VINCat
Vigilància de les infeccions nosocomials als hospitals de Catalunya

Hospital Universitari MútuaTerrassa

Recomanacions de mesures de prevenció i de control de la infecció.

Criteris d'aïllament dels pacients amb processos infecciosos en l'àmbit hospitalari

Esther Calbo

Unitat Malalties Infeccioses. Servei Medicina Interna

ÍNDEX

- Origen i paper de les precaucions de contacte.
- Reservoris i transmissió.
- Experiències exitoses.

ORIGEN I PAPER DE LES PRECAUCIONS DE CONTACTE

➢**Simples o sencillos.** Hay una receta, y si la seguimos las probabilidades de que salga todo bien son muy altas.
➢Ejemplo: preparación de un pastel.

➢**Complicados.** Se pueden subdividir en series de problemas simples, pero no hay una receta como tal. Una vez que sabe cómo hacerlo, se puede repetir el proceso y perfeccionarlo.
➢Ejemplo: enviar un cohete a la luna.

➢**Complejos.** Se parecen a criar a un niño. El desenlace es incierto, ya que cada niño es único, y el éxito con un no garantiza nada con el siguiente.
➢**Ejemplo: los microorganismos multiR**

PRECAUCIONES DE CONTACTO

HABITACIÓN INDIVIDUAL:
Aísla a un paciente de otro físicamente

BATA:
Protege al personal sanitario

GUANTES:
Protege al personal sanitario

MATERIAL DE USO EXCLUSIVO

VIEWPOINT

Contact Precautions for Endemic MRSA and VRE
Time to Retire Legal Mandates

Daniel J. Morgan, MD, MS
Department of Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore; and VA Maryland Healthcare System, Baltimore.

Richard P. Wenzel, MD, MSc
Department of Internal Medicine, Virginia Commonwealth University, Richmond.

Physical barriers have been used to prevent infectious diseases dating back to leather gloves and coats used during the Black Death in medieval Europe. In the United States, isolation of persons with infections coincided with the development of infectious disease hospitals during the 19th century and introduction of "barrier nursing" in 1910, which included the use of gowns for health care workers. The US Centers for Disease Control and Prevention (CDC) released isolation manuals starting in 1970, promoting the idea of specific precautions within 7 categories (such as strict isolation, respiratory isolation, or wound and skin precautions), easily adopted by any type of hospital. The CDC guidance was based on expert opinion and theoretical modes of transmission.

clinical disease. For example, a cluster randomized trial of active surveillance culturing for MRSA or VRE with application of gloves and gowns and involving 9139 patients identified and isolated 2 to 3 times as many patients needing isolation (38% of patients isolated with clinical culture-based isolation vs 92% with active surveillance and universal glove use) but did not decrease transmission.[2] Likewise, in another cluster randomized clinical trial, use of gloves and gowns universally in 20 intensive care units (ICUs) and in 26 180 patients had no effect on the primary outcome of MRSA or VRE transmission rates, but decreased MRSA acquisition by 2.98 per 1000 patient-days.[3] This amounted to 1 acquisition for every 336 patient-days of universal glove and gown use. Whole-genome

Morgan, Wenzel, Bearman JAMA 2017

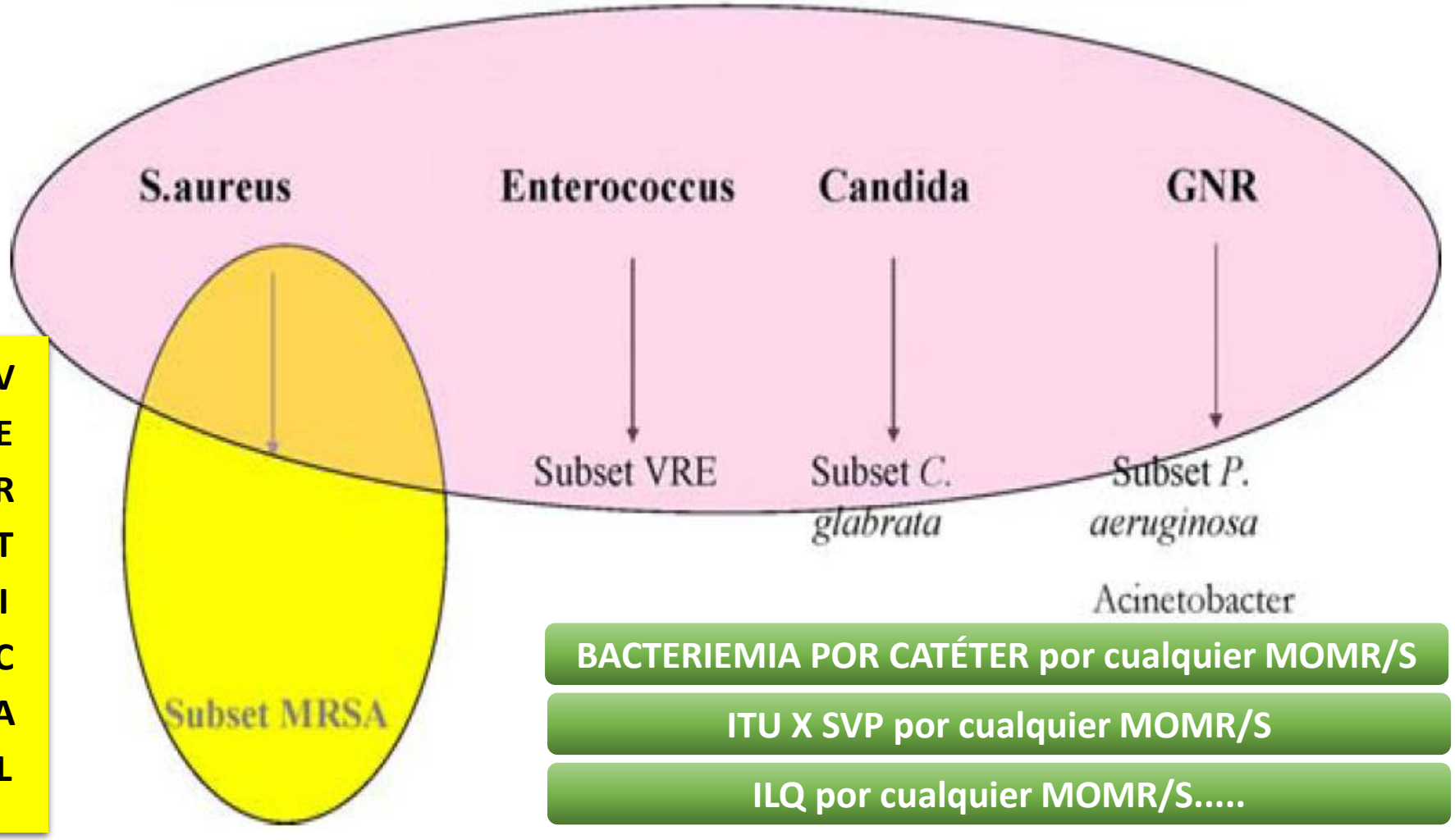
CP:TIME TO RETIRE LEGAL MANDATES

- El CDC recomendó las PC en los años 70 basadas en opiniones de experto **fundamentadas en modelos de transmisión teóricos** y con 7 categorías.
- En los 80 con la llegada del VIH se desarrollaron las PE. **Protección frente a fluidos.**
- En 2007 las guías se centran en PC dirigidas **a MOMR, se refuerza el concepto de PC.**
- La evidencia que apoya esta medida surge de brotes manejados con bundles

Morgan JAMA 2017

ESTRATEGIAS HORIZONTALES O VERTICALES

HORIZONTAL



V E R T I C A L

BACTERIEMIA POR CATÉTER por cualquier MOMR/S

ITU X SVP por cualquier MOMR/S

ILQ por cualquier MOMR/S.....

