24ème Congrès National de Réanimation, 29-30 Novembre 2019

Les Pneumopathies Extra-Hospitalières Graves

Fekri Abroug
CHU F.Bourguiba
Monastir. Tunisia

Les pneumopathies graves en Réanimation?

- Pneumopathies Aigues Communautaires:
  - *Acquise en milieu extrahospitalier*
    - Première cause d'hospitalisation adulte
    - 21% requièrent l'admission en réanimation (26% VM)
    - 4ème cause de mortalité (toutes étiologies)
    - Première cause de mortalité d'origine infectieuse: 78.8% (10x SIDA, 100x TBC),
    - Mortalité pouvant atteindre 50% en cas d'admission en réanimation avec choc septique.
  - Germes les plus souvent en cause:
    - *Streptococcus pneumoniae*
    - *Haemophilus influenzae*
    - Bactéries intracellulaires
    - Virus respiratoires (influenza, rhinovirus)
    - AMR: 6%

Les pneumopathies graves en Réanimation?

- Pneumopathies Liées aux Soins:
  - Patients hospitalisés plus de deux jours dans les 90 jours précédant l'hospitalisation actuelle,
  - Patients résidant en unité de soins de longue durée ou en maison de retraite médicalisée
  - patients ayant fréquenté un centre d'hémodialyse ou un hôpital de jour (*chimiothérapie ou antibiothérapie par voie veineuse au cours des 30 derniers jours*).
  - PES:
    - *P. aeruginosa* (4 à 14 %)
    - *Enetérobactéries BLSE*
    - *Staphylocoque MR*.

Diagnosis and Treatment of Adults with Community-acc Pneumonia

An Official Clinical Practice Guideline of the American Thoracic Infectious Diseases Society of America

Joshua P. Metlay*, Grant W. Waterer*, Ann C. Long, Antonio Anzueto, Jan Brozek, Kristina Cro Nathan C. Dean, Michael J. Fine, Scott A. Flanders, Marie R. Griffin, Mark L. Metersky, Danie Marcos I. Restrepo, and Cynthia G. Whitney; on behalf of the American Thoracic Society and Society of America

REVIEW

Challenges in severe community-a pneumonia: a point-of-view reviev

Antoni Torres[1,2,3*] James D. Chalmers[4] Charles S. Dela Cruz[5] Cristina Domin

Intensive Care Med (2019) 45:159–171

QUELS CRITÈRES DE GRAVITÉ

Inpatient General Medical versus Higher Levels of Inpatient Treatment Intensity (ICU, Step-Down, or Telemetry Unit) for Adults with CAP?

- We recommend direct
  - for patients with hypot
    or
  - respiratory failure requ
    (+++/0)
- For patients not requir
  mechanical ventilator s
  the IDSA/ATS 2007 min
  together with clinical ju
  for higher levels of trea

Validated definition includes eithe
major criterion or three or
minor criteria

Minor criteria

- Respiratory rate ⩾ 30 breaths/n
- Pa_{O2}/F_{IO2} ratio ⩽ 250
- Multilobar infiltrates
- Confusion/disorientation
- Uremia (blood urea nitrogen level ⩾ 20 mg/dl)
- Leukopenia* (white blood cell count < 4,000 cells/μl)
- Thrombocytopenia (platelet count < 100,000/μl)
- Hypothermia (core temperature
- Hypotension requiring aggress resuscitation

Major criteria

Should a Clinical Prediction Rule for Prognosis Be Used to Determine Inpatient versus Outpatient Treatment Location?

- We recommend that clinicians use a validated clinical prediction rule for prognosis, preferentially the Pneumonia Severity Index (*PSI*) over the CURB-65 (tool based on confusion, urea level, respiratory rate, blood pressure, and age >65)

Severity scoring systems for pneumonia: current understanding and next steps

Ranzania O, Taniguchic LU, Torres A, Curr Opin Pulm Med 2018

Pneumonia Seveiry Index (PSI)

Pneumonia Seveiry Index (PSI) Scoring System		
Score	**PSI Risk Class**	**30-**
PSI Risk Class 1 = Age >50 & NO - Malignancy, CCF, Cerebro-vasc, Renal or Liver disease & Normal Mental state, P<125, Resp <30, Syst BP >90, Temp 35-		
	1	
≤ 70	2	
71-90	3	

Syst BP <90
Temp <35 or ≥ 40C
Pulse ≥ 125
Investigations
Arterial pH < 7.35
Urea > 11 mmol/l

Should Gram Stain and Culture of Lower Respiratory Secretions Be Obtained at the Time of Diagnosis?

- Yes in inpatients:
  - with severe CAP especially if they are intubated (+++/0)
  - are being empirically treated for MDR pathogens (+++/0)
  - previously infected with MDR pathogens(+/0)
  - were hospitalized and received parenteral antibiotics, whether during the hospitalization event or not, in the last 90 days (+/0)
- NO in adults with CAP managed in the outpatient setting (+++/0)

Prise en charge des PAC

- L'une des difficultés de la prise en charge des PAC est la documentation microbiologique obtenue seulement dans 30 à 40 % des cas.
- L'antibiothérapie est donc le plus souvent probabiliste.
- L'ensemble des recommandations internationales préconise également *l'instauration précoce d'une antibiothérapie*.

Place des nouveaux antibiotiques dans le traitement de la pneumonie aiguë communautaire de l'adulte

L. Bondeelle et al RMR 2019

Tableau 1 Épidémiologie des pneumonies aiguës communautaires.

