Skal vi fortsette å bruke kontaktsmitteisolering for multiresistentene Gram negative?

Andreas Radtke

smittevernoverlege

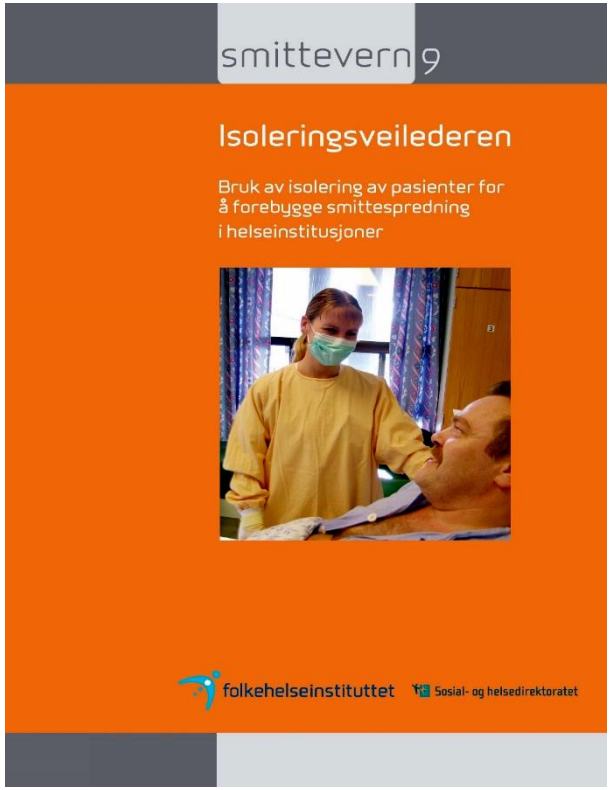
Multiresistente agens vi isolerer for

- MRSA
- VRE
- ESBL-enterobacteriacae: *E. coli*, Klebsiella, andre (ESBL-E)
- ESBL Pseudomonas, Acinetobacter…
- Karbapenemresistente enterobacteriacae (CPE)
- Karbepenemresistente Pseudomonas, Acinetobacter

Hvorfor kontaktsmitte (for multiresistente)?

Vi mener at ***basale smitteverntiltak*** ikke er tilstrekkelig for å:

- Forhindre utbrudd
- Forhindre kryssmitte
- Forhindre sykdom



Mulige smitteverntiltak mot multiresistente

- Kontaktsmittetiltak
- Pasientisolering (i enerom)
- Håndhygiene
- Renhold (overflatedesinfeksjon, kontaktpunkter)
- Antibiotikastyring
- Merking av journaler
- Rutinemessig screening (mottak, intensiv mm.)
- Klorheksidin huddesinfeksjon ved bading/vasking/stell
- Monitorering, audit og feedback av tiltakene
- Analyse av arbeidsflyten for å se etter gjenstander som brukes på tvers
- Bakteriologisk screening av overflater
- Kohortering eller stenging av sengeposter