BACTERIEMIA (POR CATÉTER) POR SARM

Wenzel et al. Int J Infect Dis 2010

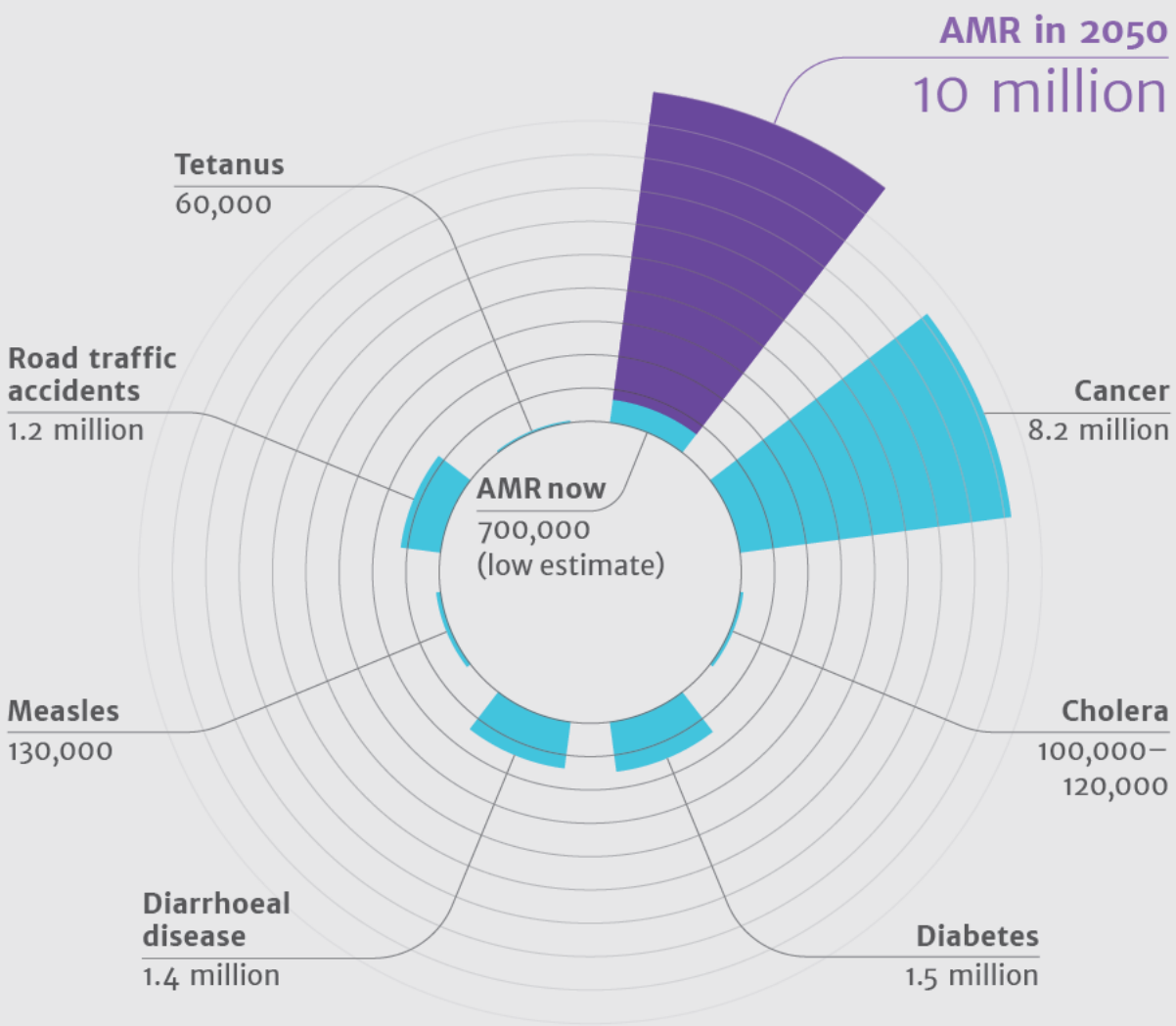
S. XX: ESKAPE

- *E. faecium*
- *S. aureus*
- *K. pneumoniae*
- *A. baumanii*
- *P. aeruginosa*
- *Enterobacter*

S. XXI: ESKAPE AMPLIAT

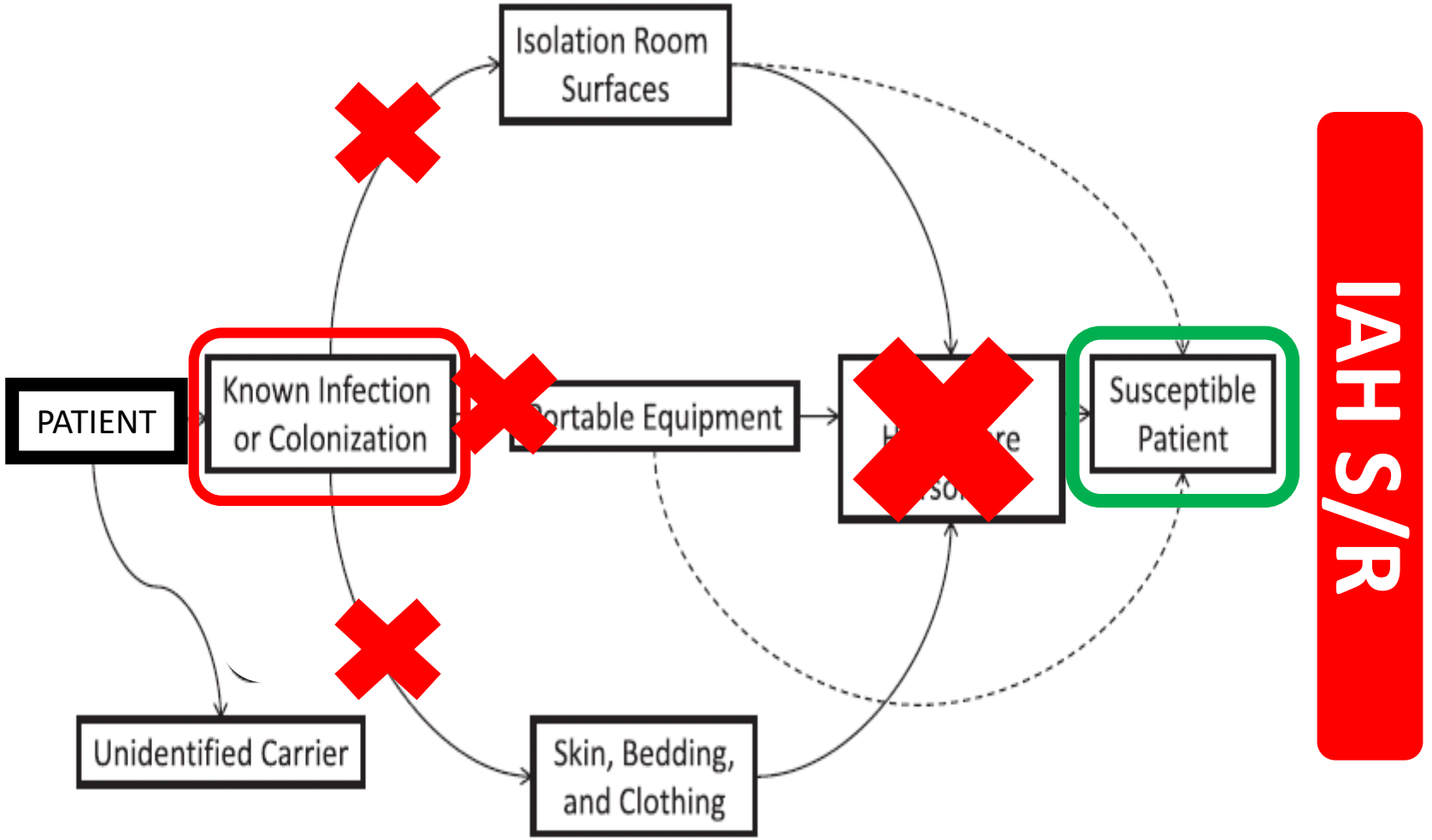
- *E. faecium*
- ***S. aureus***
- ***K. pneumoniae***
- ***C. difficile***
- *A. baumanii*
- ***P. aeruginosa***
- **Enterobacterias** productores de BLEE i carbapemases

