

Stato dell'arte: Lectio Magistralis

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26 Novembre 2024 – antibioticoresistenza ed infezioni correlate all'assistenza

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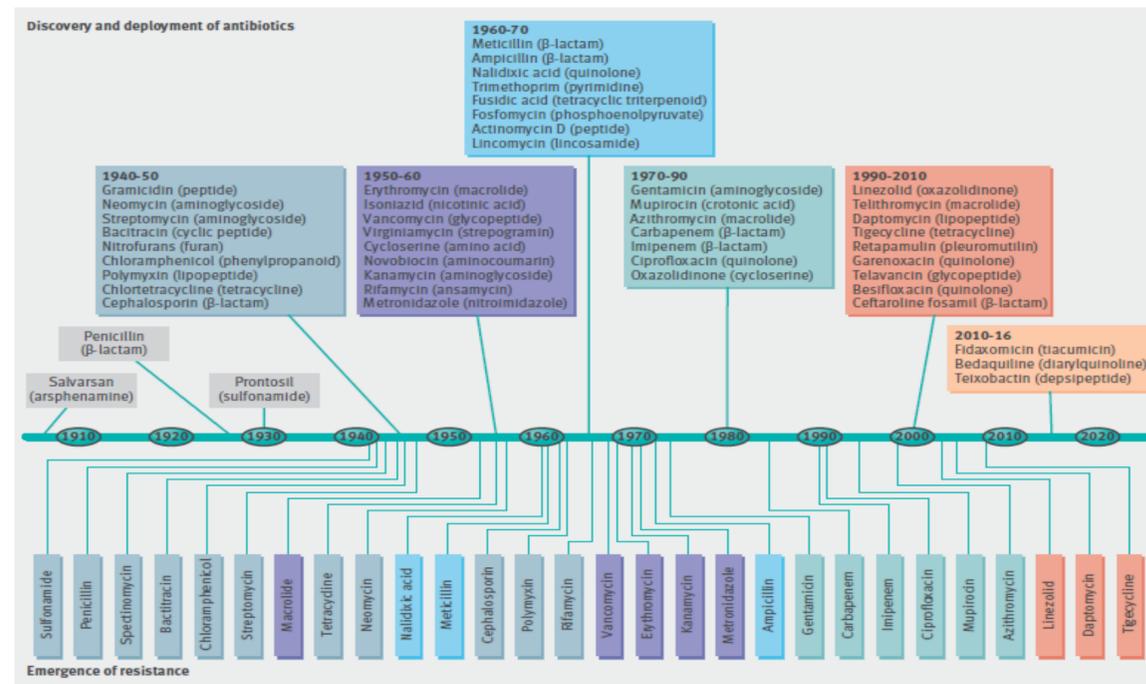
Antimicrobial
Resistance
(AMR)



Infection
Prevention and
Control (IPC)



Healthcare
associated
Infections (HAI)





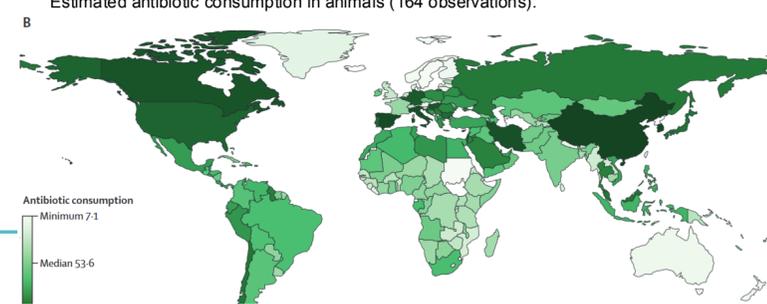
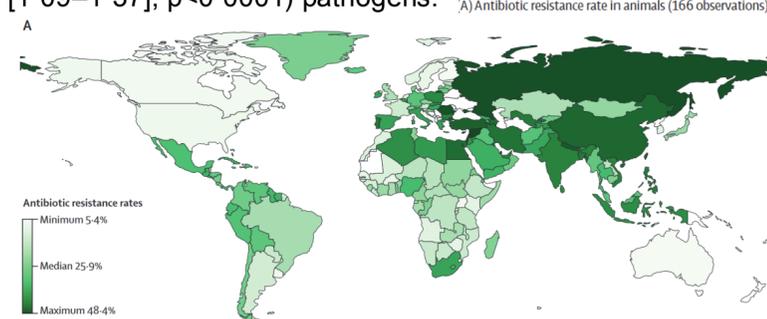
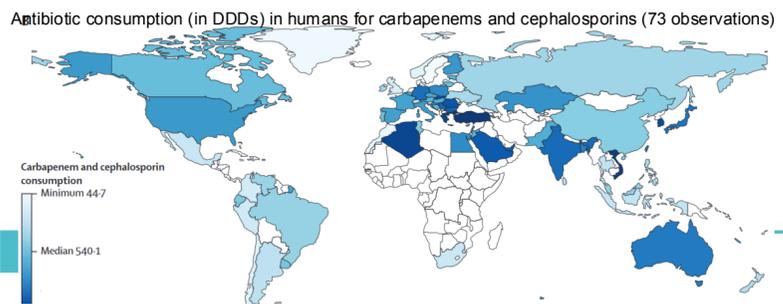
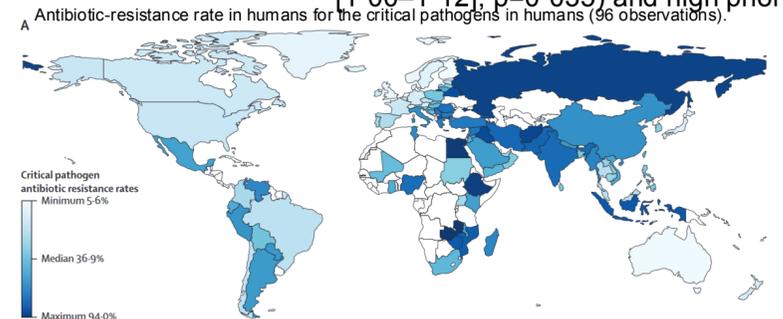
Global antimicrobial-resistance drivers: an ecological country-level study at the human-animal interface