1. Karpapenemresistente enterobacteriacae

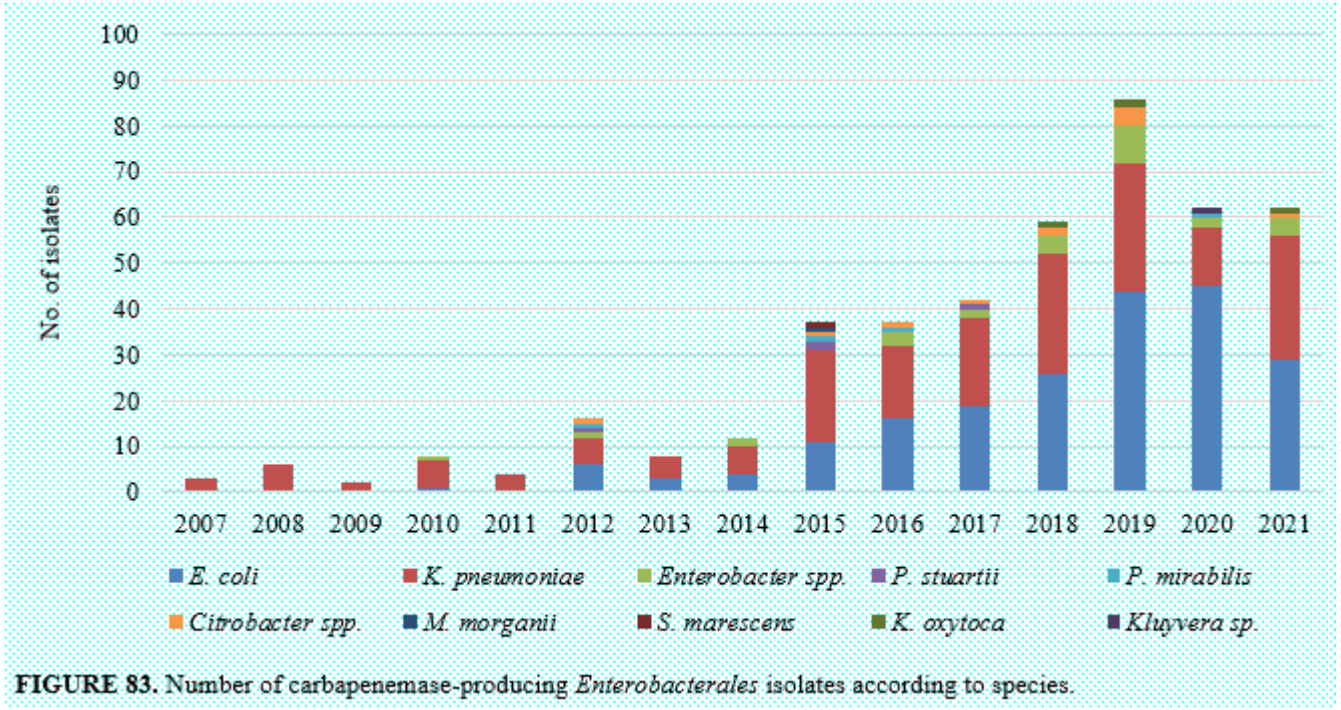


FIGURE 83. Number of carbapenemase-producing *Enterobacterales* isolates according to species.

NORM-rapport 2021

Clinical Infectious Diseases

INVITED ARTICLE

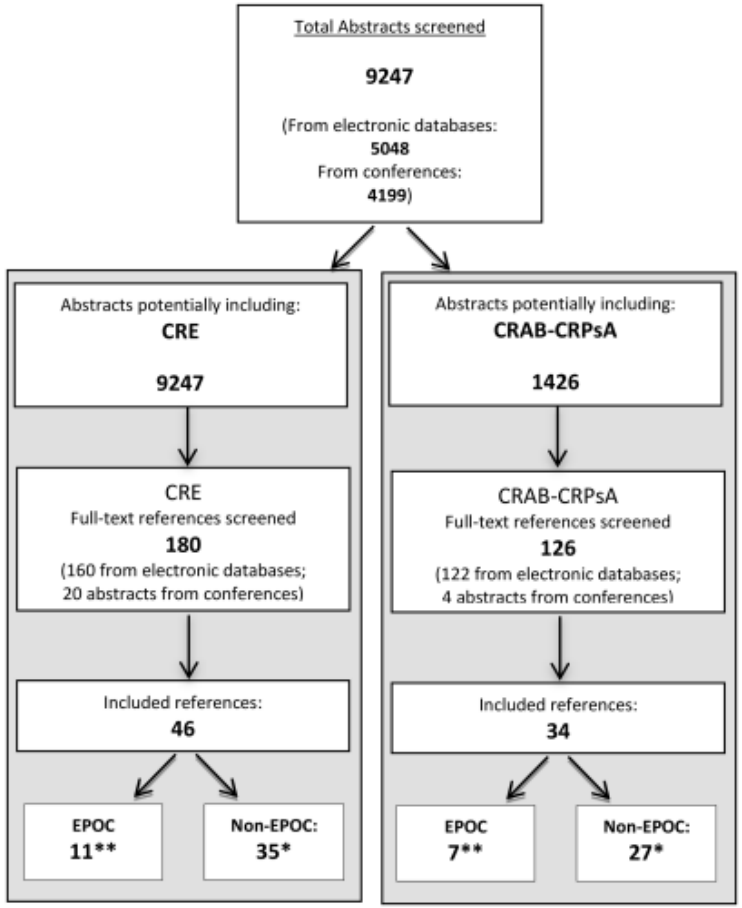
HEALTHCARE EPIDEMIOLOGY: Robert A. Weinstein, Section Editor

Control of Carbapenem-resistant Enterobacteriaceae, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* in Healthcare Facilities: A Systematic Review and Reanalysis of Quasi-experimental Studies

Sara Tomczyk,[1,2] Veronica Zanichelli,[3] M. Lindsay Grayson,[4,5,6] Anthony Twyman,[1] Mohamed Abbas,[3] Daniela Pires,[3,7] Benedetta Allegranzi,[1] and Stephan Harbarth[3]