Deaths attributable to AMR every year
compared to other major causes of death



ADQUISICIÓ, RESERVORIS, TRANSMISSIÓ

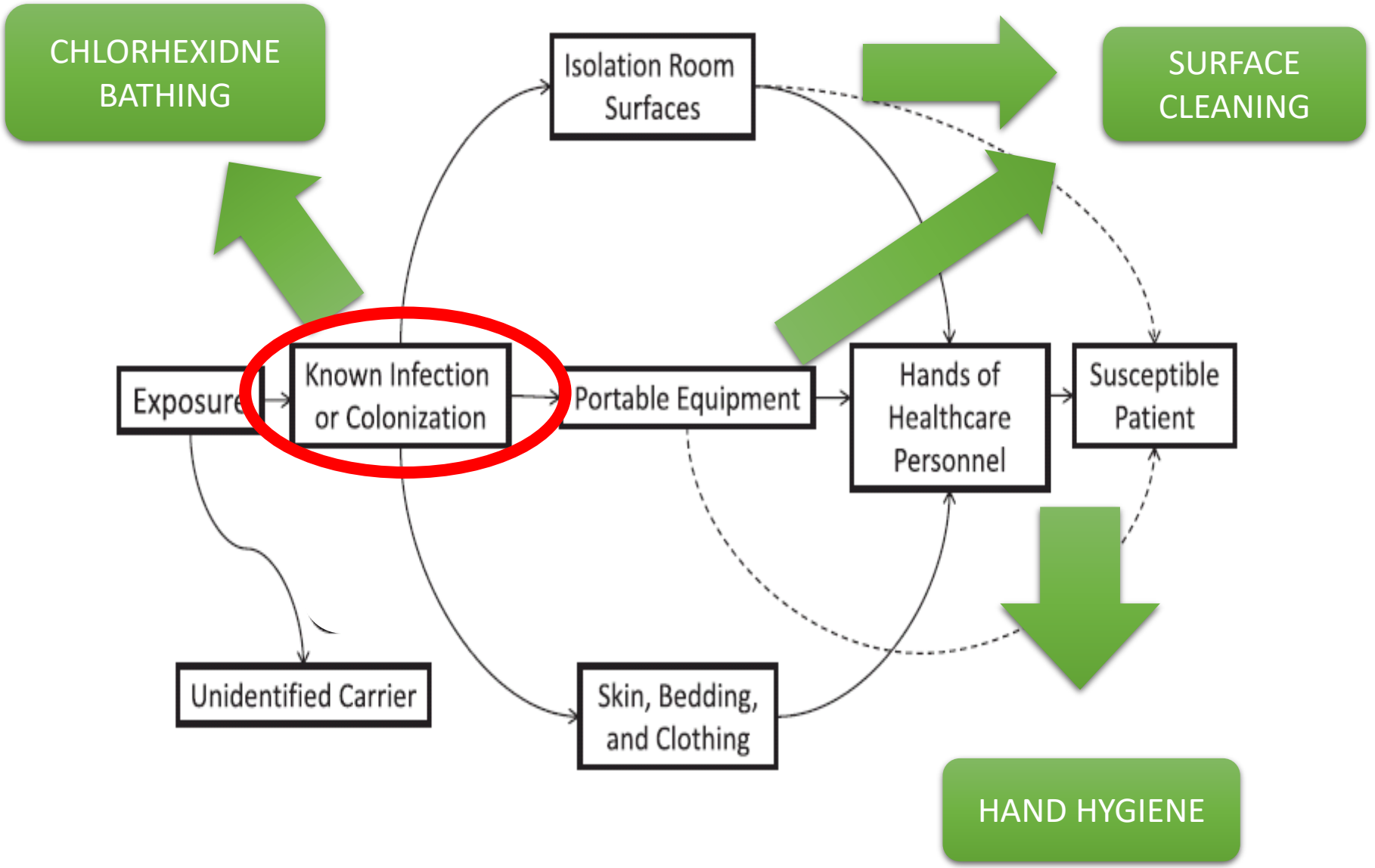
PRECAUCIONES DE CONTACTO



Paciente principal reservorio

Hospital principal factor de riesgo para la adquisición

APROXIMACIÓN HORIZONTAL



DILEMA *(en endemia)*

Máscara

Guantes

Habitación individual

cohorting

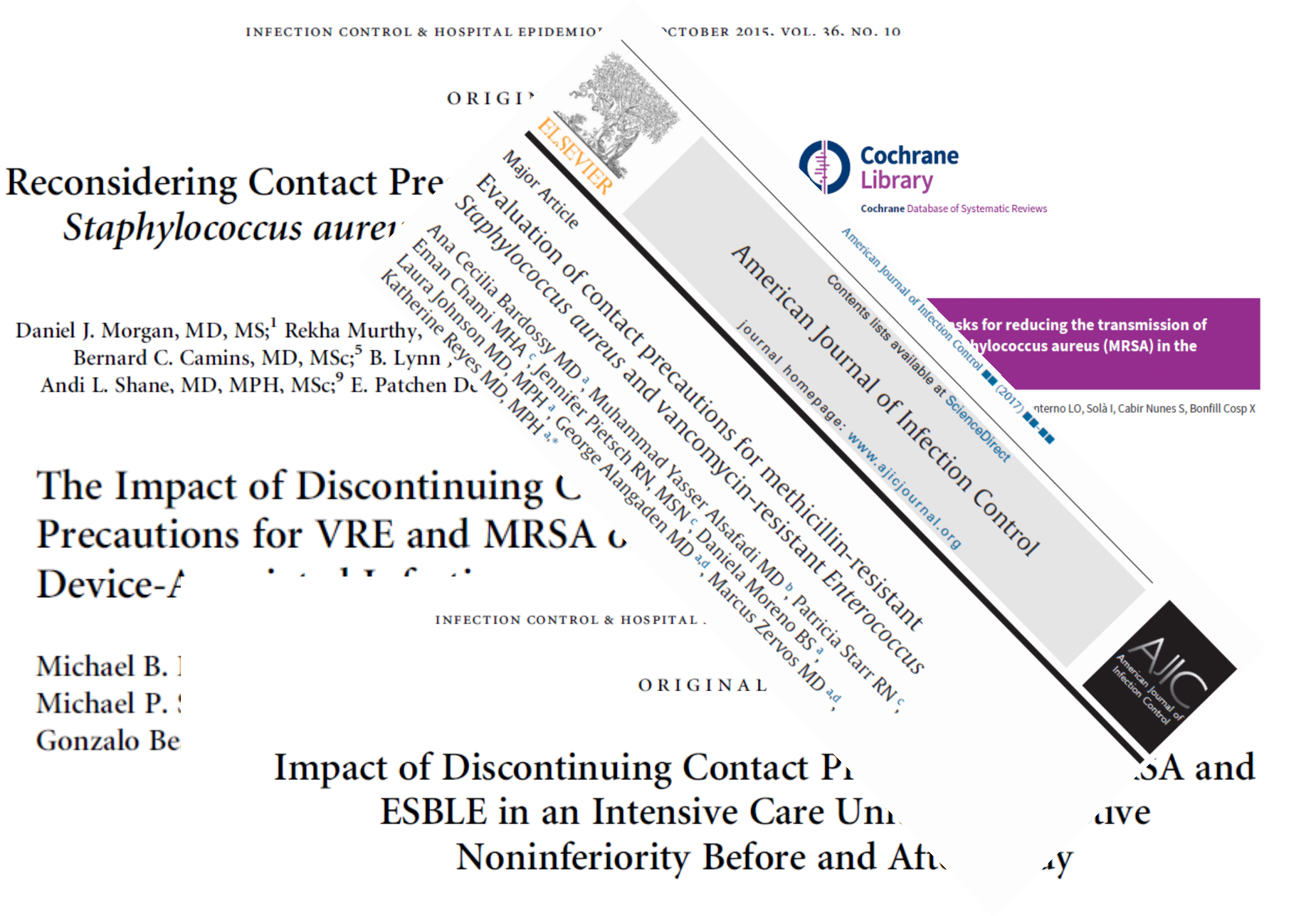
Higiene de manos

Descolonización

Intervenciones dirigidas
(CVC, ITU-SVP, ILQ..)

