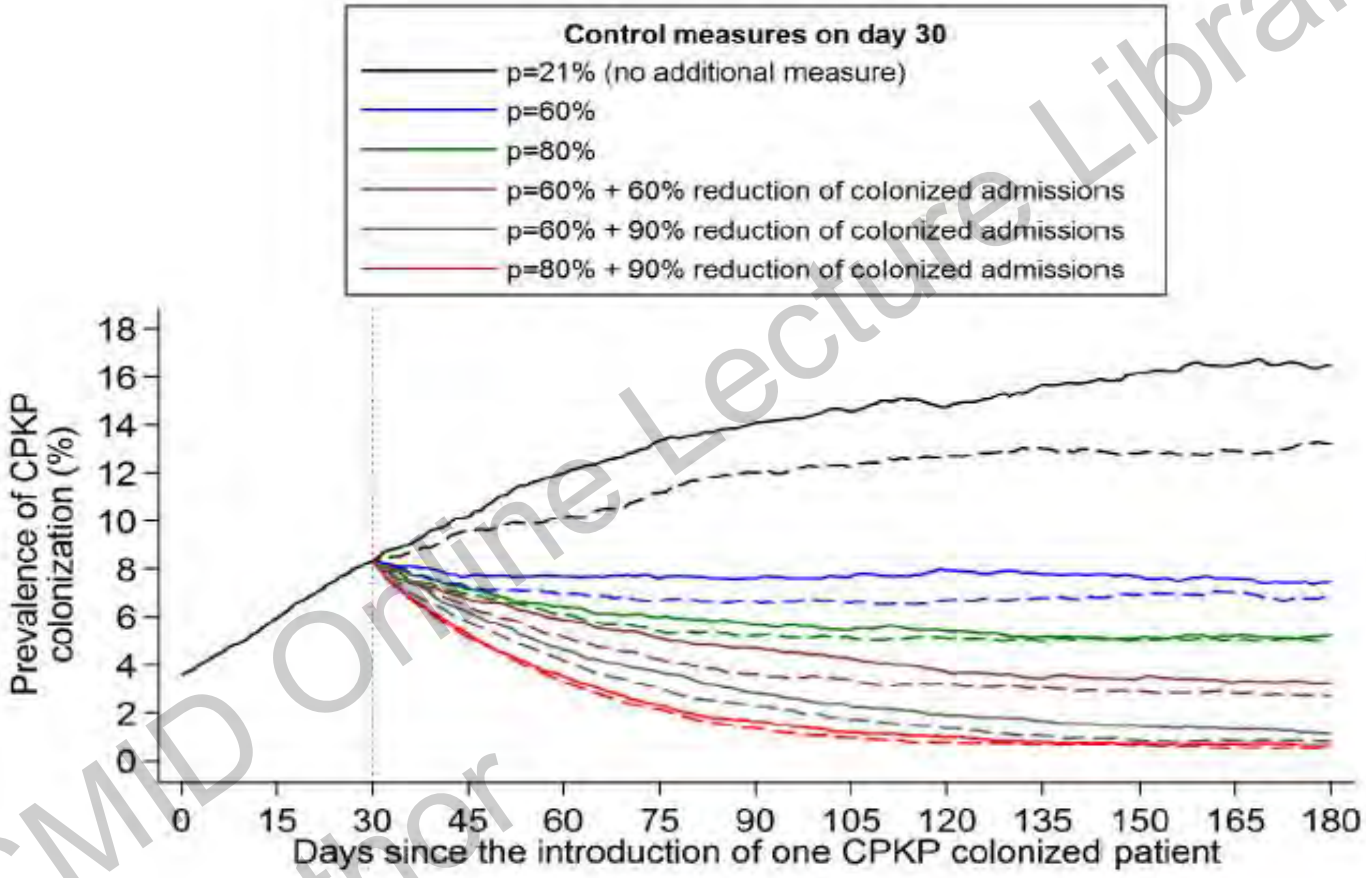
TABLE 4 Multivariate logistic regression for gut decontamination event

Predictor	Odds ratio	95% Confidence interval for odds ratio	P value
CSAT[a]	0.105	0.005–0.801	0.048
KPC-Kp infection[a]	0.139	0.021–0.754	<0.001
ICU stay	0.132	0.011–0.992	0.066

[a] Significant predictor.