	Europe — 2002 [45]			Espagne — 2010 [59]			Royaume Uni — 2011 [25]		
Germe	Ambu%	Hospit%	USI%	Ambu%	Hospit	%	USI%	PAC	%
N.I	50	44	40						
S. pneumoniae	20	26	22	35	43		42	59,8	
Mycoplasme	< 1	2	8	1	2		2	9,3	
Chlamydia	11	7	2	17	3		2	7,2	
BGN	8	7	/	6	3		3	0	
S. aureus	< 1	2	8	7	11		9	10,6	
SARM	12	11	5	9	12		10	5,6	
Virus								0,6	

Prise en charge des PAC

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- L'ensemble des recommandations internationales préconise également *l'instauration précoce d'une antibiothérapie*.

Antibiotic Therapy for Adults Hospitalized With Community-Acquired Pneumonia. *A Systematic Review*

Lee, JS et al JAMA 2016,

Figure 1. Studies Assessing Initiation of Antibiotic Therapy Within Various Time Thresholds and Short-term Mortality for With Community-Acquired Pneumonia

Source	Outcome	<Time Threshold		>Time Threshold		Adjusted OR (95% CI)	Fa
		No. of Patients	No. (%) Who Died	No. of Patients	No. (%) Who Died		
Threshold evaluated <4 h							
Houck et al,[15] 2004	30-d Mortality	8388	973 (11.6)	5383	684 (12.7)	0.85 (0.76-0.95)	
Waterer et al,[23] 2006	In-hospital mortality	NR	NR	NR	NR	0.54 (0.20-1.19)	–
Lee et al,[24] 2011	30-d Mortality	1619	107 (6.6)	443	34 (7.7)	0.74 (0.48-1.13)	
Simonetti et al,[22] 2012	30-d Mortality	477	33 (6.9)	797	37 (4.6)	1.12 (0.38-3.33)	
Threshold evaluated <6 h							
Lee et al,[8] 2014	30-d Mortality	1102555	122384 (11.1)	67467	7421 (11.0)	0.95 (0.93-0.98)	
Threshold evaluated <8 h							
Meehan et al,[13] 1997	30-d Mortality	NR	NR	NR	NR	0.85 (0.75-0.96)	
Dedier et al,[14] 2001	In-hospital mortality	809	NR	253	NR	1.69 (0.78-3.66)	

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Initial Treatment Strategies for Inpatients with CAP by level of severity and Risk for Drug Resistance *(ATS/IDSA 2019)*

Initial Treatment Strategies for Inpatients with CAP *without Risk Factors for MDR organisms*

(ATS/IDSA 2019)

	Standard Regimen
Non severe inpatient pneumonia	β-Lactam+ macrolide or monotherapy respiratory fluroquinolone (+++/+++)
Severe inpatient pneumonia	β-Lactam +macrolide or β-Lactam + fluroquinolone (+++/+)

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Initial Treatment Strategies for Inpatients with CAP by level of severity and Risk for Drug Resistance *(ATS/IDSA 2019)*

Risk Factors Associated with Potentially Antibiotic-Pathogens in Community-Acquired Pneumonia

Elena Prina[1,2], Otavio T. Ranzani[1,2], Eva Polverino[1,3], Catia Cillóniz[1,3], Miquel Ferrer[1,3]

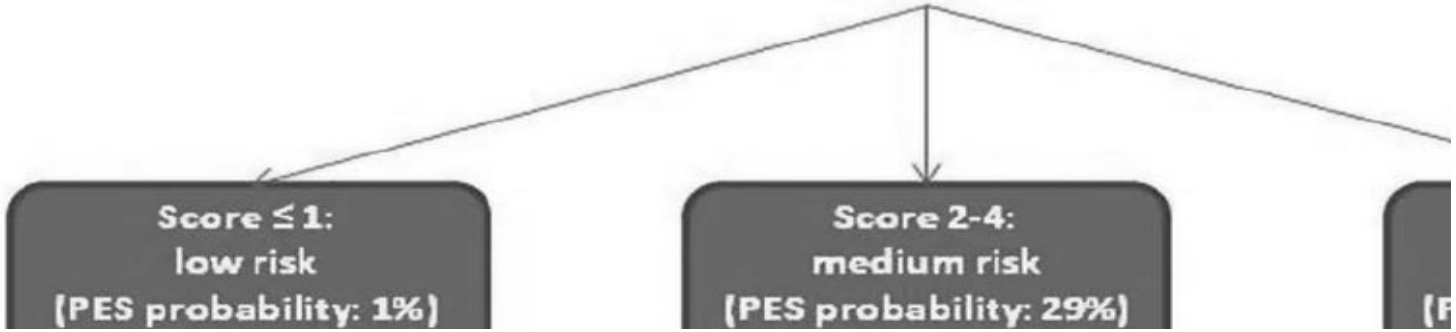
P: *Pseudomonas aeruginosa*

E: *Enterobacteriaceae extended spectrum b-lactamase-positive*

S: *Staphylococcus aureus* methicillin-resistant

PES SCORE	Poi
Age > 65y	1 po
Male	2 poi
Previous antibiotic use	2 poi
Chronic respiratory disorder	2 poi
Chronic renal disease	2 poi
At Emergency	
Consciousness impairment or aspiration evidence	2 poi
F[illegible]er or sh[illegible]rs	-1 po