Higiene ambiental

EXPERIÈNCIES RECENTS



Reconsidering Contact Pre
Staphylococcus aure

Daniel J. Morgan, MD, MS;[1] Rekha Murthy,
Bernard C. Camins, MD, MSc;[5] B. Lynn
Andi L. Shane, MD, MPH, MSc;[9] E. Patchen D

The Impact of Discontinuing C
Precautions for VRE and MRSA
Device-

Michael B.
Michael P.
Gonzalo Be

INFECTION CONTROL & HOSPITAL EPIDEMIO CTOBER 2015, VOL. 36, NO. 10

ORIGI

Major Article

Evaluation of contact precautions for methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus*

Ana Cecilia Bardossy MD [a], Muhammad Yasser Alsafadi MD [b], Patricia Starr RN [c], Eman Chami MHA [c], Jennifer Pietsch RN, MSN [c], Daniela Moreno BS [a], Laura Johnson MD, MPH [a], George Alangaden MD [a,d], Marcus Zervos MD [a,d], Katherine Reyes MD, MPH [a,*]

ELSEVIER

American Journal of Infection Control

Contents lists available at ScienceDirect

journal homepage: www.ajicjournal.org

INFECTION CONTROL & HOSPITAL

ORIGINAL

Impact of Discontinuing Contact P SA and
ESBLE in an Intensive Care Un ive
Noninferiority Before and Af y

Cochrane Library

Cochrane Database of Systematic Reviews

American Journal of Infection Control (2017)

sks for reducing the transmission of
hylococcus aureus (MRSA) in the

nterno LO, Solà I, Cabir Nunes S, Bonfill Cosp X

AJIC American Journal of Infection Control

Laurie Renaudin, MD;[1] Mathieu Llorens, PharmD;[1] Christophe Goetz, MD;[2] Sébastien Gette, MD;[3] Vincente Citro, MN;[3] Sylvia Poulain, MN;[1] Marie-Laure Vanson, MN;[1] Jocelyne Sellies, MD[1]

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

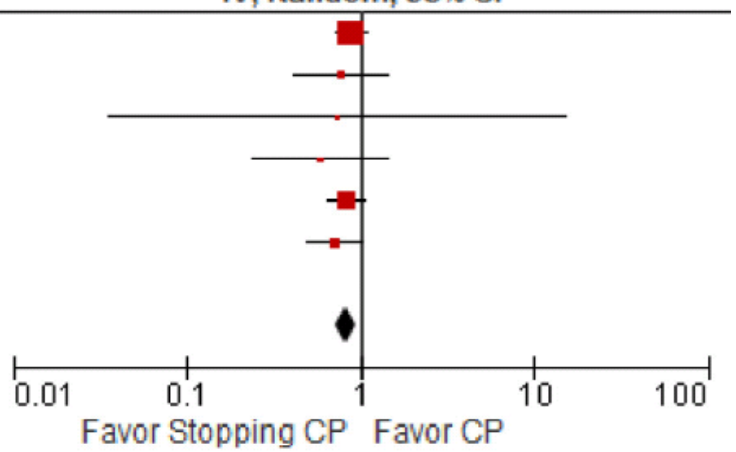
Discontinuing contact precautions for multidrug-resistant organisms: A systematic literature review and meta-analysis

Alexandre R. Marra MD, MS [a,b,*], Michael B. Edmond MD, MPH, MPA [a,c], Marin L. Schweizer PhD [d,e], Grace W. Ryan MPH [f], Daniel J. Diekema MD, MS [a,c,g]

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Random, 95% CI
Almyroudis 2016	-0.13	0.105	44.8%	0.88 [0.71, 1.08]
Edmond 2015	-0.26	0.323	4.7%	0.77 [0.41, 1.45]
Gandra 2014	-0.31	1.55	0.2%	0.73 [0.04, 15.30]
Lemieux 2016	-0.53	0.462	2.3%	0.59 [0.24, 1.46]
Martin 2016	-0.19	0.121	33.8%	0.83 [0.65, 1.05]
Rupp 2016	-0.34	0.187	14.1%	0.71 [0.49, 1.03]
Total (95% CI)			**100.0%**	**0.82 [0.72, 0.94]**

Heterogeneity: Tau² = 0.00; Chi² = 1.56, df = 5 (P = 0.91); I² = 0%

Test for overall effect: Z = 2.78 (P = 0.005)



- Abandonar las PC no se ha correlacionado con un aumento de la incidencia de infección por SARM o VRE
- Esto puede ser debido a bajo **cumplimiento** o a baja **transmisibilidad**
- Efectos adversos: menor tiempo, retraso en la atención, retraso en el ingreso y traslados, alarga estancia media, disconfort psicológico.

Marra AMJIC 2017

2011

MAJOR ARTICLE

Foodborne Nosocomial Outbreak of SHV1 and CTX-M-15–producing *Klebsiella pneumoniae*: Epidemiology and Control

Esther Calbo,[1] Núria Freixas,[2] Mariona Xercavins,[3] Montserrat Riera,[2] Carmen Nicolás,[2] Olga Monistrol,[2] Maria del mar Solé,[4] M. Rosa Sala,[5] Jordi Vila,[4] and Javier Garau[1]

[1]Infectious Diseases Unit, Service of Internal Medicine, Hospital Universitari Mútua de Terrassa, [2]Infection Control Nurse, Hospital Universitari Mútua Terrassa, [3]Microbiology, Catlab, [4]Service of Microbiology, Hospital Clínic i Provinical, Barcelona, and [5]Unitat de Vigilància Epidemiològica Vallés Occidental i Vallés Oriental Health Department, Generalitat de Catalunya, Barcelona, Spain

Ambient com principal reservori

ORIGINAL ARTICLE EPIDEMIOLOGY

Wastewater drainage system as an occult reservoir in a protracted clonal outbreak due to metallo-β-lactamase-producing *Klebsiella oxytoca*

S. Vergara-López[1], M. C. Domínguez[2], M. C. Conejo[3], Á. Pascual[3,4] and J. Rodríguez-Baño[4,5]

1) *Internal Medicine Service, Hospital La Merced,* 2) *Laboratory of Microbiology, Hospital La Merced, Osuna, Seville,* 3) *Department of Microbiology, University of Seville,* 4) *Infectious Diseases and Clinical Microbiology Unit, University Hospital Virgen Macarena and* 5) *Department of Medicine, University of Seville, Seville, Spain*

Abstract

We describe the epidemiology of a protracted nosocomial clonal outbreak due to multidrug-resistant IMP-8 producing *Klebsiella oxytoca* (MDRKO) that was finally eradicated by removing an environmental reservoir. The outbreak occurred in the ICU of a Spanish hospital from March 2009 to November 2011 and evolved over four waves. Forty-two patients were affected. First basic (active surveillance, contact precautions and reinforcement of surface cleaning) and later additional control measures (nurse cohorting and establishment of a minimum patient/nurse ratio) were implemented. Screening of ICU staff was repeatedly negative. Initial environmental cultures, including dry surfaces, were also negative. The above measures temporarily controlled cross-transmission but failed to eradicate the epidemic MDRKO strain that reappeared two weeks after the last colonized patients in waves 2 and 3 had been discharged. Therefore, an occult environmental reservoir was suspected. Samples from the drainpipes and traps of a sink were positive; removal of the sink reduced the rate number but did not stop new cases that clustered in a cubicle whose horizontal drainage system was connected with the eliminated sink. The elimination of the horizontal drainage system finally eradicated the outbreak. In conclusion, damp environmental reservoirs (mainly sink drains, traps and the horizontal drainage system) could explain why standard cross-transmission control measures failed to control the outbreak; such reservoirs should be considered even when environmental cultures of surfaces are negative.

