IPC nella gestione degli outbreak da germi MDR

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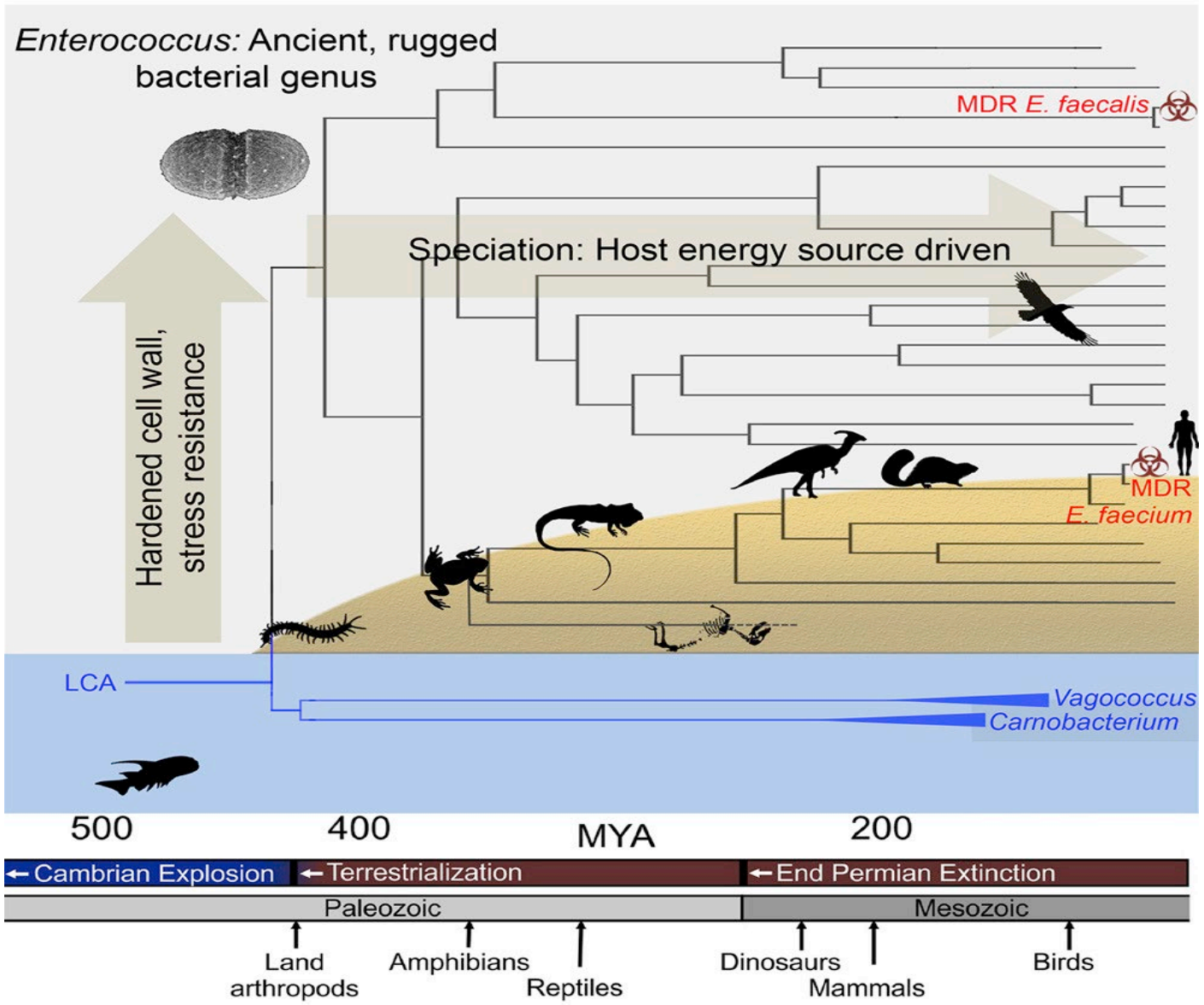
Università di Pisa

Overview della presentazione

- Storia ed epidemiologia dei batteri MDR
- Importanza dell'IPC nella gestione delle epidemie da batteri MDR
- Componenti di un efficace programma IPC
- Strategie per la gestione dell'epidemie da batteri MDR
- Sfide da affrontare



Cell 2017 169849-861.e13DOI: (10.1016/j.cell.2017.04.027)

ARTICLES | VOLUME 7, ISSUE 11, E897-E913, NOVEMBER 2022

The burden of bacterial antimicrobial resistance in the WHO European region in 2019: a cross-country systematic analysis

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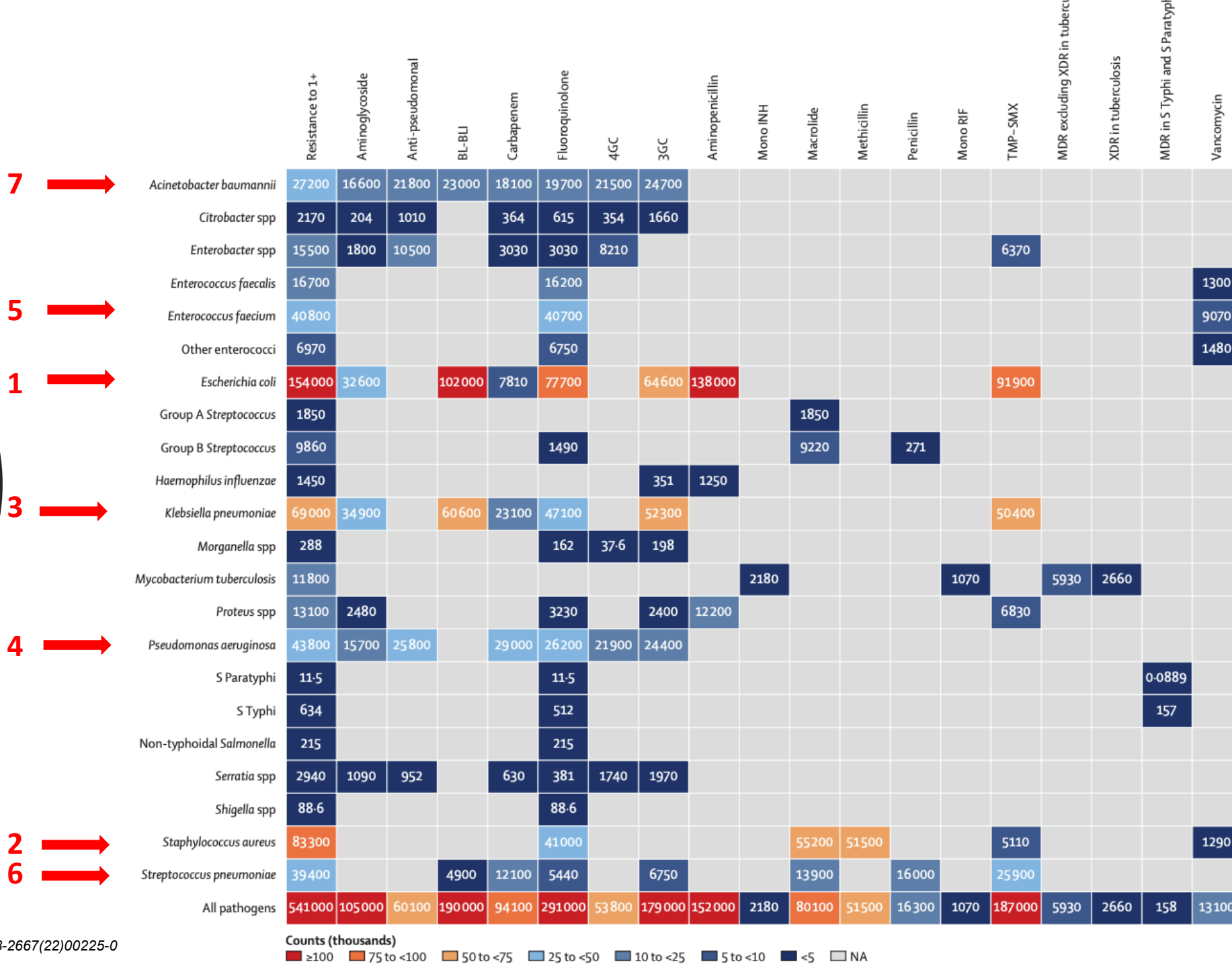
Numero di decessi associati MDR nella regione EU dell'OMS, 2019



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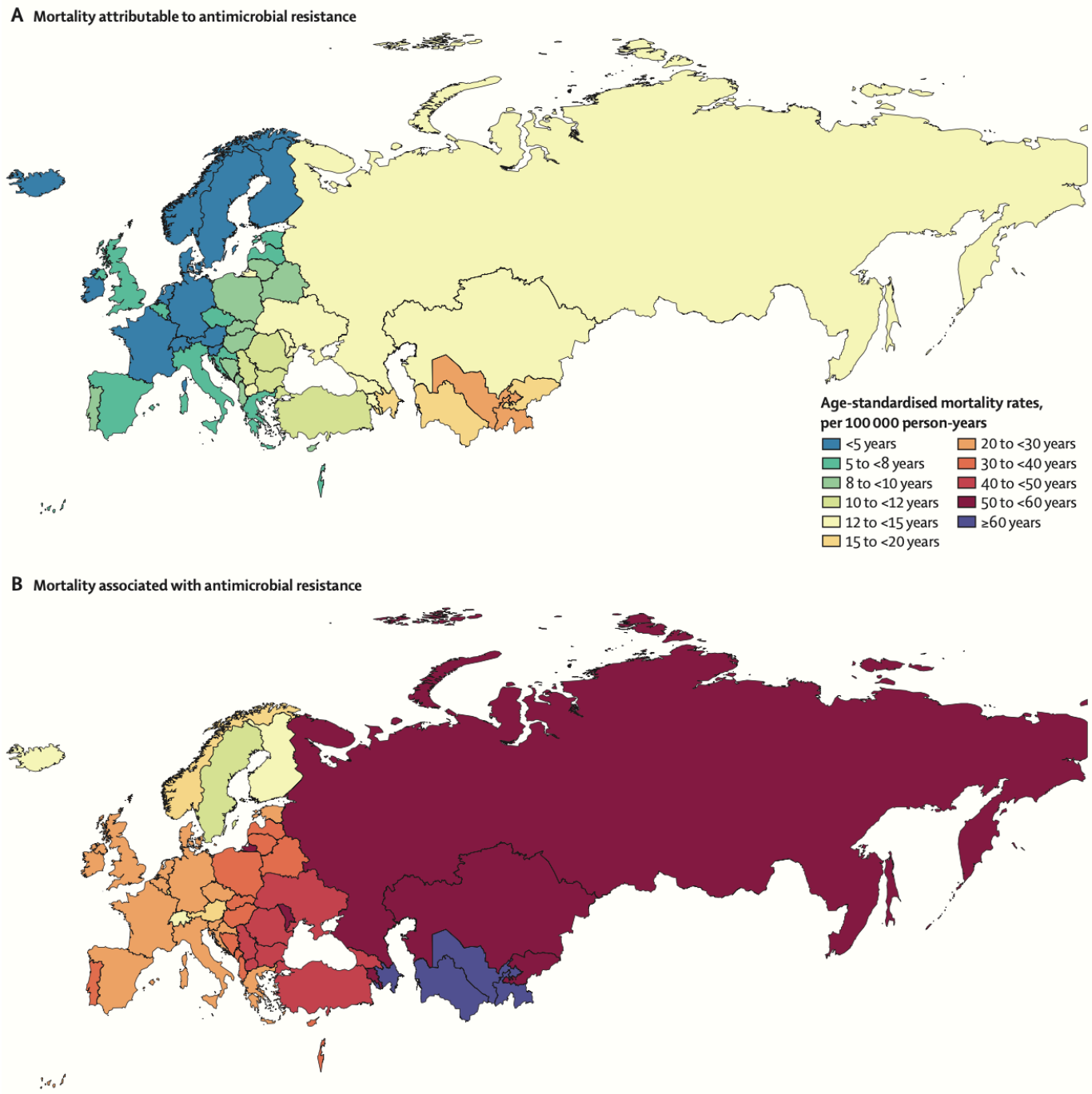
Decessi standardizzati per età, 2019