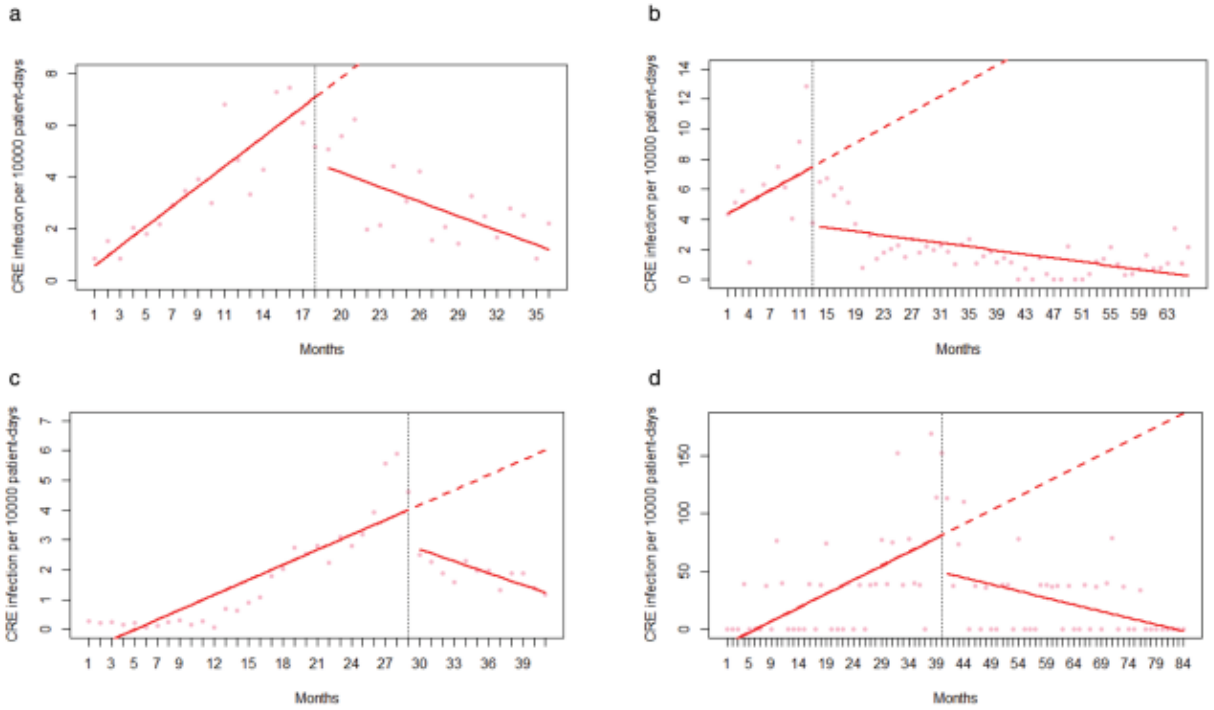
[1]Infection Prevention and Control Global Unit, Service Delivery and Safety Department, World Health Organization, [2]Institute of Global Health, University of Geneva, and [3]Infection Control Program, Geneva University Hospitals and Faculty of Medicine, Switzerland; [4]Infectious Diseases Department, Austin Health, [5]Department of Epidemiology and Preventive Medicine, Monash University, and [6]Department of Medicine, University of Melbourne, Victoria, Australia; and [7]Department of Infectious Diseases, Centro Hospitalar Lisboa Norte and Faculdade de Medicina da Universidade de Lisboa, Portugal

Tomczyk et al. Clin Infect Dis. 2019;68(5):873-884.



WHO review: CPE control

Effekt av intervensjoner



ST. OLAVS HOSPITAL
UNIVERSITETSSYKEHUSET I TRONDHEIM

Tomczyk et al. Clin Infect Dis. 2019;68(5):873-884.

WHO review: CPE control

Elementer i «bundles»

Intervention	EPOC studies
Active surveillance	10/11
Contact precautions	10/11
Cohorting	9/11
Monitoring, audit and feedback	9/11
Patient isolation	9/11
Hand hygiene education & monitoring	6/11
Education	4/11
Antibiotic stewardship	4/11
Enhanced environmental cleaning	3/11
Daily chlorhexidine gluconate baths	3/11
Flagging positive patients in medical record (alerts)	3/11
Environmental surveillance	1/11
Temporary ward closure	1/11

Tomczyk et al. Clin Infect Dis. 2019;68(5):873-884.

WHO essensielle anbefalinger for CPE

Recommendation 1: Implementation of multimodal IPC strategies, that is, hand hygiene, surveillance, contact precautions, patient isolation (single room or cohorting) and environmental cleaning.

Recommendation 2: Importance of hand hygiene compliance for the control of CRE-CRAB-CRPsA.

Recommendation 3: Surveillance of CRE-CRAB-CRPsA infection and surveillance cultures for asymptomatic CRE colonization.

Recommendation 4: Contact precautions.