Ambient com principal reservori

2017

International Journal of Antimicrobial Agents 50 (2017) 197–202

Contents lists available at ScienceDirect

International Journal of Antimicrobial Agents

journal homepage: www.elsevier.com/locate/ijantimicag

Emerging extended-spectrum β-lactamase-producing *Klebsiella pneumoniae* causing community-onset urinary tract infections: a case–control–control study

Lucía Boix-Palop [a,b,1,*], Mariona Xercavins [c], Cristina Badía [a], Meritxell Obradors [a], Montserrat Riera [d], Núria Freixas [d], Josefa Pérez [c], Mónica Rodríguez-Carballeira [a], Javier Garau [e], Esther Calbo [a,b,1,*]

[a] *Infectious Diseases Unit, Service of Internal Medicine, Hospital Universitari Mútua de Terrassa, Barcelona, Spain*
[b] *Universitat Internacional de Catalunya, Barcelona, Spain*
[c] *Microbiology Department, CatLab, Barcelona, Spain*
[d] *Hospital Universitari Mútua de Terrassa, Barcelona, Spain*
[e] *Service of Internal Medicine, Clínica Rotger, Palma de Mallorca, Spain*

Pacient com principal reservori

Klebsiella pneumoniae productora de CTX-M-15 en infecciones del tracto urinario de origen comunitario: una epidemiología en evolución.

Introducción:

- *K. pneumoniae* productora de betalactamasas de espectro extendido (KPBLEE) se ha asociado tradicionalmente a infecciones de origen nosocomial.

- Recientemente se ha descrito un incremento de los aislamientos de KPBLEE en la comunidad, especialmente en relación con cepas productoras de la enzima CTX-M-15.

Objetivos:

- Describir la prevalencia, la epidemiología y las características clínicas de las infecciones del tracto urinario de origen comunitario (ITU-OC) causadas por KPBLEE.

- Analizar los factores de riesgo asociados a la adquisición de éstas.

Resultados

XXIII CONGRESO NACIONAL SOCIEDAD ESPAÑOLA DE ENFERMEDADES INFECCIOSAS Y MICROBIOLOGÍA CLÍNICA
seimc
MADRID PALACIO MUNICIPAL DE CONGRESOS
23-25 MAYO 2019

554 días de exposición en PCO con una mediana de 4 (RIC 3-7).

49 CI
pacientes colonizados/infectados por KpBLEE

56 episodios CI

109 PCO
expuestos a CI

6 PCO
excluidos por falta de cultivo al alta

103 (94,5%)PCO

70% NETEJA AMBIENTAL

Características	Casos Índice	PCO
Edad (años)	74,6 años (DE±15,69)	71,19 (DE±14,73)
Sexo	Mujeres 32,7% Hombres 67,3%	Mujeres 29,1% Hombres 70,9%
Días de ingreso (mediana)	15 (RIC 10-31,5)	9 (RIC 6-18)
Barthel (media)	59,11 (DE±39,01)	34,42 (DE±34,42)
Charlson (ajustado a la edad)	5,23 (DE±2,4)	4,2 (DE±2,45)
Tratamiento antibiótico	80,4%	69,9%

70% HM

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Resultados

XXIII CONGRESO NACIONAL SOCIEDAD ESPAÑOLA DE ENFERMEDADES INFECCIOSAS Y MICROBIOLOGÍA CLÍNICA — seimc — MADRID PALACIO MUNICIPAL DE CONGRESOS — 23-25 MAYO 2019

Estudio molecular

CASOS ÍNDICE

Se estudiaron **52/56** episodios (92,9%)

Se identificaron **43** clones diferentes

36 clones únicos

7 clones coincidían con 3 pacientes sin relación tiempo-espacio

PACIENTES CONTACTO

Se estudiaron **103/109** pacientes

Se detectó colonización por KpBLEE en **3** PCO (2,9%)

2 PCO (1,9%) fueron considerados caso secundario.

29 (28,2%) PCO estuvieron expuestos a una superficie contaminada por KpBLEE

1 caso secundario estuvo expuesto a KpBLEE ambiental pero de distinto clon

3,6 casos secundarios por 1000 días de exposición

Hospital Universitari MútuaTerrassa

Conclusiones

- La tasa de transmisibilidad de KpBLEE tras retirar las PC en un centro de agudos **fue baja** (en el contexto de un elevado cumplimiento de HM y una política de limpieza ambiental reforzada).

- La endemia policlonal así como la colonización ambiental nos lleva a replantear el riesgo beneficio de las PC.

Contact precautions in single-bed or multiple-bed rooms for patients with extended-spectrum β-lactamase-producing Enterobacteriaceae in Dutch hospitals: a cluster-randomised, crossover, non-inferiority study

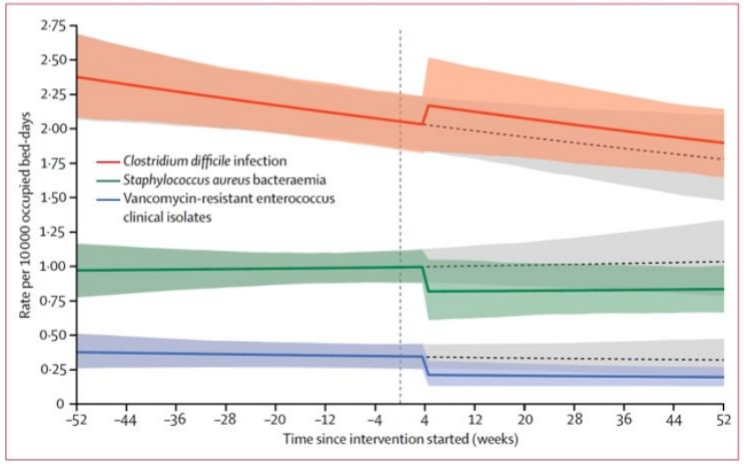
*Marjolein F Q Kluytmans-van den Bergh, Patricia C J Bruijning-Verhagen, Christina M J E Vandenbroucke-Grauls, Els I G B de Brauwer, Anton G M Buiting, Bram M Diederen, Erika P M van Elzakker, Alex W Friedrich, Joost Hopman, Nashwan al Naiemi, John W A Rossen, Gijs J H M Ruijs, Paul H M Savelkoul, Carlo Verhulst, Margreet C Vos, Andreas Voss, Marc J M Bonten, Jan A J W Kluytmans, on behalf of the SoM Study Group**

www.thelancet.com/infection **Published online August 23, 2019** **http://dx.doi.org/10.1016/S1473-3099(19)30262-2**

PROA O CONTROL D'INFECCIÓ?

CLOSTRIDIUM : CONTROL DE INFECCIÓ O PROA

An environmental cleaning bundle and health-care-associated infections in hospitals (REACH): a multicentre, randomised trial



	Estimate (95% CI)	p value
No intervention		
Clostridium difficile infections	−28·8 (−45·9 to −6·4)	0·0163
Staphylococcus aureus bacteraemia*	5·1 (−33·0 to 65·0)	0·8280
Vancomycin-resistant enterococcus clinical isolates	−15·6 (−53·1 to 51·9)	0·5653
With intervention		
Clostridium difficile infections	7·3 (−11·8 to 30·5)	0·4655
S aureus bacteraemia*	−18·1 (−40·2 to 12·0)	0·2180
Vancomycin-resistant enterococcus	−36·9 (−59·0 to −2·8)	0·0340
All infections	−5·8 (−19·8 to 9·4)	0·4246