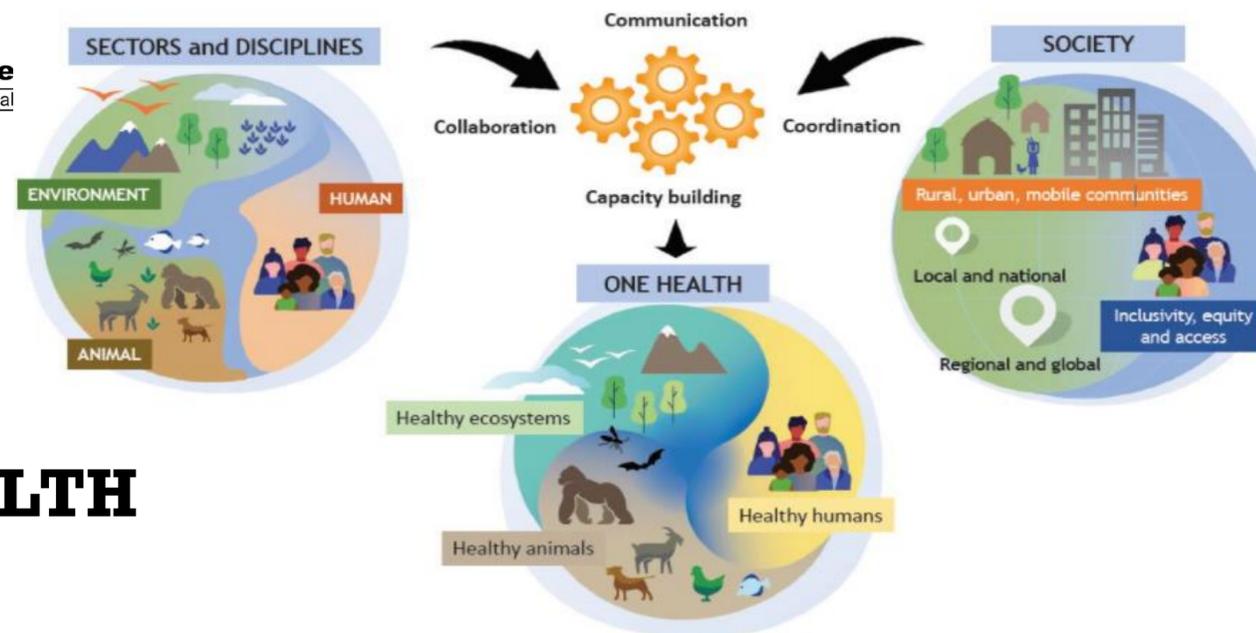
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AREZZO FIERE E CONGRESSI



Kasim Allelet al. Lancet Planet Health 2023;

CRAB, PA, ESBL E.coli, ESBL K. Pneumoniae, MRSA, VRE. faecium AMR in humans and food-producing animals
Significant associations between animal antimicrobial consumption and AMR in food-producing animals (OR 1.05 [95% CI 1.01–1.10]; p=0.013), and between human antimicrobial consumption and AMR specifically in WHO critical priority (1.06 [1.00–1.12]; p=0.035) and high priority (1.22 [1.09–1.37]; p<0.0001) pathogens.





ONE HEALTH

Un approccio integrato che mira a bilanciare e ottimizzare in modo sostenibile la salute di persone, animali ed ecosistemi. Riconosce che la salute degli esseri umani, degli animali domestici e selvatici, delle piante e dell'ambiente in generale sono strettamente legati e interdipendenti.

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**Global burden of bacterial antimicrobial resistance in 2019:
 a systematic analysis**

*Antimicrobial Resistance
 Collaborators*
 Lancet 2022; 399: 629–55*

Principali cause di morte

1. Cardiopatia ischemica
2. Ictus
3. AMR

4.95 M di morti associate a AMR
1.27 M di morti attribuibili a batteri MDR



USD 28.9 billion
 Spent annually to treat complications caused by resistant infections



USD 36.9 billion
 Cost of AMR caused by reduced workforce participation and productivity



OECD Health Policy Studies
Embracing a One Health Framework to Fight Antimicrobial Resistance

* Global Burden of Disease Study (GBD) - global research program of disease burden that assesses mortality and disability from major diseases, injuries, and risk factors. GBD is a collaboration of over 3600 researchers from 145 countries, based out of the Institute for Health Metrics and Evaluation (IHME) at the University of Washington and funded by the Bill and Melinda Gates Foundation.