PES Score



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RESEARCH ARTICLE

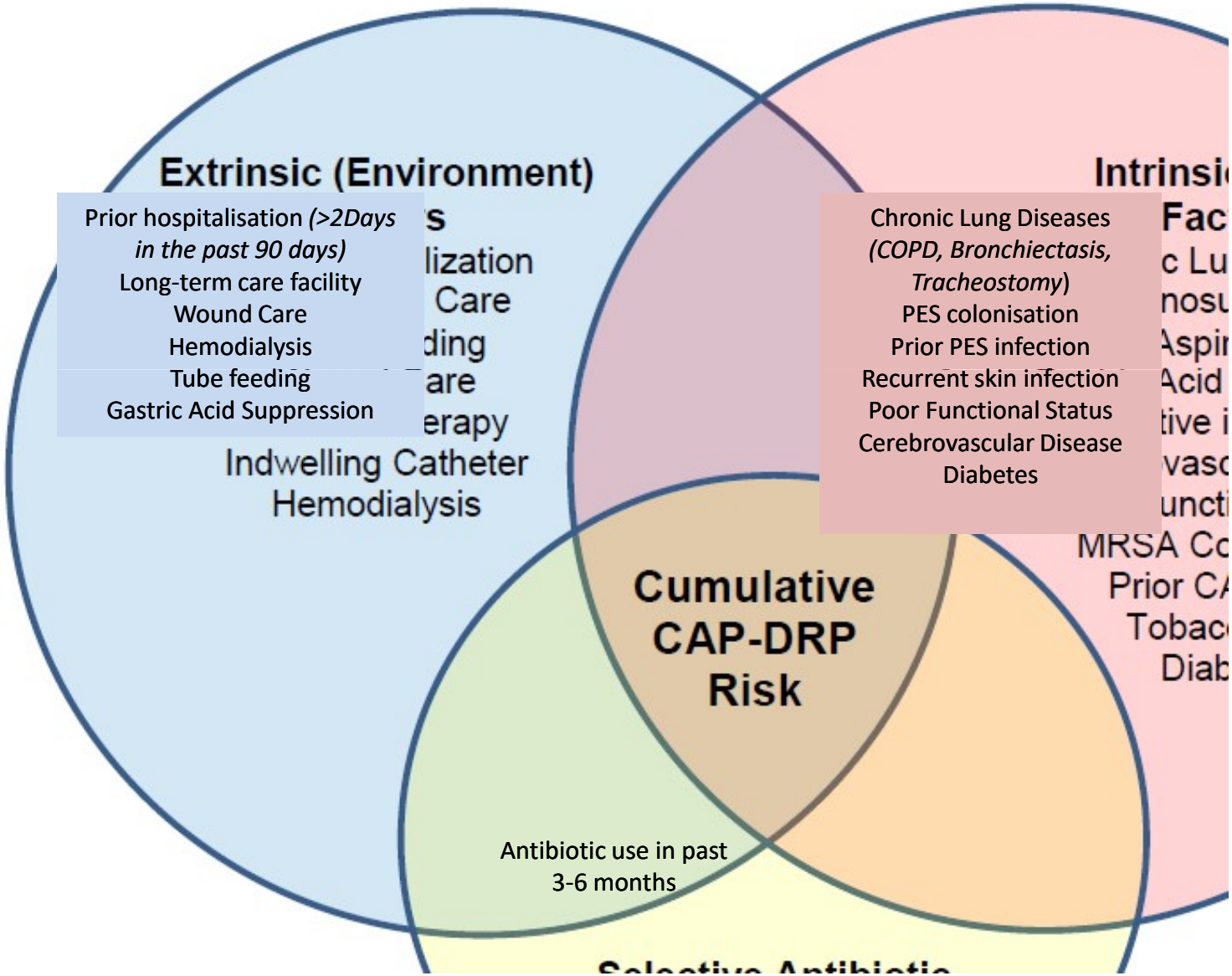
Individualizing Risk of Multidrug-Res Pathogens in Community-Onset Pne

Marco Falcone[1,2]*, Alessandro Russo[1], Maddalena Giannella[3], Roberto Gabriella Scarpellini[2], Giuliano Bertazzoni[2], José Martínez Alarcón[5], Gi

