I patogeni emergenti e i fattori di rischio: CAP e compagne di viaggio

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Steps

- Antibioticoresistenza ;
- Patogeni emergenti : dove siamo e dove andiamo….
- La realtà in Riabilitazione ;
- Diagnostic stewardship ;
- Sinergismo microbiologo clinico > infettivologo

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Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis

*Alessandro Cassini, Liselotte Diaz Högberg, Diamantis Plachouras, Annalisa Quattrocchi, Ana Hoxha, Gunnar Skov Simonsen, Mélanie Colomb-Cotinat, Mirjam E Kretzschmar, Brecht Devleesschauwer, Michele Cecchini, Driss Ait Ouakrim, Tiago Cravo Oliveira, Marc J Struelens, Carl Suetens, Dominique L Monnet, and the Burden of AMR Collaborative Group**

Lancet Infect Dis 2019; 19: 56–66
Published Online November 5, 2018
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Background Infections due to antibiotic-resistant bacteria are threatening modern health care. However, estimating their incidence, complications, and attributable mortality is challenging. We aimed to estimate the burden of infections caused by antibiotic-resistant bacteria of public health concern in countries of the EU and European Economic Area (EEA) in 2015, measured in number of cases, attributable deaths, and disability-adjusted life-years (DALYs).

- Incidenza di infezioni MDR
- Disabilità/anno correlata
- Decessi attribuibili a infezioni MDR

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- 10.000 decessi / anno legati alla antibioticoresistenza (AMR) ;
- 1/3 dei decessi che avvengono in Europa per questa problematica ;
- 1/3 di disabilità/anno (non benessere) registrate in Europa correlate alla AMR;
- In Italia nel 2050 , 13 miliardi di Euro il costo stimato della AMR;
- In Europa nel 2050 stimato 1 milione di decessi legato AMR;

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ITALIA

- **Infezioni da MRSA : 33% ;**
- **Batteriemie/sepsi da enterococcus faecium resistente alla vancomicina (VRE): 13% ;**
- **E. Coli : 30% resistente alle cefalosporine 3° generazione ;**
- **E.Coli : 43% resistenza ai fluorchinolonici ;**
- **Klebsiella pneumoniae : 34 % resistente ai carbapenemici (KPC);**
- **Batteriemie/sepsi da KPC : 2000 casi /anno ;**
- **KPC : incidenza di 3,6 casi /100.000 abitanti ;**
- **KPC : la % di resistenza più alta in Europa insieme a Romania e Grecia**

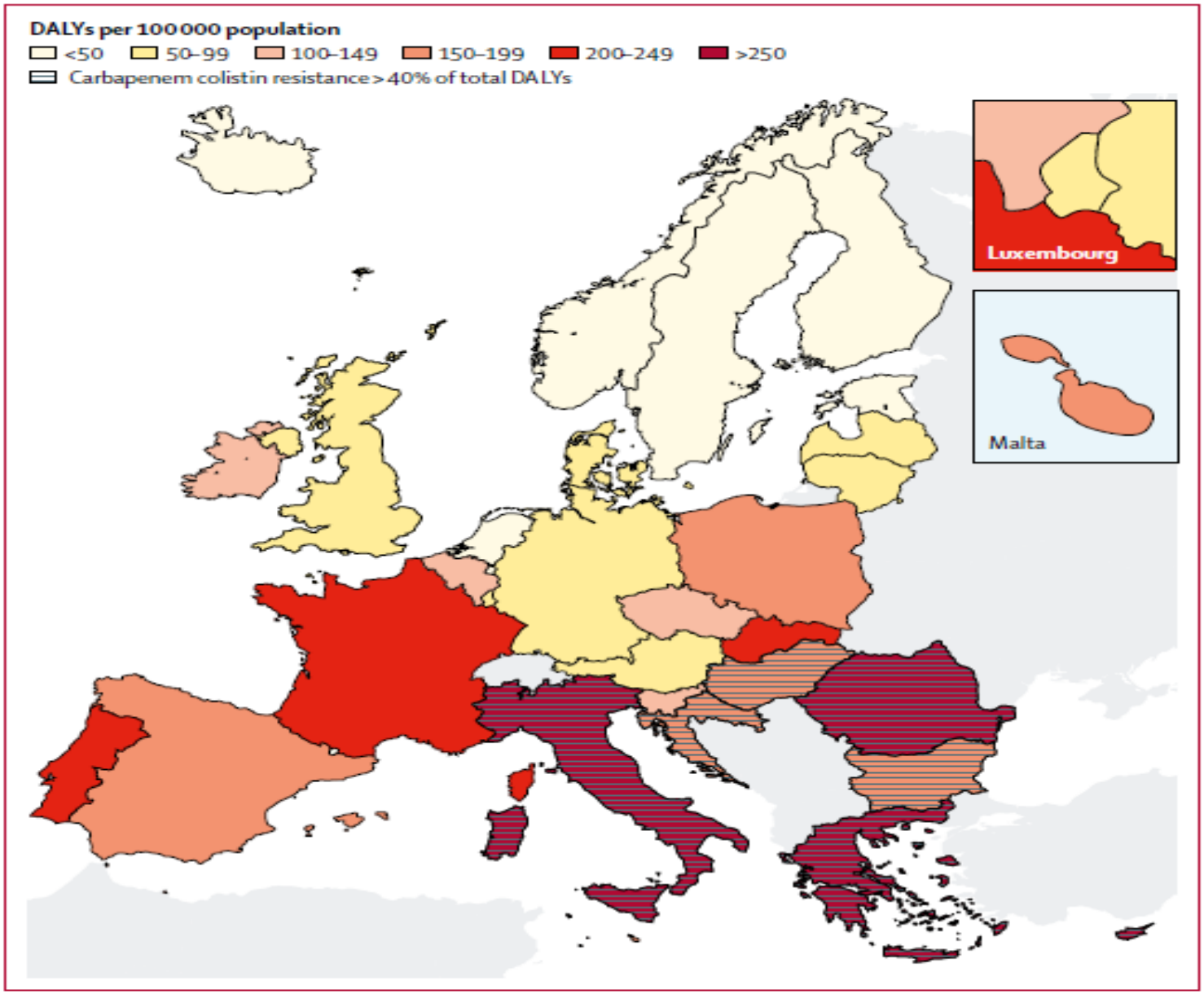


Figure 4: **Model estimates of the burden of infections with selected antibiotic-resistant bacteria of public health importance in DALYs per 100 000 population, EU and European Economic Area, 2015**

Greece did not report data on *S pneumoniae* isolates to the European Antimicrobial Resistance Surveillance Network in 2015. DALYs=disability-adjusted life-years.

E.Coli/Klebsiella ESBL/AmpC; MRSA, Pseudomonas panR, KPC, VRE, PRSP, E.Coli CR

	Median number of infections		Median number of attributable deaths		Factor increase in attributable deaths between 2007 and 2015
	2007	2015	2007	2015	
Third-generation cephalosporin-resistant *Escherichia coli**†	70 276 (63 113–77 778)	285 758 (246 318–328 828)	2139 (1901–2420)	8750 (7505–10 262)	4·12 (3·29–5·13)
Meticillin-resistant *Staphylococcus aureus*	112 782 (103 186–122 006)	143 947 (127 592–161 158)	5340 (4952–5723)	6810 (6096–7559)	1·28 (1·11–1·47)
Carbapenem-resistant *Pseudomonas aeruginosa*	17 972 (15 685–20 170)	59 529 (51 237–68 238)	1216 (1000–1469)	4008 (3235–4898)	3·29 (2·41–4·46)
Third-generation cephalosporin–resistant *Klebsiella pneumoniae** †	16 474 (15 097–17 825)	64 980 (58 360–72 048)	891 (830–950)	3508 (3197–3824)	3·95 (3·51–4·43)
Carbapenem-resistant *K pneumoniae*	2535 (2125–2952)	15 910 (13 352–18 377)	341 (288–404)	2094 (1779–2460)	6·16 (4·78–8·04)
Vancomycin-resistant *Enterococcus faecalis* and *Enterococcus faecium*	8277 (6699–9950)	15 917 (12 900–19 092)	538 (452–652)	1065 (874–1283)	1·95 (1·47–2·58)
Multidrug-resistant *P aeruginosa*‡	5603 (4796–6430)	8749 (7470–10 044)	357 (281–439)	556 (447–681)	1·55 (1·11–2·17)
Penicillin-resistant *Streptococcus pneumoniae*§	2183 (2033–2355)	2817 (2552–3104)	134 (126–143)	171 (159–184)	1·28 (1·15–1·42)
Penicillin-resistant and macrolide-resistant *S pneumoniae*¶	1916 (1782–2075)	2386 (2173–2648)	118 (110–126)	145 (135–158)	1·25 (1·12–1·40)
Carbapenem-resistant *E coli*	543 (442–647)	2616 (2283–2960)	29·2 (22·2–37·6)	141 (118–163)	4·76 (3·51–6·90)
Overall	239 238 (215 544–262 951)	602 609 (524 237–686 497)	11 144 (9999–12 407)	27 249 (23 544–31 471)	2·46 (1·01–3·00)

Data are median (95% uncertainty interval) and are age-standardised. Note that only bacteria under surveillance in both 2007 and 2015 are included in this analysis. *Excluding isolates resistant to colistin or carbapenems. †In 2015, most of the third-generation cephalosporin-resistant *E coli* (88·6%) and *K pneumoniae* (85·3%) isolates reported to EARS-Net produced an extended-spectrum β-lactamase.[3] ‡Resistance to three or more antibiotic groups as marker of multidrug resistance. §Excluding isolates resistant to macrolides. ¶Excluding isolates resistant to penicillins, but not to macrolides.

***Table 2*: Estimated annual burden of infections with selected antibiotic-resistant bacteria of public health importance, age-group standardised, EU and European Economic Area, 2007–15**

Selezione di patogeni resistenti legati all'abuso /uso inappropriato delle diverse classi di antibiotici

- **Cefalosporine di III generazione**
  - MRSA, MRSE
  - VRE
  - Streptococco pneumoniae PR
  - Enterobacteriaceae ESBL +
  - Enterobacteriaceae AmpC +
  - Acinetobacter MDR
  - Clostridium difficile

- **Fluorchinolonici**
  - MRSA
  - Pseudomonas MDR
  - Enterobacteriaceae MDR (ESBL +)
  - Enterobacteriaceae FR
  - Clostridium difficile

Selezione di patogeni resistenti legati all'abuso delle diverse classi di antibiotici

- **Carbapenemici**
  - Stenotrophomonas maltophilia MDR
  - Acinetobacter baumannii PAN-R
  - Burkholderia cepacia MDR
  - Pseudomonas spp PAN-R
  - Klebsiella (Altri Enterobatteri) KPC+
  - Enterobatteri produttori di metallo-β lattamasi
  - Candidosi invasiva
  - Clostridium difficile

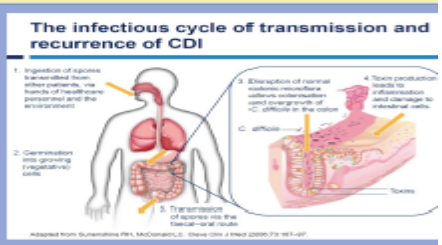
Il pericolo ceppi ipervirulenti

INFEZIONE DA CLOSTRIDIUM DIFFICILE PRODUTTORE DI TOSSINA NAP1 RIBOTIPO 027 : PRIMA SEGNALAZIONE IN EMILIA ORIENTALE

Libanore M, Rossi MR, Caputo F, Antonioli PM, Nola S, Donfront P, Zoli G

Gruppo di Lavoro per l'uso responsabile degli antibiotici e il controllo delle infezioni correlate all'assistenza – A.O.U. e AUSL di Ferrara

PREMESSA:
Nel mondo l'infezione da Clostridium difficile è in continua espansione. Negli ultimi anni sono aumentate le segnalazioni di casi gravi di gastroenterite dovuti a ceppi ipervirulenti, produttori di tossine particolarmente aggressive. Tra questi i ceppi produttori di tossina NAP1 ribotipo 027, segnalati per la prima volta in Canada ed in nord- Europa rivestono un ruolo particolarmente significativo.



CEPPI IPERVIRULENTI

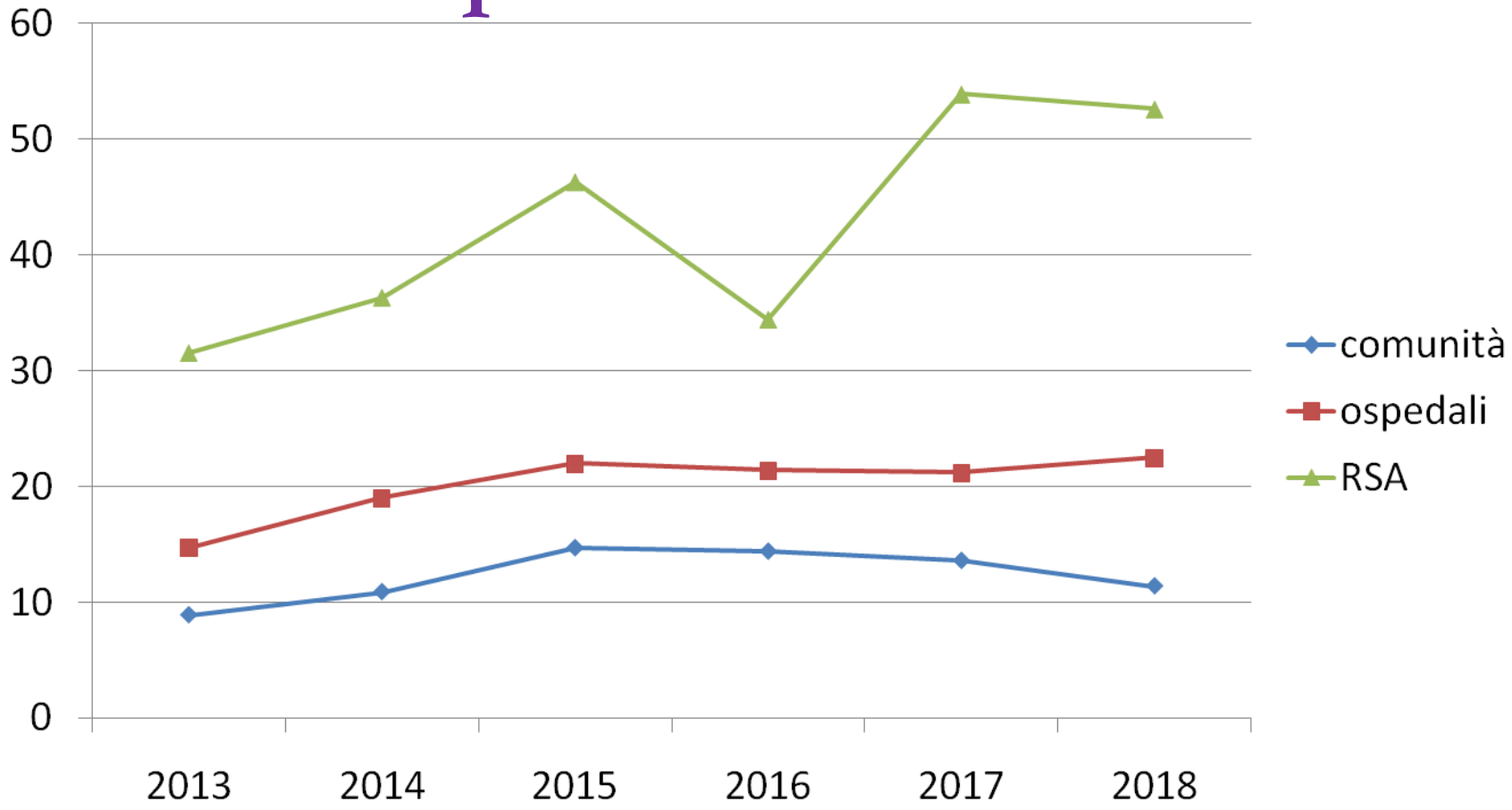
- Il ceppo **NAP1/B1/027** presenta una **delezione** di 18 paia di basi a livello di **tcdC** per cui **possiede oltre a tossina binaria** (CDT) anche **iperproduzione di tossine batteriche**
- Correlato all'uso di fluorochinoloni
- NAP1/B1/027 si è diffuso a partire dal 2003 nel mondo causa infezioni gravi ed epidemie
  - **PCR-ribotype 027**
  - Pulse-field-type NAP1
  - Restriction endonuclease analysis group B1

OBIETTIVO DELLO STUDIO:
Descrivere gli aspetti epidemiologici e clinici del pri caso di diarrea da Clostridium difficile, produttore tossina NAP1 ribotipo 027, osservato nell' area Ferrara (Emilia Orientale).

CASO CLINICO:
Pensionato di 73 anni , residente in Germania, ospite del figlio domiciliato in un centro della provincia di Ferrara, ricoverato per febbre, stato saporoso, emiparesi sinistra come esito di pregresso ictus ischemico, tosse parzialmente produttiva, fibrillazione striale cronica e lesioni multiple da pressione sacrali. Viene instaurata terapia con ceftriaxone e.v., che dopo tre giorni viene sostituito con meropenem e vancomicina per via parenterale per il riscontro di broncopolmonite basale sinistra e peggioramento delle condizioni generali. Il giorno successivo comparsa di diarrea profusa con feci verdastre, maleodoranti e algie addominali ingravescenti. L'esame delle feci rileva la presenza di un ceppo di Clostridium difficile produttore di tossina NAP1 ribotipo 27 . Viene sospesa tutta la terapia antibiotica per via e.v., il paziente è isolato secondo le procedure aziendali, e posto in nutrizione parenterale totale. Viene inserita terapia con vancomicina 250 mg x 4 /die per via orale; nei giorni successivi si assiste ad un alternanza sintomatologica, con stabilizzazione del quadro clinico dopo nove giorni dall'esordio della sindrome diarroica. A questo punto viene sospeso l' isolamento spaziale del paziente.

COMMENTO:
Il ceppo isolato per la prima volta nella nostra area è caratterizzato da una iperproduzione di tossina A e B e la produzione di tossina binaria, che aumenta sinergicamente l'azione patogena delle precedenti, ed un elevato livello di resistenza ai fluorchinolonici. La disponibilità di tecniche diagnostiche di biologia molecolare consente di tipizzare anche ceppi di Clostridium difficile produttori di queste tossine ad elevata patogenicità E' importante identificare questi casi, per il peculiare profilo di resistenza, ai fini della sorveglianza ed il controllo dell'infezione , in ambito sanitario, e per un' appropriata gestione terapeutica, volta a scongiurare complicanze che potrebbero rivelarsi anche ad esito infausto.

Clostridium difficile % di positivi 2013-2018 provincia di Ferrara



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Germi ad elevato impatto epidemiologico

- Enterobatteri ESBL + ;
- Enterobatteri AmpC + ;
- Enterobatteri resistenti alle carbapenemasi ;
- Pseudomonas aeruginosa panR ;
- Acinetobacter baumannii panR ;
- MRSA ;
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- Enterococco vancomicina resistente;
- Clostridium difficile
- Candida
- E poi……

ecdc
EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

RAPID RISK ASSESSMENT

Regional outbreak of New Delhi metallo-beta-lactamase-producing carbapenem-resistant Enterobacteriaceae, Italy, 2018–2019

4 June 2019

Periodo novembre 2018 – maggio 2019
7 Ospedali della Toscana
350 casi di enterobatteri produttori di metallo – β lattamasi (NDM) :
108 infezioni e 242 colonizzazioni

Summary

A large outbreak of New Delhi metallo-beta-lactamase (NDM)-producing carbapenem-resistant Enterobacteriaceae (CRE) has been reported from the Tuscany region in Italy. Between November 2018 and May 2019, seven Tuscan hospitals notified a total of 350 cases. Due to its size and the resulting change in the epidemiology of CRE, the reported outbreak is a significant event, despite previous endemicity of *Klebsiella pneumoniae* carbapenamase (KPC)-producing CRE in this geographic area. The change in the type of carbapenemase further reduces treatment options because NDM-producing CRE are not susceptible to some of the new beta-lactam/beta-lactamase inhibitor combinations such as ceftazidime-avibactam and meropenem-vaborbactam.

Numerous reported outbreaks and examples of cross-border transmission of NDM-producing CRE in the European Union/European Economic Area (EU/EEA) demonstrate the transmission potential of NDM-producing CRE in European healthcare systems. Outbreaks such as the one in Tuscany present a risk for cross-border transmission and further spread to other EU/EEA countries, especially since the affected area is a major tourist destination. Given the previous rapid establishment of KPC-producing CRE in Italy (which resulted in an endemic situation), the risk for further spread of NDM-producing CRE from the current outbreak is considered to be high for Italy and moderate for cross-border spread to other EU/EEA countries.

Sporadic cases of community acquisition of NDM-producing CRE have also been described for other European countries. However, the introduction and dissemination of these bacteria have mainly been associated with healthcare settings. Therefore, the risk of acquisition of NDM-producing CRE related to this outbreak is likely restricted to persons with recent healthcare contact.