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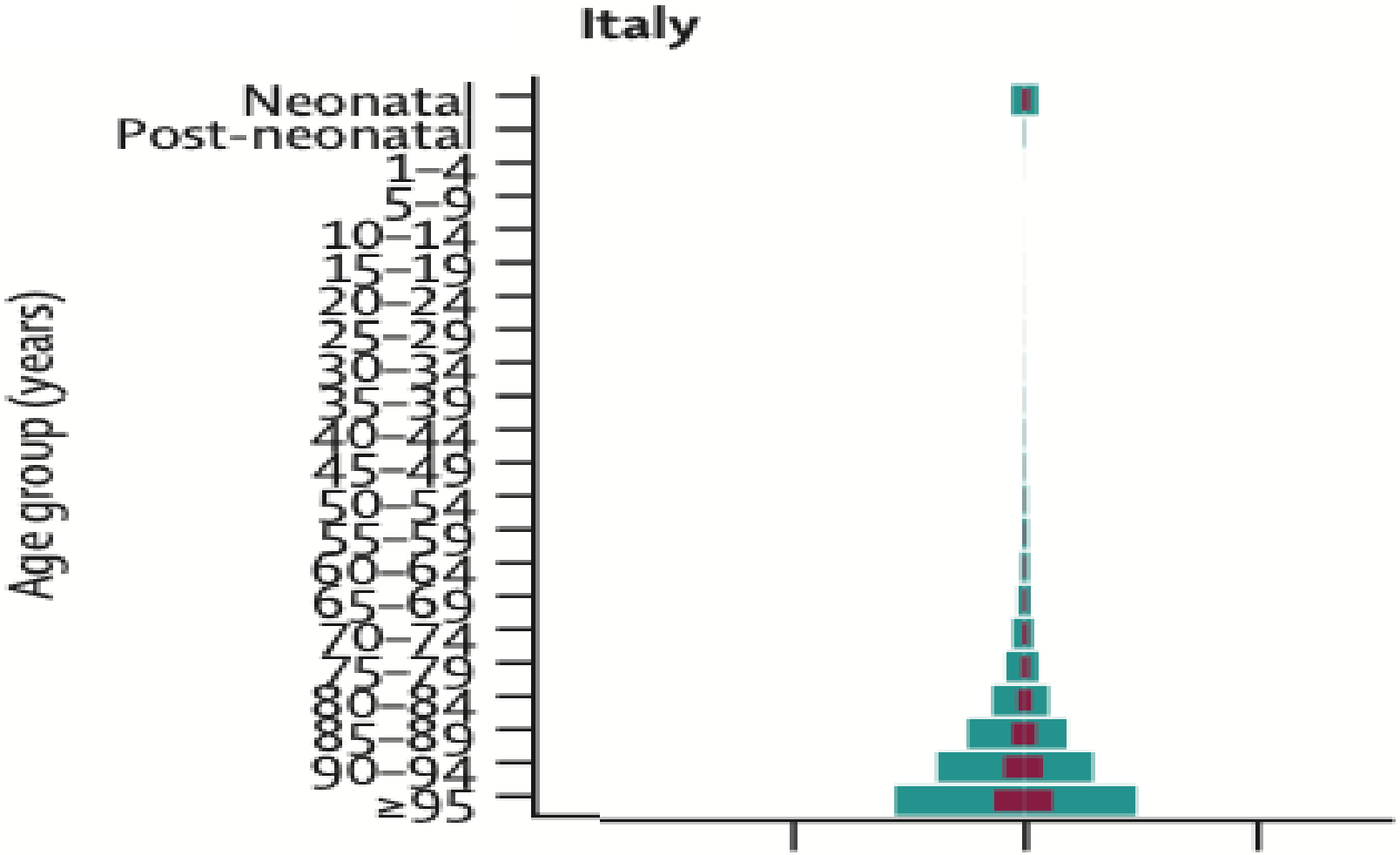
Nonostante il carico di MDR sia maggiore nei pazienti ospedalizzati adulti, gli MDR richiedono sforzi di controllo simili anche nelle popolazioni pediatriche



https://doi.org/10.1016/ S2468-2667(22)00225-0

PLOS ONE

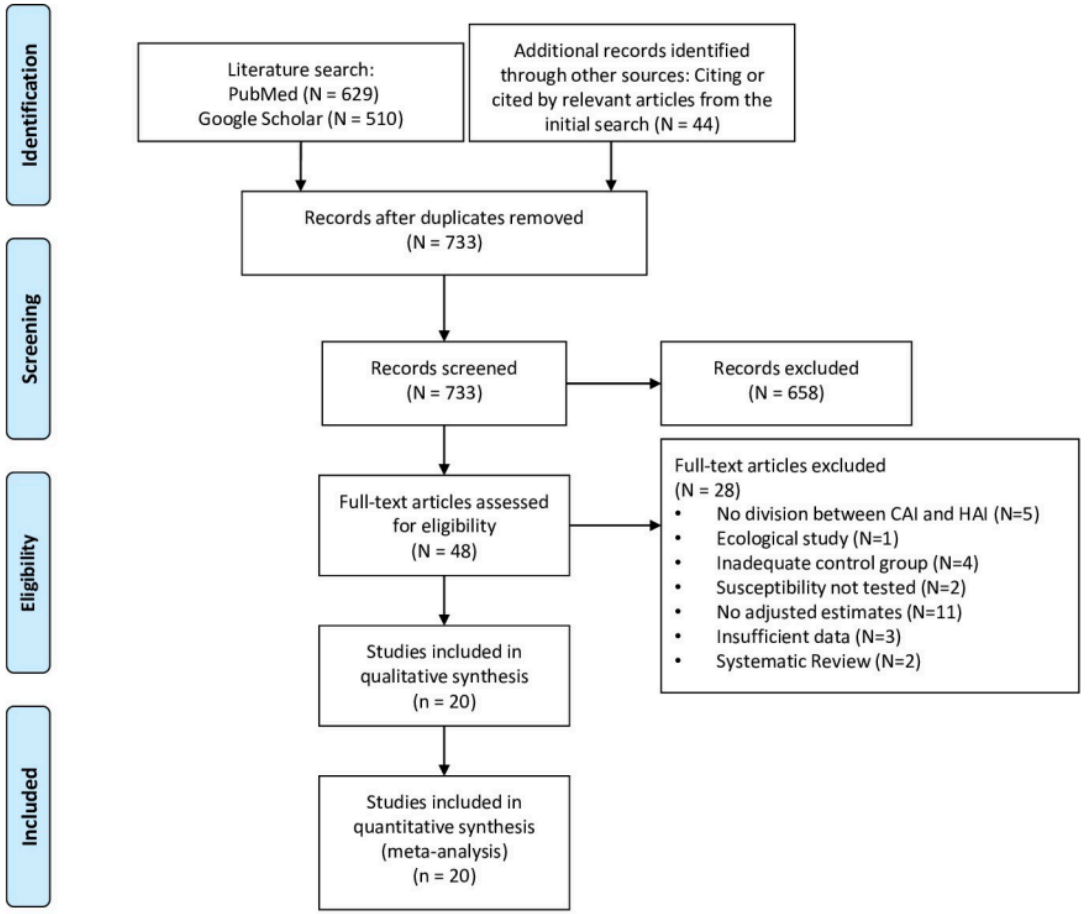
RESEARCH ARTICLE

Impact of multi-drug resistant bacteria on economic and clinical outcomes of healthcare-associated infections in adults: Systematic review and meta-analysis

Miquel Serra-Burriel[1]*, Matthew Keys[1], Carlos Campillo-Artero[1,2], Antonella Agodi[3], Martina Barchitta[3], Achilleas Gikas[4,5], Carlos Palos[6], Guillem López-Casasnovas[1]

1 Center for Research in Health and Economics, Pompeu Fabra University, Barcelona, Spain, **2** Balearic Islands Health Service, Palma de Mallorca, Balearic Islands, Spain, **3** Department of Medical and Surgical Sciences and Advanced Technologies "GF Ingrassia", University of Catania, Catania, Italy, **4** Internal Medicine Department, Infectious Diseases Unit, University Hospital of Heraklion, Crete, Greece, **5** School of Medicine, University of Crete, Heraklion, Greece, **6** Hospital Beatriz Ângelo, Loures, Lisbon, Portugal

Compared to susceptible infections, MDR HAI were associated with increased cost prolonged length of stay, and excess in-hospital mortality.



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097.

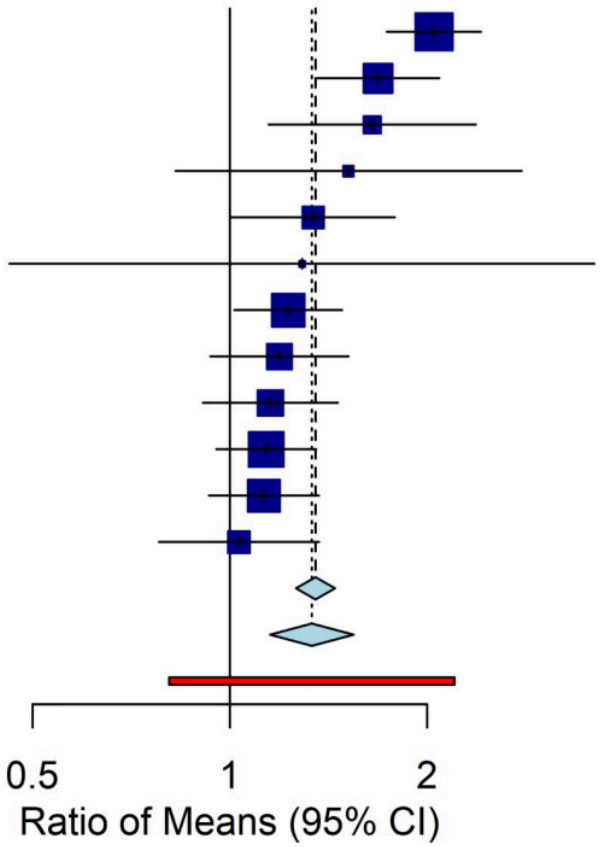
Fig 1. PRISMA flow diagram.