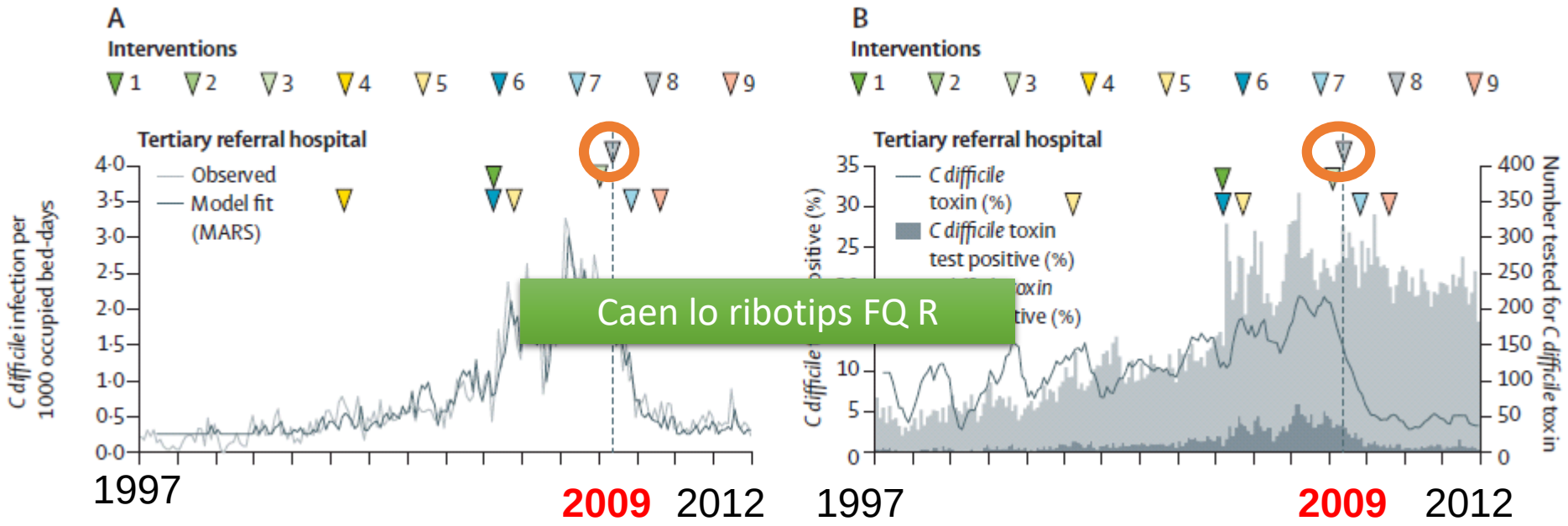
Per-protocol adjusted results, calculated using a linear trend and a binary switch with a 4-week intervention lag.
*Includes both meticillin-resistant and meticillin-sensitive *S aureus*.

Table 2: **Percentage changes in infection rates, by intervention**

Mitchell BG et al. Lancet Infect Dis 2019;epub ahead of print

Intervención multimodal, enfocada a optimizar el uso del producto, la técnica, el compromiso del personal, auditoría con retroalimentación y la comunicación
12 MESES 2016 a 2017

CLOSTRIDIUM : CONTROL DE INFECCIÓN O PROA?



Caen lo ribotips FQ R

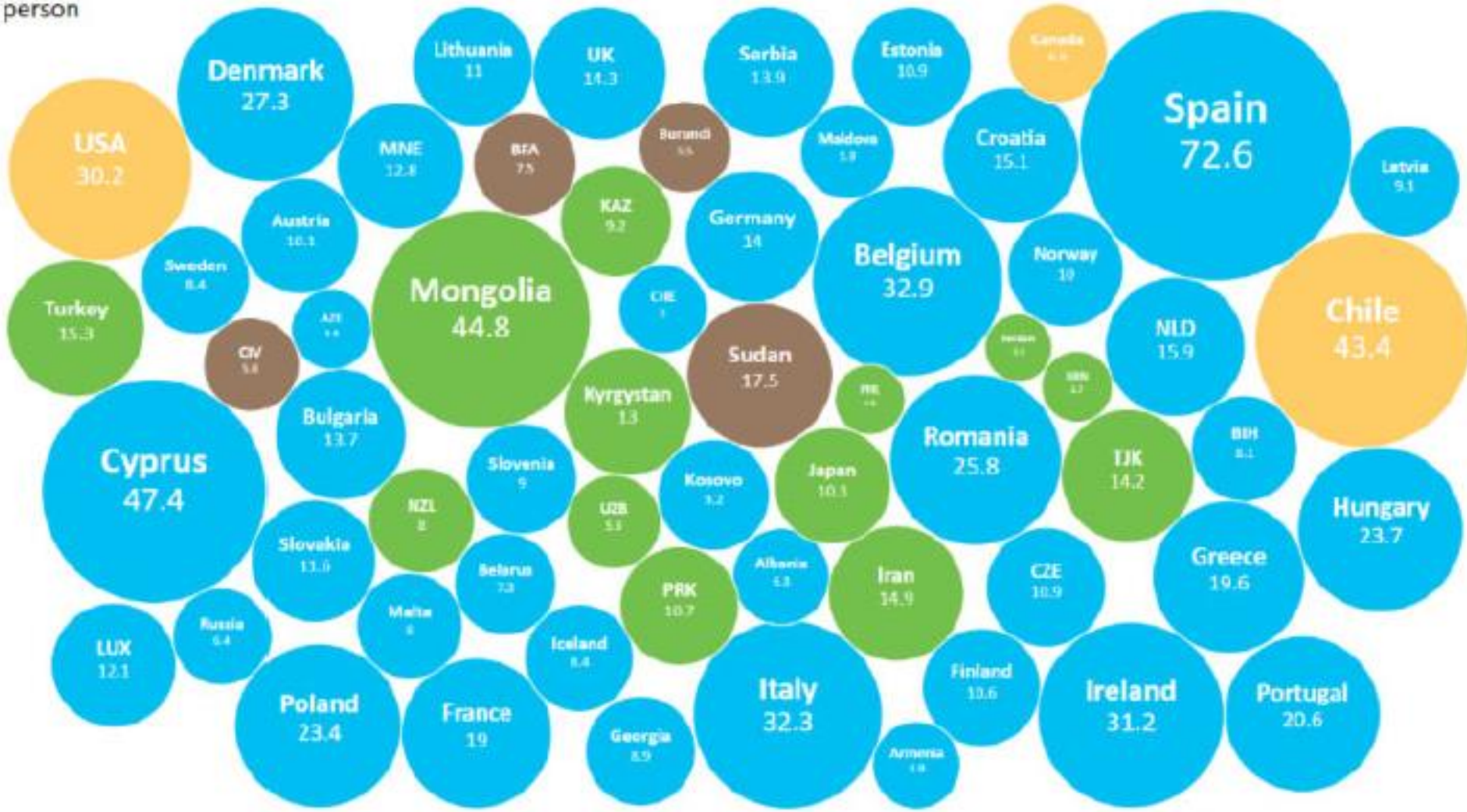
1. mandatory surveillance for individuals older than 65 years in hospitals
2. and in the community
3. and in 15–64 year olds in all settings
4. introduction of alcohol-based hand sanitiser
5. and national hand-hygiene campaign
6. **auditing of environmental cleaning standards in hospital**
7. and Hospital Environment Inspectorate inspections
8. **antibiotic stewardship (4C: cephalosporines, co-amox-clav, clindamycin, FQ)**
9. and persuasive hospital prescribing intervention to reduce use of proton-pump inhibitors

Lawes et al. Lancet Infect Dis 2017

Antimicrobial consumption by country

All sectors | Human Consumption | Community | Hospital | Animal Agriculture | Per person

*Measured in grams per person



Africa | Asia & Oceania | Europe | America

MútuaTerrassa
ASSISTENCIAL

LA PRESCRIPCIÓ ANTIMICROBIANA EN 3 TEMPS

CROS-D2

	METGES		INFERMERES

Dia 0	• **C**ultivar abans d'iniciar ANTIBIOTERÀPIA (ATB).
	  • Hemocultius.
	  • Lloc de la infecció.
	• Iniciar **ATB EMPÍRICA** segons **guies PROA.**
			• **C**ultivar abans d'iniciar l'ATB.
			  • Hemocultius: 2 extraccions.
			  • Mostra lloc de la infecció.
			• **R**ealitzar administració de l'ATB inmediatament després de la seva prescripció.

Dia 3	• Valorar pas a **via O**ral.
	  • Estabilitat clínica?*
	  • Puc canviar l'ATB a via oral?
			Abans de canviar la via venosa: consultar el pas de l'ATB a **via O**ral.

Dia 5	• Hi ha INFECCIÓ?
	  • No → **S**uspendre ATB.
	  • Sí → **D**irigir ATB segons els resultats dels cultius.
			Preguntar **Si ha De** continuar l'ATB i ...

→	• Planificar la **D**urada de l'ATB en funció de la síndrome clínica.		... la seva **D**urada.