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AREZZO FIERE E CONGRESSI



Obiettivi UE su antibioticoresistenza

- Ridurre del 20 % il consumo totale di antibiotici** negli esseri umani. Secondo le dosi definite giornaliere (DDD) per 1 000ab/die
- Almeno il **65 % del consumo totale di antibiotici** negli esseri umani corrisponde ad antibiotici del gruppo «Access» Quale definito nella classificazione AWaRe dell'OMS
- Ridurre del 15 %** l'incidenza totale delle infezioni del sangue da **Staphylococcus aureus** resistente alla meticillina (**MRSA**)
- Ridurre del 10 %** l'incidenza totale delle infezioni del sangue da **Escherichia coli** resistente alle cefalosporine di terza generazione
- Ridurre del 5 %** l'incidenza totale delle infezioni del sangue da **Klebsiella pneumoniae** resistente ai carbapenem

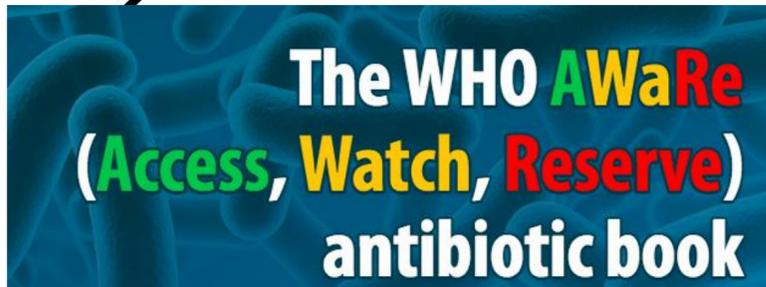


26-29 NOVEMBRE 2024
AREZZO FIERE E CONGRESSI



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The WHO AWaRe
(Access, Watch, Reserve)
antibiotic book

Access - antibiotici che hanno uno spettro di attività ristretto e un buon profilo di sicurezza in termini di reazioni avverse, da usare preferibilmente nella maggior parte delle infezioni più frequenti quali ad esempio le infezioni delle vie aeree superiori

Watch - antibiotici a spettro d'azione più ampio, raccomandati come opzioni di prima scelta solo per particolari condizioni cliniche

Reserve - antibiotici da riservare al trattamento delle infezioni da germi multiresistenti.