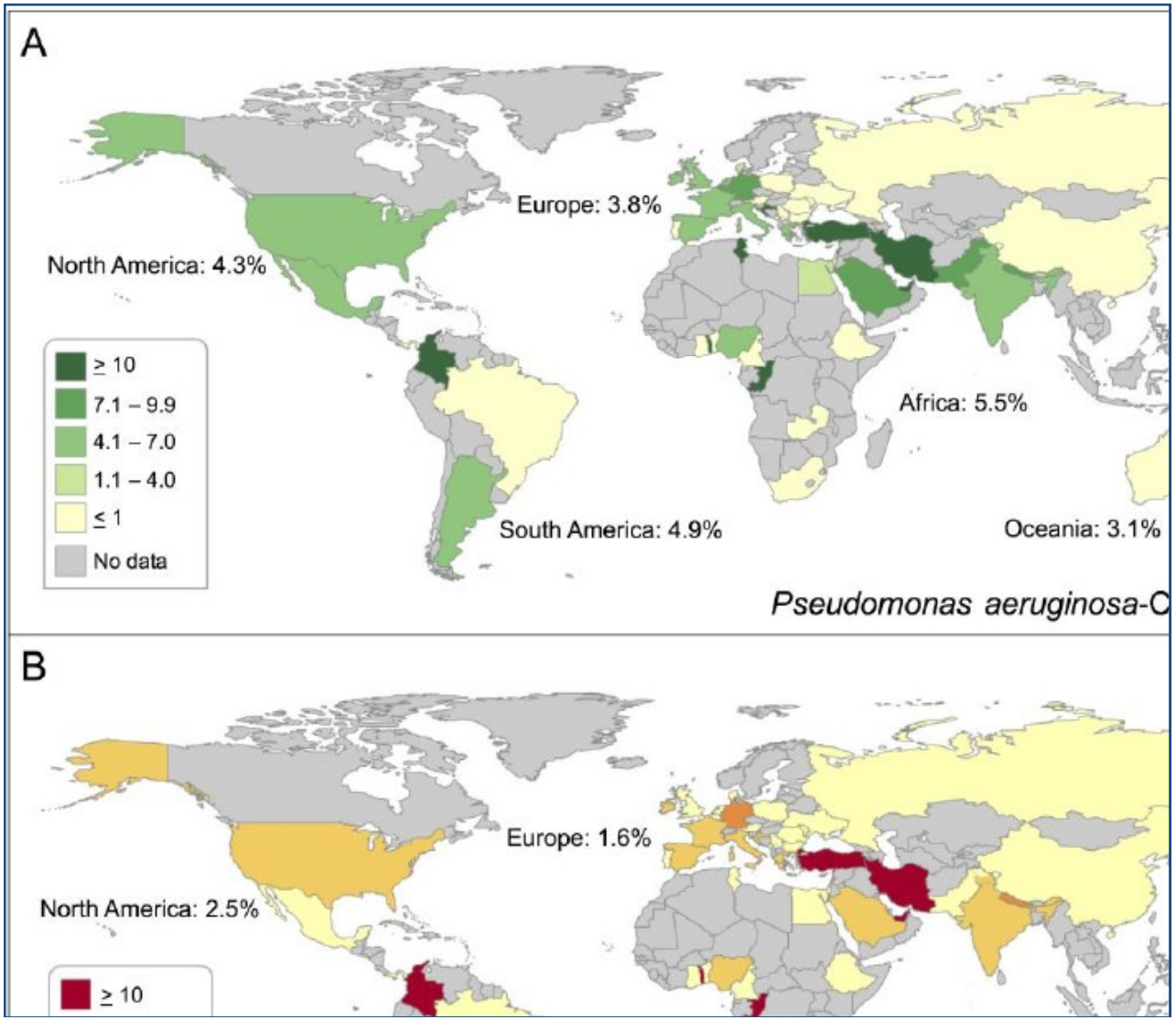
AAC
Journals.ASM.org

Epidemiology and Predictors of Multidrug-Resistant Co Acquired and Health Care-Associated Pneumonia

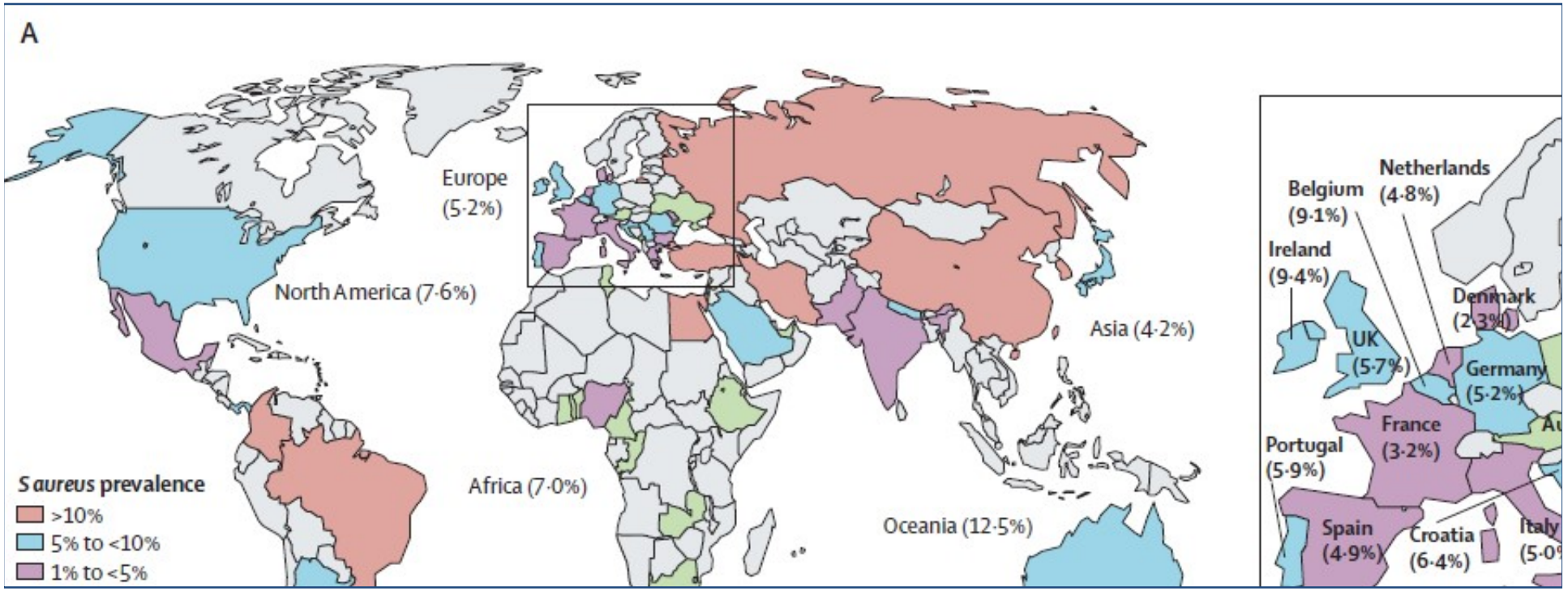
Risk Factors for drug resistance.