New Microbiologica, 36, 279-282, 2013

Emergence of a VIM-1 MBL and CTX-M-15 ESβL-producing *Klebsiella pneumoniae* clone from acute and rehabilitation hospitals in Italy

Elisabetta Nucleo[1], Melissa Spalla[1], Aurora Piazza[1], Maria Sofia Caltagirone[1], Sara Asticcioli[1], Maurizia Debiaggi[1], Carolina Matti[2], Rossana Daturi[2], Antonella Navarra[2], Maria Labonia[3], Roberta Migliavacca[1]

[1]Department of Clinical-Surgical, Diagnostic and Paediatric Sciences, Unit of Microbiology, University of Pavia, Italy;
[2]Laboratory of Microbiology I.R.C.C. S. "S. Matteo", Pavia, Italy;
[3]Laboratory of Microbiology I.R.C.C.S. "Casa Sollievo della Sofferenza", S. Giovanni Rotondo (FG), Italy

We report the emergence of VIM-1 MBL and CTX-M-15-producing *K. pneumoniae* isolates collected from patients at two acute care hospitals (I.R.C.C.S. "S. Matteo" and "Casa Sollievo della Sofferenza" Hospital) and a long-term rehabilitation facility in Northern Italy (I.R.C.C.S. "S. Maugeri").

Between February 2007 and October 2008, 30 *K. pneumoniae* strains showing decreased susceptibility to carbapenems were collected. PCR and sequencing experiments revealed the presence of bla_{VIM-1} gene in 14/30 isolates. All the above isolates carried the bla_{SHV-5} determinant as well; interestingly, 8/14 VIM positive isolates were also CTX-M-1-like producers. VIM-1 positive strains were present in all hospitals. PFGE genomic profiles of the 14/30 isolates showed that 2 different clones, A and B, were responsible for outbreaks.

The coexistence in the same bacterial cell of compatible plasmids carrying epidemiologically important emerging resistance genes, such as MBLs and CTX-Ms, is worrisome since it could predict the generation and spread of pan-resistant bacteria and the consequent treatment option limitations that can lead to significant morbidity and mortality.

Control measures should be applied to detect MBL-producing strains and to contrast the vertical and plasmidic diffusion of carbapenem-resistant *K. pneumoniae* in acute care and rehabilitation facilities.

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- Enterobatteri AmpC + ;
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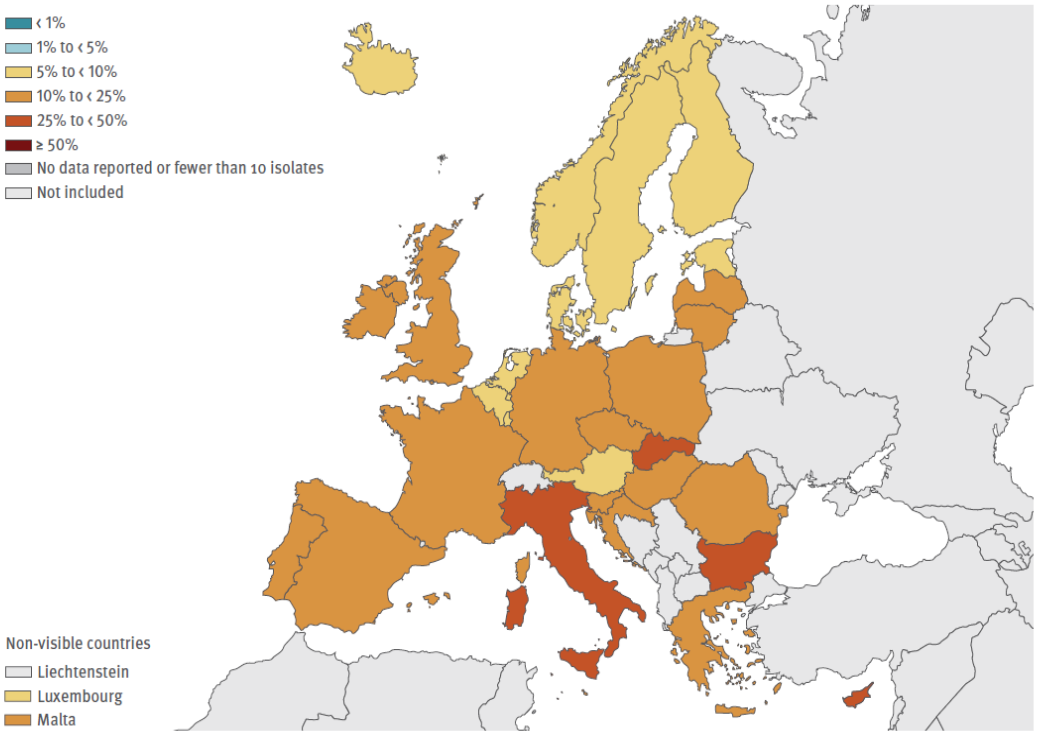
- Pseudomonas aeruginosa panR ;
- Acinetobacter baumannii panR ;
- MRSA ;
- Stafilococchi resistenti ai glicopeptidi;
- Enterococco vancomicina resistente;
- Clostridium difficile
- Candida

E.Coli resistenti alle cefalosporine (ESBL + e AmpC+)

Figure 3.3. *Escherichia coli*. Percentage (%) of invasive isolates with resistance to third-generation cephalosporins, by country, EU/EEA countries, 2017



ESBL : cause dell’ emergenza

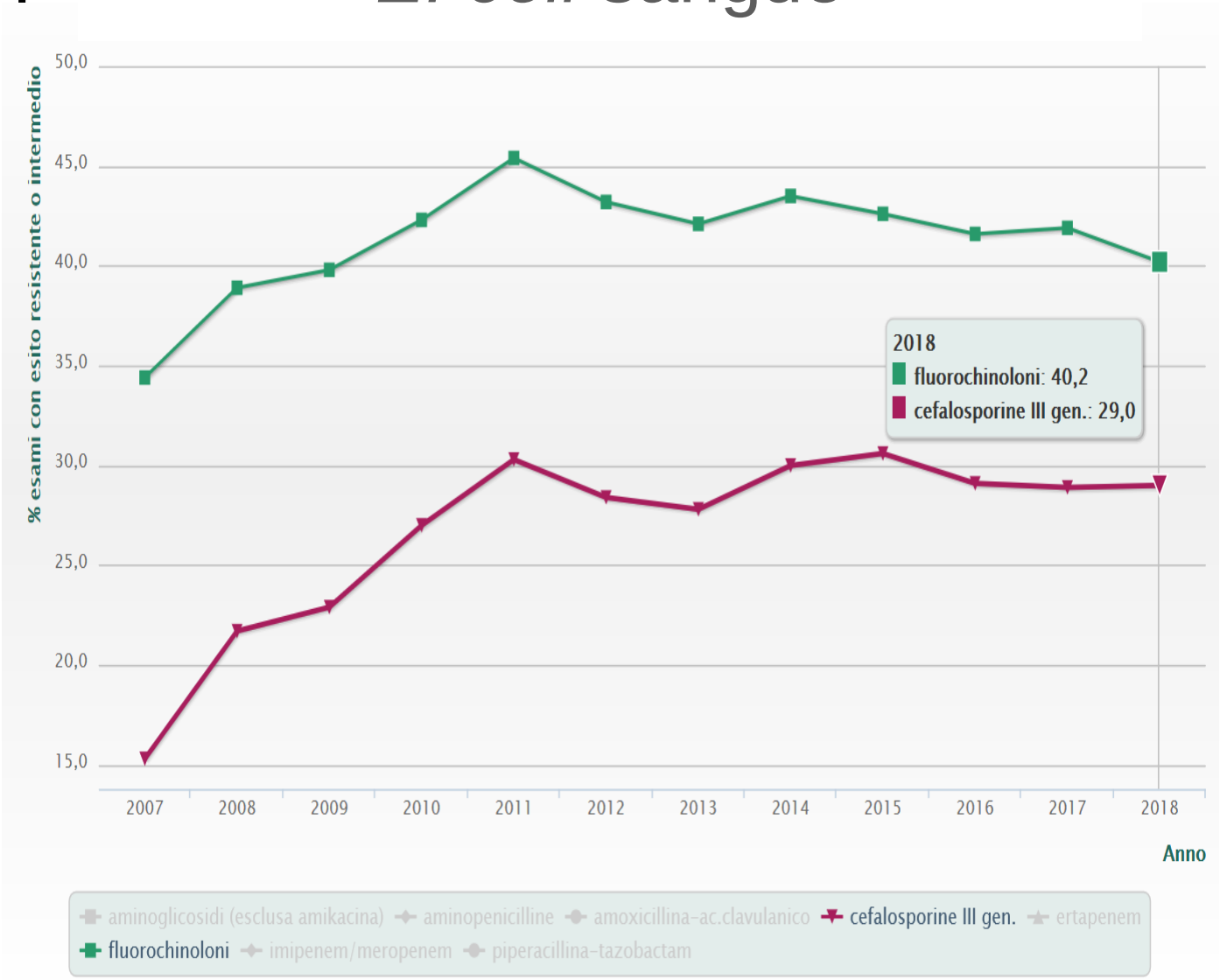
Michael *et al* – Fut Microbiol 2015

- Diffusione globale ;
- Infezioni acquisite in comunità e correlate all’ assistenza sanitaria ;
- Presenza di portatori asintomatici in comunità ;
- Ricovero c/o strutture assistenziali di lunga durata;
- Sorgente ambientale ;
- Serbatoio animale : pollame, bestiame, animali domestici e animali selvatici ;

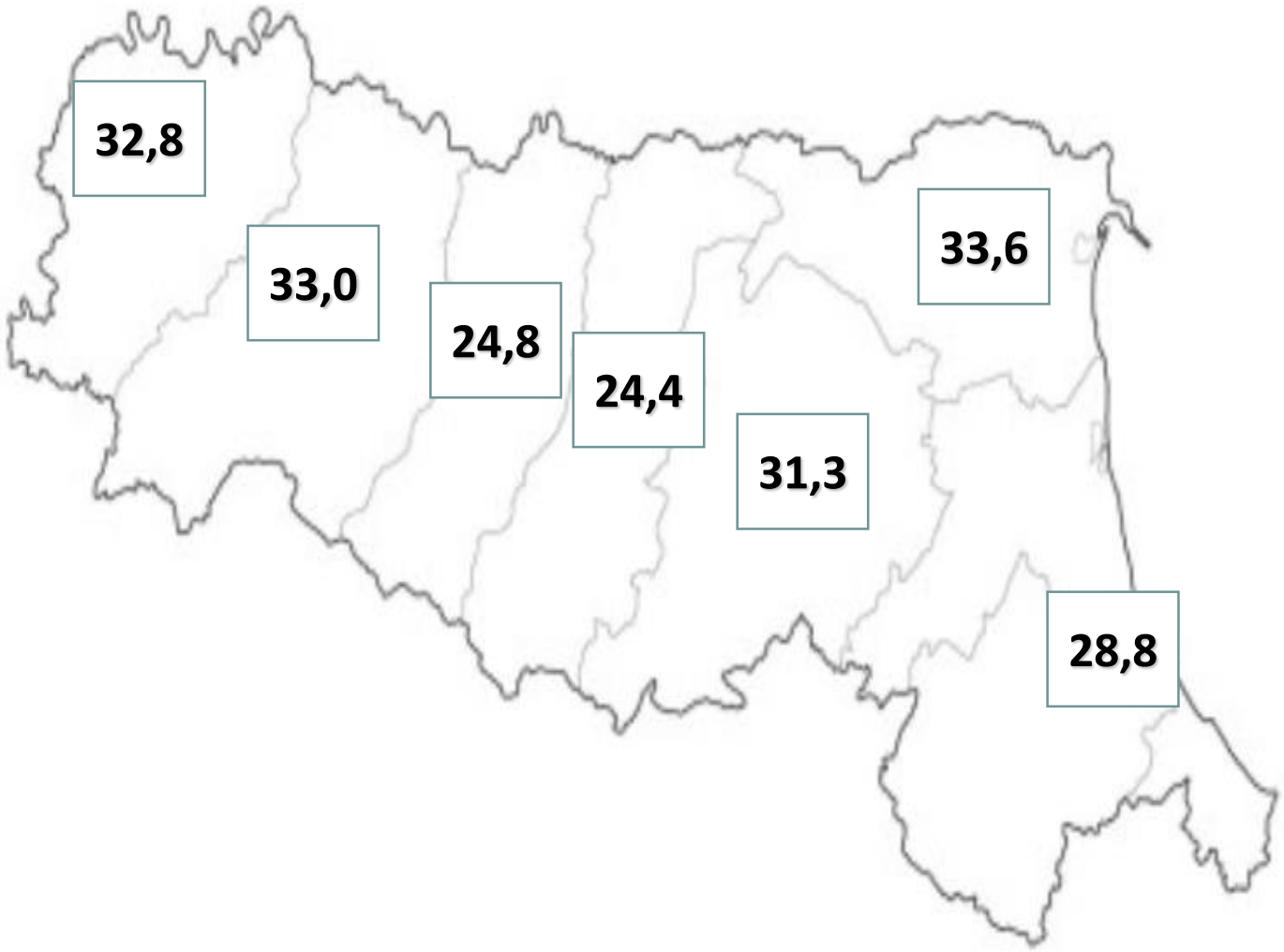
ESBL : Fattori di rischio

- Età > 65 anni ;
- Comorbidità ;
- Allettamento;
- Demenza;
- Ospedalizzazione, RSA, Centri di Riabilitazione ,Case di Riposo, Assistenza domiciliare ecc. ;
- Impiego di cefalosporine III° generazione;
- Utilizzo di fluorchinoloni;

E. coli sangue

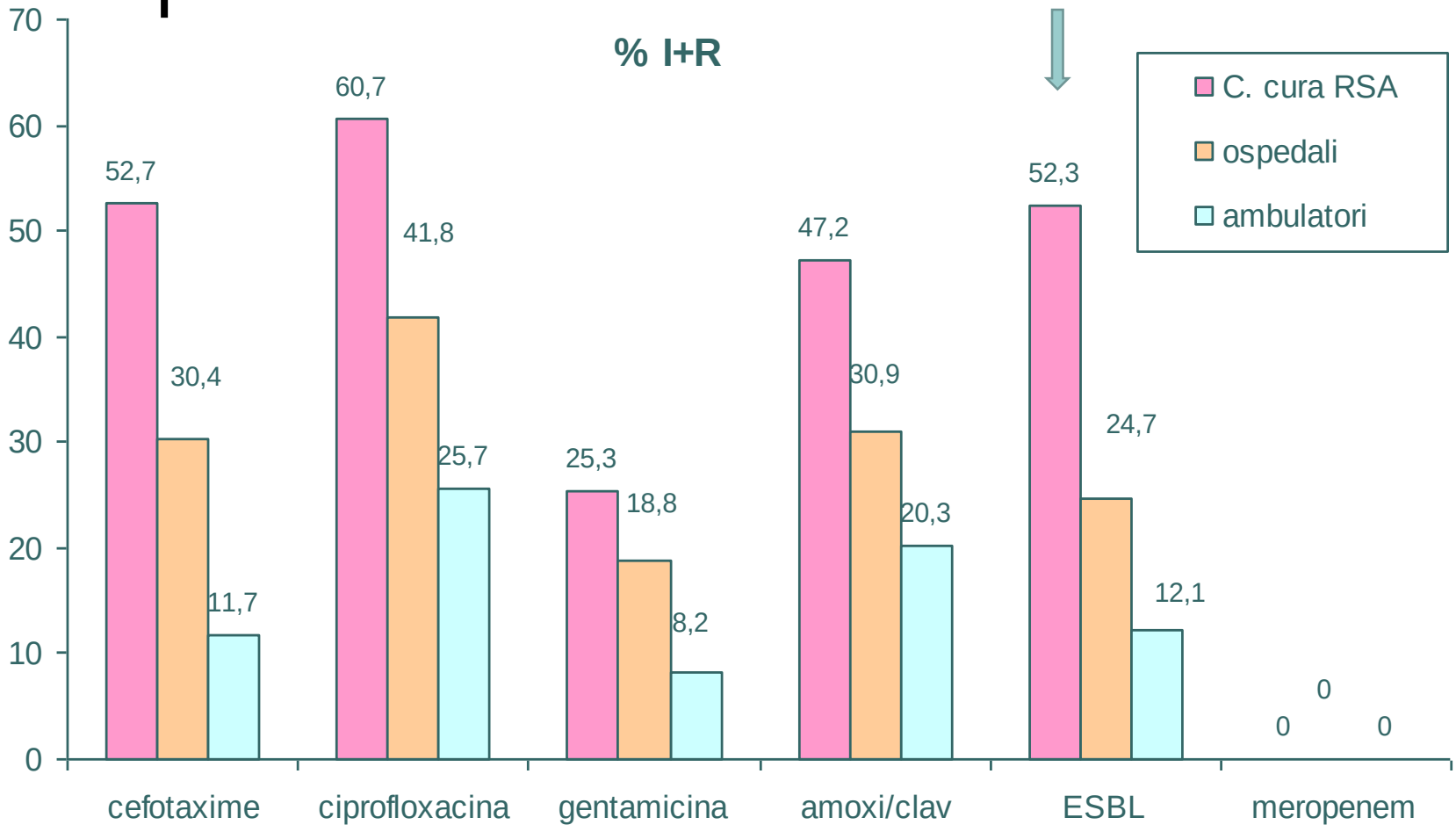


E. coli % cefalosporine I/R sangue 2018



n. ceppi
Ospedali: 1301
Ambulatori: 3311
C. Cura RSA: 94

E. Coli % R 2018



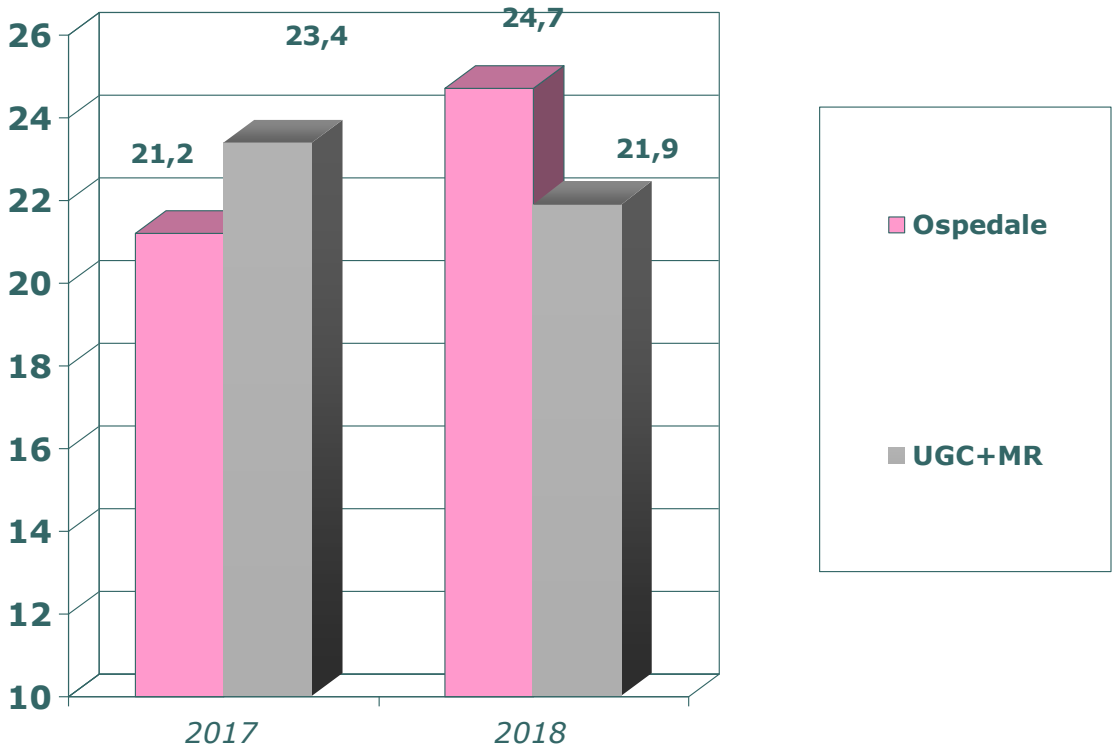
Medicina riabilitativa UGC

E. Coli ESBL

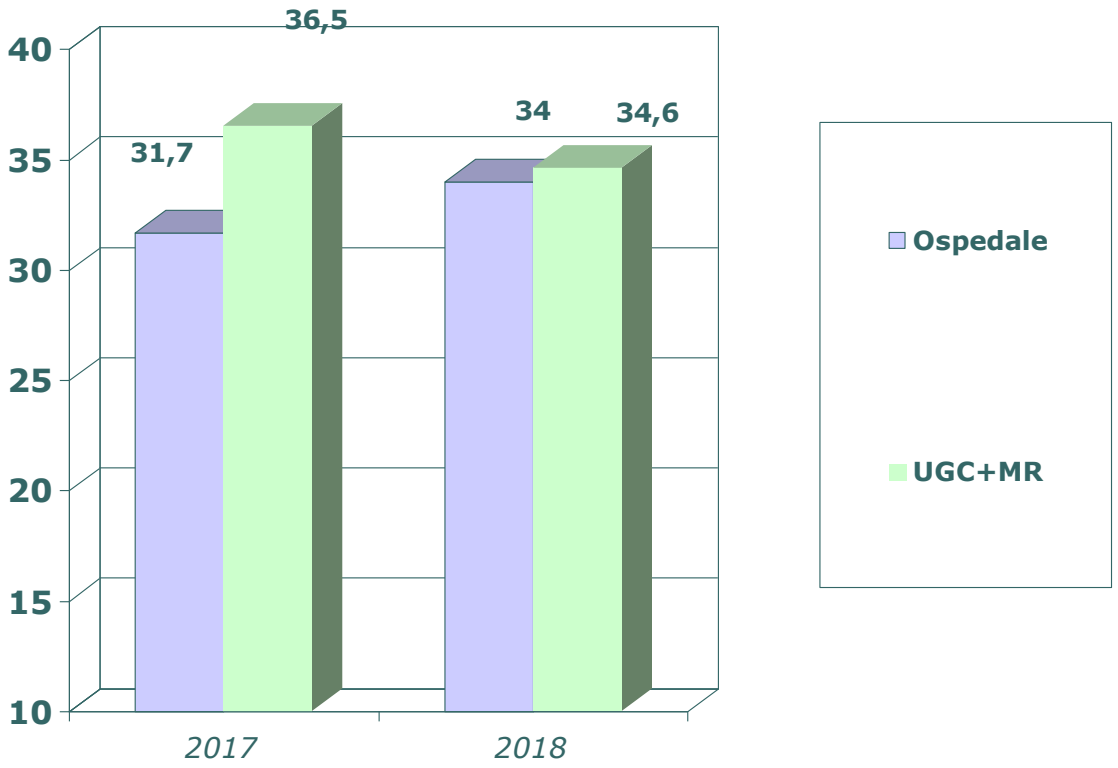
	2017			2018		
Materiale	tot	ESBL	%	tot	ESBL	%
sangue	3	2	66.7	4	1	25.0
urine	71	17	23.9	66	15	22.7
respiratori	3	0	0.0	3	0	0.0
Totale	77	18	23.4	73	16	21.9