*ESTABILITAT CLÍNICA si:
- T^a ≤ 37,8ºC
- FR ≤ 24 rpm
- SatO2 basal ≥ 90%
- FC ≤ 100 lpm
- TA sistòlica ≥ 90 mmHg
- Estat mental no alterat (respecte a basal)

CONCLUSIONS

CONCLUSIONS

- La situació de **RAM** és una amenaça actual que mereix un abordatge integral que inclou **intervencions de control d'infecció i PROA.**

- Sembla segur abandonar PC per MOMR determinats en situacions de:
  - Endemia estable
  - Amb condicions estructurals adequades
  - **Bon compliment de la HM**
  - Bany de clorexidina +/- descolonització
  - Neteja ambiental,
  - **UN EQUIP CONTROL INFECCIÓ expert i atent**

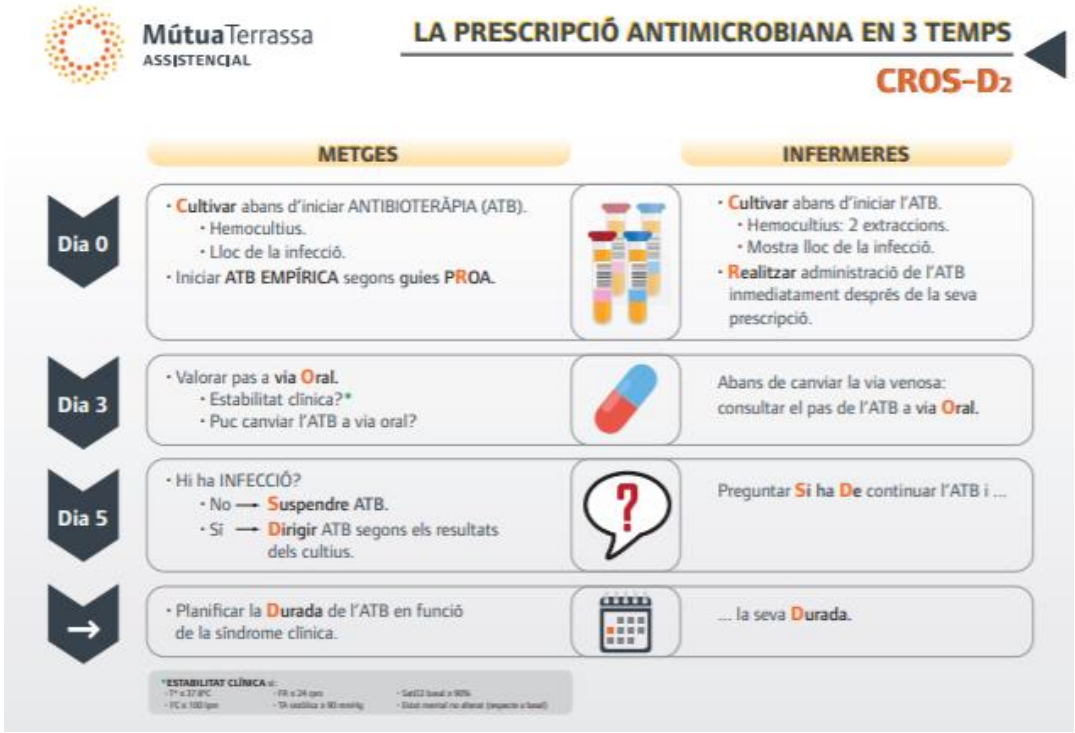
- Focalitzar els esforços del ECI cap a **estratègies preventives horitzontals** (dirigides a síndromes) pot ser més eficaç.

- Estratègia "*vestit a mida*" tenint en compte **l'epidemiologia local** i atents als canvis vs estratègia "cafè per a tots".

- Si mantenim les PC hauríem monitoritzar el compliment.

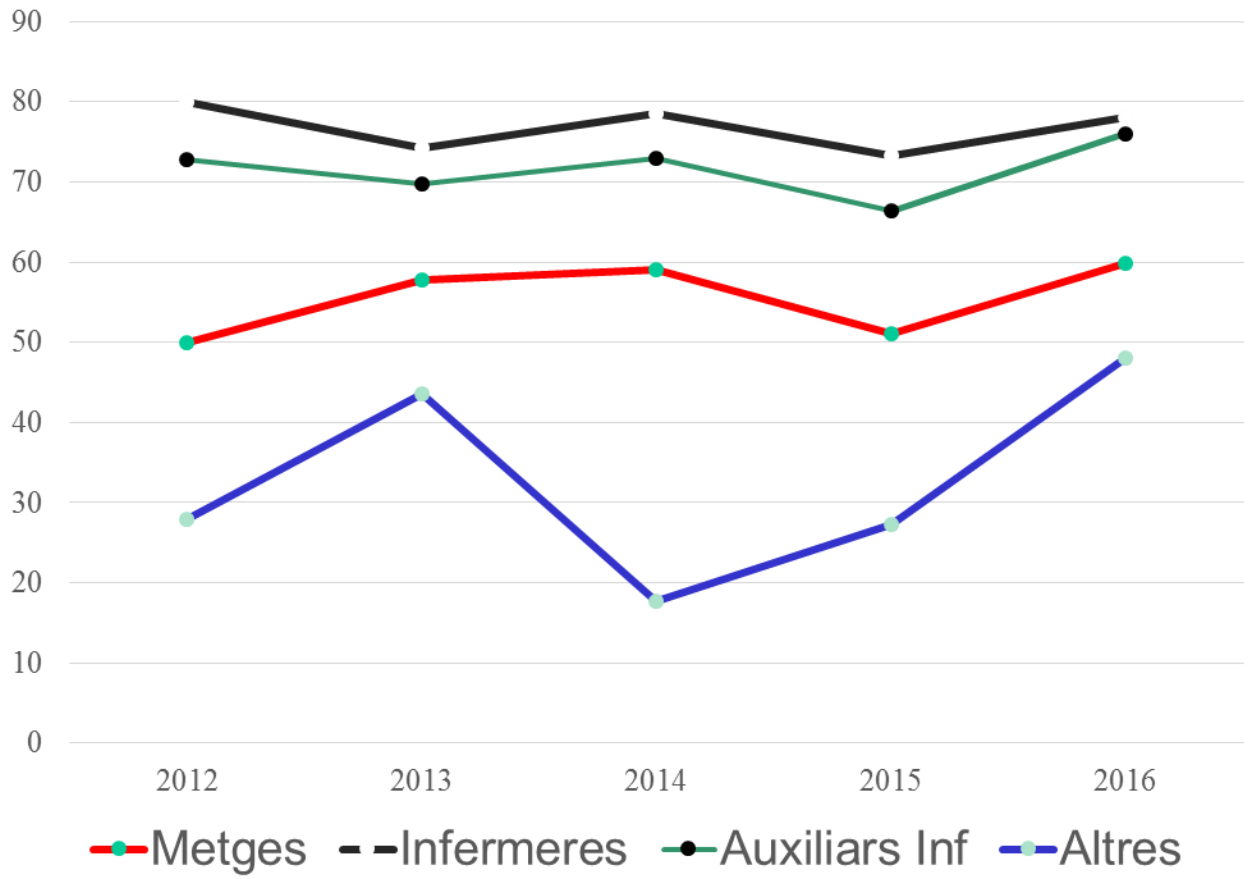
PART DE LA SOLUCIÓ ÉS A LES TEVES MANS

Curtis New Engl J Med 2009



Hospital Universitari MútuaTerrassa

Resultat observacions compliment higiene de mans



REVISIONES SISTEMÁTICAS

	N	A favor	En contra
Cohen JHI 2015	6 PC aisladas (4/6 miden cumplimiento 21-87%)	1/6 demuestra caídas en la transmisión (*A. baumannii*)	No se mojan: baja calidad, bajo cumplimiento
Morgan ICHE 2015	48, brotes, bundle 11 CP SARM (+AS) 5 CP VRE (+AS)	6/11 SARM resultado positivo 5/5 VRE resultado negativo	No hay evidencia suficiente en la literatura para sustentar las PC Aportan encuesta de hospitales, 30 no usan PC
Kullar AMJIC 2016	6 estudios, RCT, bundle	PC disminuyen la transmisión en brotes si hay alto cumplimiento No correlación con caída de la tasa de infecciones	No impacto en contexto de endemia Efectos adversos asociados