https://doi.org/10.1371/journal.pone.0227139.g001

Costo in eccesso attribuibile alle infezioni da germi MDR

Source	ROM (95% CI)
Ansgar Resch et al.	2.05 [1.74; 2.42]
Rebecca R. Roberts et al.	1.68 [1.36; 2.09]
Laura Puchter et al.	1.65 [1.15; 2.37]
Robert K. Pelz et al.	1.52 [0.83; 2.78]
Patrick D. Mauldin et al.	1.34 [1.01; 1.79]
Brian J Kopp et al.	1.29 [0.46; 3.60]
Zhihui Chen et al.	1.23 [1.02; 1.48]
John J. Engemann et al.	1.19 [0.93; 1.52]
Nelson et al.	1.15 [0.91; 1.46]
Matthew J. Neidell et al.	1.14 [0.95; 1.35]
Marta Riu et al.	1.13 [0.93; 1.37]
Yehuda Carmeli et al.	1.03 [0.78; 1.37]
Total (fixed effect)	1.35 [1.26; 1.45]
Total (random effects)	1.33 [1.15; 1.54]
Prediction interval	[0.81; 2.20]

Heterogeneity: $\chi^2_{11} = 44.09$ ($P < .01$), $I^2 = 75\%$



PLOS ONE | https://doi.org/10.1371/journal.pone.0227139 J

Photograph: Science History Images/Alamy

Table 8 *Escherichia coli.* Total number of invasive isolates tested (n = 99 038)[a] and AMR percentage (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**47 225**	**47.7**
Single resistance (to indicated antimicrobial group)		
Total (all single resistance)	**32 659**	**33.0**
Aminopenicillins	29 751	30.0
Fluoroquinolones	2516	2.5
Other antimicrobial groups	392	0.4
Resistance to two antimicrobial groups		
Total (all two-group combinations)	**9564**	**9.7**
Aminopenicillins + fluoroquinolones	5335	5.4
Aminopenicillins + third-generation cephalosporins	2454	2.5
Aminopenicillins + aminoglycosides	1639	1.7
Other antimicrobial group combinations	136	0.1
Resistance to three antimicrobial groups		
Total (all three-group combinations)	**6180**	**6.2**
Aminopenicillins + third-generation cephalosporins + fluoroquinolones	4212	4.3
Aminopenicillins + fluoroquinolones + aminoglycosides	1541	1.6
Other antimicrobial group combinations	427	0.4
Resistance to four antimicrobial groups		
Total (all four-group combinations)	**3386**	**3.4**
Aminopenicillins + third-generation cephalosporins + fluoroquinolones + aminoglycosides	3365	3.4
Other antimicrobial group combinations	21	<0.1
Resistance to five antimicrobial groups		
Aminopenicillins + third-generation cephalosporins + fluoroquinolones + aminoglycosides + carbapenems	24	<0.1

Table 9 *Klebsiella pneumoniae*. Total number of invasive isolates tested (n = 40 160)[a] and AMR percentage (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**24733**	**61.6**
Single resistance (to indicated antimicrobial group)		
Total (all single resistance)	**3035**	**7.6**
Third-generation cephalosporins	1436	3.6
Fluoroquinolones	1418	3.5
Other antimicrobial groups	181	0.5
Resistance to two antimicrobial groups		
Total (all two-group combinations)	**3239**	**8.1**
Third-generation cephalosporins + fluoroquinolones	2368	5.9
Third-generation cephalosporins + aminoglycosides	480	1.2
Other antimicrobial group combinations	391	1.0
Resistance to three antimicrobial groups		
Total (all three-group combinations)	**5963**	**14.8**
Third-generation cephalosporins + fluoroquinolones + aminoglycosides	4659	11.6
Third-generation cephalosporins + fluoroquinolones + carbapenems	1228	3.1
Other antimicrobial group combinations	76	0.2
Resistance to four antimicrobial groups		
Third-generation cephalosporins + fluoroquinolones + aminoglycosides + carbapenems	3190	7.9

Antimicrobial resistance surveillance in Europe 2023 2021 data

Table 10 *Pseudomonas aeruginosa*. Total number of invasive isolates tested (n = 13 689)[a] and AMR percentage (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**9447**	**69.0**
Single resistance (to indicated antimicrobial group)		
Total (all single resistance types)	**1796**	**13.1**
Carbapenems	769	5.6
Fluoroquinolones	670	4.9
Piperacillin-tazobactam	211	1.5
Other antimicrobial groups	146	1.1
Resistance to two antimicrobial groups		
Total (all two-group combinations)	**1031**	**7.5**
Piperacillin-tazobactam + ceftazidime	535	3.9
Fluoroquinolones + carbapenems	241	1.8
Other antimicrobial group combinations	255	1.9
Resistance to three antimicrobial groups		
Total (all three-group combinations)	**554**	**4.0**
Piperacillin-tazobactam + ceftazidime + carbapenems	181	1.3
Piperacillin-tazobactam + ceftazidime + fluoroquinolones	168	1.2
Other antimicrobial group combinations	205	1.5
Resistance to four antimicrobial groups		
Total (all four-group combinations)	**377**	**2.8**
Piperacillin-tazobactam + fluoroquinolones + ceftazidime + carbapenems	207	1.5
Other antimicrobial group combinations	170	1.2
Resistance to five antimicrobial groups		
Piperacillin-tazobactam + fluoroquinolones + ceftazidime + aminoglycosides + carbapenems	484	3.5

Table 11 *Acinetobacter* species. Total number of invasive isolates tested (n = 10 206)[a] and AMR percentage (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**2 604**	**25.5**
Single resistance (to indicated antimicrobial group)		
Total (any single resistance)	**297**	**2.9**
Fluoroquinolones	177	1.7
Other antimicrobial groups	120	1.2
Resistance to two antimicrobial groups		
Total (any two-group combinations)	**505**	**4.9**
Fluoroquinolones + carbapenems	375	3.7
Fluoroquinolones + aminoglycosides	119	1.2
Other antimicrobial group combinations	11	0.1
Resistance to three antimicrobial groups		
Fluoroquinolones + aminoglycosides + carbapenems	6 800	66.6

Table 12 *Staphylococcus aureus*. Total number of invasive isolates tested (n = 60 432)[a] and AMR percentage (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**50 016**	**82.8**
Single resistance (to indicated antimicrobial group)		
Total (any single resistance)	**4 887**	**8.1**
Fluoroquinolones	2 860	4.7
MRSA	1 778	2.9
Other antimicrobial groups	249	0.4
Resistance to two antimicrobial groups		
Total (any two-group combinations)	**5 220**	**8.6**
MRSA + fluoroquinolones	5 133	8.5
Other resistance combinations	87	0.1
Resistance to three antimicrobial groups		
MRSA + fluoroquinolones + rifampicin	309	0.5

Table 13 *Streptococcus pneumoniae*. Total number of invasive isolates tested (n = 5 952)[a] and percentage of non-wild-type/AMR (%) per phenotype, EU/EEA, 2021

AMR pattern[b]	Number of isolates	Percentage of total[c]
Fully susceptible (to included antimicrobial groups)	**4512**	**75.8**
Single non-wild-type/resistance (to included antimicrobial groups)		
Total (any single resistance)	**855**	**14.4**
Penicillin non-wild-type[d]	402	6.8
Macrolides	385	6.5
Fluoroquinolones	67	1.1
Other antimicrobial group combinations	1	< 0.1
Non-wild-type/resistance to two antimicrobial groups		
Total (any two-group combinations)	**556**	**9.3**
Penicillin non-wild-type[d] + macrolides	535	9.0
Other antimicrobial group combinations	21	0.4
Non-wild-type/resistance to three antimicrobial groups		
Total (any three-group combinations)	**28**	**0.5**
Other antimicrobial group combinations	28	0.5
Non-wild-type/resistance to four antimicrobial groups		
Penicillin non-wild-type[d] + third-generation cephalosporins + fluoroquinolones + macrolides	1	< 0.1

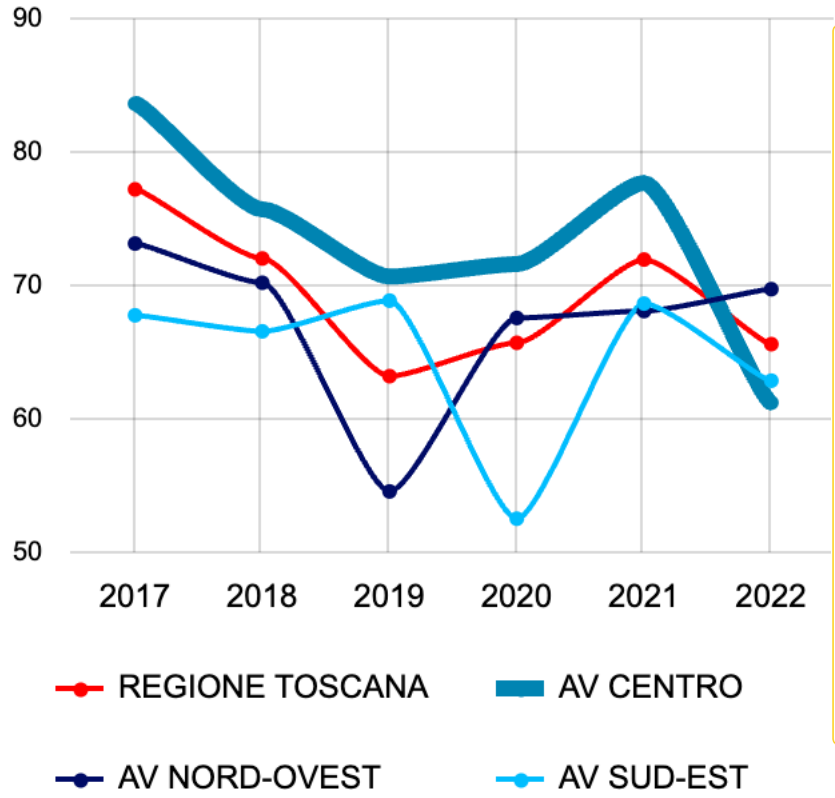
Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2021 EU/EEA range, population-weighted mean and trend, Italy, 2017–2021