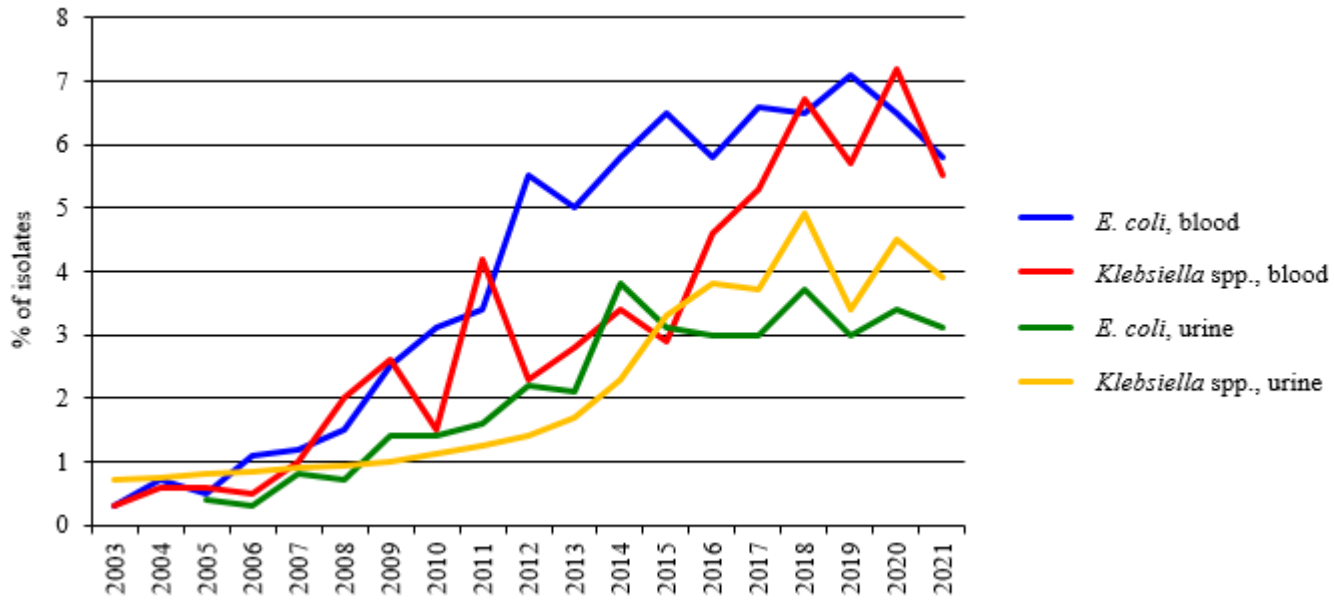
Recommendation 5: Patient isolation.

Recommendation 6: Environmental cleaning

Recommendation 7: Surveillance cultures of the environment for CRE-CRAB-CRPsA colonization/ contamination.

Recommendation 8: Monitoring, auditing and feedback.

2. ESBL-enterobacteriacae



NORM-rapport 2021

Oppsummering ESBL-E. coli 2017

Clinical Infectious Diseases

INVITED ARTICLE

HEALTHCARE EPIDEMIOLOGY: Robert A. Weinstein, Section Editor

Contact Precautions for Preventing Nosocomial Transmission of Extended-Spectrum β Lactamase–Producing *Escherichia coli*: A Point/Counterpoint Review

Sarah Tschudin-Sutter,[1] Jean-Christophe Lucet,[2] Nico T. Mutters,[3] Evelina Tacconelli,[4] Jean Ralph Zahar,[5] and Stephan Harbarth[6]

[1]Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel, University of Basel, Switzerland; [2]Infection Control Program, Bichat University Hospital, Paris, France; [3]Heidelberg University Hospital, Department of Infectious Diseases, and [4]Division of Infectious Diseases, Department of Internal Medicine I, German Center for Infection Research (DZIF), Tübingen University Hospital, Germany; [5]Infection Control Unit, Microbiology Department, Avicenne Hospital, Paris-Nord University (UHR SMBH), Bobigny, France; and [6]Infection Control Programme, Geneva University Hospitals and Medical School, Switzerland

Clinical Infectious Diseases® 2017;65(2):342–7

"It is likely that a majority of patients and wards do not need to rely on contact precautions for preventing nosocomial ESBL-EC transmission in nonepidemic settings, without harming patient safety, providing sufficient compliance with standard precautions and ongoing surveillance."

Noen poeng

- Estimert transmisjonsinsidens ESBL-E.coli: 0,4 – 4,2 / 1000 dager med eksponering
  - For lite smittsom for store utbrudd
  - Akuttsykehus mot samme husstand
- Klon ST 131: mer smittsom

- ESBL-Ec BSI har muligens en noe høyere dødelighet enn vanlige Ec
- ESCMID guidelines (2015) recommend contact precautions
  - moderat evidens

Tschudin-Sutter et al. Clin Infect Dis. 2017;65(2):342-7.

Contact isolation versus standard precautions to decrease acquisition of extended-spectrum β-lactamase-producing Enterobacterales in non-critical care wards: a cluster-randomised crossover trial

Friederike Maechler, Frank Schwab, Sonja Hansen, Carolina Fankhauser, Stephan Harbarth, Benedikt D Huttner, Cristina Diaz-Agero, Nieves Lopez, Rafael Canton, Patricia Ruiz-Garbajosa, Hetty Blok, Marc J Bonten, Fieke Kloosterman, Joost Schotsman, Ben S Cooper, Michael Behnke, Jennifer Golembus, Axel Kola, Petra Gastmeier, on behalf of the R-GNOSIS WP5 study group

R-GNOSIS WP5

Cluster-randomized cross-over trial
20 wards in 4 European university hospitals

Control: 12-month period of SP for ESBL-E
Intervention: 12 months of CP (glove + gown) for ESBL-E

- ESBL-E incidence densities / 1000 patient days at risk
- Incidence densities of ward-acquired ESBL-*Escherichia coli* and ESBL-*Klebsiella pneumoniae*
- ESBL-E admission prevalence