	Contact precautions in a single-bed room	Contact precautions in a multiple-bed room	Risk difference (90% CI)	Risk difference (95% CI)	Relative risk (95% CI)
Transmission of ESBL-producing Enterobacteriaceae to wardmates					
All index patients: per-protocol population, crude	11/275 (4%)	14/188 (7%)	3·4% (−0·3 to 7·1)	3·4% (−1·0 to 7·9)	1·86 (0·86 to 4·01)
All index patients: per-protocol population, adjusted*	..	..	3·4% (−0·2 to 6·9)	3·4% (−0·8 to 7·6)	1·95 (0·91 to 4·18)
All index patients: intention-to-treat population, crude	15/312 (5%)	18/304 (6%)	1·1% (−1·9 to 4·1)	1·1% (−2·4 to 4·7)	1·23 (0·63 to 2·40)
All index patients: intention-to-treat population, adjusted*	..	..	1·6% (−1·1 to 4·3)	1·6% (−1·7 to 4·8)	1·33 (0·69 to 2·56)
Index patients without unprotected ward stay: per-protocol population	2/96 (2%)	3/78 (4%)	1·8% (−2·5 to 6·1)	1·8% (−3·4 to 6·9)	1·85 (0·32 to 10·77)
Index patients without unprotected ward stay: intention-to-treat population	3/109 (3%)	5/134 (4%)	1·0% (−2·7 to 4·7)	1·0% (−3·5 to 5·4)	1·36 (0·33 to 5·55)
Rectal carriage of ESBL-producing Enterobacteriaceae in wardmates					
All wardmates: per-protocol population, crude	322/4174 (8%)	256/2919 (9%)	..	1·1% (−0·3 to 2·4)	1·14 (0·97 to 1·33)
All wardmates: per-protocol population, adjusted†	..	..	..	1·0% (−0·3 to 2·3)	1·16 (0·99 to 1·35)
All wardmates: intention-to-treat population, crude	377/4790 (8%)	400/4578 (9%)	..	0·9% (−0·3 to 2·0)	1·11 (0·97 to 1·27)
All wardmates: intention-to-treat population, adjusted†	..	..	..	0·9% (−0·2 to 2·0)	1·14 (1·00 to 1·30)
Wardmates of index patients with unprotected ward stay: per-protocol population	117/1448 (8%)	94/1206 (8%)	..	−0·1% (−2·1 to 2·0)	0·99 (0·76 to 1·29)
Wardmates of index patients with unprotected ward stay: intention-to-treat population	130/1665 (8%)	173/2046 (9%)	..	0·6% (−1·1 to 2·4)	1·08 (0·87 to 1·35)
Length of hospital stay in wardmates (days)					
Per-protocol population	11 (6–21)	11 (6–22)	..	0·3 (−0·8 to 1·5)	1·02 (0·96 to 1·08)
Intention-to-treat population	11 (6–22)	11 (5–22)	..	0·1 (−0·9 to 1·1)	1·01 (0·96 to 1·06)
30-day mortality in wardmates					
Per-protocol population‡	155/4133 (4%)	123/2890 (4%)	..	0·5% (−0·4 to 1·4)	1·14 (0·90 to 1·43)
Intention-to-treat population§	174/4742 (4%)	180/4525 (4%)	..	0·3% (−0·5 to 1·1)	1·08 (0·88 to 1·33)

Data are n/N (%) or median (IQR), unless otherwise stated. ESBL=extended-spectrum β-lactamase. *Analyses were adjusted for unprotected ward days of the index patient. †Analyses were adjusted for unprotected exposure days to the index patient. ‡30-day mortality data were missing for 70 wardmates. §30-day mortality data were missing for 101 wardmates.

Table 3: **Effect of isolation strategy on patient-level outcomes**

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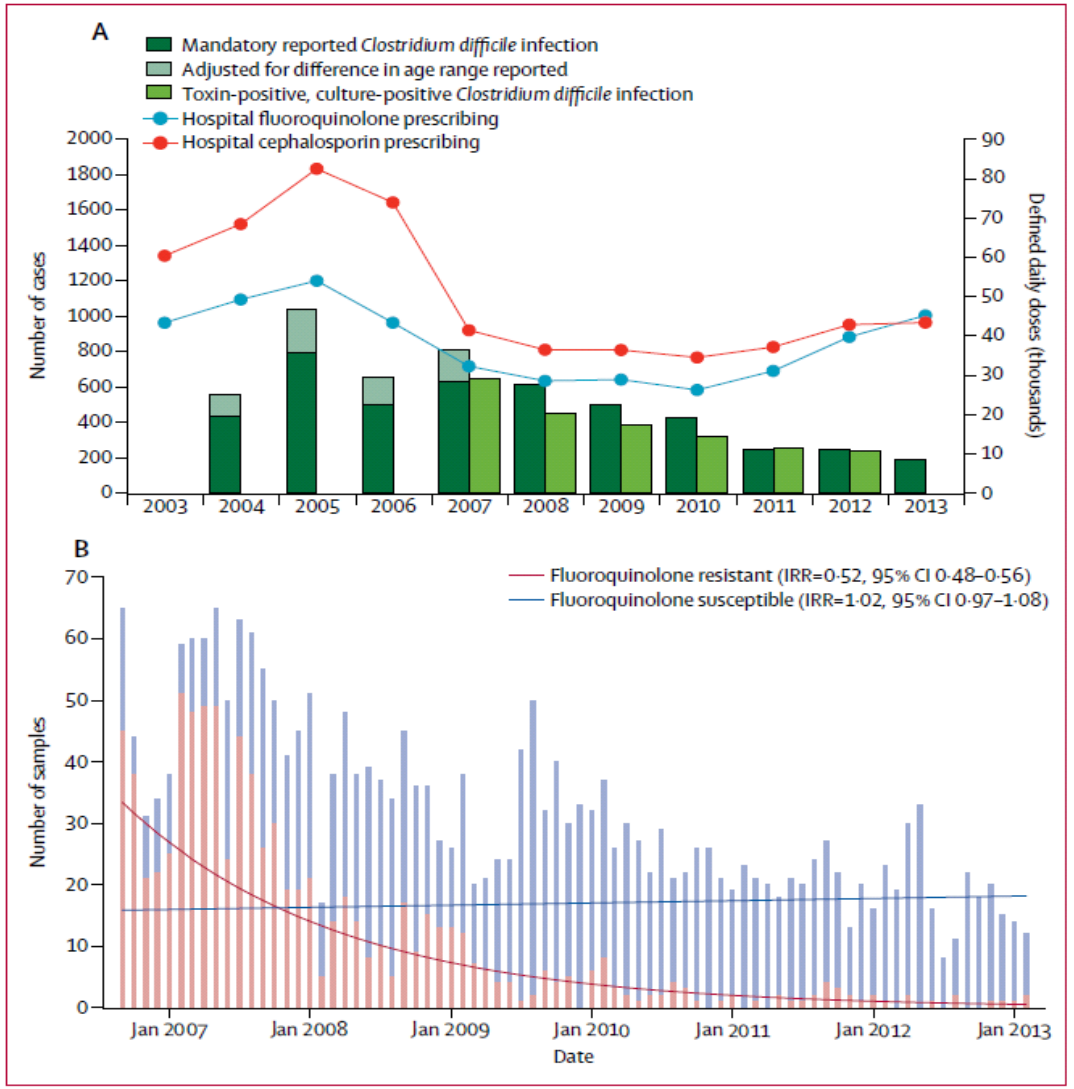
CLOSTRIDIUM : CONTROL D'INFECCIÓ O PROA

- ST resistents a FQ apareixen abans de l'epidèmia (027, 001, 017, 106)
- todas las medidas (la restricció de FQ) consiguen la caíd sólo de los R a FQ
- Las medidas de CI no impactan sobre la incidencia.
- No hay evidencia de transmisión (agrupación local) de los ST sensibles a FQ: hay una fuente externa.
- No caen los casos secundarios (ST similares) FQ sensibles



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GRÀCIES

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