E coli CPE = 0 ceppi

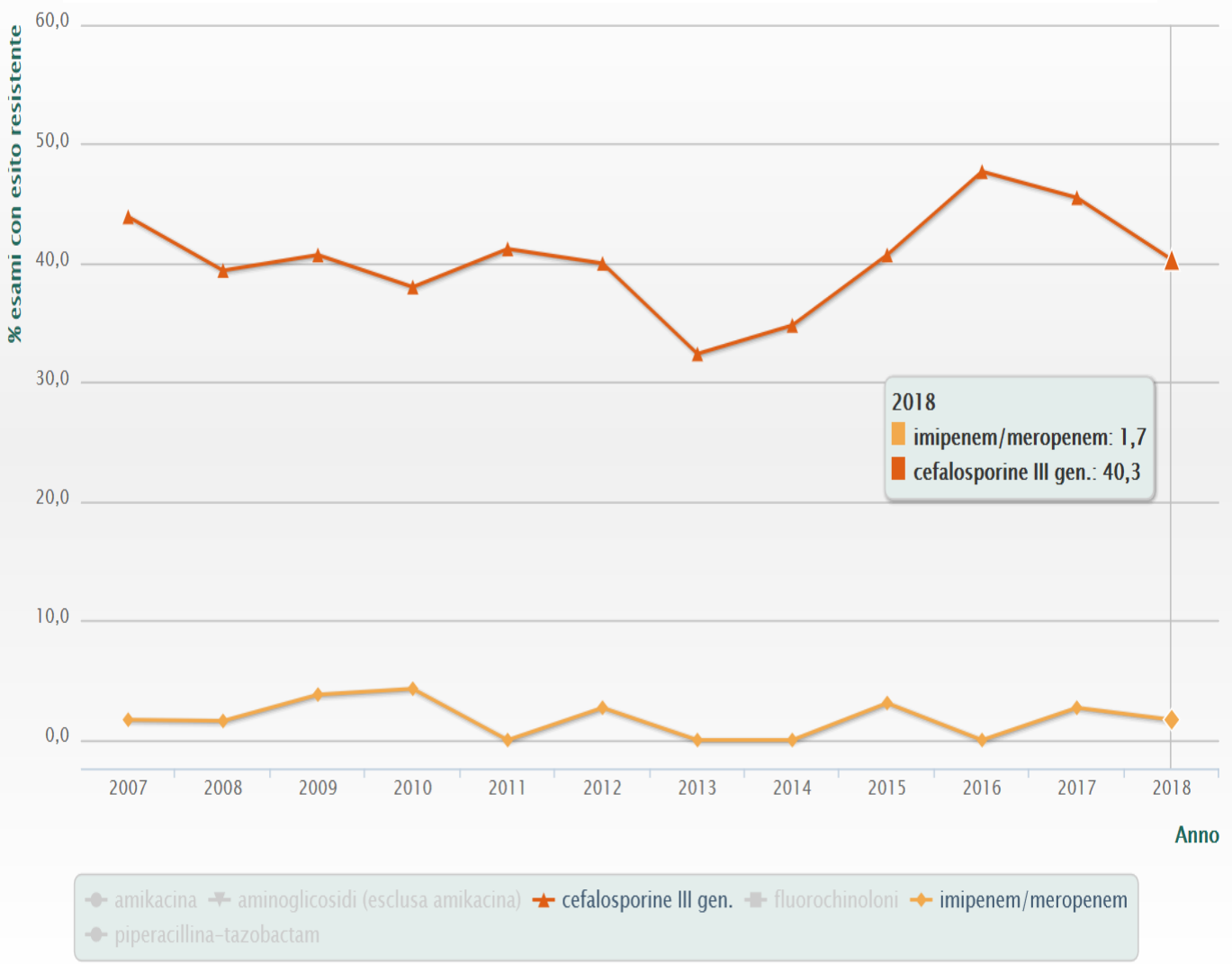
E. coli ESBL da tutti i materiali



Kl pneumoniae ESBL da tutti i materiali

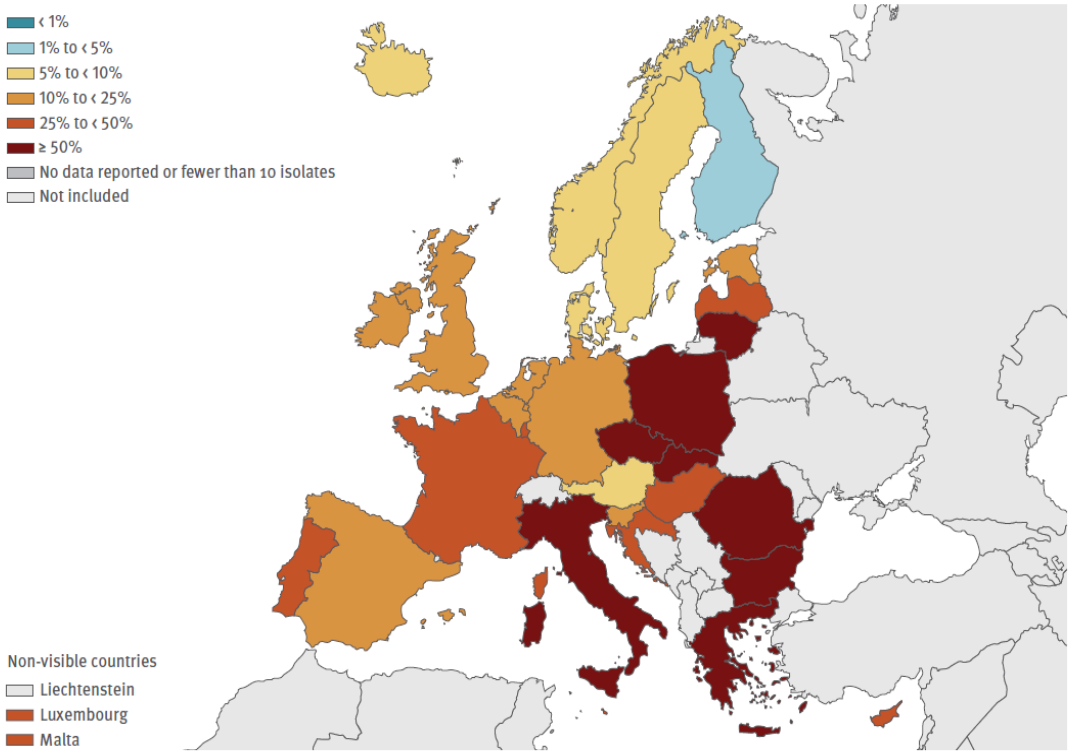


Enterobacter sangue 2018



Klebsiella pneumoniae ESBL+

Figure 3.9. *Klebsiella pneumoniae*. Percentage (%) of invasive isolates with resistance to third-generation cephalosporins, by country, EU/EEA countries, 2017



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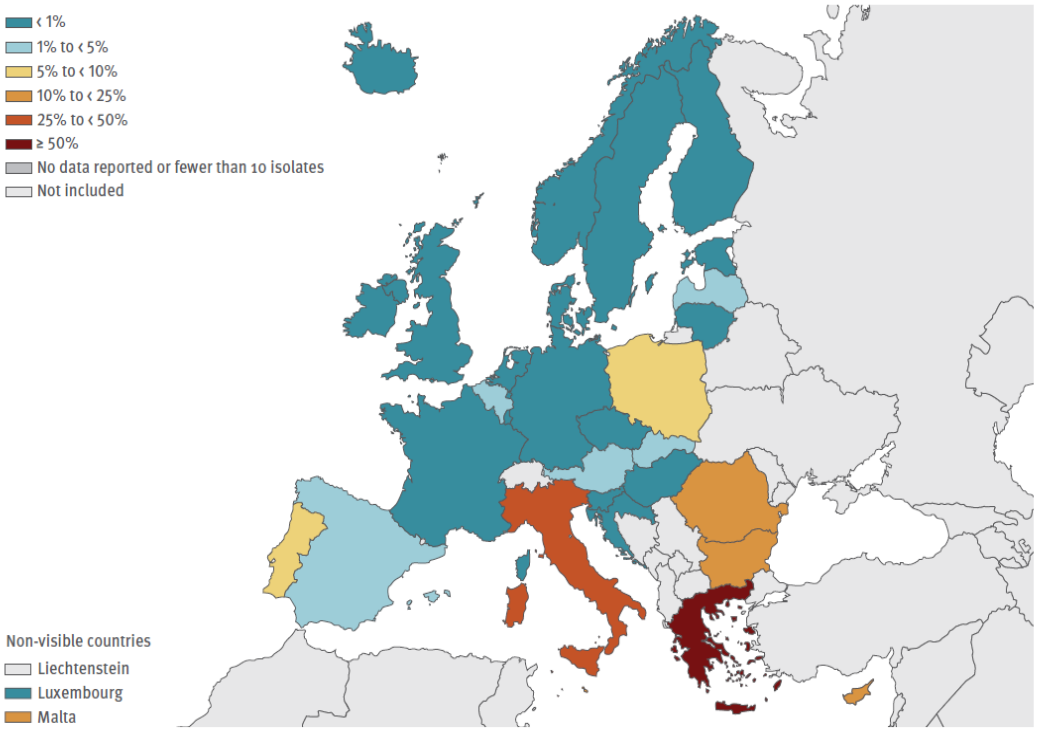
- Candida
- E poi……

KPC +

Figure 3.11. *Klebsiella pneumoniae*. Percentage (%) of invasive isolates with resistance to carbapenems, by country, EU/EEA countries, 2017



E.R. 4° posto dopo Lazio, Piemonte e Lombardia

Tabella 7. Casi di batteriemie da CPE segnalati per genere, regione e provincia autonoma, 1° aprile 2013 – 31 luglio 2016

Regione/Provincia Autonoma (PA)	F		M		Non indicato		Totale
	n.	%	n.	%	n.	%	n.
Piemonte	269	36,8	459	62,9	2	0,3	730
Valle d'Aosta	2	28,6	5	71,4	0	0,0	7
Lombardia	208	31,7	424	64,5	25	3,8	657
PA Bolzano	1	33,3	2	66,7	0	0	3
PA Trento	0	0	1	100,0	0	0	1
Veneto	36	30,2	83	69,7	0	0	119
Friuli-Venezia Giulia	16	41,0	22	56,4	1	2,6	39
Liguria	218	36,5	373	62,5	6	1,0	597
Emilia-Romagna	217	35,9	387	64,1	0	0	604
Toscana	111	37,2	185	62,1	2	0,7	298
Umbria	19	33,9	36	64,3	1	1,8	56
Marche	20	30,8	45	69,2	0	0	65
Lazio	376	39,7	554	58,6	16	1,7	946
Abruzzo	5	55,6	4	44,4	0	0,	9
Campania	91	40,1	132	58,1	4	1,8	227
Puglia	178	40,2	258	58,2	7	1,6	443
Basilicata	0	0	1	100,0	0	0	1
Calabria	30	37,0	51	63,0	0	0	81
Sicilia	170	40,8	241	57,8	6	1,4	417
Sardegna	11	35,5	20	64,5	0	0	31
Totale	1978	37,1	3283	61,6	70	1,3	5331

*La regione Molise non ha segnalato casi nel triennio considerato.

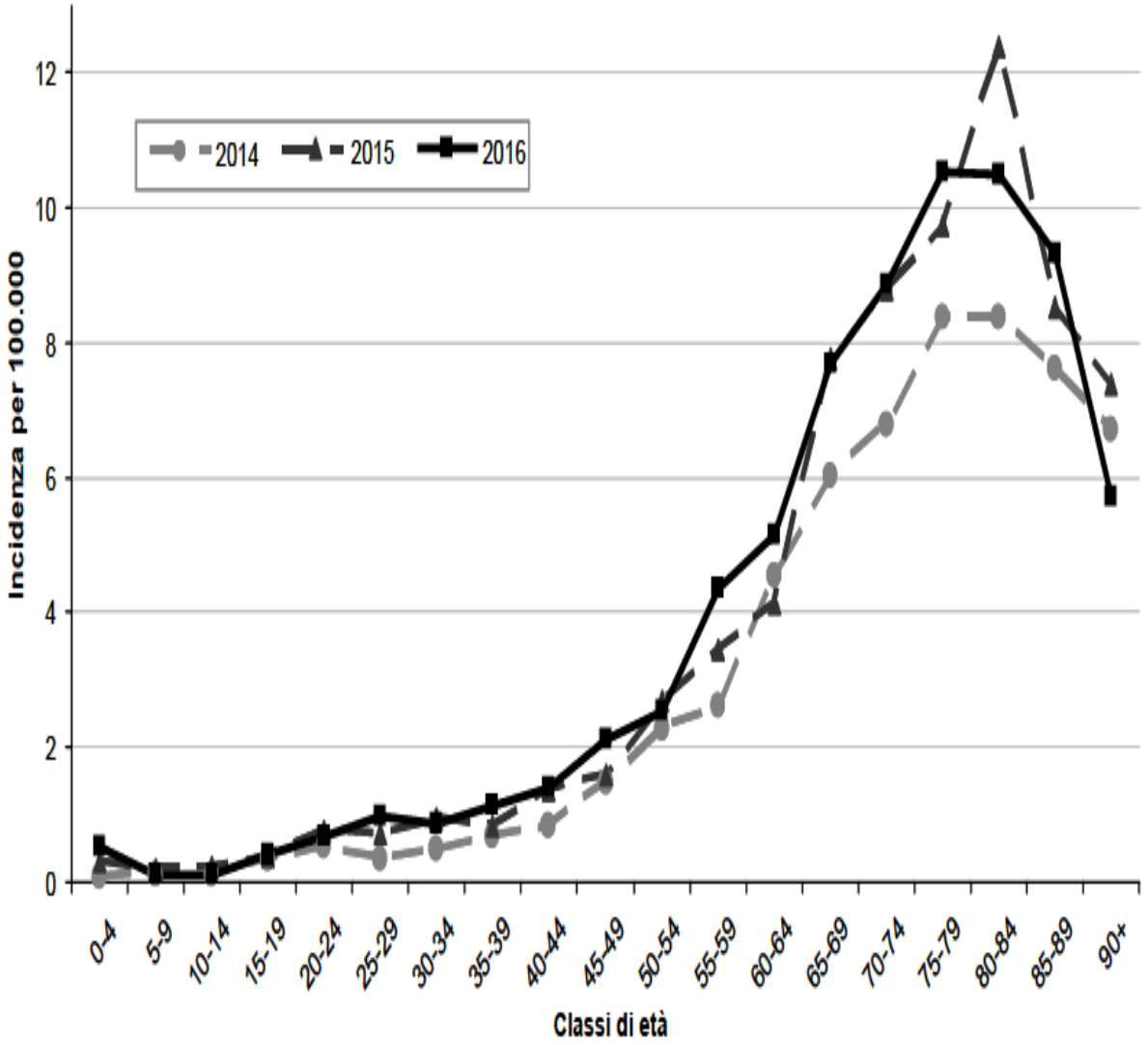
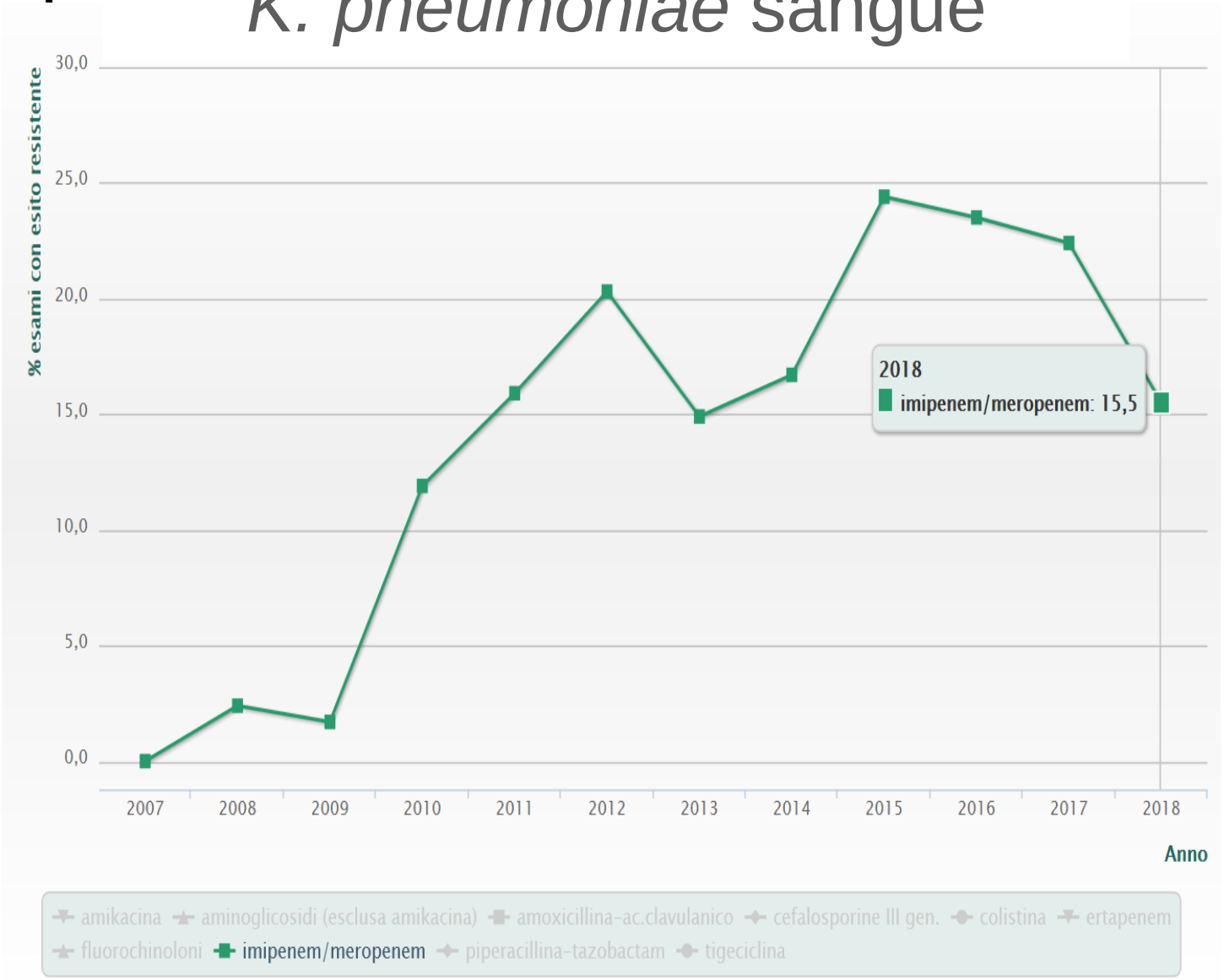
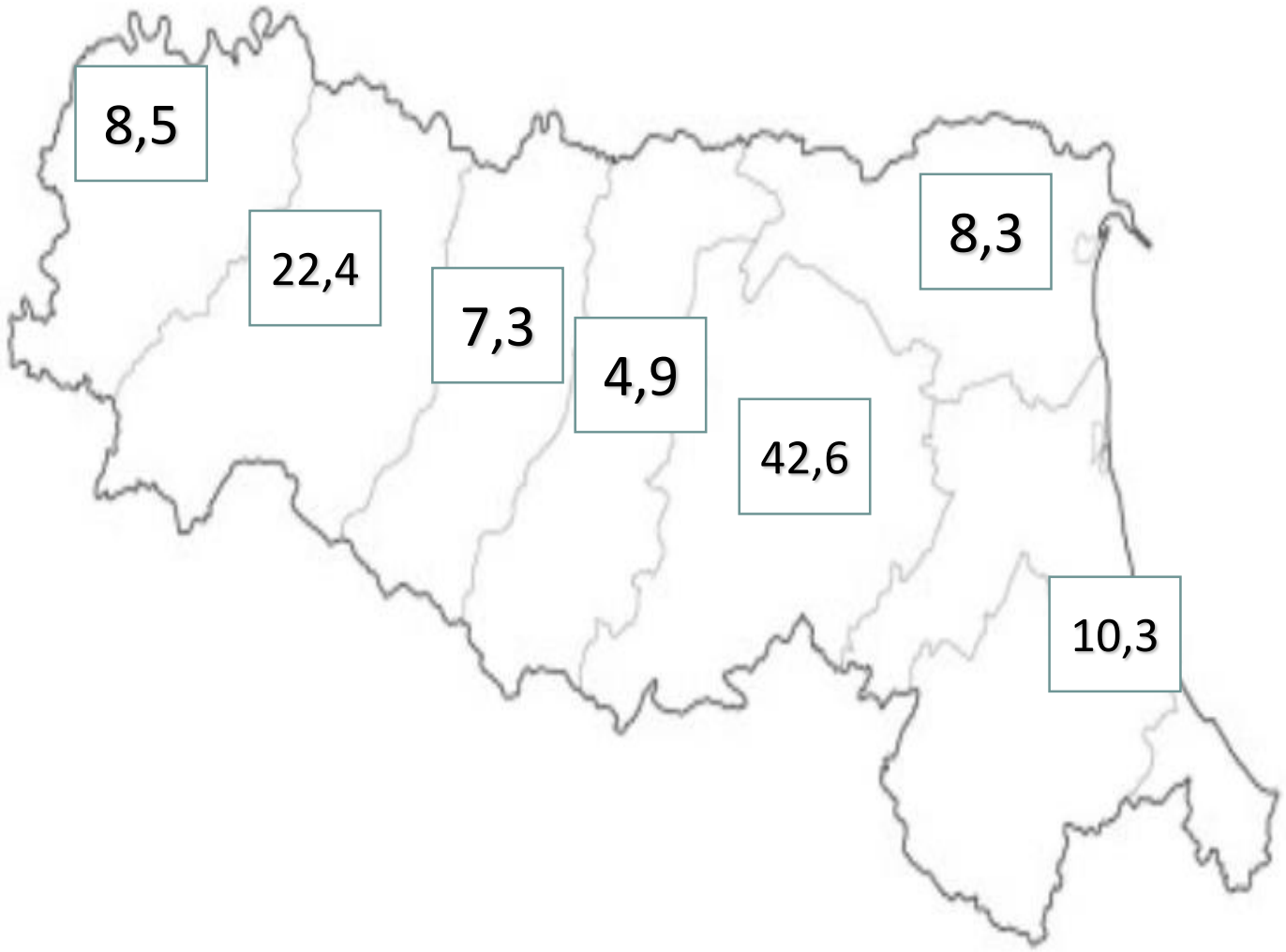