Admission screening + weekly screening + discharge screening

Ward-level generalized estimating equation (GEE) model
Cox proportional-hazards models

16,784 patients with LOS > 3 days and ≥ 2 screening cultures (ITT analysis)
11,368 patients with LOS > 7 days and ≥ 2 screening cultures (PP analysis)

Maechler F et al. Lancet Infect Dis 2020

Maechler et.al. *Lancet Infect Dis* 2020; 20: 575–84

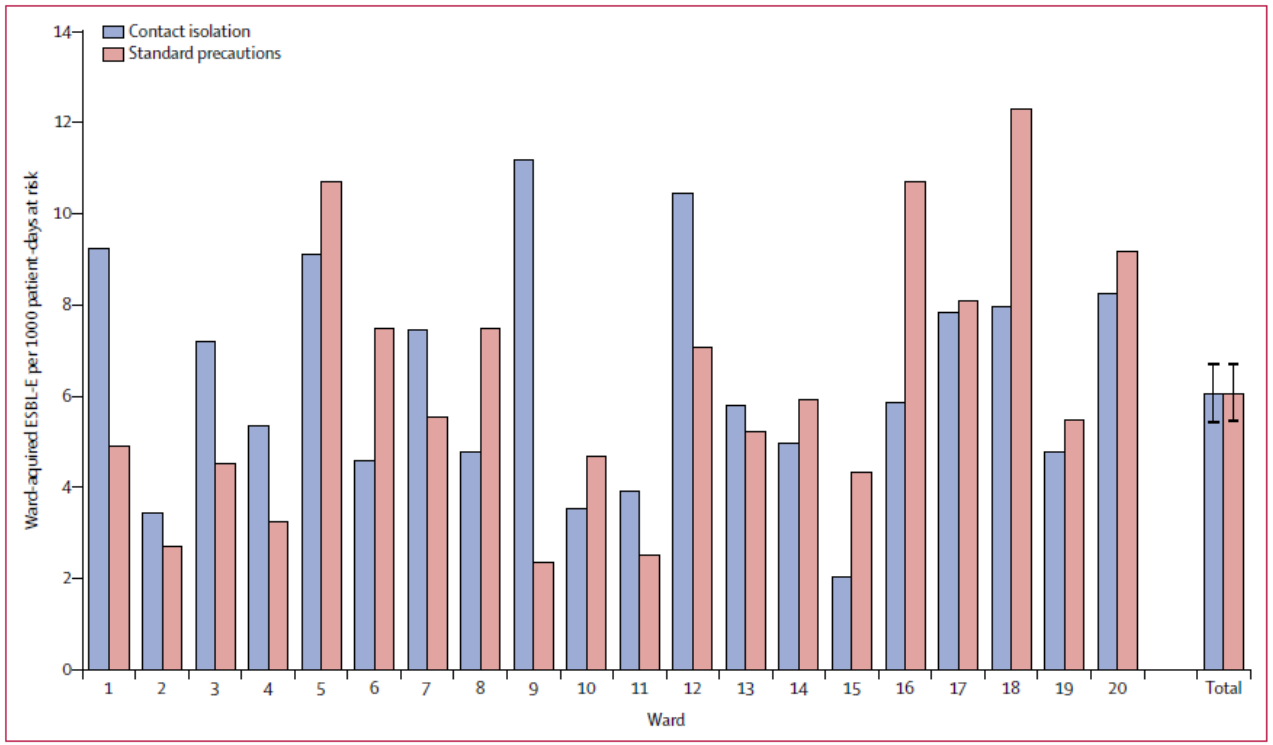


Figure 3: **ESBL-E acquisition rates in the per-protocol population for individual wards and pooled ESBL-E acquisition rates per intervention**
Error bars represent 95% CIs. ESBL-E=extended-spectrum β-lactamase-producing Enterobacterales.

- **Patient-level analysis accounting for patients' LOS:**
  - Adjusted hazard ratio for care in CI 1.0 (95%CI, 0.86 to 1.15; P = 0.89; adjusted for ward and country).
  - No evidence of an intervention effect on the risk of ESBL-E-acquisition over time

Incidence density: 6.0 (95CI 5.4-6.7) (CP) vs 6.1 (95%CI 5.5-6.7) (SP) of ward-acquired ESBL-E per 1000 days at risk

Lite trend (usignifikant) mot mer smitte ved Klebsiella enn E.coli

Maechler et.al. *Lancet Infect Dis* 2020; 20: 575–84

Contents lists available at ScienceDirect

Clinical Microbiology and Infection

journal homepage: www.clinicalmicrobiologyandinfection.com

Original article

Impact of single-room contact precautions on hospital-acquisition and transmission of multidrug-resistant *Escherichia coli*: a prospective multicentre cohort study in haematological and oncological wards