Burden and Risk Factors for P*seudomonas aeruginosa* CAP: a Multinational Point Prevalence Study of Hospitalised Patients, *Eur Respir J* 2018

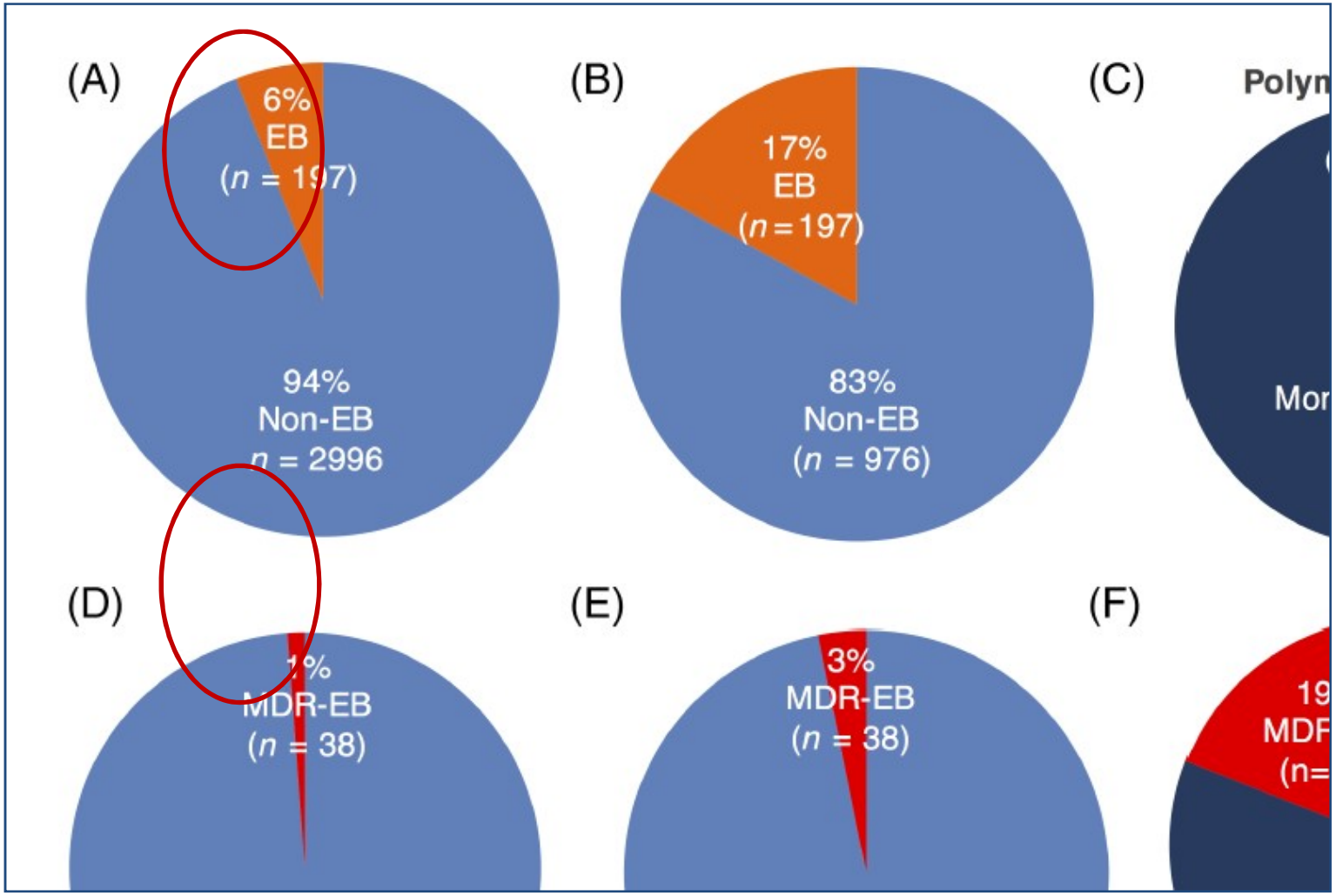


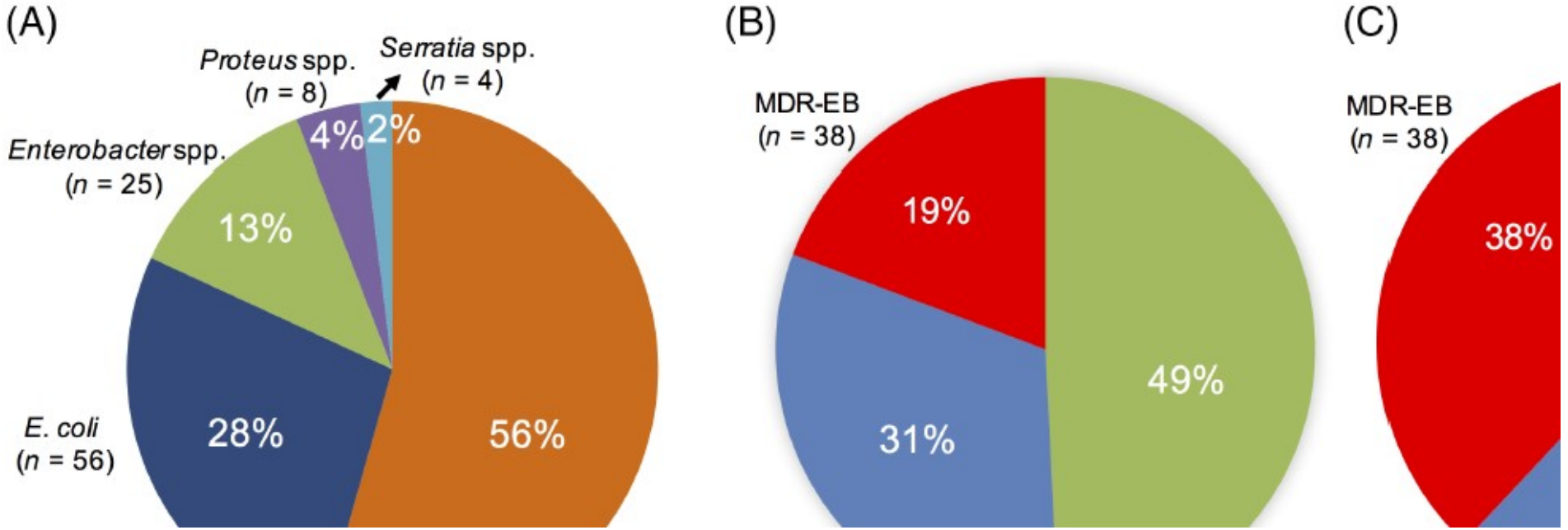
Global initiative for meticillin-resistant *Staphylococcus aureus* pneumonia (GLIMP): an international, observational cohort study, *Lancet Infect Dis* 2016

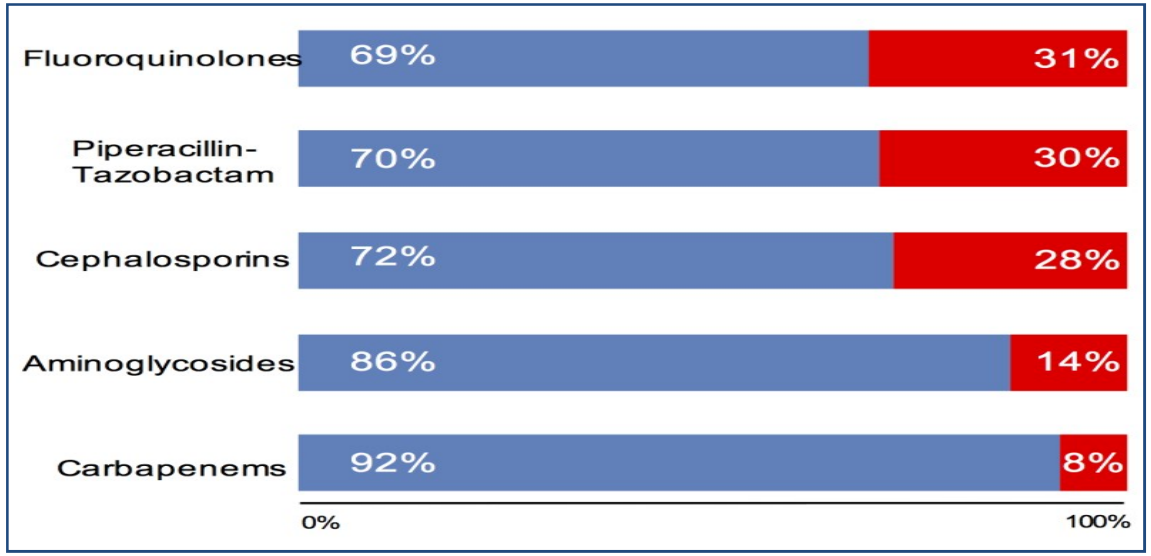


Prevalence and risk factors for Enterobacteriaceae in patients hospitalized with community-acquired pneumonia,

GLIMP Investigators, Respirology,2019




(A)
Proteus spp.
(n = 8)
Serratia spp.
(n = 4)
Enterobacter spp.
(n = 25)
4%
2%
13%
E. coli
(n = 56)
28%
56%
(B)
MDR-EB
(n = 38)
19%
49%
31%
(C)
MDR-EB
(n = 38)
38%


Fluoroquinolones
69%
31%
Piperacillin-Tazobactam
70%
30%
Cephalosporins
72%
28%
Aminoglycosides
86%
14%
Carbapenems
92%
8%
0%
100%

Characteristics of all patients with CAP (n = 3193) due to EB and MDR-EB in comparison to the rest of the population with CAP

	Non EB CAP (n=2996)	**EB CAP** (n=197)	p value	**Non MDR-EB** CAP (n=3155)	**MDR-EB CAP** (n=38)	p value
Europe (1941)	1837 (94,6)	104 (5,4)	0,02	1923 (99,1)	18 (0,9)	0,1
North America (484)	463 (95,7)	21 (4,3)	0,08	481 (99,4)	3 (0,6)	0,26
Asia (405)	376 (92,8)	29 (7,2)	0,38	400 (98,8)	5 (1,2)	0,81
South America (203)	186 (91,6)	17 (8,4)	0,18	200 (98,5)	3 (1,5)	0,73
Africa (128)	105 (82)	23 (18)	**<0,01**	120 (93,8)	8 (6,3)	**<0,01**
Oceania (32)	29 (90,6)	3 (9,4)	0,45	31 (96,9)	1 (3,1)	0,32

Initial Treatment Strategies for Inpatients with CAP *with Risk Factors for MDR organisms* *(ATS/IDSA 2019)*