Bacterial species	Antimicrobial group/agent	2017		2018		2019		2020		2021		2021 EU/EEA range and population-weighted mean[b]	Trend 2017–2021[c]
		n	%	n	%	n	%	n	%	n	%		
E. coli	Aminopenicillin (amoxicillin/ampicillin) resistance	4078	67.1	7533	64.5	4457	68.1	4214	64.5	5518	58.9	53.1 (31.7–70.2)	↓
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7077	29.5	16253	28.7	18409	30.9	18750	26.4	21153	23.8	13.8 (5.5–37.3)	↓*
	Carbapenem (imipenem/meropenem) resistance	7280	0.3	15452	0.4	17086	0.4	18001	0.5	19905	0.4	0.2 (0.0–1.1)	–
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6945	44.9	16043	41.7	18417	40.6	18840	37.6	20989	32.5	21.9 (9.6–51.6)	↓*
	Aminoglycoside (gentamicin/netilmicin/tobramycin) resistance[d]	7134	18.4	15901	16.0	18382	15.9	17994	14.9	20614	13.2	9.6 (4.1–27.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones and aminoglycosides[d]	6454	13.7	15622	11.4	17961	11.6	17593	9.8	20392	8.3	5.1 (1.2–14.8)	↓*
K. pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2546	54.6	5832	53.6	7699	57.6	8400	54.3	9094	53.3	34.3 (3.4–81.4)	–
	Carbapenem (imipenem/meropenem) resistance	2633	29.5	5660	26.8	7325	28.5	8293	29.5	8760	26.7	11.7 (0.0–73.7)	–
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2562	55.7	5752	52.7	7692	54.7	8486	52.4	9028	50.0	33.6 (0.0–80.0)	↓*
	Aminoglycoside (gentamicin/netilmicin/tobramycin) resistance[d]	2571	34.5	5693	27.0	7682	32.6	8084	31.6	8821	30.1	23.7 (0.0–69.1)	–
	Combined resistance to third-generation cephalosporins, fluoroquinolones and aminoglycosides[d]	2352	31.6	5587	24.8	7560	30.3	7842	29.5	8712	27.5	21.2 (0.0–67.4)	–
P. aeruginosa	Piperacillin-tazobactam resistance	1309	23.2	2938	23.9	3768	24.1	4537	24.2	4530	23.4	18.7 (0.0–47.2)	–
	Ceftazidime resistance	1332	20.0	2974	19.9	3798	19.0	4473	19.3	4560	19.1	15.8 (2.3–46.0)	–
	Carbapenem (imipenem/meropenem) resistance	1433	19.6	3014	15.8	3794	13.7	4615	15.9	4708	16.4	18.1 (3.5–45.9)	–
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1390	25.1	2994	22.9	3875	21.7	4599	19.6	4665	18.6	18.7 (3.3–48.0)	↓*
	Aminoglycoside (gentamicin/netilmicin/tobramycin) resistance[e]	1428	18.0	2983	12.8	3859	11.4	ND	ND	ND	ND	8.9 (0.0–41.7)	NA
	Combined resistance to ≥ 3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)[e]	1182	15.9	2849	14.5	3581	13.0	ND	ND	ND	ND	12.6 (0.0–42.1)	NA
Acinetobacter spp.	Carbapenem (imipenem/meropenem) resistance	868	78.7	1383	79.2	1588	79.3	2552	80.8	2734	86.9	39.9 (0.0–99.5)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	804	79.2	1368	81.1	1636	82.5	2522	83.4	2729	88.1	43.0 (1.5–99.8)	↑*
	Aminoglycoside (gentamicin/netilmicin/tobramycin) resistance[d]	836	76.1	1369	77.0	1637	78.8	2496	80.2	2697	85.1	39.6 (2.1–98.8)	↑*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides[d]	763	72.6	1351	75.7	1569	76.6	2451	78.7	2649	84.7	36.8 (0.0–98.5)	↑*
S. aureus	MRSA[f]	3591	33.9	8263	34.0	9681	34.3	10923	33.5	11344	30.0	15.8 (0.9–42.9)	↓*
S. pneumoniae	Penicillin non-wild-type[g]	522	10.5	928	9.2	1017	11.9	516	13.4	481	10.0	16.3 (3.6–35.7)	–
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	599	22.7	1095	20.3	1298	22.3	639	24.1	630	24.0	18.3 (0.0–36.0)	–
	Combined penicillin non-wild-type and resistance to macrolides[g]	474	5.3	879	4.7	989	6.7	491	7.7	463	6.5	9.9 (0.0–28.0)	–
E. faecalis	High-level gentamicin resistance	1630	45.9	2927	39.9	2395	34.9	3028	37.4	3018	36.3	29.0 (6.7–55.2)	↓*
E. faecium	Vancomycin resistance	1049	14.6	2273	18.9	2839	21.3	4166	23.6	4736	28.2	17.2 (0.0–66.4)	↑*

Acinetobacter spp. resistente ai carbapenemi - Andamento temporale

Rapporto (x 100) - Totale - Emocolture

Fonte: ARS - Rete SMART



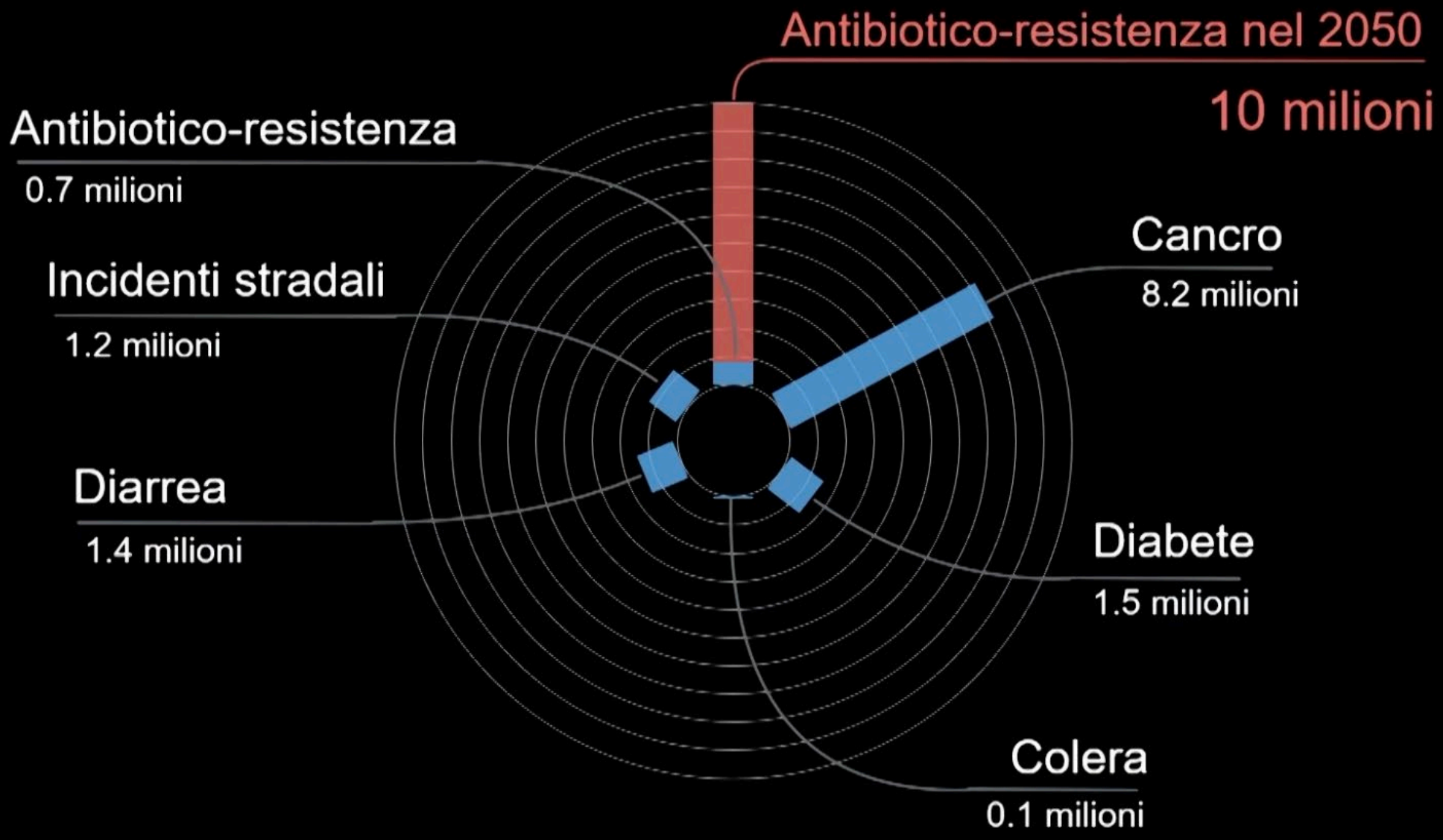
***Acinetobacter spp.* resistenti ai carbapenemi**

Rapporto (x 100) - Anno 2022 - Totale - Emocolture

Fonte: ARS - Rete SMART

Principio attivo	SIR						
	Sensibili		Intemedi		Resistenti		Tot.
	N	%	N	%	N	%	N
meropenem	**82**	**33,47**	**2**	**0,82**	**161**	**65,71**	**245**
amikacina	92	38,33	0	0	148	61,67	240
cotrimossazolo	94	38,84	3	1,24	145	59,92	242
gentamicina	91	37,92	0	0	149	62,08	240
tobramicina	4	44,44	0	0	5	55,56	9
ciprofloxacina	0	0	78	31,97	166	68,03	244

ARS TOSCANA
agenzia regionale di sanità



O' Neill, J., Antimicrobial Resistance: Tackling a Crisis for the Future Health and Wealth of Nations (2015)

Come possiamo contrastare tutto questo?

Strumenti chiave di un efficace programma di controllo delle infezioni

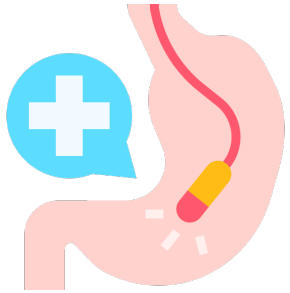
- sorveglianza
- uso corretto degli antimicrobici
- definizione di protocolli e monitoraggio dell'adesione alle buone pratiche
- formazione degli operatori, promozione dei comportamenti corretti
- restituzione, diffusione e discussione dei dati
- aggiornamento/monitoraggio di procedure relative a servizi generali
- vaccinazione del personale e dei pazienti che appartengono a gruppi a rischio.