Figura 8. Incidenza dei casi di batteriemie da CPE per classi di età e anno, 2014-2016

K. pneumoniae sangue

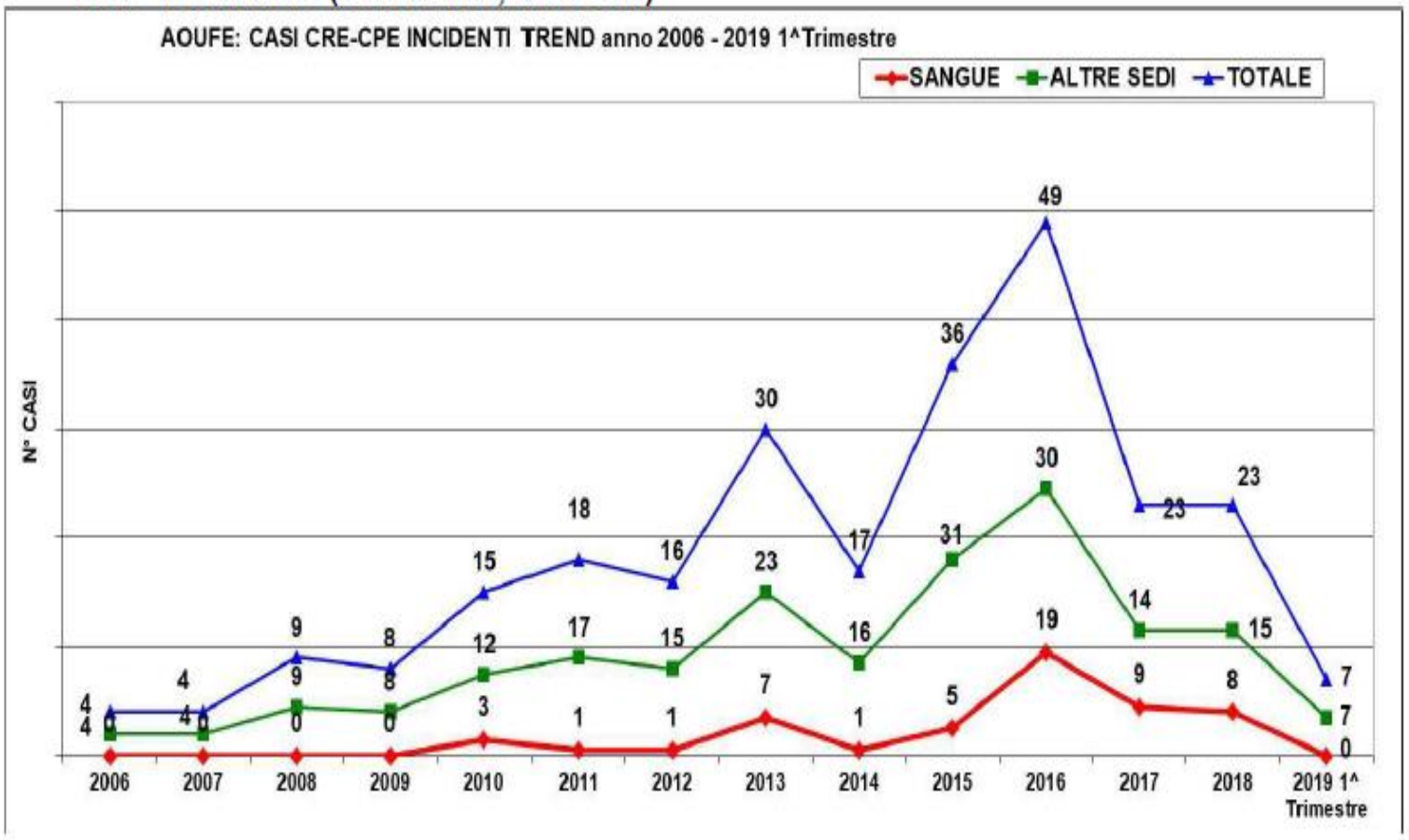


K. pneumoniae meropenem R sangue 2018



Enterobatteri carbapenemasi produttori

Grafico 1 - Distribuzione del N° di infezioni attive da CPE-CRE (casi incidenti), totale e per sede di infezione (batteriemie, altre sedi)



ASCESSO DELLA LOGGIA RENALE E FOSSA ILIACA DA KLEBSIELLA PNEUMONIAE CARBAPENEMASI RESISTENTE (KPC) TRATTATO CON SUCCESSO CON TIGECICLINA

Libanore Marco, Bicocchi Roberto, Pantaleoni Mario, Carillo Carmelina°, Macca Marina°°, Sartori Sergio°°°, Lavezzi Susanna°°

Unità Operativa Complessa Malattie Infettive, Azienda Ospedaliera – Universitaria Ferrara; °° Sezione di Microbiologia Clinica, Laboratorio Unico Provinciale, Azienda Ospedaliera – Universitaria Ferrara; °° Unità Operativa Complessa Gravi Cerebrolesioni, Azienda Ospedaliera – Universitaria Ferrara; °°° Sezione di Ecografia Interventiva, Azienda Ospedaliera – Universiataria Ferrara

CASO CLINICO: Donna di 27 anni, con grave trauma cranio – encefalico , per incidente della strada, in dipendenza totale, affetta da comizialità, diabete mellito insulino- dipendente e portatrice di PEG, già sottoposta a nefrectomia destra per , mostra la presenza di due raccolte in loggia renale destra ed in fossa iliaca omolaterale. Sotto guida angioecografica viene eseguita aspirazione delle due raccolte con fuoriuscita di essudato purulento verdastro, estremamente denso con cui vengono allestiti campioni per esame colturale. La paziente viene posta in terapia con tigeciclina 100 mg e.v. 1° somministrazione, seguita da 50 mg e.v. ogni 12 ore. La crescita evidenzia lo sviluppo di KPC sensibile a tigeciclina, il cui dosaggio viene raddoppiato e mantenuto per complessivi 16 giorni. Il monitoraggio ecografico delle lesioni documenta la risoluzione dei processi infettivi precedentemente descritti.

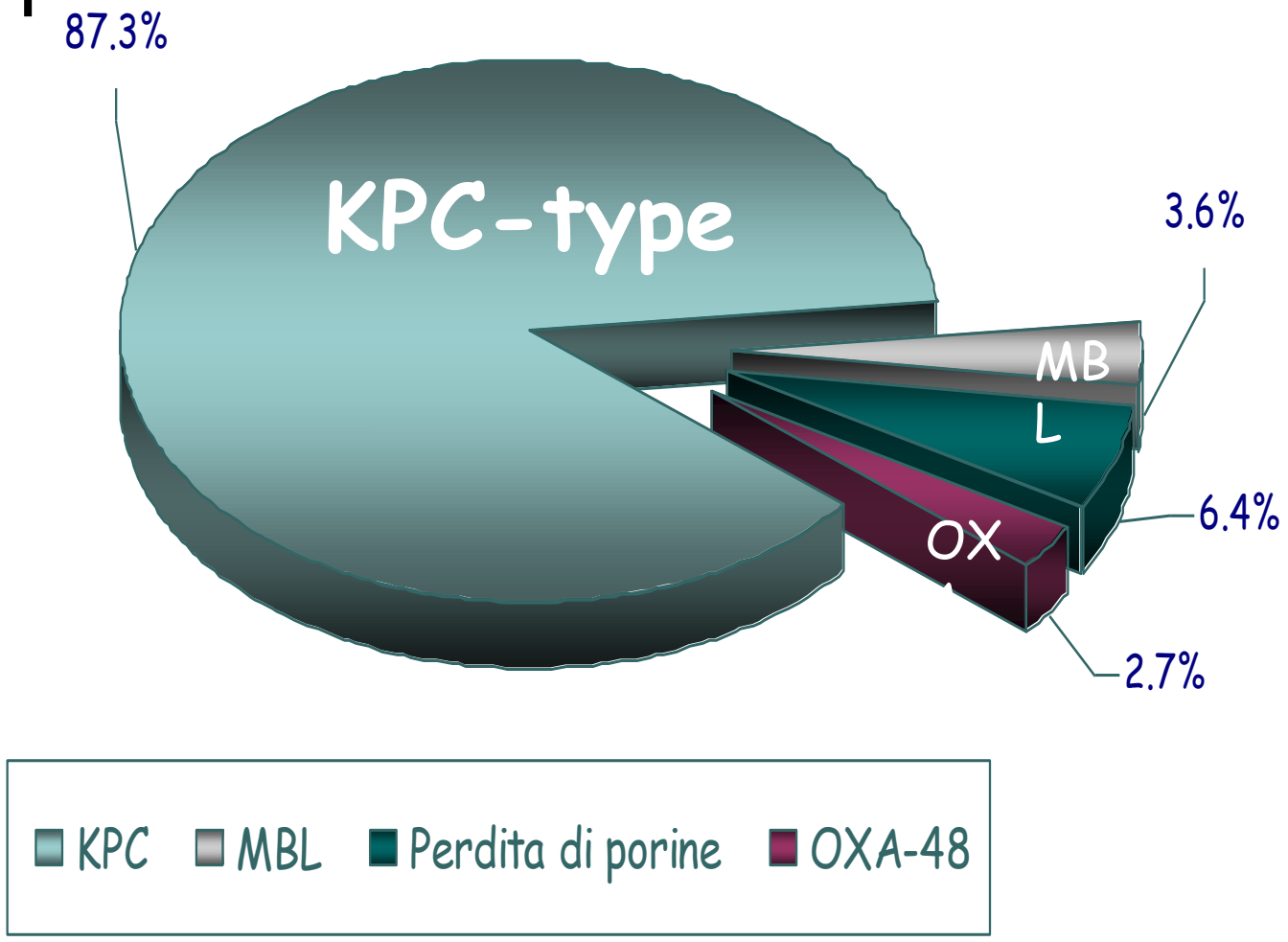
Figura 1.Tigeciclina, struttura molecolare.

CONCLUSIONI: La rapida definizione della eziologia , delle caratteristiche fenotipiche di resistenza e del profilo di sensibilità del microrganismo, il ricorso a nuove molecole antibiotiche insieme al tempestivo impiego dell' ecografia interveniva, in alternativa alla chirurgia tradizionale, costituiscono elementi fondamentali per un'adeguata gestione di queste severe infezioni. La emergenza e la diffusione di patogeni MDR è preoccupante ed impone al clinico cambiamenti nelle strategie terapeutiche. Tra queste tigeciclina si è dimostrata una valida opzione nella terapia degli ascessi addominali da KPC.

BIBLIOGRAFIA: Di Carlo P, Pantuso G, Cusimano A, et al. Two cases of monomicrobial intraabdominal abscess due to KPC – 3 Klebsiella pneumoniae ST258 clone. BMC Gastroenterology 2011; 11: 103-108.

Sader HS, Castanheira M, Flamm RK, Mendes RE, Farrell DJ, Jones RN Tygecicline activity tested against carbapenem resistant enterobacteriaceae from 18 european nations: results from the SENTRY surveillance program (2010-2013). Diagn Microbiol Infect Dis 2015; 83: 183-86.

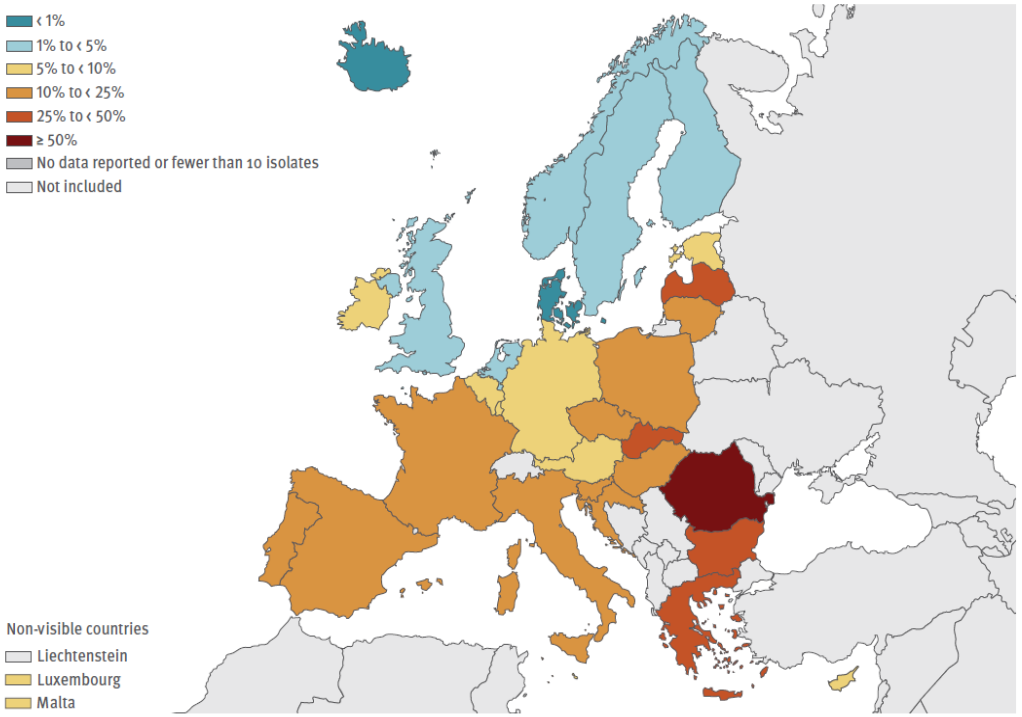
Meccanismi di resistenza ai carbapenemi in *Klebsiella pneumoniae* (n=110)