Trend 5 anni : non decremento significativo del consumo antibiotico europeo

Country	A. DDD per 1,000 inhabitants per day						B. DDD per 100 bed-days						C. DDD per 100 discharges											
	2017	2018	2019	2020	2021	Trendline	5-year trend	CAGR	2017	2018	2019	2020	2021	Trendline	5-year trend	CAGR	2017	2018	2019	2020	2021	Trendline	5-year trend	CAGR
Belgium	1.62	1.62	1.59	1.41	1.43	—	—	-3.0%	54.1	54.5	54.6	56.7	56.2	—	—	1.0%	359.3	359.1	353.7	377.9	352.4	—	—	-0.5%
Croatia	1.80	1.88	1.95	1.70	1.86	—	—	0.8%	67.9	71.9	75.2	81.1	81.5	↑	4.7%	418.8	439.3	453.8	479.0	477.6	—	—	3.3%	
Estonia	1.65	1.55	1.54	1.65	1.41	—	—	-3.0%	68.0	63.3	62.7	76.8	63.8	—	—	-1.6%	414.8	388.8	386.8	470.2	401.9	—	—	-0.8%
Finland*	2.11	2.28	2.10	1.94	1.84	—	—	-3.4%	75.1	81.8	79.3	81.1	76.5	—	—	0.4%	478.9	525.4	495.2	507.3	486.7	—	—	0.4%
France	1.74	1.77	1.74	1.63	1.69	—	—	-0.7%	74.3	76.8	76.5	79.6	81.3	—	—	2.3%	410.9	425.0	422.3	452.1	451.7	—	—	2.4%
Hungary	1.13	1.12	1.16	1.21	1.12	—	—	-0.2%	44.7	45.1	47.5	66.6	61.3	—	—	8.2%	244.3	243.7	255.5	354.4	359.6	—	—	10.1%
Iceland	1.66	1.53	1.33	1.11	1.02	—	↓	-11.5%	91.0	91.2	82.4	71.7	63.1	—	—	-8.7%	522.8	511.3	451.0	398.5	339.7	—	↓	-19.2%
Ireland	1.60	1.78	1.77	1.47	1.49	—	—	-1.8%	73.4	80.3	81.0	69.2	64.6	—	—	-3.1%	431.3	476.6	483.8	394.6	412.5	—	—	-1.1%
Italy	1.89	1.91	1.90	1.92	1.54	—	—	-5.1%	96.5	97.8	98.0	113.1	86.1	—	—	-2.8%	668.8	684.5	690.4	846.7	637.7	—	—	-1.2%
Latvia	1.89	1.92	1.88	1.92	1.48	—	—	-5.0%	82.1	82.1	83.3	98.4	75.0	—	—	-2.2%	494.6	489.3	490.4	581.1	451.6	—	—	-1.2%
Lithuania	2.25	2.25	2.30	2.31	1.95	—	—	-3.5%	57.8	58.4	60.7	81.9	68.8	—	—	4.5%	375.3	378.3	386.5	544.3	448.8	—	—	4.6%
Luxembourg	1.72	1.48	1.47	1.34	1.36	—	—	-5.7%	65.9	57.3	58.2	62.6	61.8	—	—	-1.6%	488.9	432.9	431.2	471.6	448.2	—	—	-2.1%
Netherlands	0.83	0.84	0.80	0.76	0.70	—	—	-4.3%	61.2	63.9	64.0	69.3	61.5	—	—	0.2%	313.7	326.6	325.8	357.7	317.5	—	—	0.3%
Norway	1.38	1.30	1.30	1.16	1.14	—	—	-4.5%	53.1	51.3	52.1	52.0	49.2	—	—	-1.0%	320.9	306.8	308.3	306.1	288.1	—	—	-2.7%
Poland	1.62	1.36	1.42	1.36	1.37	—	—	-4.0%	50.0	44.0	47.3	59.0	51.5	—	—	0.7%	332.0	294.0	314.9	402.4	356.9	—	—	1.8%
Portugal	1.37	1.33	1.37	1.42	1.47	—	—	1.7%	51.2	49.2	50.0	56.8	56.5	—	—	2.5%	457.7	443.7	459.3	562.8	519.3	—	—	3.2%
Slovakia	1.45	1.81	1.38	1.27	1.43	—	—	-0.4%	45.4	58.7	45.1	48.9	55.4	—	—	5.1%	305.1	397.0	300.8	333.2	387.4	—	—	6.1%
Slovenia	1.52	1.50	1.51	1.32	1.42	—	—	-1.7%	51.9	51.4	52.9	55.9	59.2	—	—	3.3%	344.4	342.8	349.3	366.3	380.4	—	—	2.5%
Spain	1.75	1.74	1.64	1.56	1.49	—	↓	-4.0%	92.8	91.7	87.5	91.5	83.0	—	—	-2.7%	559.9	551.6	525.0	584.4	523.0	—	—	-1.7%
Sweden	1.51	1.65	1.47	1.42	1.40	—	—	-1.0%	71.7	81.2	73.8	78.5	75.1	—	—	1.2%	400.8	443.9	402.3	415.9	406.0	—	—	0.3%

ESAC-Net study group. Measuring hospital antibiotic consumption in EU/EEA countries: comparison of different metrics, 2017 to 2021. Euro Surveill. <https://doi.org/10.2807/1560-7917>

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Country	2019	2020	2021	2022	2023	Trend 2019-2023	Progress towards 2030 target*			
							Change (%) 2019-2023	Recommended reduction (%) 2019-2030	2023	Target 2030
Austria	11.6	8.8	8.8	10.5	11.3		-3%	-3%	11.3	11.2
Belgium	21.4	16.7	17.4	20.5	20.6		-3%	-18%	20.6	17.5
Bulgaria	20.7	22.7	24.4	25.7	26.3	↑	+27%	-18%	26.3	17.0
Croatia	18.8	15.7	18.2	20.2	21.2		+13%	-9%	21.2	17.1
Cyprus	30.1	28.9	25.0	33.5		N/A	N/A	-27%	N/A	22.0
Czechia	16.9	13.4	13.7	17.1	18.1		+7%	-9%	18.1	15.4
Denmark	15.3	14.3	14.4	15.2	16.2		+6%	-9%	16.2	13.9
Estonia	11.8	10.5	10.1	12.4	12.7		+8%	-3%	12.7	11.4
Finland	14.7	11.9	11.3	12.5	12.9		-12%	-9%	12.9	13.4
France	25.1	20.3	21.5	24.3	24.1		-4%	-27%	24.1	18.3
Germany					13.3		N/A	-9%	13.3	11.5
Greece ⁶	34.1	28.1	23.5	32.9	28.5		N/A	-27%	28.5	24.9
Hungary	14.4	11.2	11.9	14.4	14.2		-2%	-9%	14.2	13.1
Iceland	19.3	16.5	16.8	18.6	18.5		-4%	N/A	18.5	N/A
Italy	21.7	18.4	17.5	21.9	23.1		+6%	-18%	23.1	17.8
Lithuania	16.3	14.2	14.1	18.5	18.7		+15%	-9%	18.7	14.7
Luxembourg ⁶	21.1	16.1	15.9	19.1	20.2		-4%	-18%	20.2	17.3
Malta	20.7	16.6	15.8	24.0	22.9		+11%	-18%	22.9	17.0
Netherlands	9.5	8.5	8.3	9.1	9.6		+1%	-3%	9.6	9.2
Norway	14.9	13.9	14.0	15.3	15.5		+4%	N/A	15.5	N/A
Poland	23.6	18.5	20.2	23.6	23.2		-2%	-27%	23.2	17.2
Portugal	19.3	15.2	15.3	18.8	19.7		+2%	-9%	19.7	17.6
Romania	25.8	25.2	25.7	27.6	27.4		+6%	-27%	27.4	18.8
Slovakia	19.3	14.4	16.0	20.8	20.1		+4%	-9%	20.1	17.6
Slovenia	13.0	10.2	10.2	12.4	13.4		+3%	-9%	13.4	11.8
Spain	24.9	19.7	20.0	23.2	24.1		-3%	-27%	24.1	18.2
Sweden	11.8	10.3	10.1	11.2			N/A	-3%	N/A	11.4
EU/EEA**	19.8	16.4	16.4	19.3	19.9		+1%	N/A	19.9	N/A
EU***	19.9	16.4	16.4	19.4	20.0		+1%	-20%	20.0	15.9