L.M. Biehl [1,2,†], P. Higgins [2,3,†], T. Wille [3], K. Peter [1], A. Hamprecht [2,3], S. Peter [4,5], D. Dörfel [6,7], W. Vogel [6], H. Häfner [8], S. Lemmen [8], J. Panse [9], H. Rohde [10,11], E.-M. Klupp [10], P. Schafhausen [12], C. Imirzalioglu [13,14], L. Falgenhauer [13,14], J. Salmanton-García [1], M. Stecher [1,2], J.J. Vehreschild [1,2], H. Seifert [2,3], M.J.G.T. Vehreschild [1,2,*]

Hospital-acquisition of F3GCR-EC :

- 22/1386 (1.6%) (SP) vs 16/1582 (1.0%) (CP, p=0.19)

BSI caused by F3GCR-EC :

- 3/1386 (0.22%) (SP) vs 4/1582 (0.25%) (CP, p=1.0)

Patient-to-patient transmission (WGS)

- three cases (in SP and CP, p=1.000)

Prospective multicentre 12-month cohort study
(4 German haematology and oncology divisions)

2 divisions with CP (single room + glove + gown) for F3GCR-Ec (R to FQ and 3rd gen cephs)
2 divisions with SP for F3GCR-Ec

HA-colonization or bloodstream infection with F3GCR-EC cross-transmission

Admission and discharge screening + WGS + cgMLST
2968 patients included.

Biehl et al. Clinical Microbiology and Infection 25 (2019) 1013e102

Contents lists available at ScienceDirect

Clinical Microbiology and Infection

journal homepage: www.clinicalmicrobiologyandinfection.com

Original article

Impact of single-room contact precautions on hospital-acquisition and transmission of multidrug-resistant *Escherichia coli*: a prospective multicentre cohort study in haematological and oncological wards

L.M. Biehl [1,2,†], P. Higgins [2,3,†], T. Wille [3], K. Peter [1], A. Hamprecht [2,3], S. Peter [4,5], D. Dörfel [6,7], W. Vogel [6], H. Häfner [8], S. Lemmen [8], J. Panse [9], H. Rohde [10,11], E.-M. Klupp [10], P. Schafhausen [12], C. Imirzalioglu [13,14], L. Falgenhauer [13,14], J. Salmanton-García [1], M. Stecher [1,2], J.J. Vehreschild [1,2], H. Seifert [2,3], M.J.G.T. Vehreschild [1,2,*]

Hospital-acquisition of F3GCR-EC :

- 22/1386 (1.6%) (SP) vs 16/1582 (1.0%) (CP, p=0.19)

BSI caused by F3GCR-EC :

- 3/1386 (0.22%) (SP) vs 4/1582 (0.25%) (CP, p=1.0)

Patient-to-patient transmission (WGS)

- three cases (in SP and CP, p=1.000)

Table 3
Competing risk analysis for hospital-acquired F3GCR-EC colonization or bloodstream infection

Variable	Univariate analysis			Multivariate analysis[b]		
	SHR[a]	95% CI	p value	SHR[a]	95% CI	p value
Site group						
SCP						
NCP	1.57	0.82–2.99	0.171	1.88	0.92–3.82	0.083

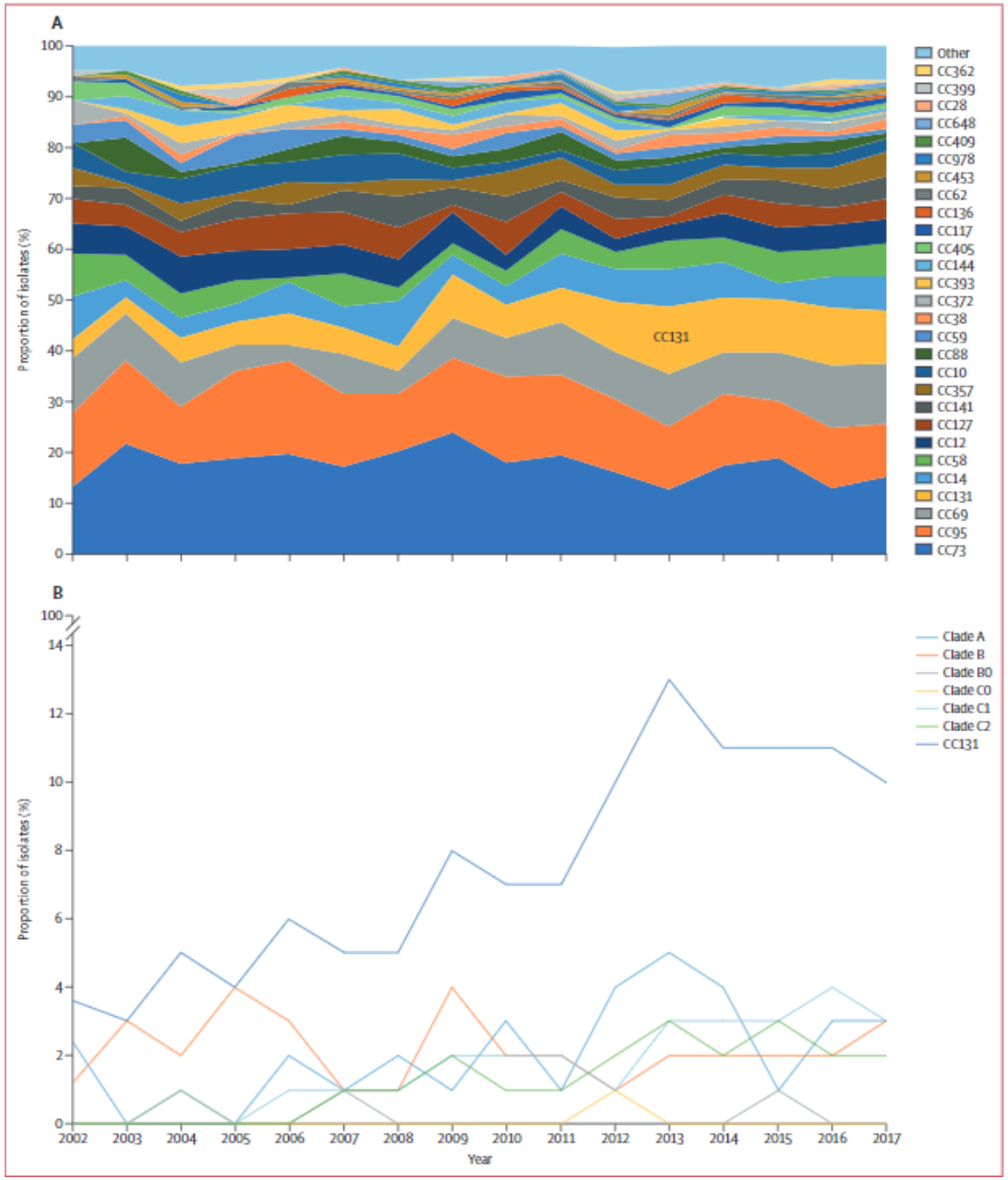
Biehl et al. Clinical Microbiology and Infection 25 (2019) 1013e102