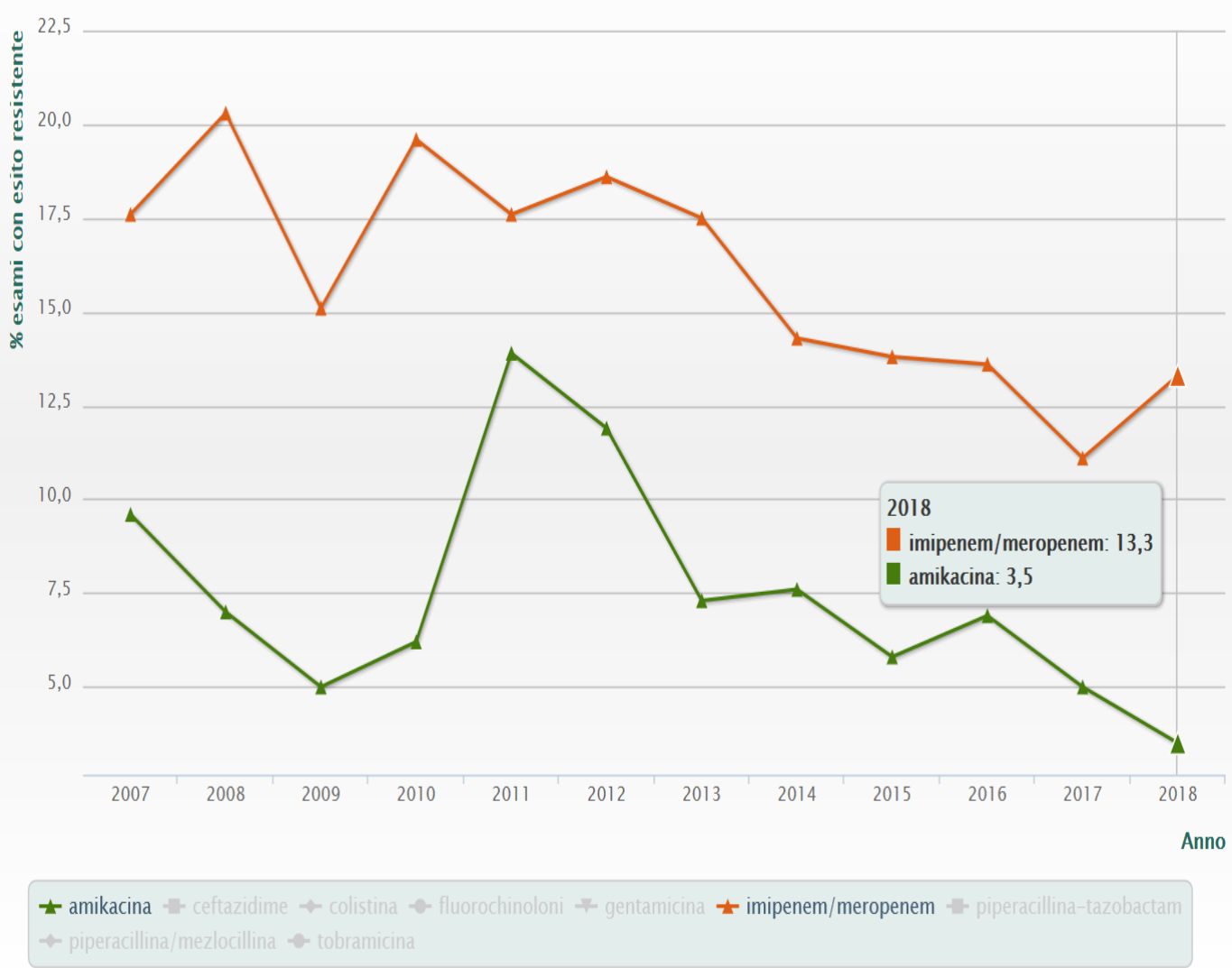
Sorveglianza nazionale 2013

Pseudomonas aeruginosa panR

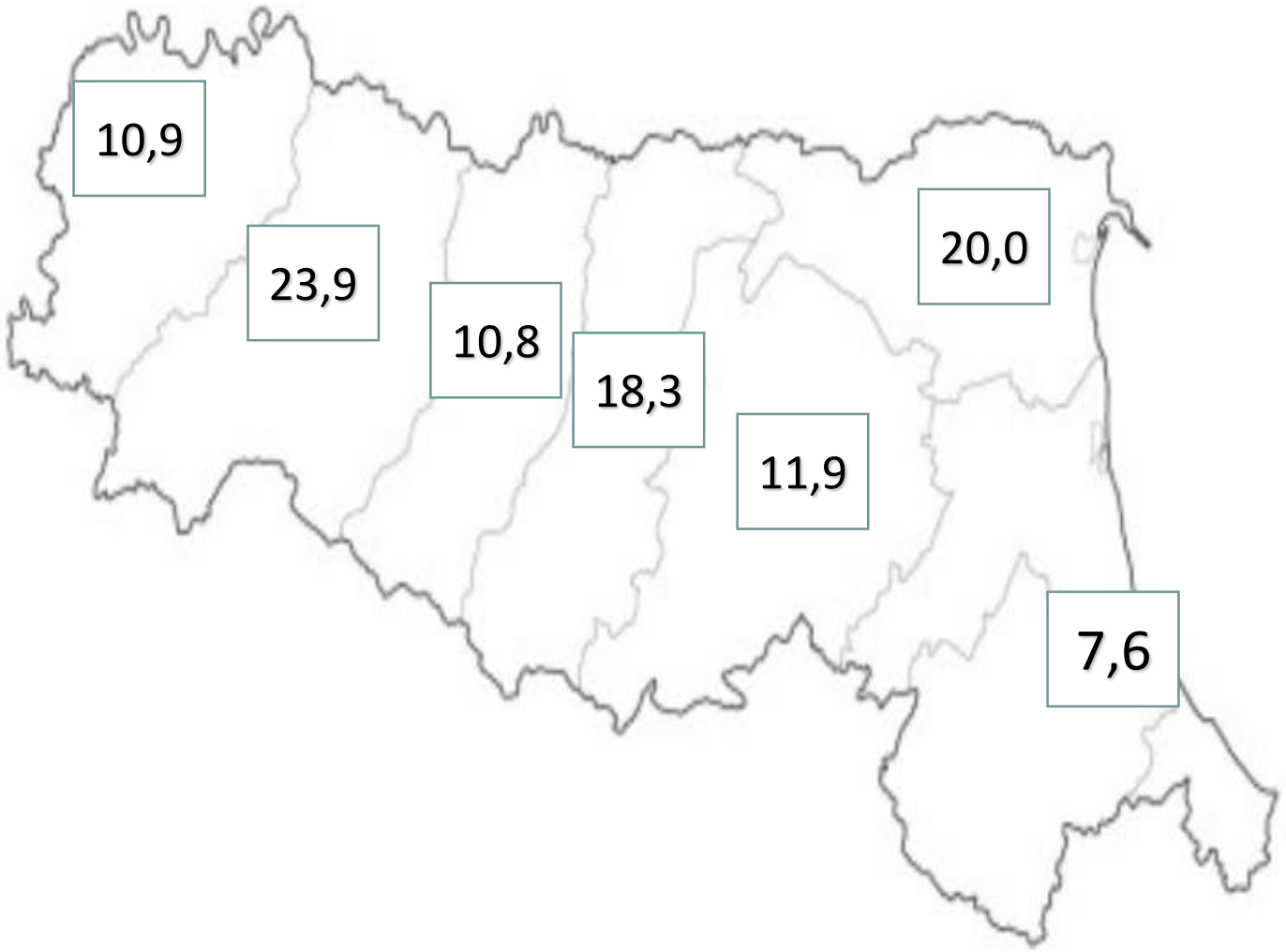
Figure 3.18. *Pseudomonas aeruginosa*. Percentage (%) of invasive isolates with combined resistance (resistance to three or more antimicrobial groups among piperacillin ± tazobactam, ceftazidime, fluoroquinolones, aminoglycosides and carbapenems), by country, EU/EEA countries, 2017



P. aeruginosa sangue



P. aeruginosa meropenem R sangue 2018

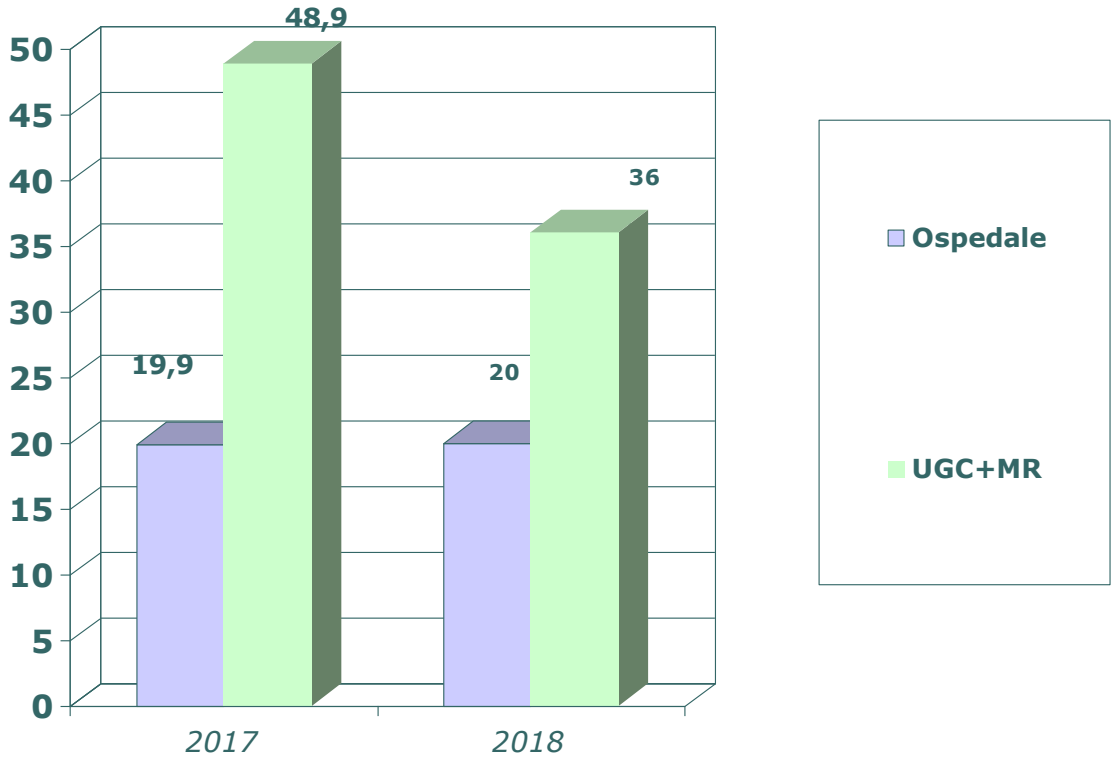


Medicina riabilitativa UGC

Pseudomomas aeruginosa R Meropenem

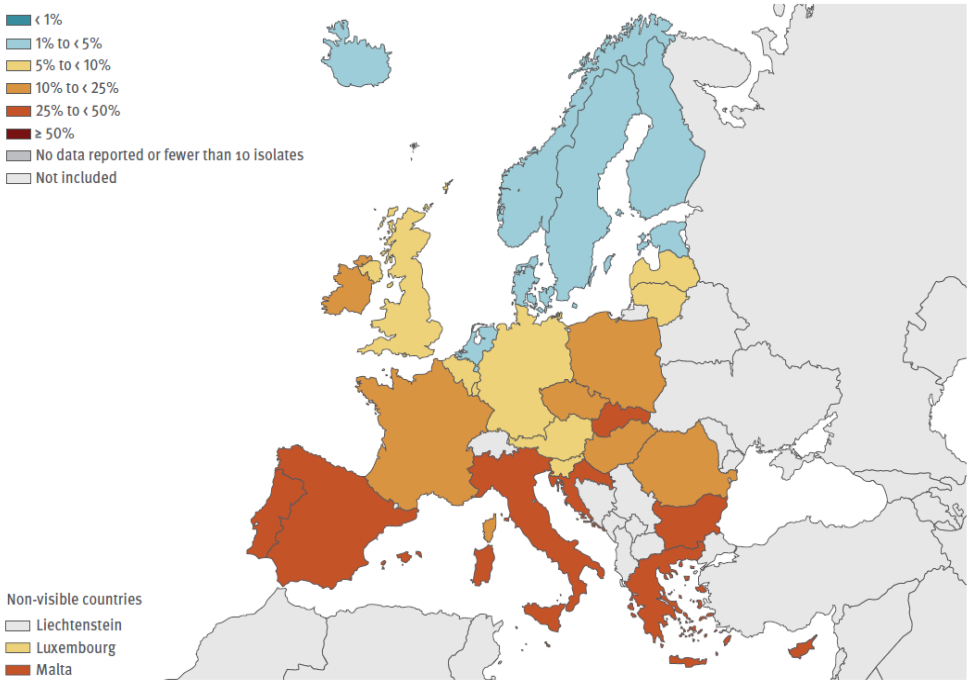
	2017			2018		
Materiale	tot	R mer	%	tot	R mer	%
Sangue	5	0	0	4	2	50
urine	25	10	40	22	5	22,7
respiratori	17	13	76,5	24	11	45,8
Totali	47	23	48,9	50	18	36

Ps aeruginosa Meropenem R da tutti i materiali



MRSA

Figure 3.25. *Staphylococcus aureus*. Percentage (%) of invasive isolates with resistance to meticillin (MRSA), by country, EU/EEA countries, 2017



Staphylococcus aureus meticillino resistente

- ***S. aureus* resistente a tutti i beta-lattamici ad eccezione delle nuove cefalosporine (ceftarolina e ceftobiprolo)**
- PBP2a e PBP2c codificate da *mecA* e *mecC*

	OX	FOX	mecA/mecC	
MRSA	R	R	+	
BORSA	R	S	-	Iperproduzione di beta-lattamasi
HR-MRSA	S	R	+	Gene mec espressione eterogenea (mecC)
OS-MRSA	S	S	+	Gene mec inattivato

ORIGINAL ARTICLE BACTERIOLOGY

Carriage of methicillin-resistant *Staphylococcus aureus* on admission to European rehabilitation centres—a prospective study

E. Bilavsky[1,2], Y. Lerman[3], A. Rabinovich[3], J. Salomon[4], C. Lawrence[5], A. Rossini[6], A. Salvia[6], J. V. Samso[7], J. Fierro[7], M. Hochman[1], M. Kazma[1], A. Klein[1], M. J. Schwaber[1,2], Y. Carmeli[1,2] and MOSAR WP5 study team*

1) *Division of Epidemiology and Preventive Medicine*, 2) *Sackler Faculty of Medicine*, 3) *Geriatric Division, Tel-Aviv Sourasky Medical Centre, Tel Aviv University, Tel Aviv, Israel*, 4) *Pharmaco Epidemiology of Infectious Diseases, Inserm U657, Institut Pasteur, CNAM (CASER, SITI, R2S2), Paris, France*, 5) *Department of Microbiology, Assistance Publique Hôpitaux de Paris, CHU Raymond Poincaré, Hôpital maritime de Berck, Garches, France*, 6) *Fondazione Santa Lucia IRCCS, Rome, Italy and* 7) *Hospital de Neurorehabilitació, Institut Guttmann, Barcelona, Spain*

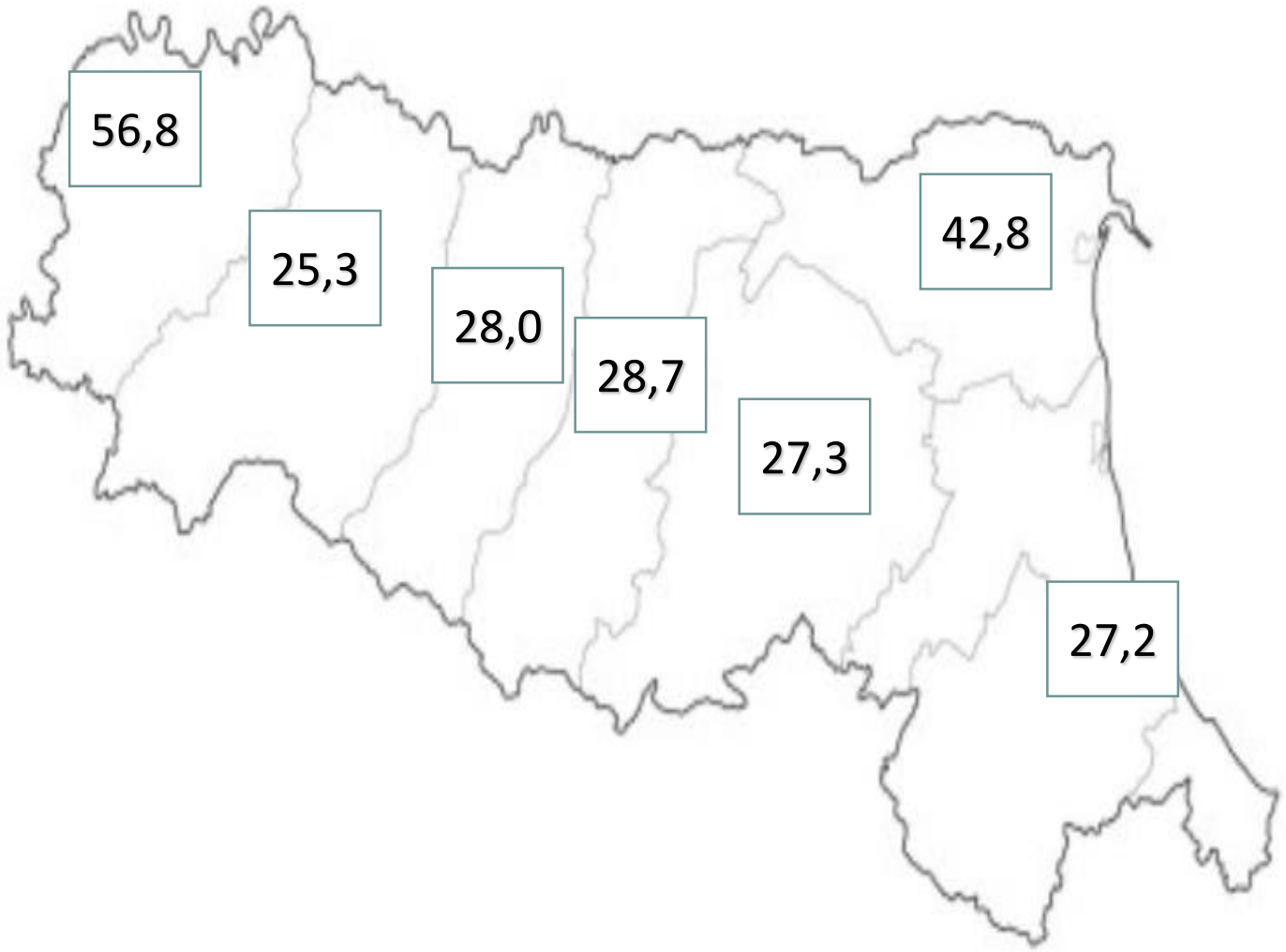
TABLE 1. Comparison of demographic characteristics and comorbidities in patients with positive and negative results on methicillin-resistant *Staphylococcus aureus* screening

	MRSA positive (n = 105)	MRSA negative (n = 1099)	p	OR
Demographic parameters				
Male: female (%)	69/31	45/55	<0.001	4
Age mean ± SD (year)	68.3 ± 19.8	69.3 ± 18.6	0.6	
Age >65 years (n, %)	60 (57.1)	734 (66.8)	0.041	0.6
Admitted from acute-care facility (n, %)	91 (86.7)	955 (86.9)	0.99	1
Long acute-care hospital stay (>2 weeks) (n, %)	66 (62.9)	464 (42.2)	<0.001	2.3
Recent stay in another long-term-care facility (n, %)	46 (43.8)	271 (24.7)	<0.001	2.4
Comorbidities				
History of colonization with MRSA (n, %)	28 (26.7)	45 (4.1)	<0.001	8.5
History of colonization with multidrug resistance bacteria other than MRSA (n, %)	1 (1)	31 (2.8)	0.4	0.4
Admitted with infection	11 (10.5)	126 (11.5)	0.76	0.9
Reduced level of consciousness (n, %)	25 (23.8)	152 (13.8)	0.006	1.9
Cardiovascular disease (n, %)	60 (57.1)	654 (59.5)	0.58	0.9
Peripheral vascular disease (n, %)	13 (12.4)	52 (4.7)	0.001	2.8
Pressure sores (n, %)	20 (19)	98 (8.9)	0.001	2.4
Diabetes mellitus (n, %)	24 (22.9)	237 (22)	0.78	1.1
Chronic lung disease (n, %)	14 (13.3)	99 (9)	0.15	1.5
Cerebral vascular accident/transient ischaemic attack (n, %)	20 (19)	171 (16)	0.36	1.3
Tetraplegia/Quadriplegia (n, %)	20 (19)	141 (12.8)	0.07	1.6
Dementia (n, %)	6 (5.7)	70 (6.4)	0.78	0.9
Renal disease (n, %)	16 (15.2)	106 (9.6)	0.07	1.7
Malignancy (n, %)	10 (9.5)	175 (15.9)	0.08	0.6
Immunodeficiency (n, %)	9 (8.6)	49 (4.5)	0.06	2
Surgery/Invasive procedure in last year (n, %)	72 (68.6)	665 (60.5)	0.12	1.4
Invasive device in the past month (n, %)	78 (74.3)	764 (69.5)	0.38	1.2

MRSA, methicillin-resistant *Staphylococcus aureus*; OR, odds ratio.

S. aureus sangue

MRSA sangue 2018



Stafilococco aureo MR anno 2018

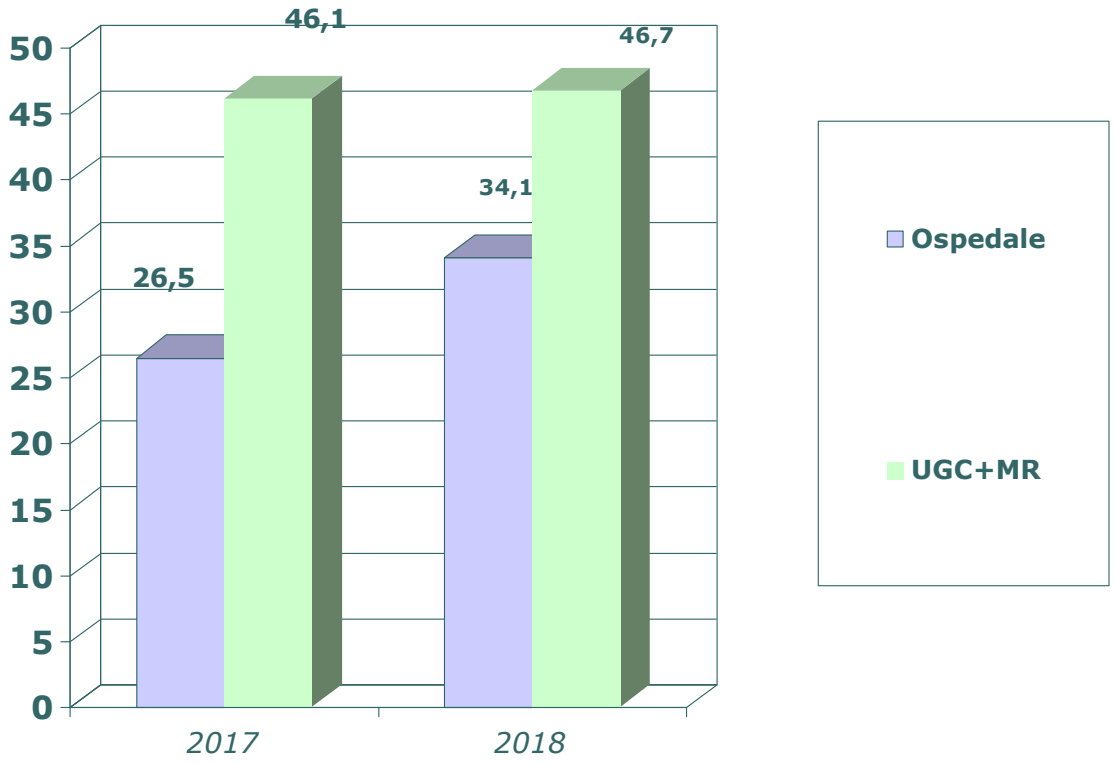
Provenienza	S.Aureo n. ceppi	MR	% MR
Paz.ambulat	399	88	22,1
Cona	431	147	34,1
Delta	65	25	38,5
Cento	51	31	60.8
Argenta	16	7	43,8
totale	962	298	31