26-29 NOVEMBRE 2024
AREZZO FIERE E CONGRESSI



Consumo di antibiotici
Andamento 2019 – 2023
Target -20% DDD

Antimicrobial consumption in the EU/EEA (ESAC-Net)

Annual Epidemiological Report for 2023

Consumo complessivo di antibatterici in DDD:

Eu : +1%; DDD 2023 20.0 → target 2030 15.9

Italia: +6%; DDD 2023 23.1 → target 2030 17.8



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Country	2019	2020	2021	2022	2023	Trend 2019-2023	Progress towards the 2030 target of ≥65% Access group *	
							Change 2019-2023 (percentage points)	Increase needed 2019-2030 to reach target (percentage points)
Austria	58.1	60.9	59.9	59.5	61.6		+3.4	-6.9
Belgium	67.9	67.3	68.4	69.4	68.9		+1.0	None
Bulgaria	45.1	40.5	38.3	40.7	42.0		-3.1	+19.9
Croatia	62.7	61.4	60.2	60.1	60.7		-2.0	+2.3
Cyprus	48.9	44.3	48.3	55.4		N/A	N/A	+16.1
Czechia	60.2	61.9	61.4	58.9	60.6		+0.4	+4.8
Denmark	78.4	79.0	79.3	80.1	80.1	↑	+1.7	None
Estonia	61.3	61.1	63.7	64.0	64.2	↑	+2.9	+3.7
Finland	73.2	70.3	70.4	72.3	74.0		+0.8	None
France	72.0	70.5	72.4	71.3	72.7		+0.7	None
Germany					60.1	N/A	N/A	N/A
Greece ^o	46.8	48.6	51.9	42.6	42.0	N/A	-4.8	+18.2
Hungary	50.5	51.0	49.2	49.1	50.3		-0.2	+14.5
Iceland	82.9	83.0	83.3	83.7	82.1		-0.8	N/A
Italy	48.9	47.2	47.8	47.2	50.8		+1.9	+16.1
Lithuania	68.3	67.6	70.5	70.7	66.6		-1.7	None
Luxembourg ^o	59.5	60.2	60.6	60.8	61.7	N/A	+2.2	+5.5
Malta	49.9	54.7	58.0	55.0	56.0		+6.1	+15.1
Netherlands	71.2	70.1	70.2	71.0	71.8		+0.6	None
Norway	64.1	58.8	58.8	62.0	61.4		-2.7	N/A
Poland	60.4	62.9	60.9	56.7	60.4		+0.1	+4.6
Portugal	61.4	61.6	61.6	61.0	62.5		+1.1	+3.6
Romania	52.8	49.9	49.0	50.3	51.2		-1.6	+12.2
Slovakia	42.4	43.6	40.2	37.7	41.7		-0.7	+22.6
Slovenia	62.1	63.3	64.0	61.7	62.4		+0.3	+2.9
Spain	63.0	62.0	62.3	61.2	61.8		-1.2	+2.0
Sweden	71.0	68.0	67.6	69.0		N/A	N/A	None
EU**	61.3	60.4	60.7	59.8	61.5		+0.4	+3.9
EU***	61.1	60.4	60.8	59.8	61.5		+0.4	+3.9

26-29 NOVEMBRE 2024
AREZZO FIERE E CONGRESSI



Consumo di antibiotici «Access»
Andamento 2019 – 2023
Target + 65%

Antimicrobial consumption in the EU/EEA (ESAC-Net)

Annual Epidemiological Report for 2023

Consumo di antibatterici «Access»:

Eu : +0.4%; target 2030 se +3.9%

Italia: +1.9%; target 2030 se +16.1%



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AREZZO FIERE E CONGRESSI



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SURVEILLANCE REPORT

**Antimicrobial resistance in the
EU/EEA (EARS-Net)**

Annual Epidemiological Report for 2023



26-29 NOVEMBRE 2024
AREZZO FIERE E CONGRESSI



Meticillin-resistant *Staphylococcus aureus* (MRSA) :
incidenza europea di BSI 4.64 per 100 mila - 17.6% meno del 2019
Decremento significativo rispetto all'anno baseline per gli obiettivi EU.
Target 2030 sostanzialmente raggiunto

Escherichia coli resistente a cefalosporine di terza generazione:
incidenza europea di BSI 10.35 per 100 mila
3.6% meno del 2019.
Decremento non significativo rispetto all'anno baseline per gli obiettivi EU.