ST131 i Norge

Clonale kompleks blant *E.coli* i NORM systemet

Emergence and dissemination of antimicrobial resistance in *Escherichia coli* causing bloodstream infections in Norway in 2002–17: a nationwide, longitudinal, microbial population genomic study

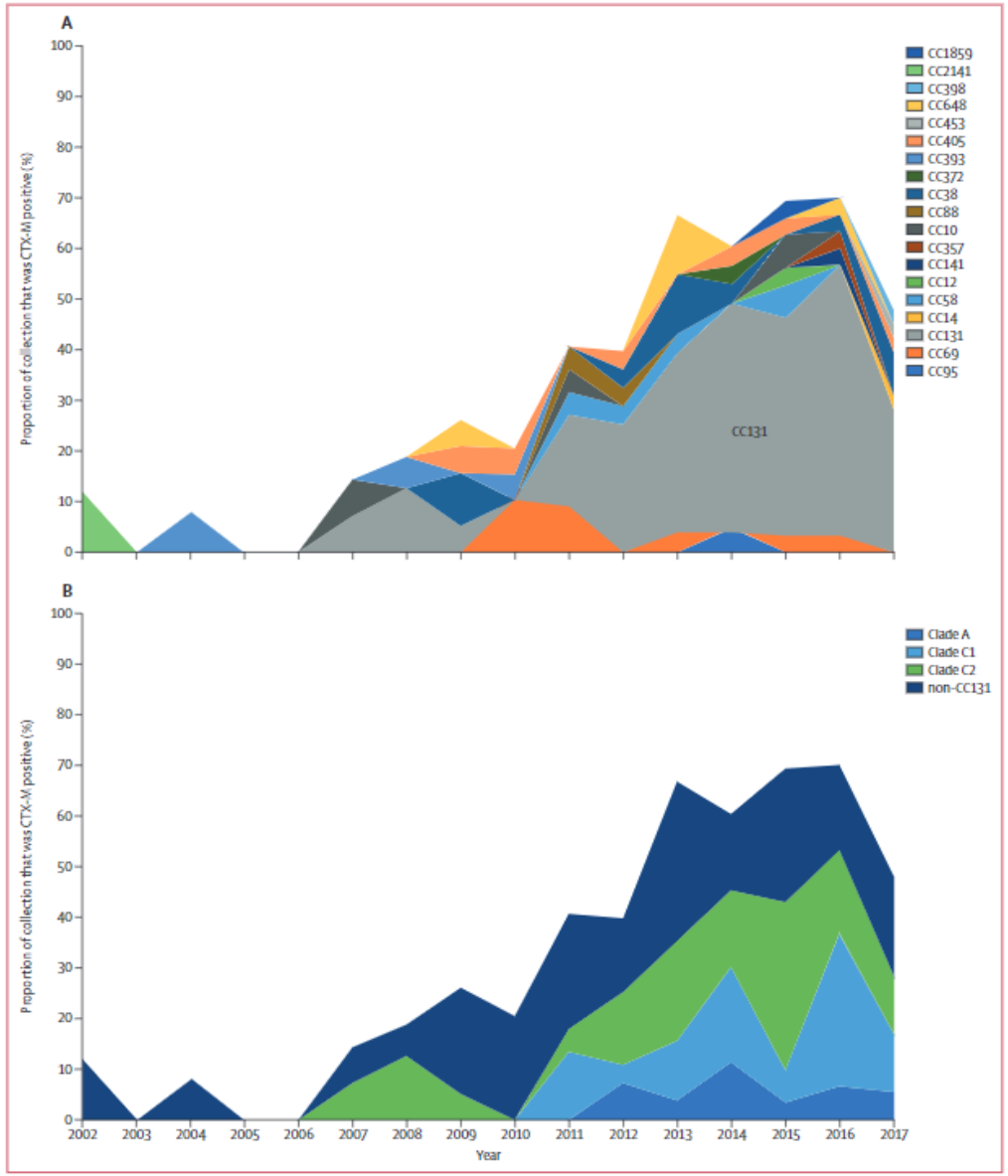
Rebecca A Gladstone, Alan McNally, Anna K Pöntinen, Gerry Tonkin-Hill, John A Lees, Kusti Skytén, François Cléon, Martin O K Christensen, Bjørg C Haldorsen, Kristina K Bye, Karianne W Gammelsrud, Reidar Hjetland, Angela Kümmel, Hege E Larsen, Paul Christoffer Lindemann, Iren H Löhr, Åshild Marvik, Einar Nilsen, Marie T Noer, Gunnar S Simonsen, Martin Steinbakk, Ståle Tofteland, Marit Vattøy, Stephen D Bentley, Nicholas J Croucher, Julian Parkhill, Pål J Johnsen, Ørjan Samuelsen, Jukka Corander**