Medicina riabilitativa UGC

Stafilococco aureo MR

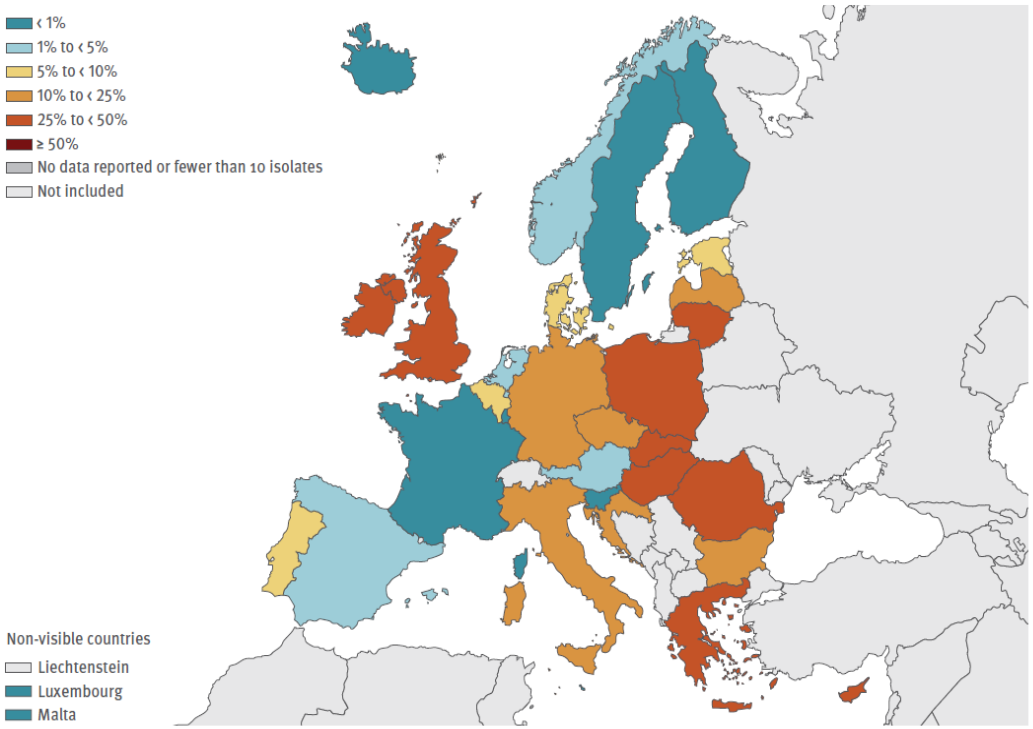
	2017			2018		
Materiale	tot	MR	%	tot	MR	%
Sangue	7	4	57,1	5	3	60
urine	2	1	50	5	2	40
respiratori	4	1	25	5	2	40
Totale	13	6	46,1	15	7	46,7

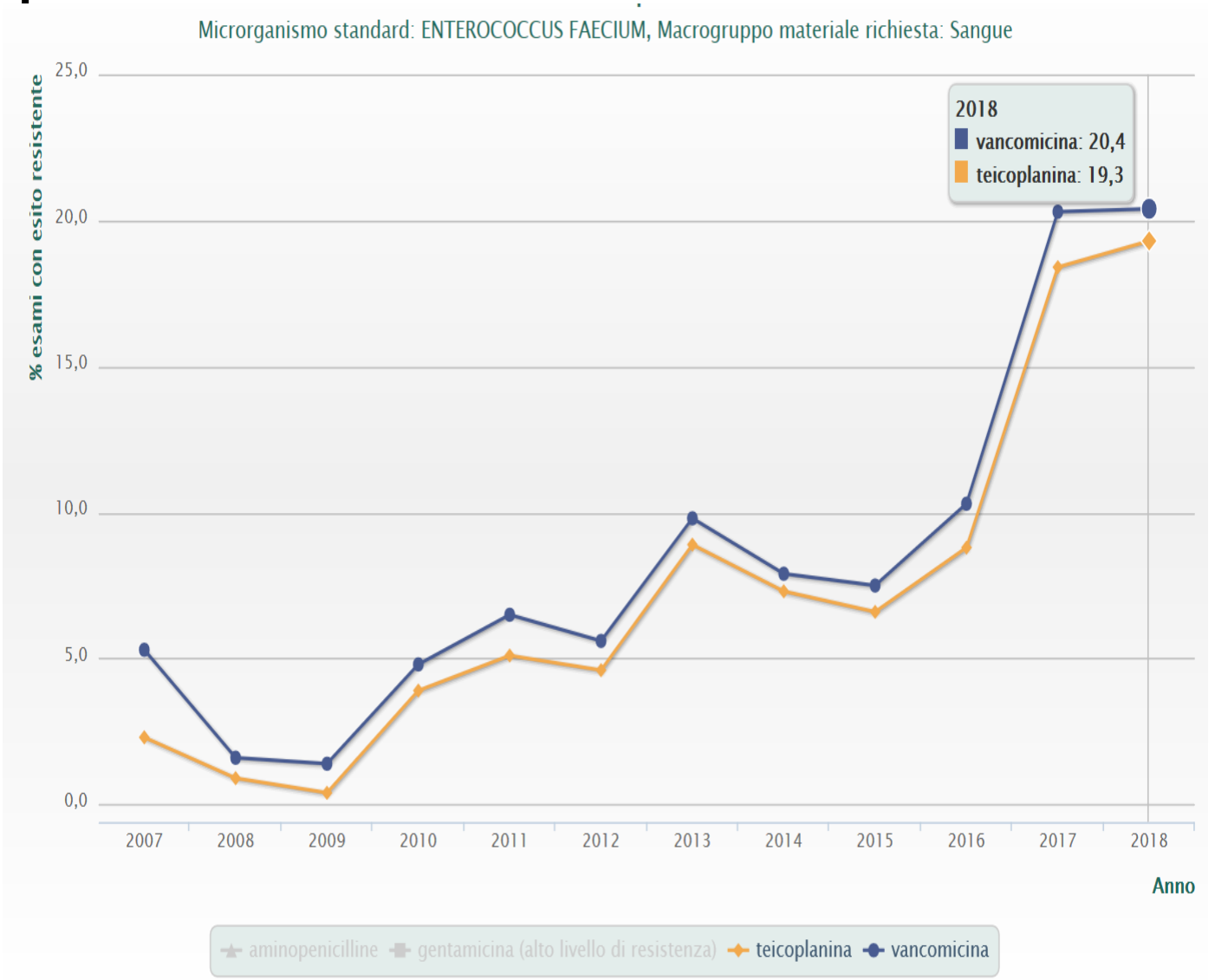
Stafilococco aureo MR da tutti i materiali



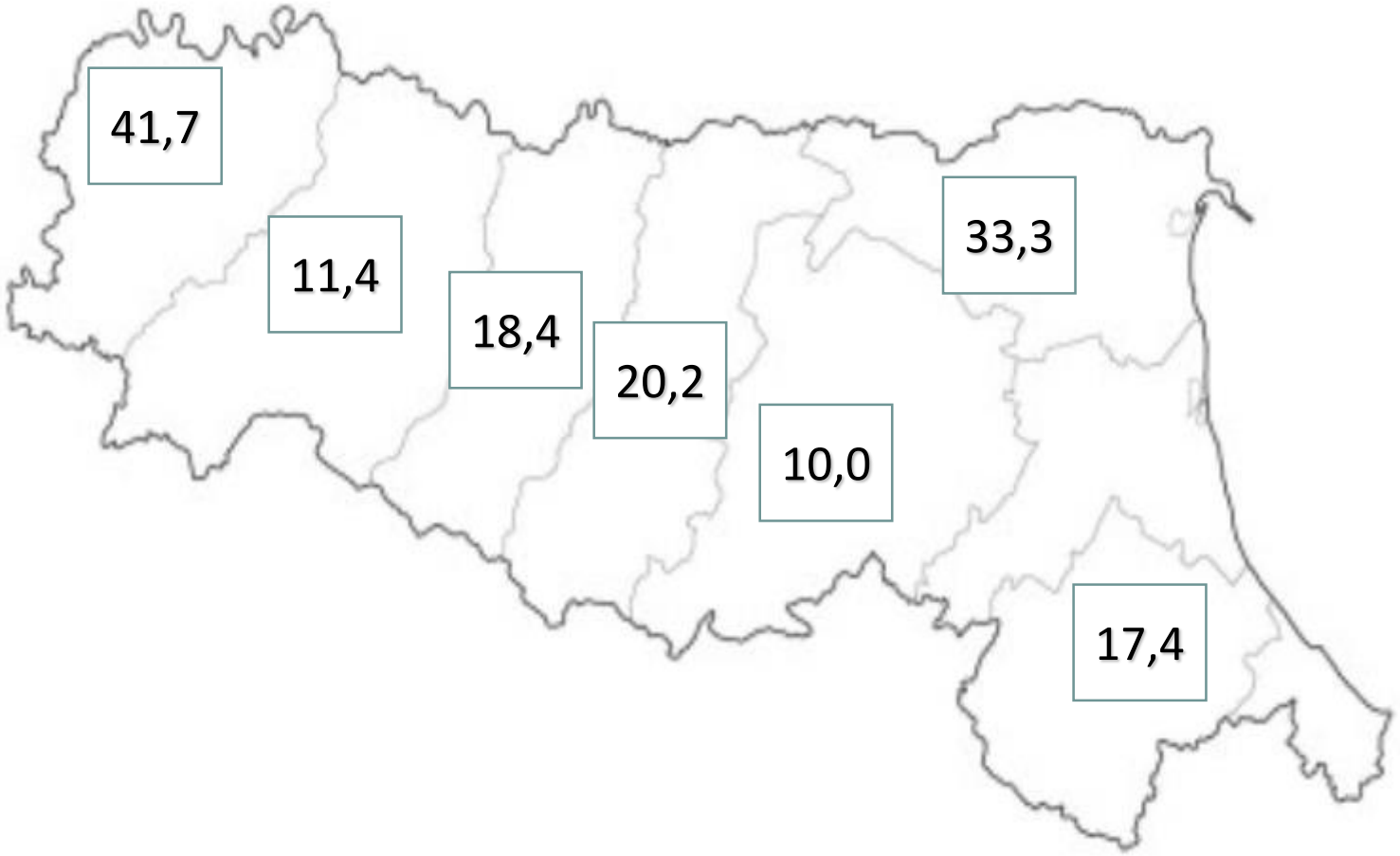
Enterococco Faecium resistenti alla vancomicina (VRE)

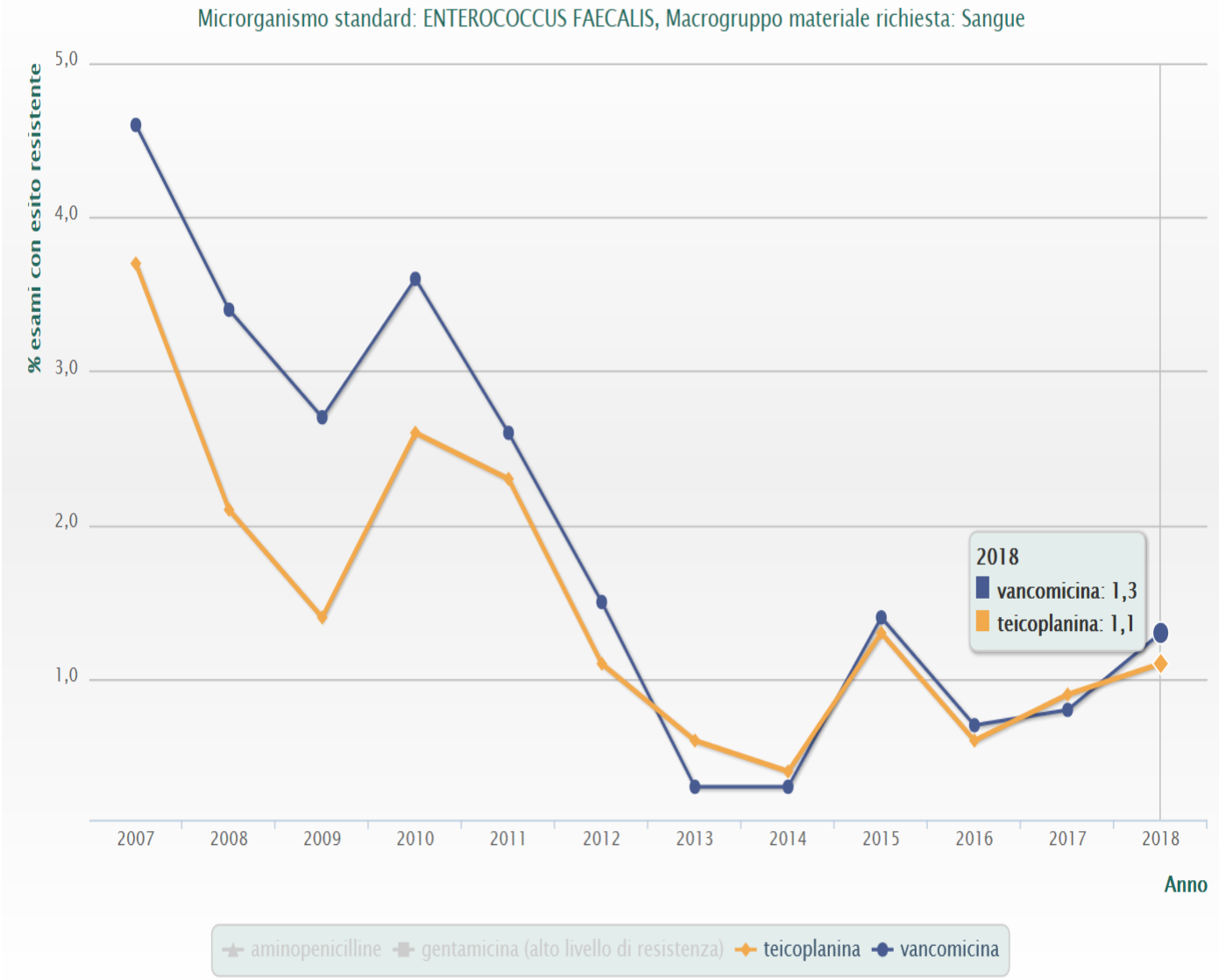
Figure 3.27. *Enterococcus faecium*. Percentage (%) of invasive isolates with resistance to vancomycin, by country, EU/EEA countries, 2017



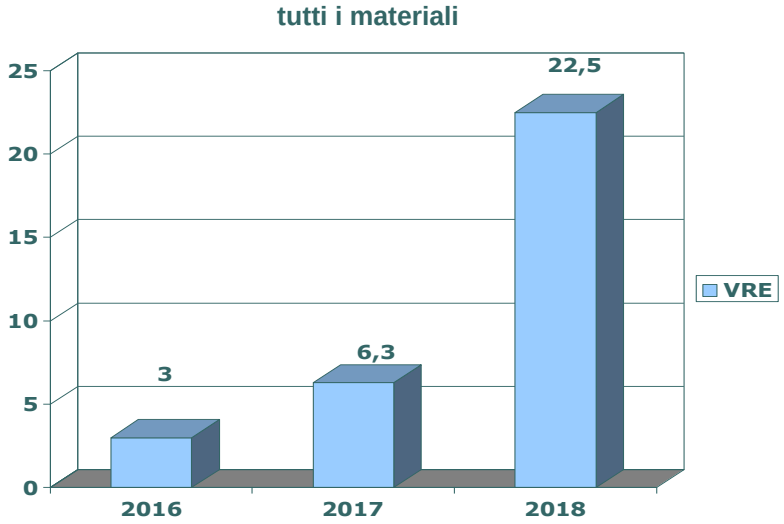

Microrganismo standard: ENTEROCOCCUS FAECIUM, Macrogruppo materiale richiesta: Sangue
% esami con esito resistente
25,0
20,0
15,0
10,0
5,0
0,0
2018
vancomicina: 20,4
teicoplanina: 19,3
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Anno
aminopenicilline
gentamicina (alto livello di resistenza)
teicoplanina
vancomicina

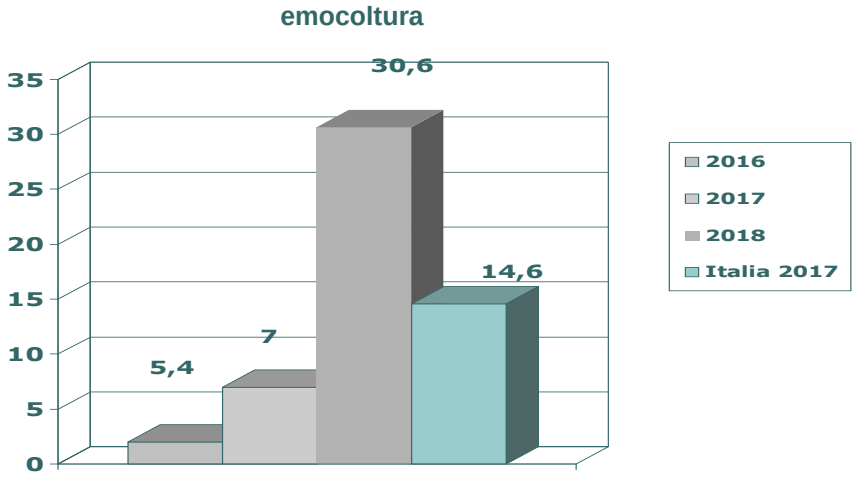
E. faecium % vancomicina R sangue 2018

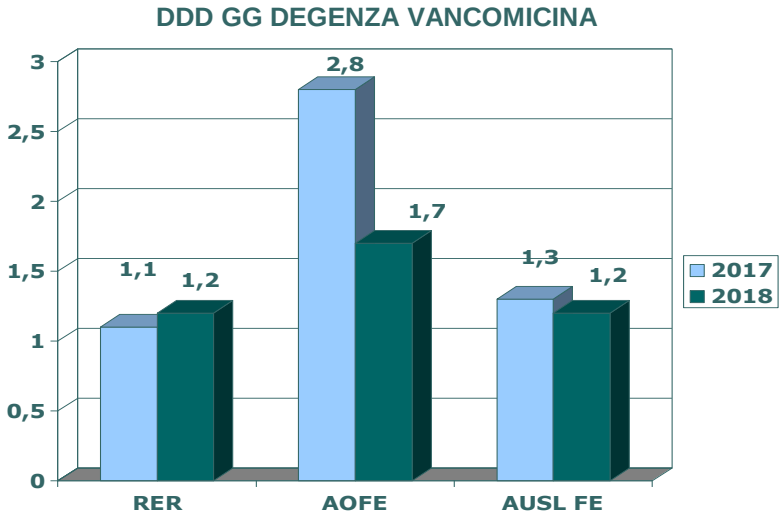



Microrganismo standard: ENTEROCOCCUS FAECALIS, Macrogruppo materiale richiesta: Sangue
% esami con esito resistente
5,0
4,0
3,0
2,0
1,0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Anno
2018
vancomicina: 1,3
teicoplanina: 1,1
aminopenicilline
gentamicina (alto livello di resistenza)
teicoplanina
vancomicina

Enterococco faecium % resistente alla vancomicina







Steps

- Antibioticoresistenza ;
- Patogeni emergenti : dove siamo e dove andiamo….
- **La realtà in Riabilitazione** ;
- Diagnostic stewardship ;
- Sinergismo microbiologo clinico > infettivologo

Online version at http://www.minervamedica.it

European Journal of Physical and Rehabilitation Medicine 2019 April;55(2):191-8
DOI: 10.23736/S1973-9087.18.05342-X

ORIGINAL ARTICLE

Identifying clinical complexity in patients affected by severe acquired brain injury in neurorehabilitation: a cross sectional survey

Federico SCARPONI [1] *, Mauro ZAMPOLINI [1], Chiara ZUCCHELLA [2], Stefano BARGELLESI [3], Chiara FASSIO [4], Francesca PISTOIA [5], Michelangelo BARTOLO [6], on behalf of C.I.R.C.LE (Comorbidità in Ingresso in Riabilitazione nei pazienti con grave CerebroLEsione acquisita) study group ‡

Policentrica Italiana
Infezioni rilevate all' ingresso
in neuroriabilitazione
Infezioni batteriche 32,59%
Infezioni fungine 10,58%