Klebsiella pneumoniae resistente a carbapenemi:
incidenza europea di BSI 3.97 per 100 mila
57.5% più del 2019.
Incremento significativo rispetto all'anno baseline per gli obiettivi EU

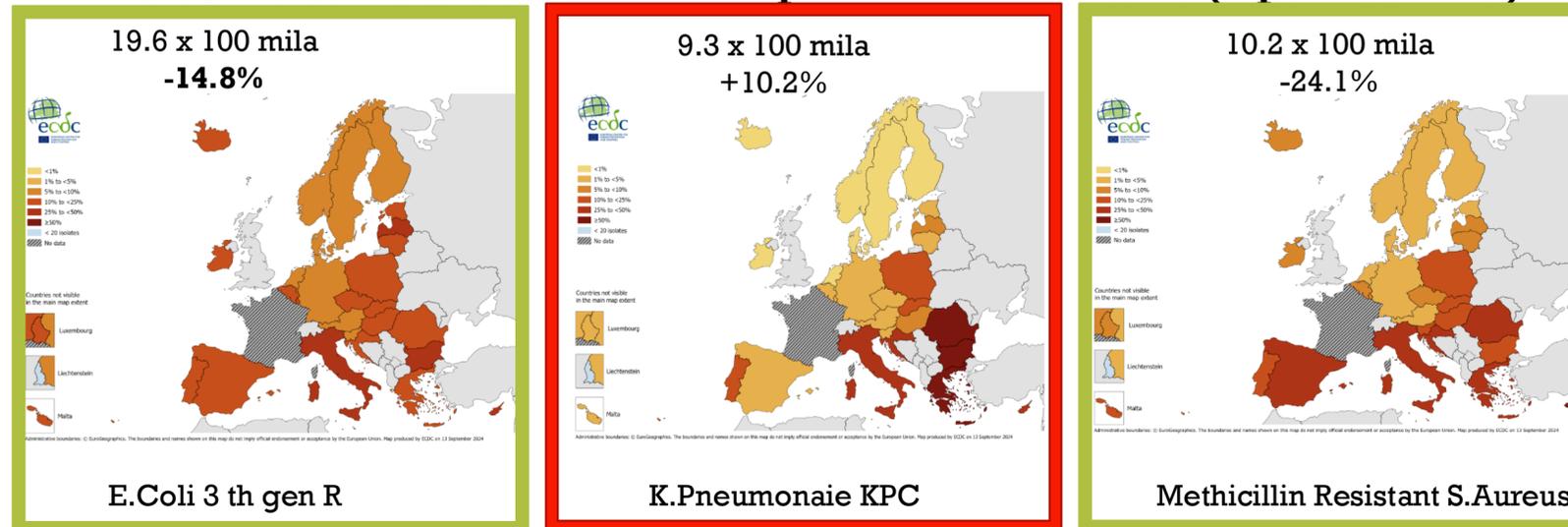
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ITALIA - BSI con fenotipo di resistenza

Incidenza stimata e variazione rispetto al 2019 in Italia (n per 100 mila)



SURVEILLANCE REPORT
Antimicrobial resistance in the EU/EEA (EARS-Net)
 Annual Epidemiological Report for 2023

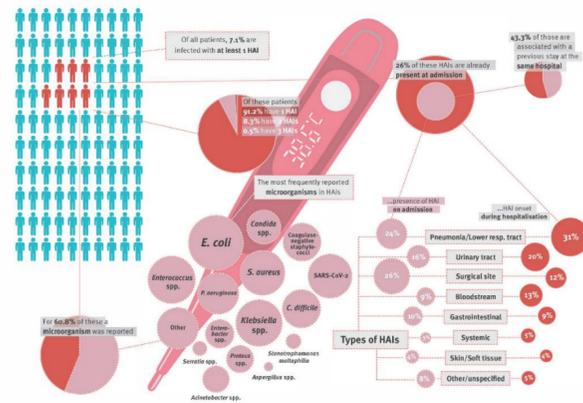
Segnali di miglioramento da valori di incidenza molto elevati

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Healthcare-associated infections (HAIs) in European hospitals

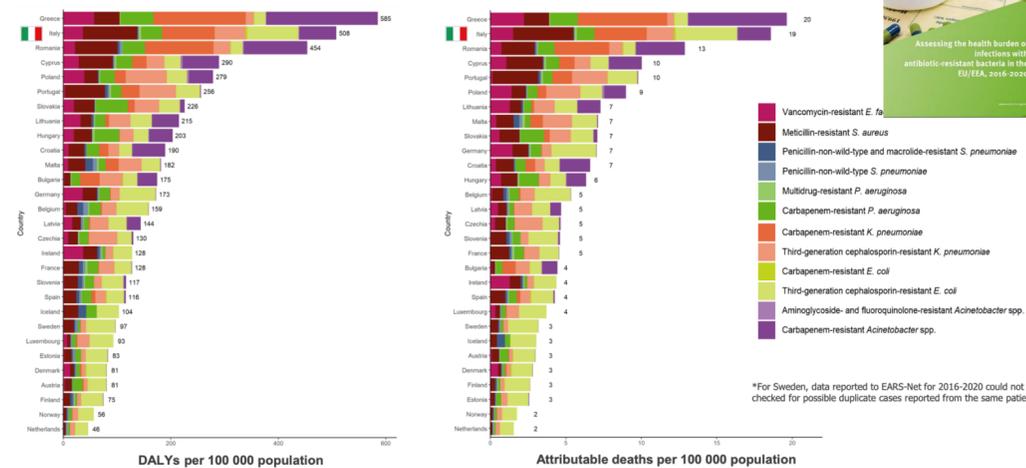
In 2022 and 2023, ECDC coordinated the third point prevalence survey (PPS) to collect data on healthcare-associated infections (HAIs) and on antimicrobial use in European hospitals.