	Standard Regimen	Risk factors for MDR
Non severe inpatient pneumonia	β-Lactam+ macrolide or monotherapy respiratory fluroquinolone	Add MDR coverage (and obtain cultures/ nasal PCR) 4 deescalation or continued therapy
Severe inpatient pneumonia	β-Lactam +macrolide or β-Lactam + fluroquinolone	Add MDR coverage (and obtain cultures/ nasal PCR) 4 deescalation or continued therapy

β-Lactam:
beta-lactam/betalactamase inhibitor
or a third G cephalosporin

Which Empirical Coverage for MDR organisms? Rely on Locally validated ecology

	First Choice	Alternative
Pseudomonas Aeruginosa	Piperacillin-Tazobactam	Ceftazidime, Imipenem
MRSA	Vancomycine	Linezolid
ESBL	Imipenem	Ertapenem

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ESBL	Imipenem	**Ertapenem**

Journal of Antimicrobial Chemotherapy (2004) **53**, *Suppl. S2*, ii59–ii66
DOI: 10.1093/jac/dkh207

Ertapenem versus ceftriaxone for the treatment of commu pneumonia in adults: combined analysis of two mul randomized, double-blind studies

- Ertapenem is a once-a day parenteral β-lactam agent with excellent *in vitro* activity against bacteria that, in general, are associated with community-acquired infections,
  - streptococci,
  - *Haemophilus* spp.,
  - methicillin-susceptible *Staphylococcus aureus*
  - Enterobacteriaceae
  - And anaerobes,
  - *not effective against Pseudomonas aeruginosa*

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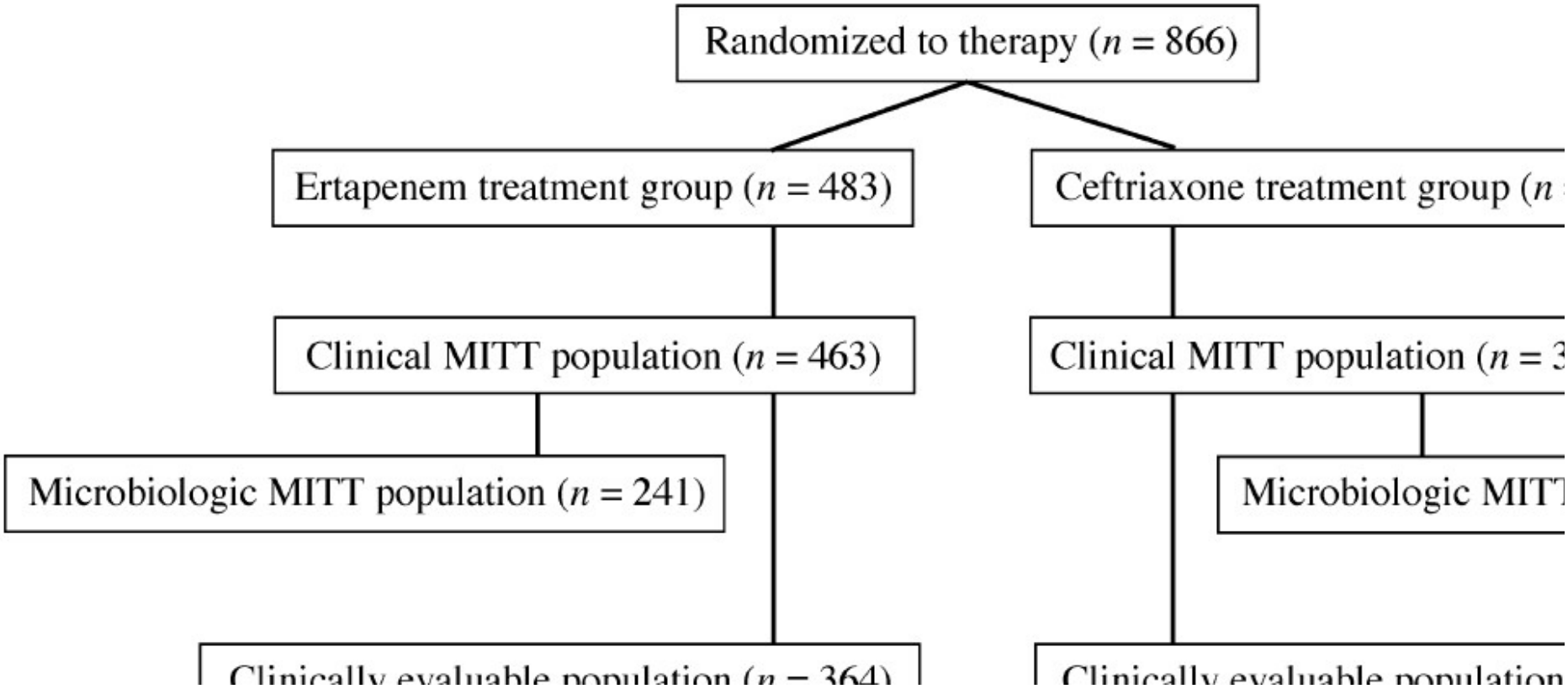


Incidence of pathogens identified at baseline in microbiologically evaluable patients with CAP