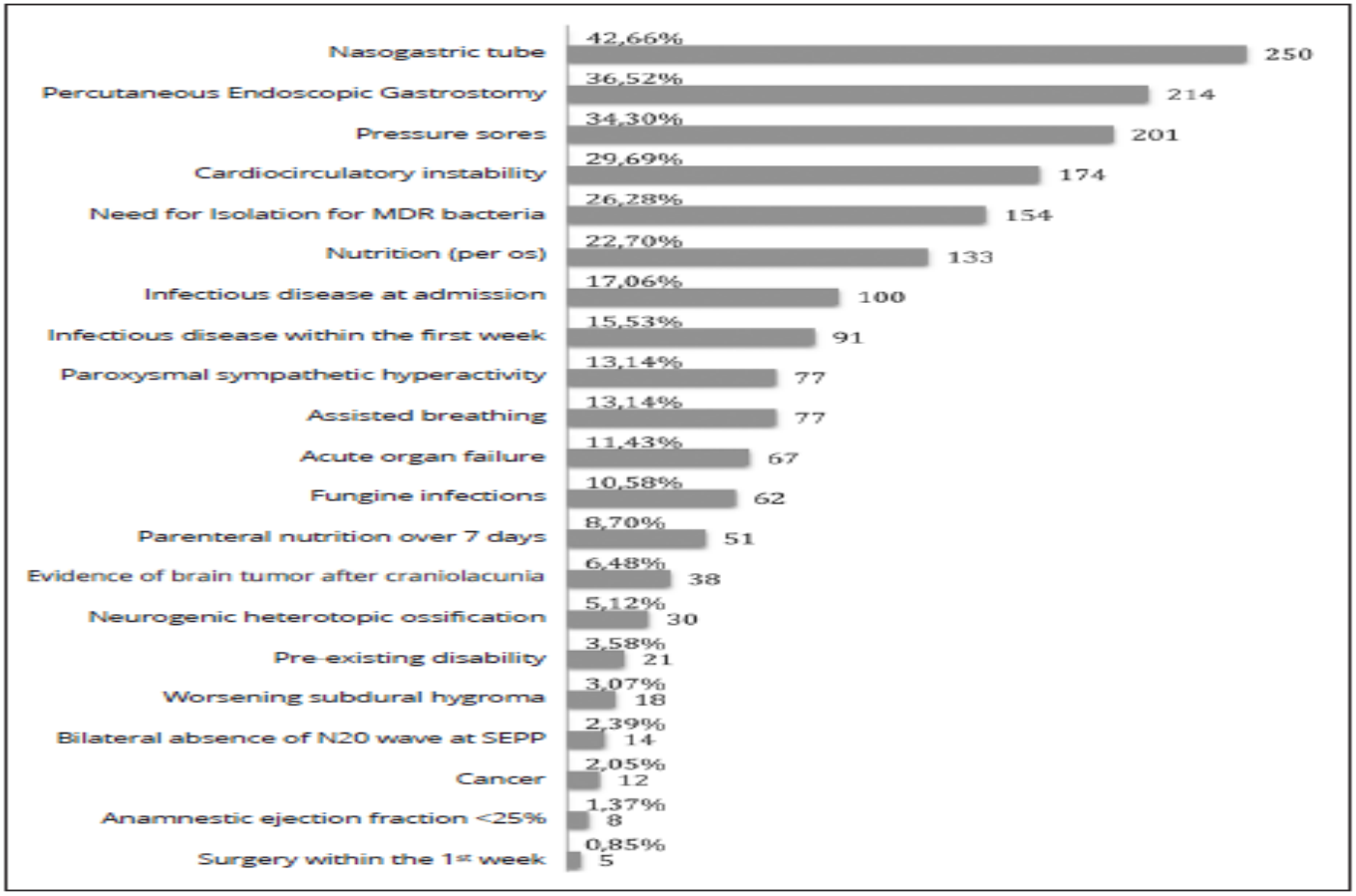
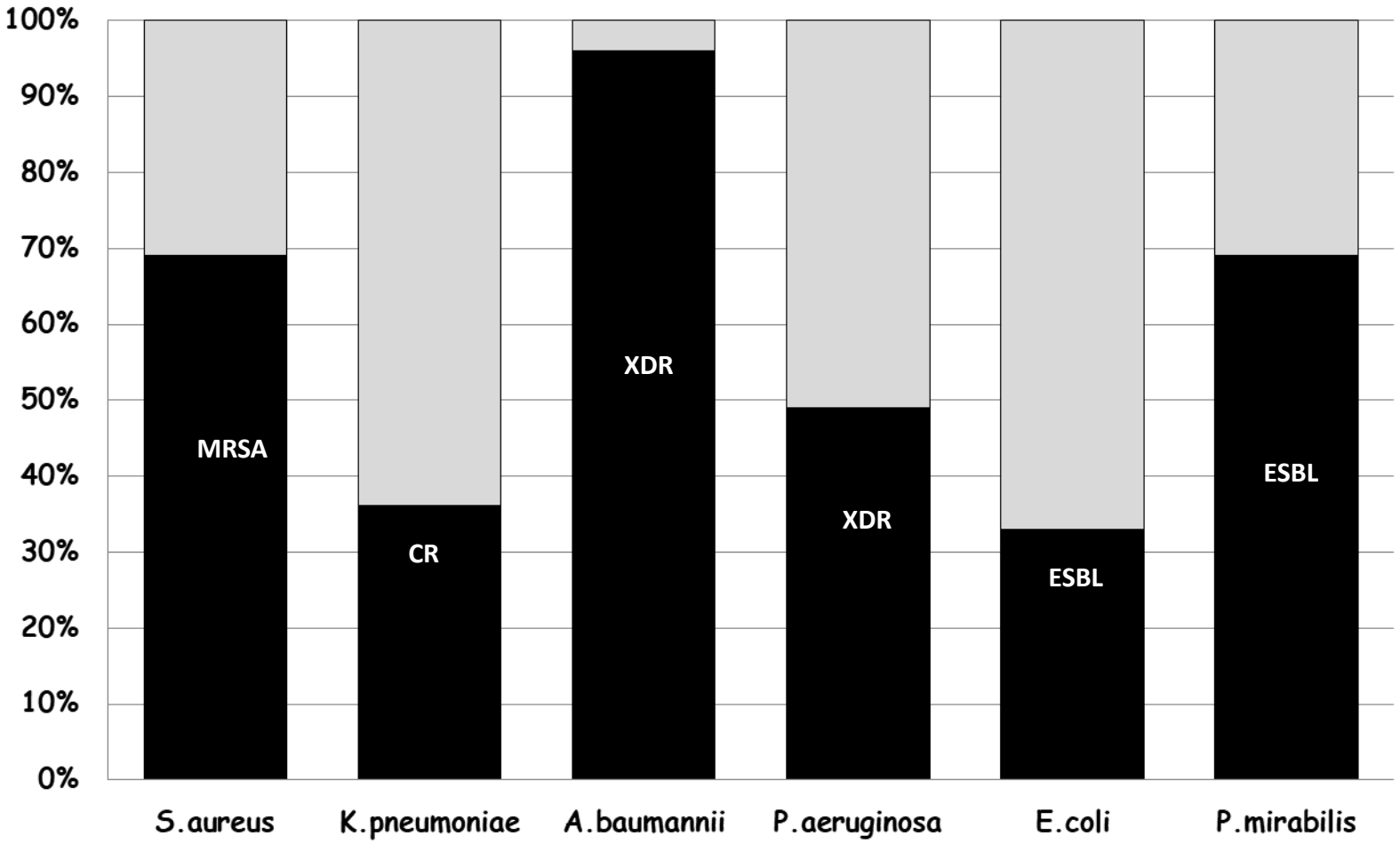


Figure 2.—Clinical conditions reported in the first week of rehabilitation stay.

Centro di Riabilitazione Montecatone 2011
prima dell' attivazione AMS

MULTIDRUGRESISTANT MICROORGANISMS IN CLINICAL ISOLATES



MOSAR

Mastering hospital Antimicrobial resistance and its spread into the community in Europe

MOSAR work package 5, examines resistance in rehabilitation centres.

7 wards in 4 rehabilitation centres:

- **Tel-Aviv, Israel (2 geriatric rehabilitation wards);**
- **Badalona, Spain, (1 spinal cord injury rehabilitation unit);**
- **Rome, Italy, (1 neurological and 1 orthopaedic rehabilitation unit);**
- **Berck, France, (2 neurological and orthopaedic rehabilitation wards).**

These wards have a total of 290 hospital beds:

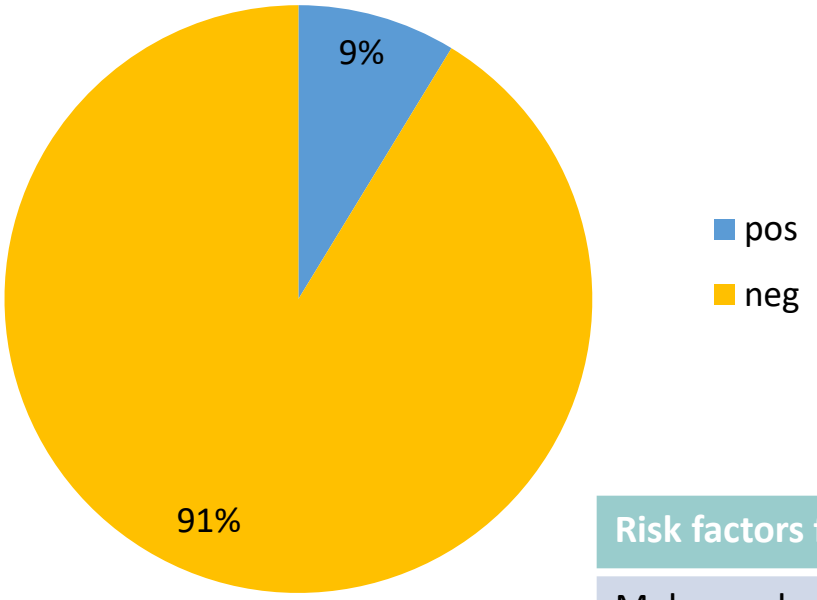
- **203 for neurological rehabilitation,**
- **34 for orthopaedic rehabilitation,**
- **53 beds dedicated to both.**

The study included adult patients newly admitted to the study wards between October 2008 and March 2010.

Carriage of methicillin-resistant *Staphylococcus aureus* on admission to European rehabilitation centres—a prospective study

E. Bilavsky et al. Clin Microbiol Infect 2012

MRSA carriers on admission

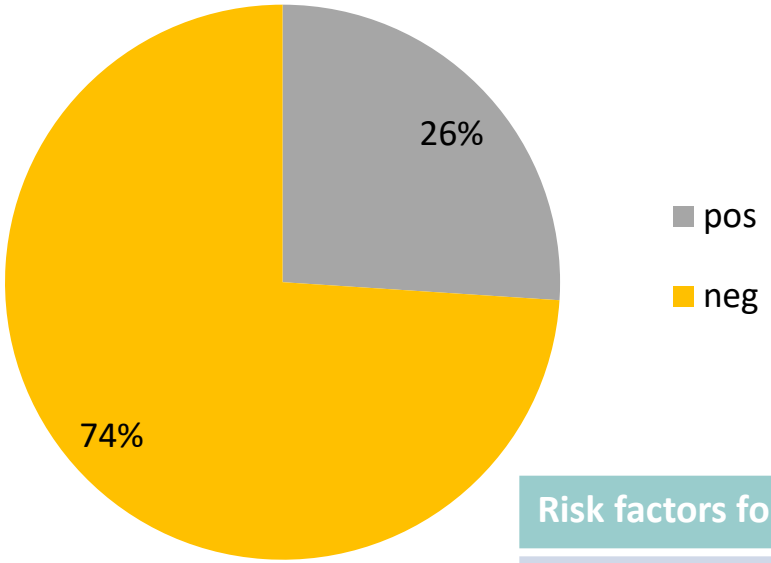


Risk factors for carriage	OR	95% CI	p
Male gender	2.2	1.4–3.6	0.001
History of MRSA positivity	6.8	3.8–12.3	<0.001
Peripheral vascular disease	2.5	1.2–5	0.013
Recent stay in another LTCF	2.1	1.3–3.5	0.004
>2 weeks acute-care hospital stay	1.9	1.2–3	0.004

Risk factors for colonization with extended-spectrum beta-lactamase-producing enterobacteriaceae on admission to rehabilitation centres

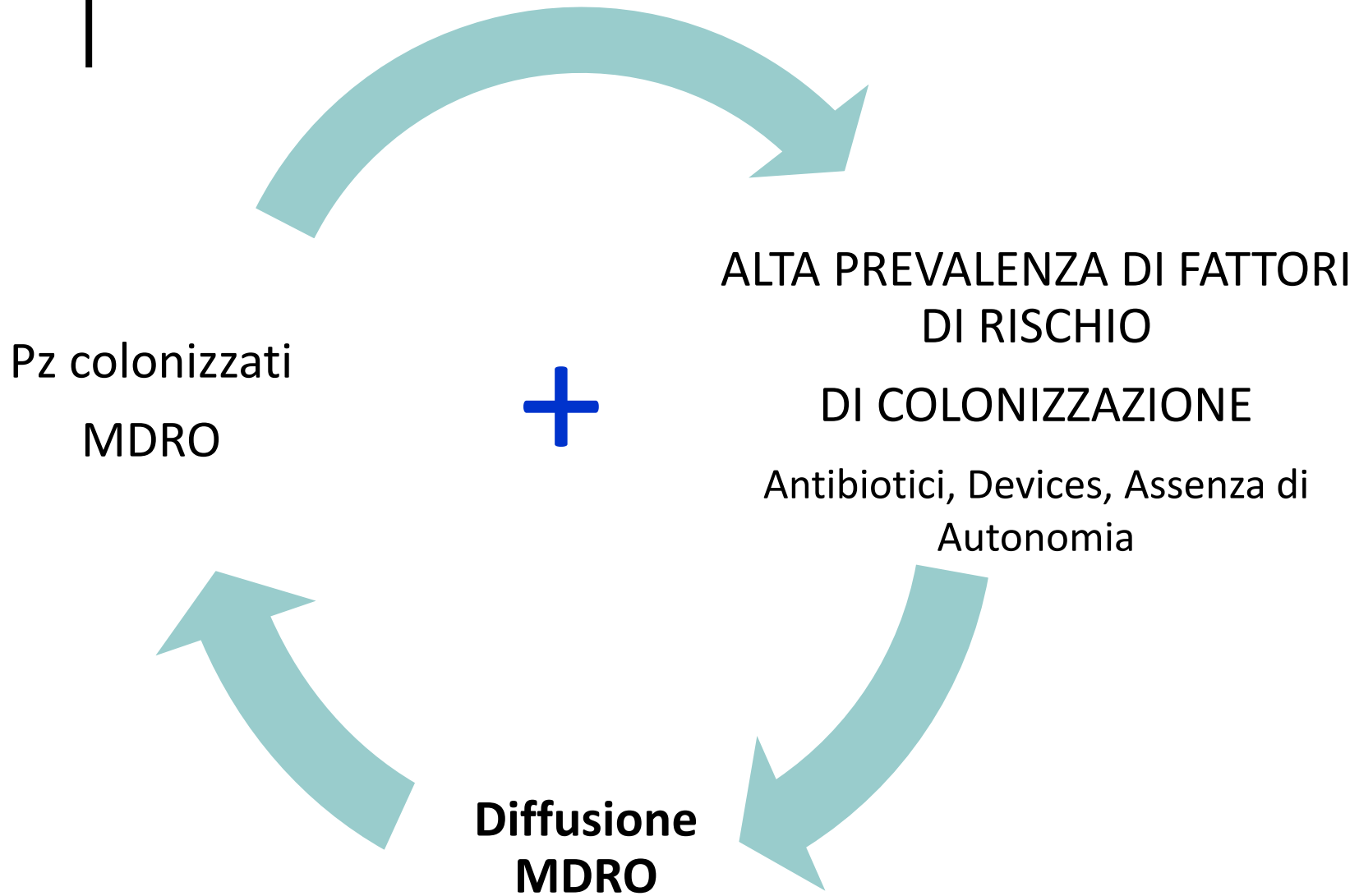
E. Bilavsky et al. Clin Microbiol Infect 2014

ESBL carriers on admission



Risk factors for carriage	OR	95% CI	p
>2 weeks acute-care hospital stay	1.34	1.12–1.6	0.002
History of colonization with ESBL	2.97	1.99-4.43	<0.001
Unconsciousness on admission	2.59	1.55-4-34	<0.001
Surgery in the past year	1.49	1.2-1.86	<0.001
Antibiotics in the past month	1.80	1-55-4.34	<0.001

MDRO NEI CENTRI DI RIABILITAZIONE



Original Article

Ann Rehabil Med 2015;39(5):686-695
pISSN: 2234-0645 • eISSN: 2234-0653
http://dx.doi.org/10.5535/arm.2015.39.5.686

Annals of Rehabilitation Medicine

Prevalence of and Risk Factors for Multidrug-Resistant Bacteria in Urine Cultures of Spinal Cord Injury Patients

Min-Soo Kang, MD, Bum-Suk Lee, MD, Hye-Jin Lee, MD, Seung-Won Hwang, MD, Zee-A Han, MD, PhD

Department of Physical Medicine and Rehabilitation, National Rehabilitation Center, Seoul, Korea

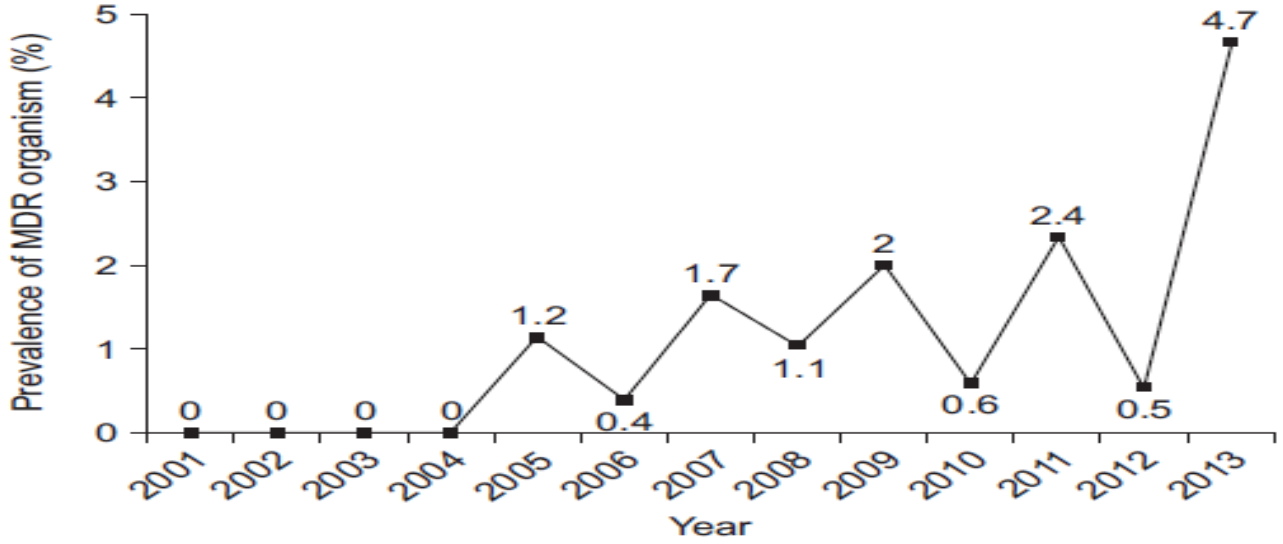


Fig. 1. Yearly prevalence of multidrug-resistant (MDR) organism isolation from 2001 to 2013.

Original Article

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arm
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Min-Soo Kang, MD, Bum-Suk Lee, MD, Hye-Jin Lee, MD, Seung-Won Hwang, MD, Zee-A Han, MD, PhD

Department of Physical Medicine and Rehabilitation, National Rehabilitation Center, Seoul, Korea

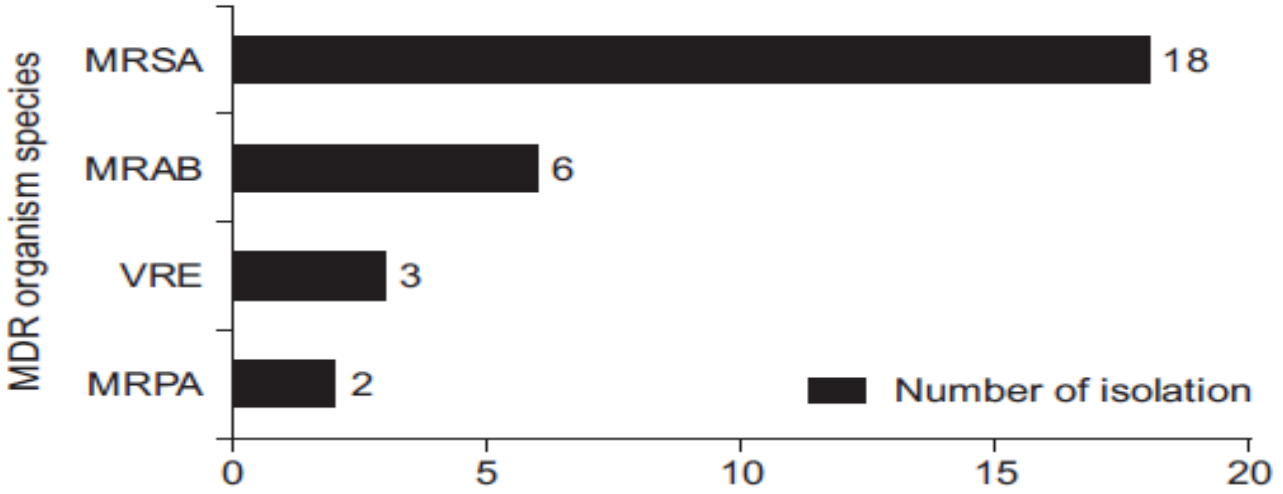

Fig. 2. Species of cultured multidrug-resistant (MDR) isolates. MRSA, methicillin-resistant *Staphylococcus aureus*; MRAB, multidrug-resistant *Acinetobacter baumannii*; VRE, vancomycin-resistant *Enterococci*; MRPA, multidrug-resistant *Pseudomonas aeruginosa*.