Source: www.ecdc.europa.eu/en/publications-data/healthcare-associated-infections-european-hospitals, ECDC, 2024

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Health burden of infections with antibiotic-resistant bacteria by country*, EU/EEA, 2020



Source: ECDC, 17 November 2022 (includes country profiles as Annex 2 of the ECDC report).

2020 in EU:

- Oltre 800.000 infezioni da batteri resistenti agli antibiotici
- Più di 35.000 decessi attribuibili
- Oltre 1 milione di disability-adj. life years (DALY) persi

2023: 7.1% di tutti i pazienti almeno un'ICA



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Strategie di prevenzione ICA

*Secondo l'OCSE, l'implementazione di un pacchetto comprendente una **migliore igiene delle mani, programmi di stewardship antibiotica e una maggiore igiene ambientale** nelle strutture sanitarie ridurrebbe l'onere sanitario della resistenza antimicrobica dell'**85%**.*

INFECTION
PREVENTION AND
CONTROL



ANTIMICROBIAL
STEWARDSHIP

 Effect of antibiotic stewardship on the incidence of infection and colonisation with antibiotic-resistant bacteria and *Clostridium difficile* infection: a systematic review and meta-analysis

David Baur*, Beryl Primrose Gladstone*, Francesco Burkert, Elena Carrara, Federico Foschi, Stefanie Döbele, Evelina Tacconelli