Gladstone et al. Lancet Microbe 2021; 2: e331–41

ST131 i Norge

Clonale kompleks blant ESBL-*E.coli*



ST. OLAVS HOSPITAL
UNIVERSITETSSYKEHUSET I TRONDHEIM

Gladstone et al. Lancet Microbe 2021; 2: e331–41

Fordeler og ulemper med standardtiltak for ESBL-*E. coli*

- Fordeler
  - De fleste ESBL er *E.coli*: mange sparte isoleringer
  - Enklere hverdag for pasienter, på avdelinger og serviceavdelinger
  - Sparer arbeidstid og andre kostnader

- Ulemper
  - Forvirrende med tiltak for en bakteriespecies
  - Kan føre til spørsmål/utvanning av tiltak for andre ESBL

Kontaktsmittetiltak bør revurderes for ESBL-*E. coli* fordi:

- Lavere smitterate sammenlignet med andre ESBL-produserende enterobakterier
- Lavere potensiale for overlevelse i miljøet
  - (0.4% of 470 environmental samples for *E. coli* for 94 patients)
- Reservoir er hovedsaklig i samfunnet, ikke sykehus
- Ingen evidens som støtter kontaktsmitte i ikke-utbruddssituasjoner

…men:

- tross lavere transmisjonsrater er det mye mer *E.coli*
  - gir høyere transmisjon totalt
- Sykehjem o.l. har høyere transmisjonsrater og bør ha egne regler
- Vulnerable pasienter (immunsvekkede o.l.) må vurderes annerledes?
- Utbruddspotensiale av ST 131
- ESBL-*E. coli* som plasmidreservoir for andre enterobaeteriaceae

Skal vi fortsatt bruke kontaktsmittetiltak for ESBL-*E.coli*?

For:

- Lav insidens (<10%)
- Enerom?
- Overvåker håndhygiene

  >80% etterlevelse
- Basale smittevernrutiner blir overholdt
- Godt renhold

Imot:

- Ingen screening
  - Bør man ha det på intensiv eller mottak?
  - Screening for ST131
- Stor andel ST131 blant ESBL-*E.coli*
- Kompleks rådgiving

Referanser

- Tomczyk et al. CID. 2019. https://doi.org/10.1093/cid/ciy752
- Tschudin-Sutter et al. CID. 2017. http://dx.doi.org/10.1093/cid/cix258
- Kluytmans-van den Bergh et al. Lancet Infect Dis. 2019. http://dx.doi.org/10.1016/S1473-3099(19)30262-2
- Maecheler et al. Lancet Infect Dis. 2020. http://10.1016/S1473-3099(19)30626-7
- Biehl et al. Clin Microb Infect. 2019. 10.1016/j.cmi.2018.12.029
- Gurieva et al. CID. 2018. 10.1093/cid/cix825
- Guet-Revillet et al. AJIC. 2012. 10.1016/j.ajic.2011.10.007
- Burgess et al. Open Forum Infec Dis. 2015. 10.1093/ofid/ofv011
- Andersson et al. Scand Infect Dis 2012. https://doi.org/10.3109/00365548.2012.671956
- Price et al. mBio. 2013. https://doi.org/10.1128/mBio.00377-13
- Johnson et al. mSphere. 2016. https://doi.org/10.1128/mSphere.00314-16
- Gladstone et al. Lancet Microbe. 2021 https://doi.org/10.1016/S2666-5247(21)00031-8