Original Article

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Annals of Rehabilitation Medicine

Prevalence of and Risk Factors for Multidrug-Resistant Bacteria in Urine Cultures of Spinal Cord Injury Patients

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Table 5. Risk factors associated with MDR organism isolation

Predictive factor	OR (95% CI)	p-value*
Sex (male)	2.881 (0.854-9.720)	0.088
Year at admission (from 2001 to 2013)	1.249 (1.103-1.414)	<0.001
Tetraplegia	2.120 (0.878-5.119)	0.095
Hospitalization history	4.330 (0.574-32.661)	0.155
Catheter-free	(Reference)	-
Intermittent catheterization	1.453 (0.467-4.521)	0.519
Suprapubic indwelling catheter	3.335 (0.763-14.571)	0.109
Urethral indwelling catheter	3.547 (1.246-10.097)	0.018

MDR, multidrug-resistant; OR, odds ratio; CI, confidence interval.
*Multivariate logistic regression analysis.

Outcome of neurological early rehabilitation patients carrying multi-drug resistant bacteria: results from a German multi-center study

J. D. Rollnik et al. BMC Neurology (2017) 17:53

- Prevalence for MDRO all'ingresso:
- MRSA 7.0%
- Enterobatteri ESBL + 12.6%
- VRE 2.8%

Journal of Hospital Infection 97 (2017) 234–240

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Infection control measures and prevalence of multidrug-resistant organisms in non-hospital care settings in northeastern Germany: results from a one-day point prevalence study

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Prevalence of different multidrug-resistant organisms in long-term care facilities, rehabilitation clinics and homecare services

Multidrug-resistant organisms	Prevalence in facilities[a] (95% CI)		
	Long-term care facilities	Rehabilitation clinics	Homecare services
Pathogens			
MRSA	1.43 (1.04–1.97)	0.53 (0.27–1.05)	2.09 (1.02–4.25)
VRE	0.08 (0.02–0.28)[b]	0.07 (0.01–0.38)	0.90 (0.31–2.60)
C. difficile	0.58 (0.35–0.96)	0.13 (0.04–0.48)	0.60 (0.16–2.15)
3MRGN			
Acinetobacter spp.	0.00 (0.00–0.15)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Enterobacter spp.	0.00 (0.00–0.15)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Escherichia coli	0.35 (0.18–0.66)	0.07 (0.01–0.38)	0.00 (0.00–1.13)
Klebsiella pneumoniae	0.04 (0.01–0.22)	0.07 (0.01–0.38)	0.00 (0.00–1.13)
Pseudomonas aeruginosa	0.08 (0.02–0.28)	0.00 (0.00–0.26)	1.19 (0.47–3.03)[c]
Other	0.23 (0.11–0.51)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Total	0.70 (0.44–1.10)	0.13 (0.04–0.48)	1.19 (0.47–3.03)
4MRGN			
Acinetobacter spp.	0.00 (0.00–0.15)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Enterobacter spp.	0.00 (0.00–0.15)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Escherichia coli	0.00 (0.00–0.15)	0.00 (0.00–0.26)	0.30 (0.05–1.67)
Klebsiella pneumoniae	0.04 (0.01–0.22)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Pseudomonas aeruginosa	0.04 (0.01–0.22)	0.00 (0.00–0.26)	0.30 (0.05–1.67)
Other	0.12 (0.04–0.34)	0.00 (0.00–0.26)	0.00 (0.00–1.13)
Total	0.19 (0.08–0.45)	0.00 (0.00–0.00)	0.60 (0.16–2.15)

CI, confidence interval; MRSA, meticillin-resistant *Staphylococcus aureus*; VRE, vancomycin-resistant enterococci; 3MRGN/4MRGN, three/four multidrug-resistant Gram-negative.

[a] Weighted by number of patients.

[b] $P > 0.08$.

[c] $P > 0.22$.

Prevalenza d'infezioni (comprese respiratorie) in riabilitazione: **9,3%** Studio Regionale 2016

Studio di prevalenza su infezioni correlate all'assistenza e uso di antibiotici negli ospedali per acuti
Rapporto regionale 2016

Tabella 4. Prevalenza di pazienti con infezione per area di ricovero

Categorie	N. pazienti	Pazienti con						
		ICA n (%)	ICA respiratorie n (%)	ICA urinarie n (%)	batteriemia n (%)	infezioni sito chirurgico n (%)	ICA gastro-intestinali n (%)	altre ICA n (%)
Totale	*6.235*	*496 (8,0%)*	*138 (2,2%)*	*99 (1,6%)*	*83 (1,3%)*	*83 (1,3%)*	*46 (0,7%)*	*86 (1,4%)*
Specialità medica (MED)	2.935	232 (7,9%)	62 (2,1%)	50 (1,7%)	50 (1,7%)	11 (0,4%)	24 (0,8%)	55 (1,9%)
Specialità chirurgica (SUR)	1.652	118 (7,1%)	22 (1,3%)	9 (0,5%)	11 (0,7%)	59 (3,6%)	9 (0,5%)	14 (0,8%)
Lungodegenza (LTC)/Riabilitazione (RHB)	484	45 (9,3%)	12 (2,5%)	21 (4,3%)	3 (0,6%)	4 (0,8%)	5 (1,0%)	3 (0,6%)
Ginecologia/Ostetricia (GO)	334	3 (1,0%)	.	.	.	1 (0,3%)	.	2 (0,6%)
Geriatria (GER)	312	29 (9,3%)	7 (2,2%)	13 (4,2%)	5 (1,6%)	2 (0,6%)	5 (1,6%)	1 (0,3%)
Terapia intensiva (ICU)	256	61 (23,8%)	33 (12,9%)	1 (0,4%)	14 (5,5%)	6 (2,3%)	3 (1,2%)	10 (3,9%)
Neonatologia (NEO)/Pediatria (PED)	178	1 (0,6%)	.	.	.	.	.	1 (0,6%)
Altre (OTH)	43	6 (14,0%)	1 (2,3%)	5 (11,5%)	.	.	.	.
Psichiatria (PSY)	41	1 (2,4%)	1 (2,4%)	.	.	.	.	.

NB Il totale dei pazienti con almeno un'infezione non equivale alla somma delle singole infezioni poiché un paziente può avere più di una ICA.

J. Phys. Ther. Sci. 28: 382–391, 2016

The Journal of Physical Therapy Science

Original Article

Medical complications experienced by first-time ischemic stroke patients during inpatient, tertiary level stroke rehabilitation

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[3)] *Physical Medicine and Rehabilitation Clinic, Bayındır Hospital, Turkey*

Table 3. Number of patients with medical complications during rehabilitation

Urinary tract infection, n (%)	39 (48.1)
Shoulder pain, n (%)	30 (37.0)
Insomnia, n (%)	30 (37.0)
Depression, n (%)	26 (32.1)
Musculoskeletal pain other than shoulder pain, n (%)	26 (32.1)
Newly occurring arrhythmia, n (%)	17 (21)
Angina, n (%)	13 (16.0)
Pneumonia, n (%)	11 (13.6)
Decubitis, n (%)	9 (11.1)
Anxiety disorder, n (%)	9 (11.1)
Gastrointestinal complications (peptic ulcer disease, diarrhea, constipation, abdominal pain), n (%)	6 (7.4)
Delirium, n (%)	6 (7.4)
Deep vein thrombosis, n (%)	3 (3.7)
New stroke, n (%)	2 (2.5)
Seizure, n (%)	1 (1.2)
Hematuria, n (%)	1 (1.2)
Pulmonary embolism, n (%)	0 (0)

Aggressive *versus* conservative antibiotic use to prevent and treat ventilator-associated pneumonia in patients with severe traumatic brain injury: comparison of two case series

Arturo CHIEREGATO [1], Paolo MALACARNE [2 *], Francesco COCCIOLO [3], Maurizio RAVALDINI [3], Emanuele RUSSO [3], Bruno VIAGGI [4], Michele GIARDINO [5], Carlotta ROSSI [5], Bruno SIMINI [6], Guido BERTOLINI [5]

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TABLE III.—*Patients who developed VAP: microorganisms isolated.*

	Pisa		Cesena		P value		Italian ICUs (194 general, 14 neurosurgical)	
VAP	74/165 (44.8%)		103/262 (39.3%)				1060/6,245 (17.0%)	
VAP with microbiological diagnosis (N./%)	68 (91.9%)		101 (98.1%)				881 (83.1%)	
	Isolated	MDR	Isolated	MDR	Isolated	MDR	Isolated	MDR
	N. (%*)	N. (%**)	N. (%*)	N. (%**)			N. (%*)	N. (%**)
Gram +	23 (33.8%)	10 (43.5%)	46 (45.5%)	2 (4.4%)	0.1285	0.0001	361 (41.0%)	116 (32.1%)
Staphylococcus aureus | MRSA	21(30.9%)	5 (23.8%)	44 (43.6%)	2 (4.6%)	0.0966	0.0312	315 (35.8%)	82 (26.0%)
Streptococcus pneumoniae | penicillin resistant	1 (1.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.4024	-	13 (1.5%)	2 (15.4%)
Enterococcus faecalis or *faecium* | vancomycin resistant	1 (1.5%)	0 (0.0%)	4 (4.0%)	0 (0.0%)	0.6492	-	17 (1.9%)	0 (0.0%)
Gram -	49 (72.1%)	22 (44.9%)	58 (57.4%)	8 (13.8%)	0.0529	0.0004	585 (66.4%)	204 (34.9%)
Klebsiella | ESBL	9 (13.2%)	6 (66.7%)	8 (7.9%)	4 (50.0%)	0.2600	0.6372	113 (12.8%)	30 (26.6%)
Enterobacter | ESBL	7 (10.3%)	2 (28.6%)	1 (1.0%)	0 (0.0%)	0.0075	1.0000	67 (7.6%)	13 (19.4%)
Serratia | ESBL	4 (5.9%)	0 (0.0%)	2 (2.0%)	1 (50.0%)	0.2212	0.3333	41 (4.7%)	5 (12.2%)
Pseudomonas aeruginosa	7 (10.3%)		35 (34.7%)		0.0003		191 (21.7%)	
multi resistant, non carbapenemase producer		2 (28.6%)		0 (0.0%)		0.0244		32 (16.8%)
multi resistant carbapenemase productor		0 (0.0%)		0 (0.0%)		-		26 (13.6%)
Escherichia coli | ESBL	10 (14.7%)	1 (10.0%)	3 (3.0%)	1 (33.3%)	0.0050	0.4231	90 (10.2%)	16 (17.8%)
Proteus | ESBL	4 (5.9%)	1 (25.0%)	1 (1.0%)	1 (100.0%)	0.1588	0.4000	23 (2.6%)	8 (34.8%)
Acinetobacter | carbapenem resistant	16 (23.5%)	9 (56.3%)	5 (5.0%)	1 (20.0%)	0.0003	0.3108	98 (11.1%)	53 (54.1%)

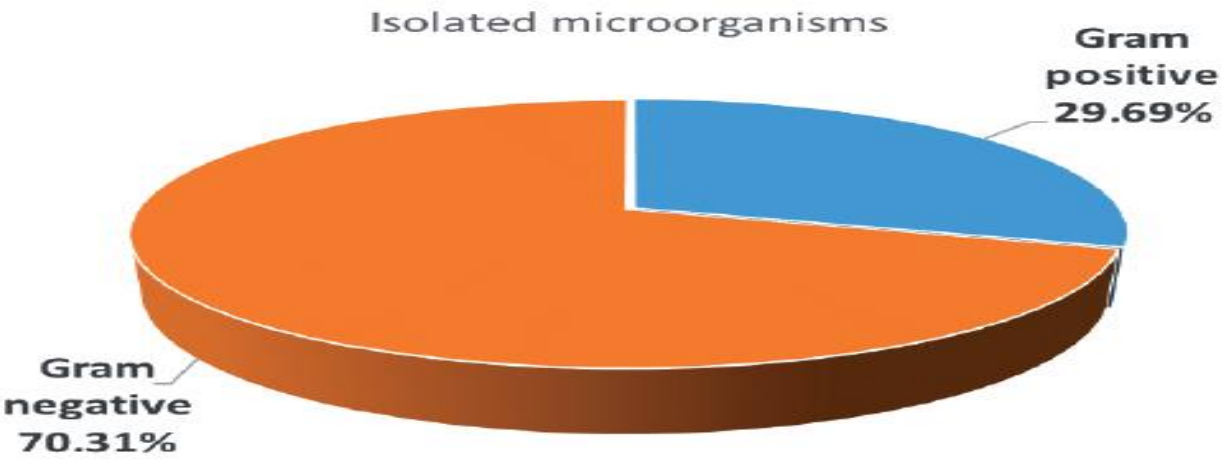

Figure 1. Isolated microorganisms.

Monaldi Archives for Chest Disease 2018; volume 88:888

pime EDITRICE

Monitoring of hospital acquired pneumonia in patients with severe brain injury on first access to intensive neurological rehabilitation: First year of observation

Gianfranco Beghi[1], Antonio De Tanti[2], Paolo Serafini[3], Chiara Bertolino[2], Antonietta Celentano[3], Graziella Taormina[2]

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[2] Cardinal Ferrari Centre, Fontanellato (PR)
[3] Santo Stefano Rehabilitation Institute, Porto Potenza Picena (MC), Italy

Table 2. Microorganisms isolated during hospitalization prior to rehabilitation.

	Pneumonia group	Control group	Total
Klebsiella pneumoniae	3	13	16
Pseudomonas aeruginosa	0	12	12
Methicillin-Resistant *Staphylococcus aureus* (MRSA)	1	8	9
Escherichia coli	1	5	6
Acinetobacter baumannii	1	4	5
Staphylococcus spp Methicillin-Resistant Coagulase Negative (MRCoN)	0	4	4
Enterococcus faecalis	0	3	3
Serratia marcescens	0	2	2
Streptococcus pneumoniae	2	0	2
Citrobacter spp.	0	1	1
Enterobacter aerogenes	1	0	1
Enterococcus faecium	0	1	1
Haemophilus influenzae	1	0	1
Neisseria meningitidis	1	0	1
Proteus mirabilis	0	1	1

Steps

- Antibioticoresistenza ;
- Patogeni emergenti : dove siamo e dove andiamo….
- La realtà in Riabilitazione ;
- **Diagnostic stewardship** ;
- Sinergismo microbiologo clinico > infettivologo

Fast-laboratory: si abbreviano i tempi

Terapia empirica/ragionata > Mirata

Fast-laboratory ovvero alta tecnologia : MALDI-TOF

Diagnostica microbiologica rapida con definizione eziologica e profilo di R

INFEZIONE	DISTRETTO/ TESSUTO	CAMPIONE	PANNELLO *FILMARRAY*® (*)	INFORMAZIONE OTTENIBILE
Sepsi	Sangue	Emocoltura positiva	BCID (Blood Culture ID)	Identificazione di specie per: - 19 batteri Gram-negativi - 5 batteri Gram-positivi - 5 specie di *Candida* Meccanismi di resistenza identificati: - *KPC* - *mecA* - *vanA/B*
Respiratoria	Alte vie respiratorie	Tampone naso-faringeo	RP (Respiratory)	Identificazione di specie per: - 17 virus - 3 batteri
Gastro intestinale	Apparato digerente	Feci	GI (Gastrointestinal)	Identificazione di specie per: - 5 virus - 13 batteri - 4 parassiti
Meningite	Sistema Nervoso Centrale	CSF	ME (Meningitis / Encephalitis)	Identificazione di specie per: - 6 batteri - 8 Virus - 2 Lieviti

PNEUMONIA PANEL*PLUS* - 34 TARGETS IN 75 MIN.

BIOMÉRIEUX

15 Common Bacteria with bins results

Bacteria

Semi - Quantitative

Acinetobacter calcoaceticus-baumannii complex
Serratia marcescens
Proteus spp.
Klebsiella pneumoniae group
Enterobacter aerogenes
Enterobacter cloacae
Escherichia coli
Haemophilus influenzae
Moraxella catarrhalis
Pseudomonas aeruginosa
Staphylococcus aureus
Streptococcus pneumoniae
Klebsiella oxytoca
Streptococcus pyogenes
Streptococcus agalactiae

Atypical Bacteria

Qualitative

Legionella pneumophila
Mycoplasma pneumoniae
Chlamydia pneumoniae

3 Qualitative Bacteria that cause Atypical Pneumonia

Viruses

Qualitative

Influenza A
Influenza B
Adenovirus
Coronavirus
Parainfluenza virus
Respiratory Syncytial virus
Human Rhinovirus/Enterovirus
Human Metapneumovirus
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

9 Viruses

Antibiotic Resistance Genes

Methicilin Resistance

mecA/*mecC* and MREJ

ESBL

CTX-M

Carbapenemases

KPC
NDM
Oxa48-like
VIM
IMP

7 antimicrobial resistance markers

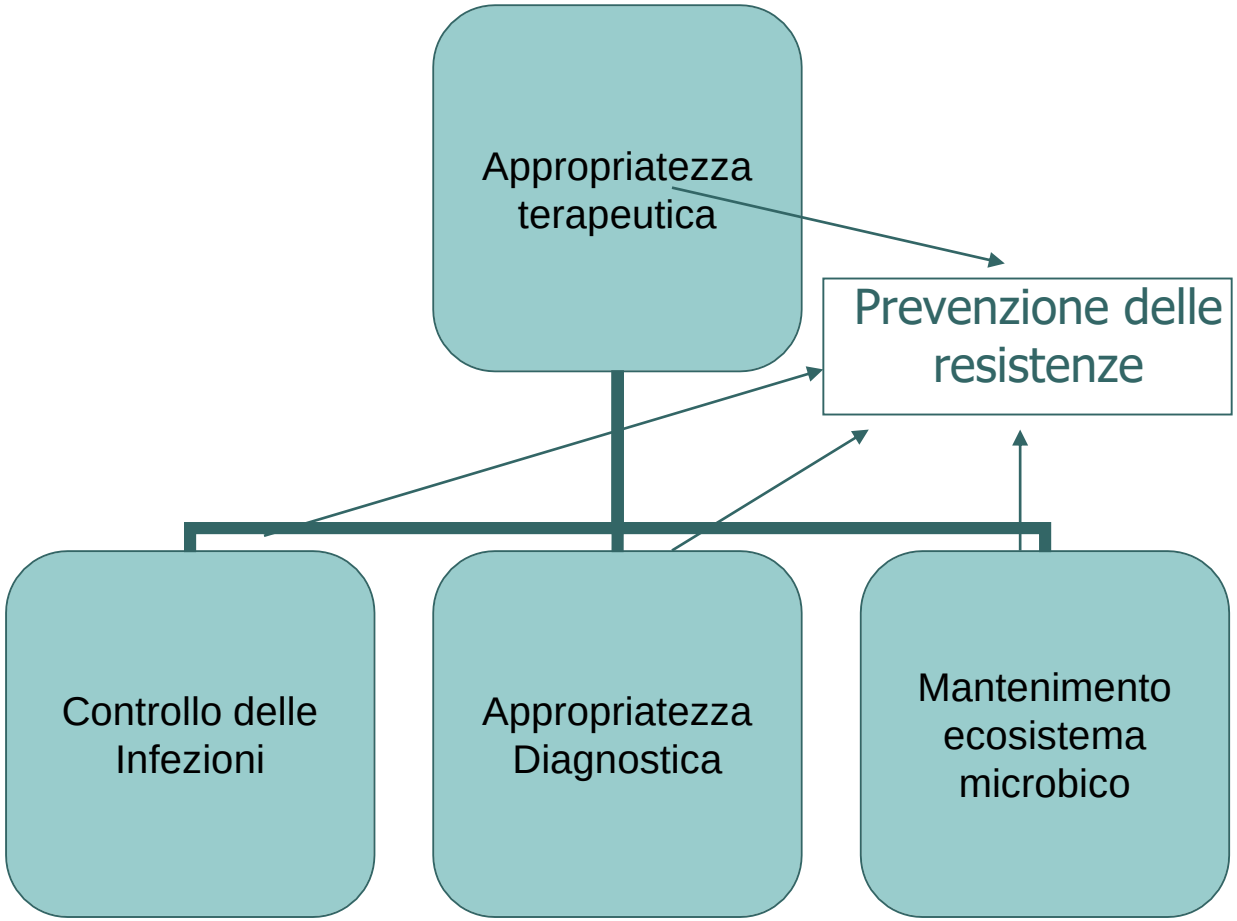
Colture in tempo reale


198.18.0.1/WaspLab/ABPM/step/292005
Sample Barcode : 35693401 Age :
Name :
Surname :
Source :
Tasks Done
To-Do Tasks
1 - Colonia blu(BLU)
(space bar) Picked
(u) Undo Picking
(X) Picking not possible
Frontal
Info
Plate barcode : 3569340101
1 - Colonia blu(BLU)
1) GRAM (MALDI)
Colonia blu(BLU)
GRAM (MALDI)
Isolate : 1
CHR-KPC (Kima)
Comment for media:3569340101
Home
Dashboard
Picking
Log-Out

Steps

- Antibioticoresistenza ;
- Patogeni emergenti : dove siamo e dove andiamo….
- La realtà in Riabilitazione ;
- Diagnostic stewardship ;
- **Sinergismo microbiologo clinico > infettivologo**

Ruolo dell' Infettivologo



Consulenze infettivologiche Ospedale Cona