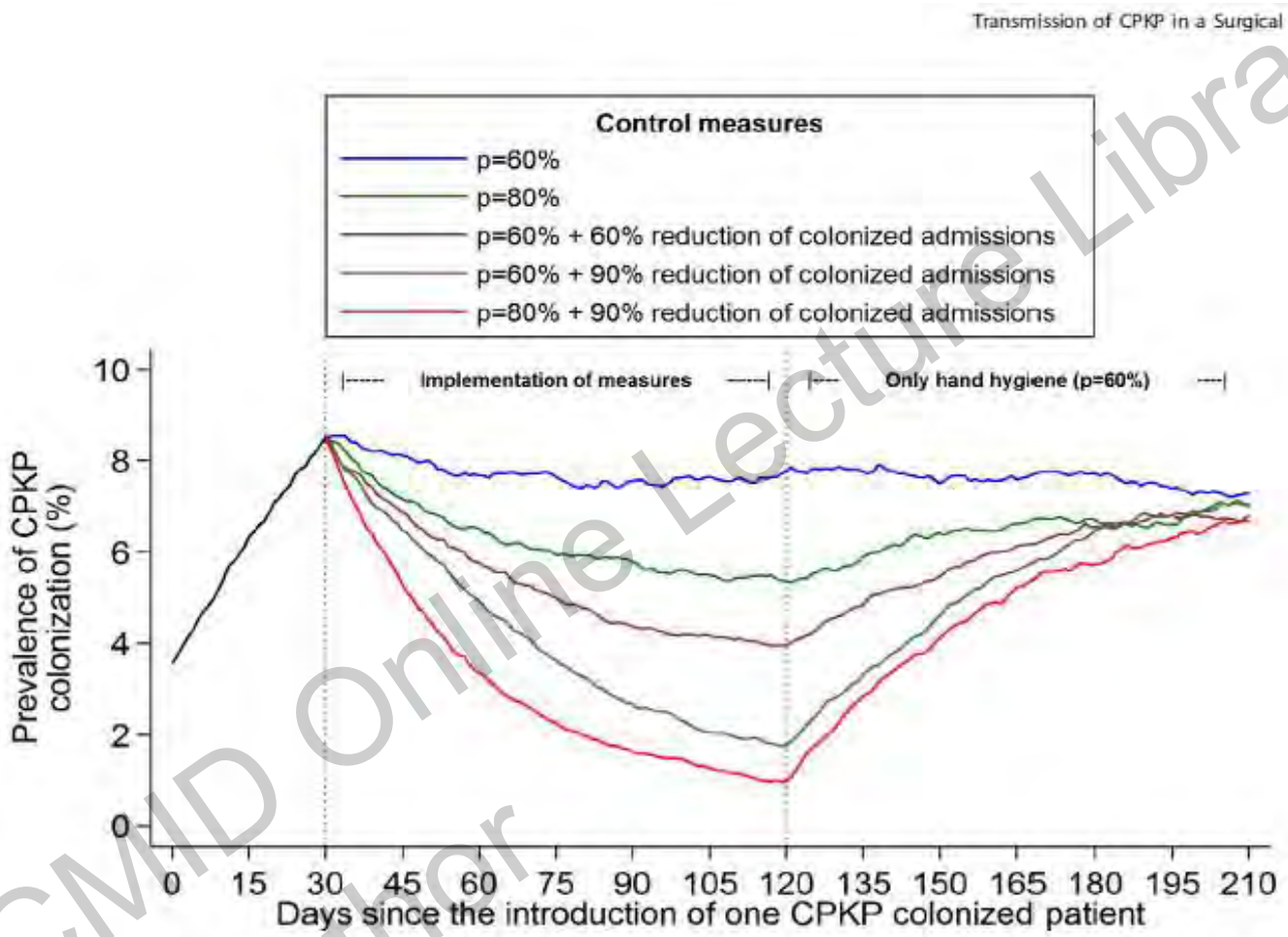
Eradication of CR-KP Carriage

Tascini, AAC 2014



What and when in practical life?

Sypsa, PlosOne 2012



What and when in practical life?

Sypsa, PlosOne 2012

Failure of interventions

- **Overall failure rate: 31%**
- Risk factors:
  - **not applying a bundle approach (45% vs 28%)**
  - endemic situation (47% vs 27%)
  - MDR *P. aeruginosa*.
- **Endemic setting:**
  - **lack of implementation of HH plus EDU (RR 4.7)**
  - lack of implementation of HH plus CP (RR 1.8)
- **Epidemic setting:**
  - **lack of implementation of HH plus PI plus CP (RR 2.3)**
  - lack of implementation of HH plus PE plus CP plus ASC (RR 1.7).

Tacconelli et al, ECCMID 2014

EUCIC
European Committee on Infection Control

Tacconelli	Germany
Friedrich	The Netherlands
Gastmeier	Germany
Gikas	Greece
Goossens	Belgium
Harbarth	Switzerland
Holmes	United Kingdom
Johansson	Sweden
Lucet	France
Rodríguez-Baño	Spain
Szilágyi	Hungary

Wide European network (national committee)
Collaboration with other national and international major stakeholders

Education
Guideline
Research

Morbidity
Mortality
Dry atb pipeline
Costs

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- **Agreement on ICP are strongly needed at European level.**
- **Active collaborations and integrations of existing structures through international stakeholders should be achieved.**
- **Coordination of research and multisite interventions.**
- **National health programme** should include a specific economic plan (**European funding**?) to support hospitals with high-endemic CR-GNB, providing resources for adequate staffing and training.

Conclusions (I)

Conclusions (II)

- **Practical level (agreement exists):**
  - **Multifaceted approach is needed and has to include education and implementation of hand washing**
- **Future research:**
  - **Transmission dynamic in particular focused on P. aeruginosa at both endemic and epidemic level;**
  - **New study design for IC interventions**
  - **Stop monocenter study and provide support for multicenter interventions**

"OK, now that we all agree, let's all go back to our desks and discuss why this won't work."