Fonte: Piano Nazionale di Contrasto all'Antibiotico-Resistenza (PNCAR) 2022-2025

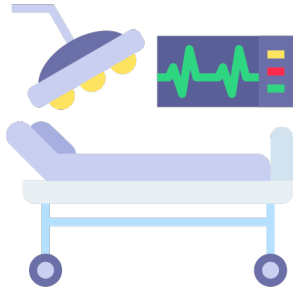
IPC intorno al paziente

igiene
delle mani

diamonds are a *Klebsiella*'s best friend

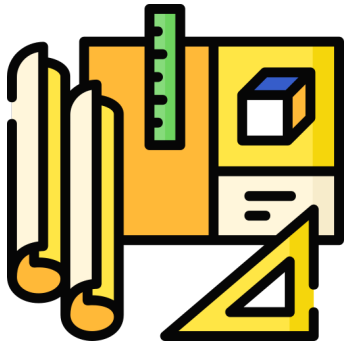


igiene dei
dispositivi



igiene
dell'unità del
paziente

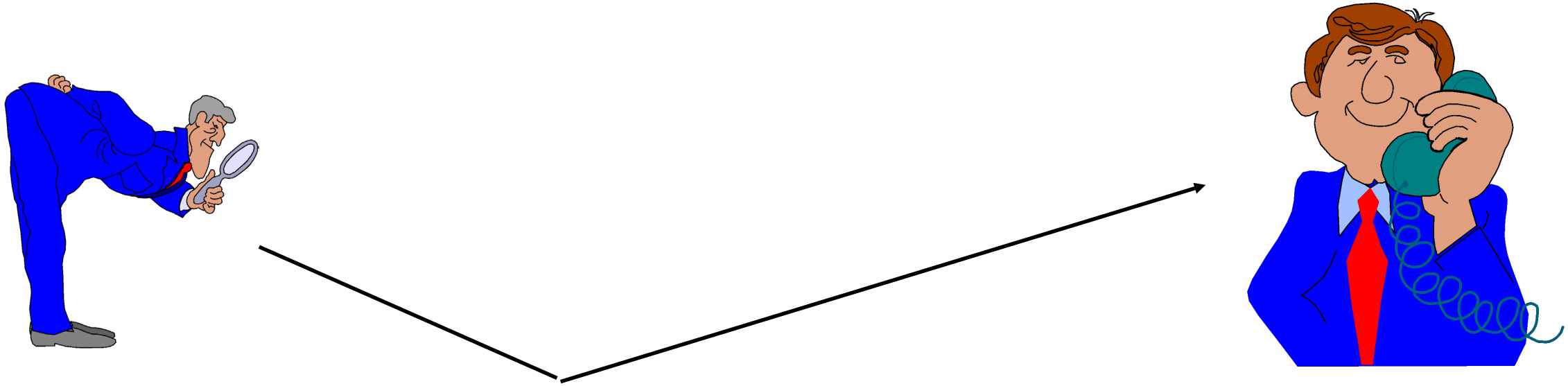
sorveglianza
innovativa
ICA



IPC by design

Courtesy of Dott Fabrizio Gemmi

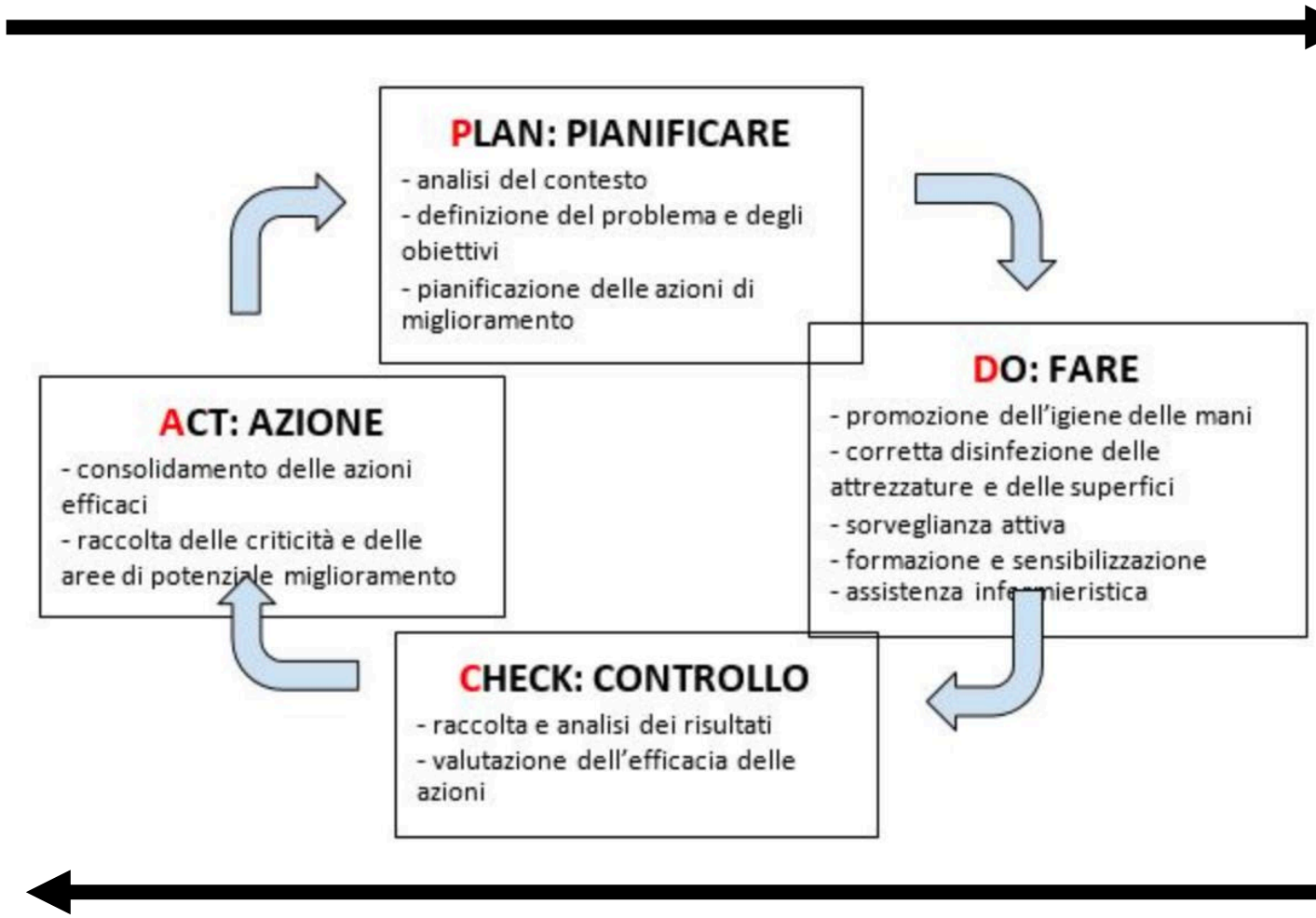
L’INFORMAZIONE PER L’AZIONE



Sorveglianza

Dati

Azioni



Informazioni

Decisioni

Controllo

| Minireview | 1 January 2002

Hunting Health Care-Associated Infections from the Clinical Microbiology Laboratory: Passive, Active, and Virtual Surveillance

Authors: Lance R. Peterson, Stephen E. Brossette | AUTHORS INFO & AFFILIATIONS

DOI: https://doi.org/10.1128/jcm.40.1.1-4.2002 • Check for updates

Editorials

How effective are clinical decision support systems?

BMJ 2020 ; 370 doi: https://doi.org/10.1136/bmj.m3499 (Published 17 September 2020)
Cite this as: *BMJ* 2020;370:m3499

Linked Research
Computerised clinical decision support systems and absolute improvements in care

Linked Opinion
What I have learned about clinical decision support systems over the past decade

Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals 2016–2017

Monitoring

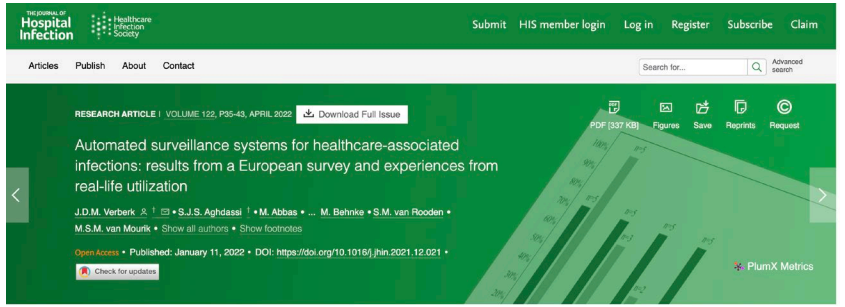
5 May 2023

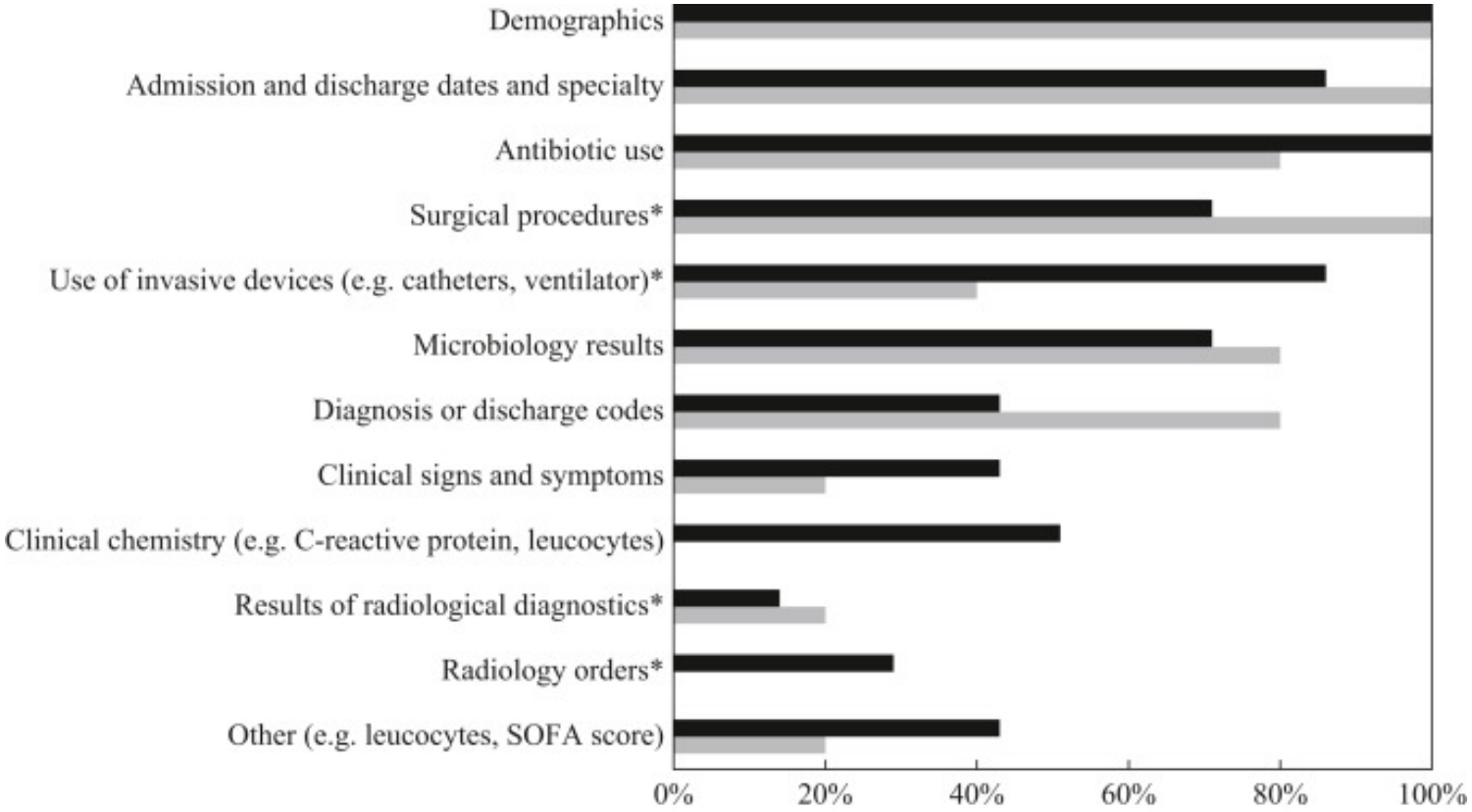
Cite:

Translate this page

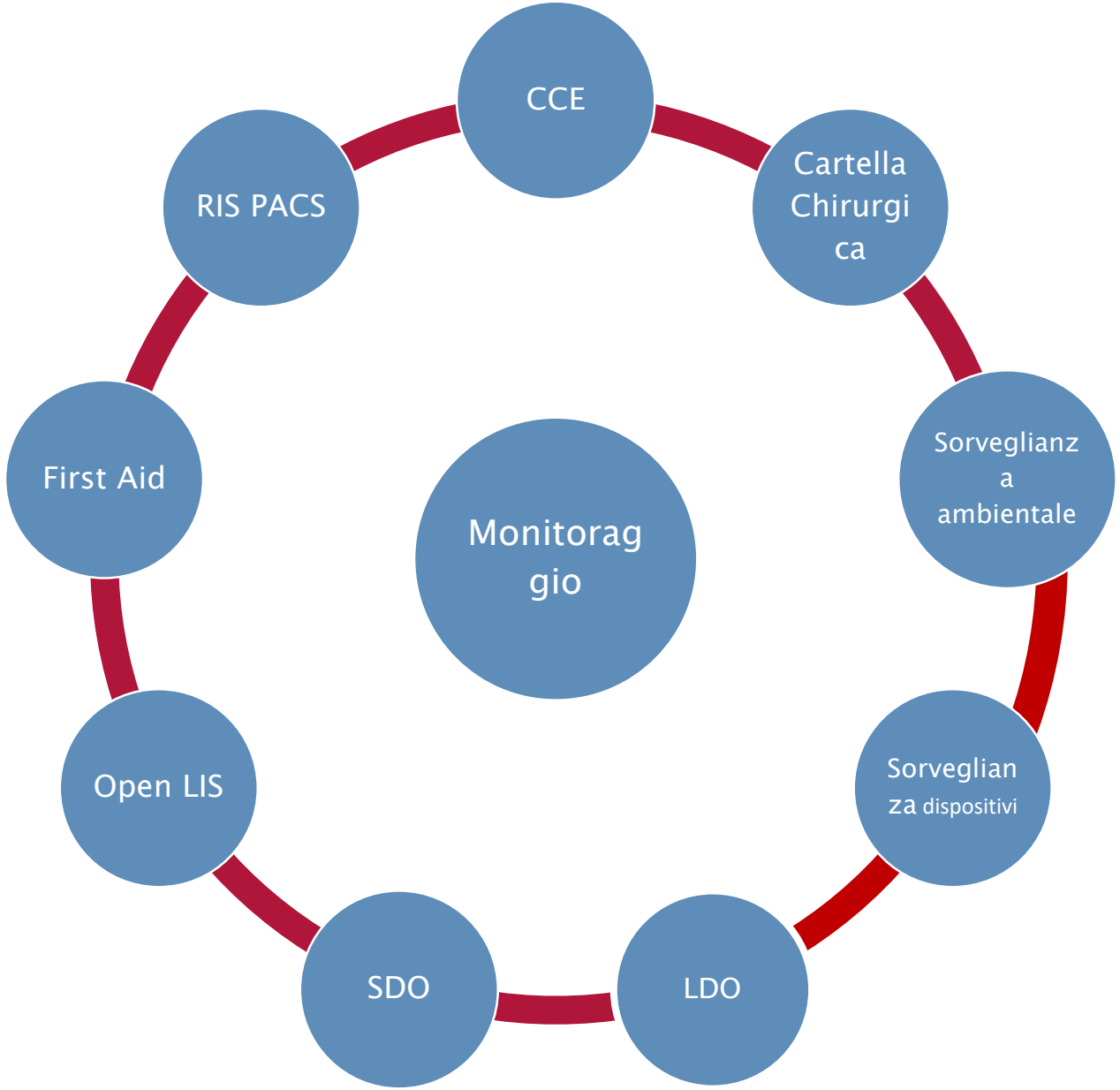
The 2016–2017 ECDC point prevalence survey was the second EU-wide point prevalence survey of

Una mentalità data-driven per rispondere alle ICA





J Hosp Infect. 2022 Apr;122:35-43. doi: 10.1016/j.jhin.2021.12.021. Epub 2022 Jan 12.


CCE
Cartella Chirurgica
Sorveglianza ambientale
Sorveglianza dispositivi
LDO
SDO
Open LIS
First Aid
RIS PACS
Monitoraggio

Antimicrobial Stewardship & Healthcare Epidemiology (2023), **3**, e25, 1–8
doi:10.1017/ash.2022.312

Review

Automating surveillance for healthcare-associated infections: Rationale and current realities (Part I/III)

Erica S. Shenoy MD, PhD[1,2,3] and Westyn Branch-Elliman MD, MMSc[3,4,5]

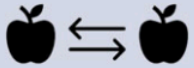
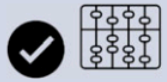
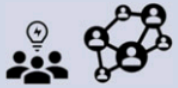
[1]Infection Control Unit, Massachusetts General Hospital, Boston, Massachusetts, [2]Division of Infectious Diseases, Department of Medicine, Massachusetts General Hospital, Boston, Massachusetts, [3]Harvard Medical School, Boston, Massachusetts, [4]Section of Infectious Diseases, Department of Medicine, Veterans' Affairs (VA) Boston Healthcare System, Boston, Massachusetts and [5]VA Boston Center for Healthcare Organization and Implementation Research (CHOIR), Boston, Massachusetts

Abstract

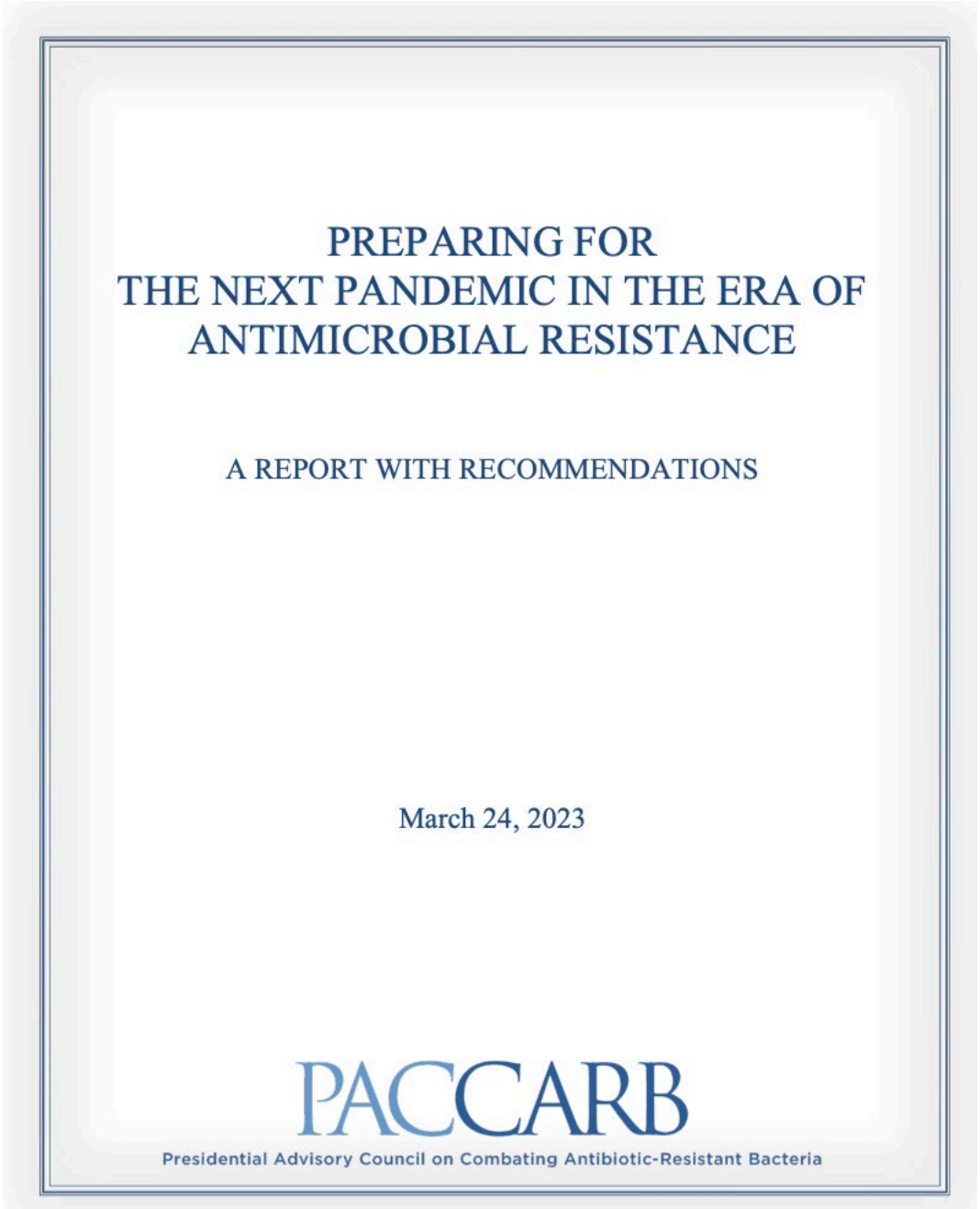
Infection surveillance is one of the cornerstones of infection prevention and control. Measurement of process metrics and clinical outcomes, such as detection of healthcare-associated infections (HAIs), can be used to support continuous quality improvement. HAI metrics are reported as part of the CMS Hospital-Acquired Conditions Program, and they influence facility reputation and financial outcomes.

(Received 19 August 2022; accepted 13 September 2022)

Benefits, Downsides, and Considerations for Automated Infection Surveillance

Benefits of Automated Surveillance	Downsides of Automated Surveillance	Additional Considerations
Time and resources		
Potential to save infection control practitioner time once stably implemented 	Increases need for IT support, which is challenging, particularly for smaller facilities 	Costs of future saved IP time need to be weighed against increased IT costs 
Frees up IP time for other activities, such as education, bedside rounds, pandemic responses 	Initial validation requires substantial upfront IP resources. Updates and changes to HAI definitions require ongoing resources 	During implementation, consider trade-offs between complexity of electronic tools and time-saved. Collaboration with IT is essential 
Reliability and reproducibility		
Objective measurement, potentially improving intra- and interfacility comparisons 	Most HAI definitions require at least some manual review, introducing subjectivity and reduces intra- and interfacility comparisons 	Reliability and reproducibility are challenging for some HAI (eg, SSI) due to variation in surveillance processes 
Most studies suggest automated infection surveillance estimates are more accurate than manually derived estimates 	Some HAI elements have limited automation potential due to how the EHR data are organized 	Natural language processing and machine learning may facilitate automation, however, requires complex and ongoing IT support 
Real-time quality improvement and evidence generation		
Automated surveillance enhances our potential to link datasets (eg, clinical and genomics data, antimicrobial resistance profiles and treatment) to improve detection and response 	Most automated infection surveillance activities occur within a facility or healthcare network. Without access to truly longitudinal data, detection strategies will always be limited 	Automating surveillance provides the opportunity to achieve a “learning healthcare system” for real-time quality improvement 

Note. EHR, electronic health record; HAI, healthcare-associated infection; IP, infection preventionist; IT, information technology; SSI, surgical-site infection.



Box 1: PACCARB Recommendations

Equity, Trust, and Communication

Recommendation 1: Prioritize social, structural, and behavioral interventions that build trust in public health guidance and increase uptake of both pharmaceutical and non-pharmaceutical interventions in steady-state and during a PHE.

Recommendation 2: Include marginalized and vulnerable communities during the development, implementation, and communication of all pandemic preparedness policies.

Infection Prevention and Control and Antimicrobial Stewardship

Recommendation 3: Include infection prevention and control and antimicrobial stewardship as core capabilities and goals in pandemic preparedness policies including through dissemination of existing and updated guidelines.