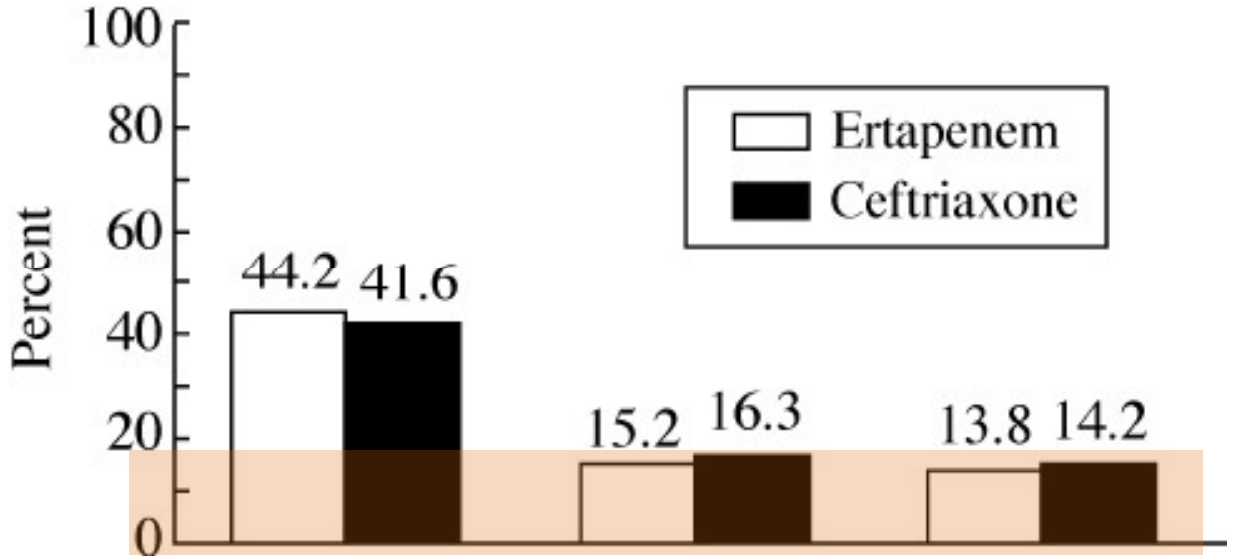
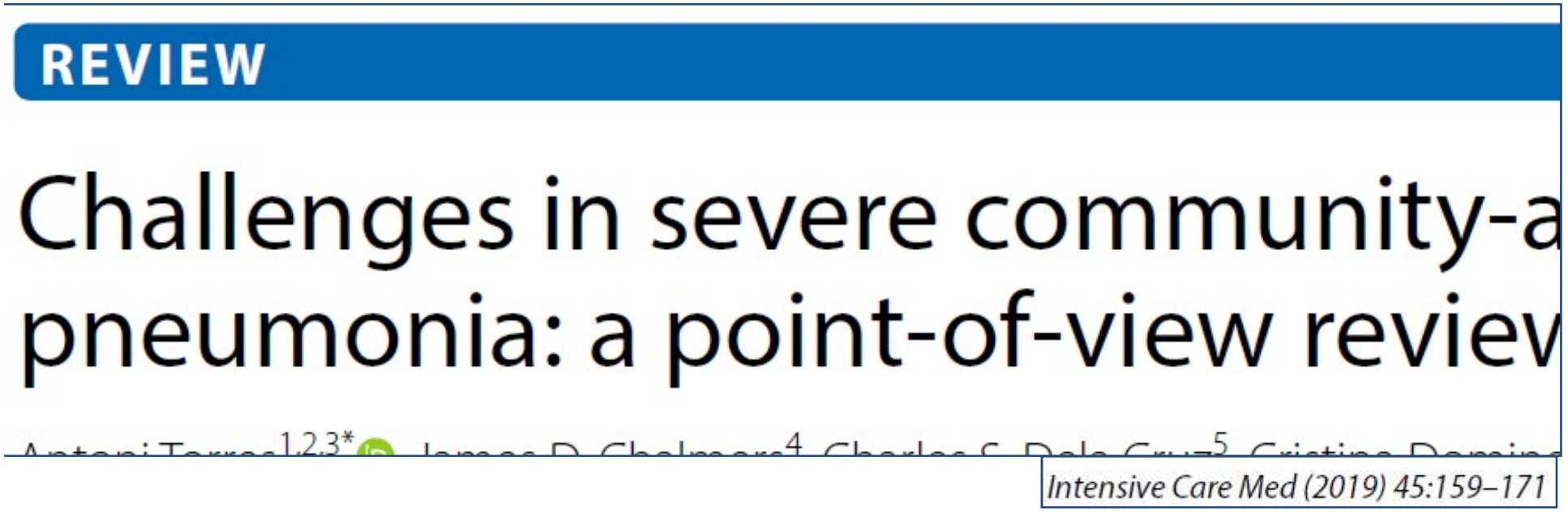


Table 3. Clinical cure rates, by stratum, in clinically evaluable patients wit acquired pneumonia at the TOC visit

	Ertapenem		Ceftri	
Stratum	*n/m*	% response (95% CI[a])	*n/m*	% re
Age ≤ 65 years	203/223	91.0 (87.3–94.8)	165/179	92
Age > 65 years	132/141	93.6 (89.6–97.7)	105/115	91
PSI ≤ 3	254/274	92.7 (89.6–95.8)	196/209	93
PSI > 3	81/90	90.0 (83.8–96.2)	74/85	87



- The controversy is threefold:
  - (1) is beta-lactam/macrolide combination therapy superior to other beta-lactam treatments?
  - (2) Are additional antibiotics required for PES pathogens? And
  - (3) RCT of usual treatment (cephalosporin/macrolide) with additional empirical coverage for PES pathogens versus pathogen-specific therapy based on rapid diagnostic testing.