Recommendation 4: Create a mechanism for rapid guideline development for appropriate antimicrobial use in response to an emerging AMR pathogen and to maintain antimicrobial stewardship during an emergency.

Workforce Expansion

Recommendation 5: Bolster the workforce by expanding recruitment and support of public health professionals, infection preventionists, and infectious diseases specialists and engaging a broader set of providers in human and animal healthcare.

Recommendation 6: Develop pathways that would allow for qualified practitioners in other One Health domains to provide support to human healthcare during a PHE.

Recommendation 7: Build capacity for both human and animal diagnostic laboratory networks to meet emergency surge testing demands.

Data Sharing and Security

Recommendation 8: Invest in global capacity for AMR pathogen surveillance and early detection of novel AMR pathogens.

Recommendation 9: Expand and diversify sectors participating in domestic AMR surveillance efforts to include outpatient clinical settings, independent/clinical laboratories, wildlife, companion animals, wastewater, and others.

Recommendation 10: Modernize existing surveillance databases for One Health interoperability to accommodate data input from different human, animal, and environmental health sources, as well as variables that capture social determinants of health.

Recommendation 11: Invest in improved data privacy and security to encourage more private entities to contribute data, including AMR data, to federal data management systems used in public health, agricultural, and environmental sectors.

Product Innovation

Recommendation 12: Develop novel antimicrobials, vaccines, diagnostics, and threat-agnostic platform technologies focused on resistant bacterial and fungal pathogens, which are material threats likely to arise during a PHE.

Recommendation 13: In anticipation of a PHE, establish flexible, response-ready clinical trial networks that include outpatient settings and vulnerable populations, such as pediatrics, and that can easily adapt in an emergency to determine the safety and efficacy of novel countermeasures.

Recommendation 14: Develop accelerated regulatory approval pathways to assess novel, unique, or nontraditional technologies or products and ensure sufficient funding and procedures are in place to support and maintain the FDA review process during a PHE.

Lessons from COVID-19 to manage infectious diseases in low-income and middle-income countries 2

How can lessons from the COVID-19 pandemic enhance antimicrobial resistance surveillance and stewardship?

Kamini Walia, Marc Mendelson, Gagandeep Kang*, Ramasubramanian Venkatasubramanian*, Rina Sinha*, Sonam Vijay*, Balaji Veeraraghavan, Buddha Basnyat, Camilla Rodrigues, Nitin Bansal, Pallab Ray, Purva Mathur, Ram Gopalakrishnan, Vinod C Ohri*

Key messages

- Antimicrobial resistance (AMR) is steadily rising globally, especially in low-income and middle-income countries (LMICs)
- Critical gaps still exist in AMR surveillance and stewardship activities that have hindered progress in the containment of AMR
- The necessary focus on and investment in AMR containment strategies in LMICs, although lacking to start with, were further deprioritised during the COVID-19 pandemic
- Key strategies such as effective governance practices, diagnostics innovations, focus on vaccination programmes, digitisation, and community engagement acted as important pillars leading to COVID-19 management in LMICs
- Frameworks and strategies used for COVID-19 containment provide critical lessons to strengthen AMR surveillance and stewardship
- When deciding on national commitments for tackling AMR, LMICs should aspire to build a cohesive and enforceable response while considering the local context

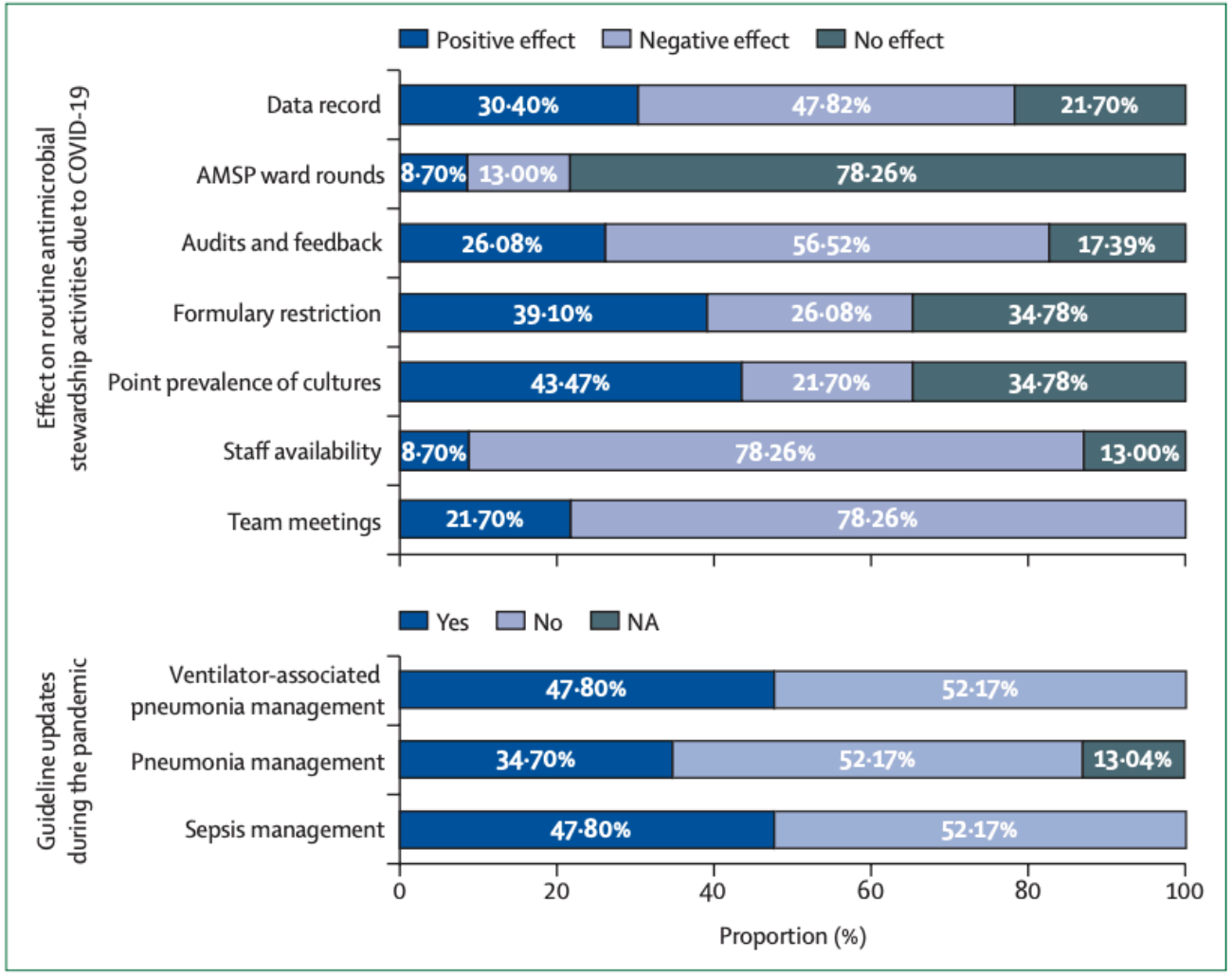
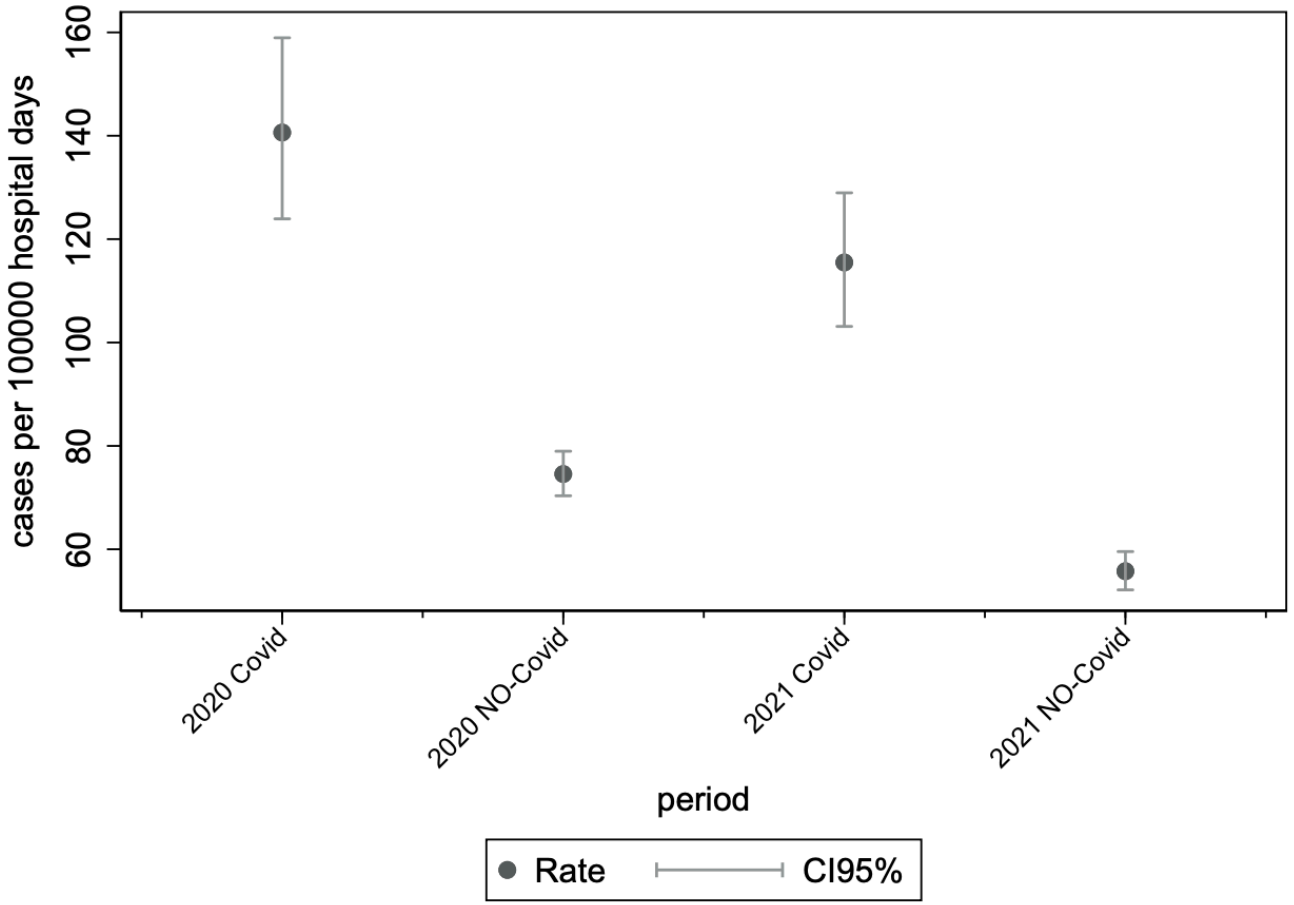


Figure 1: **The effect of COVID-19 on the practice of antimicrobial stewardship in Indian hospitals**

Incidenza dei casi di NDM-CRE per 100.000 giornate di degenza in regime ordinario nel periodo pre-pandemia e durante la pandemia per pazienti Covid-19 e non Covid-19, gennaio 2020 - dicembre 2021



pathogens

MDPI

Brief Report

Increased Risk of Acquisition of New Delhi Metallo-Beta-Lactamase-Producing Carbapenem-Resistant Enterobacterales (NDM-CRE) among a Cohort of COVID-19 Patients in a Teaching Hospital in Tuscany, Italy

Andrea Davide Porretta [1,2,*], Angelo Baggiani [1,2], Guglielmo Arzilli [1], Virginia Casigliani [1], Tommaso Mariotti [1], Francesco Mariottini [1], Giuditta Scardina [1], Daniele Sironi [1], Michele Totaro [1], Simona Barnini [3] and Gaetano Pierpaolo Privitera [1,2]

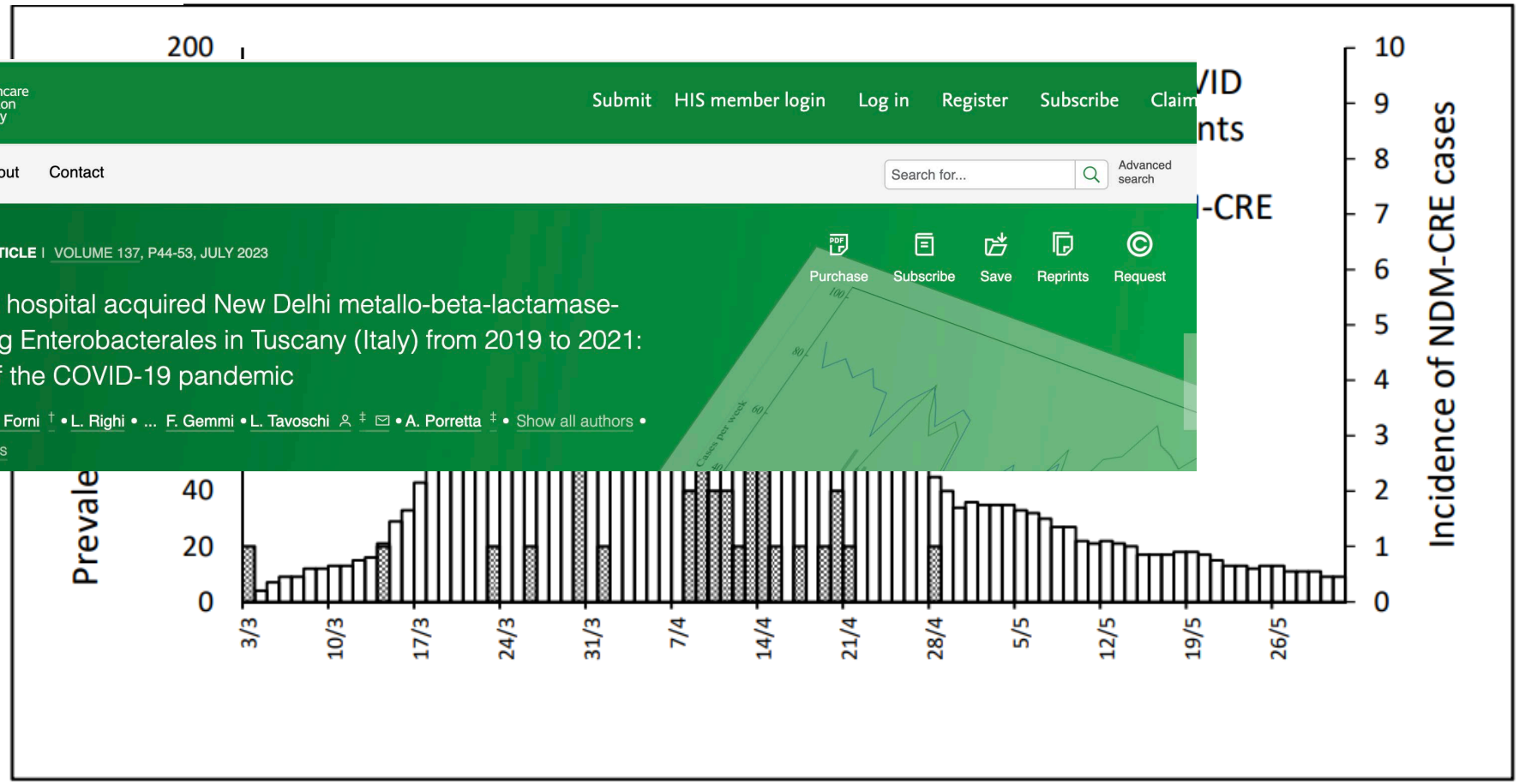
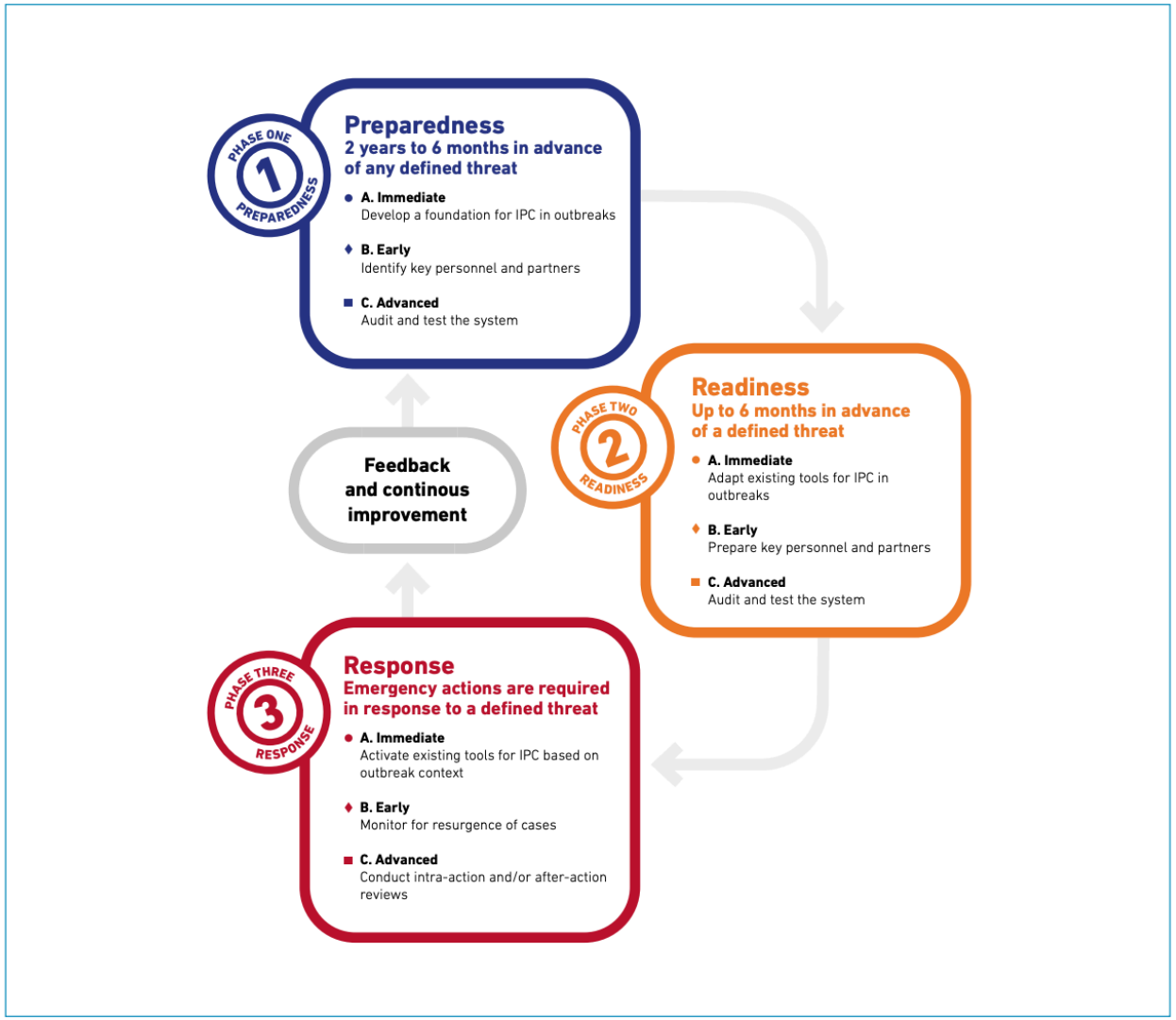


Figure 1. Prevalence of hospitalized COVID-19 patients and incidence of NDM-CRE cases.

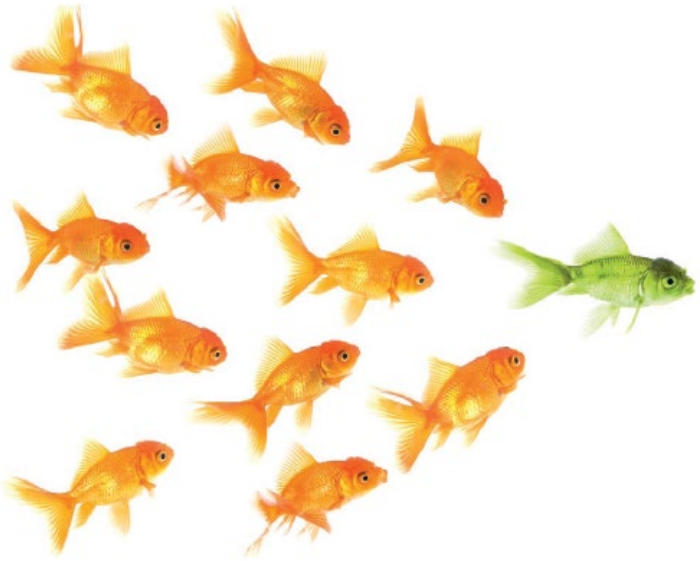
Fig. 14. IPC at the core of outbreak preparedness, readiness and response



IPC: infection prevention and control.

Global report on infection prevention and control: executive summary. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

Organisational priority and leadership



INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY SEPTEMBER 2010, VOL. 31, NO. 9

ORIGINAL ARTICLE

The Importance of Leadership in Preventing Healthcare-Associated Infection: Results of a Multisite Qualitative Study

Sanjay Saint, MD, MPH; Christine P. Kowalski, MPH; Jane Banaszak-Holl, PhD;
Jane Forman, ScD, MHS; Laura Damschroder, MS, MPH; Sarah L. Krein, PhD, RN

TABLE 3. Behaviors of Leaders Who Successfully Implemented Practices or Facilitated Implementation of Practices to Prevent Healthcare-Associated Infection (HAI)

1. Successful leaders focused on cultivating a culture of clinical excellence. They developed a vision, articulated the organizational culture well, and successfully conveyed that to staff at all levels.
2. Successful leaders were solution oriented. They focused on overcoming barriers and did not tend to throw up their hands and complain about how the system will not allow change; rather, they pulled the issue out of the fray of organizational disconnect by dealing directly with resistant staff or process issues that impeded prevention of HAI.
3. Successful leaders inspired staff. They cultivated leadership skills and inspired the people they supervised. This inspiration was described by staff as motivating and energizing them to work toward the goal of preventing HAI.
4. Successful leaders thought strategically while acting locally. They seemed to plan ahead and left few things to chance. They did the politicking necessary before crucial issues came up for committee votes. They leveraged personal prestige to move initiatives forward. They worked well across disciplines and kept their eye on the prize: improving patient care.

Courtesy of Prof Privitera

Grazie per l’attenzione!

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