26-29 NOVEMBRE 2024
AREZZO FIERE E CONGRESSI

**SINERGIA DEI PROGRAMMI
DI
PREVENZIONE
CONTROLLO
AMS e PROGRAMMA DI
LAVAGGIO DELLE MANI**

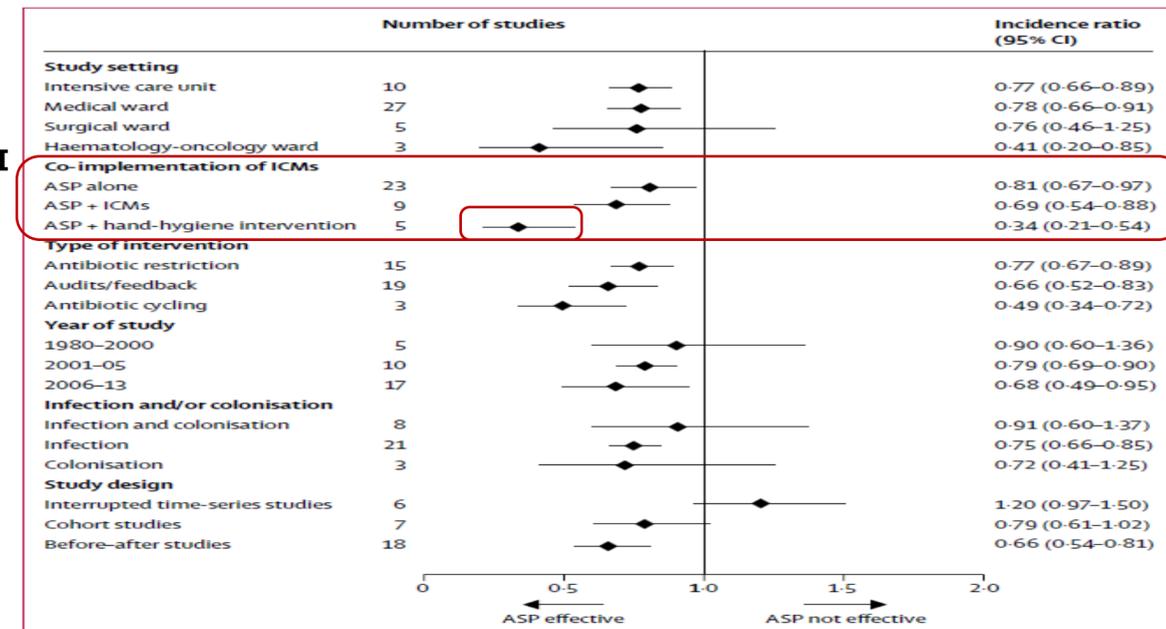
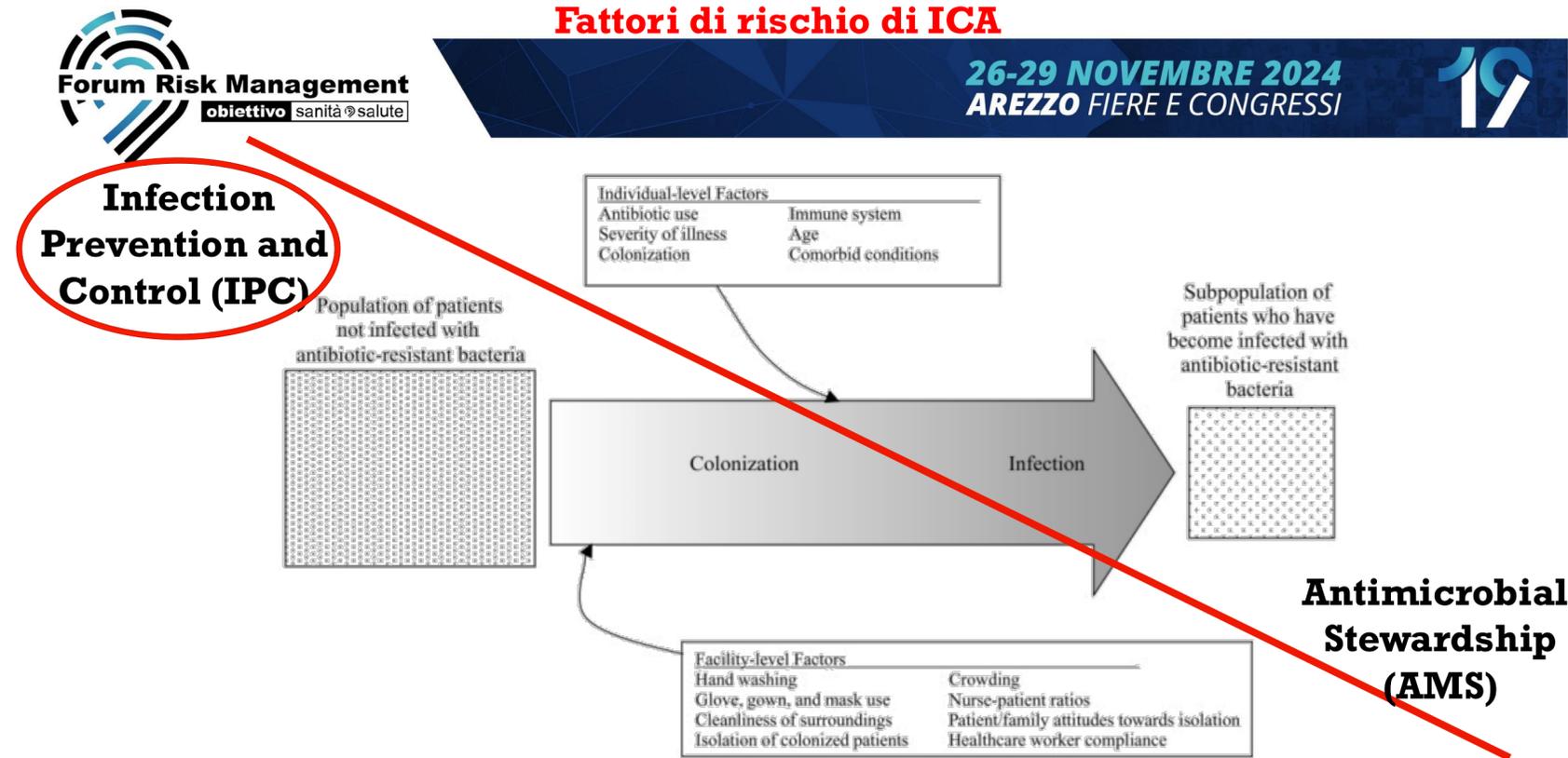


Figure 5: Summary forest plot of the incidence ratios for studies investigating the effect of ASPs on antibiotic resistance, according to study characteristics
ICM=infection control measure. ASP=antibiotic stewardship programme.

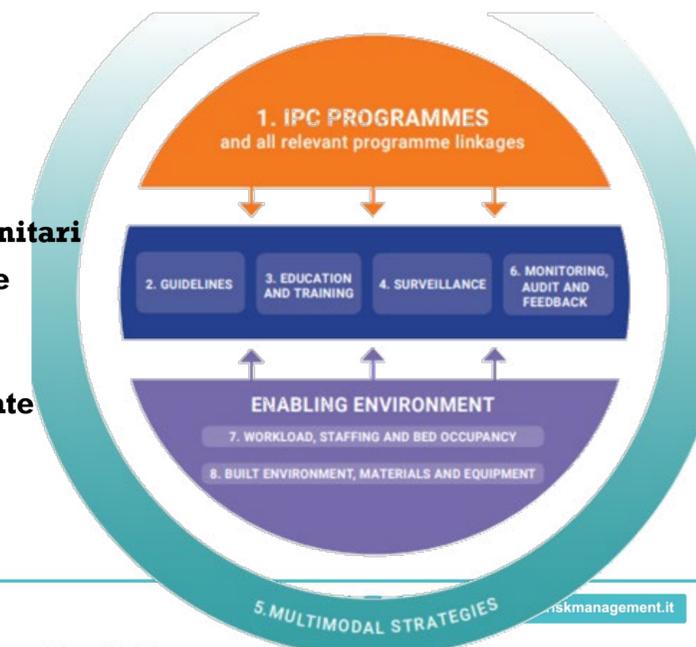
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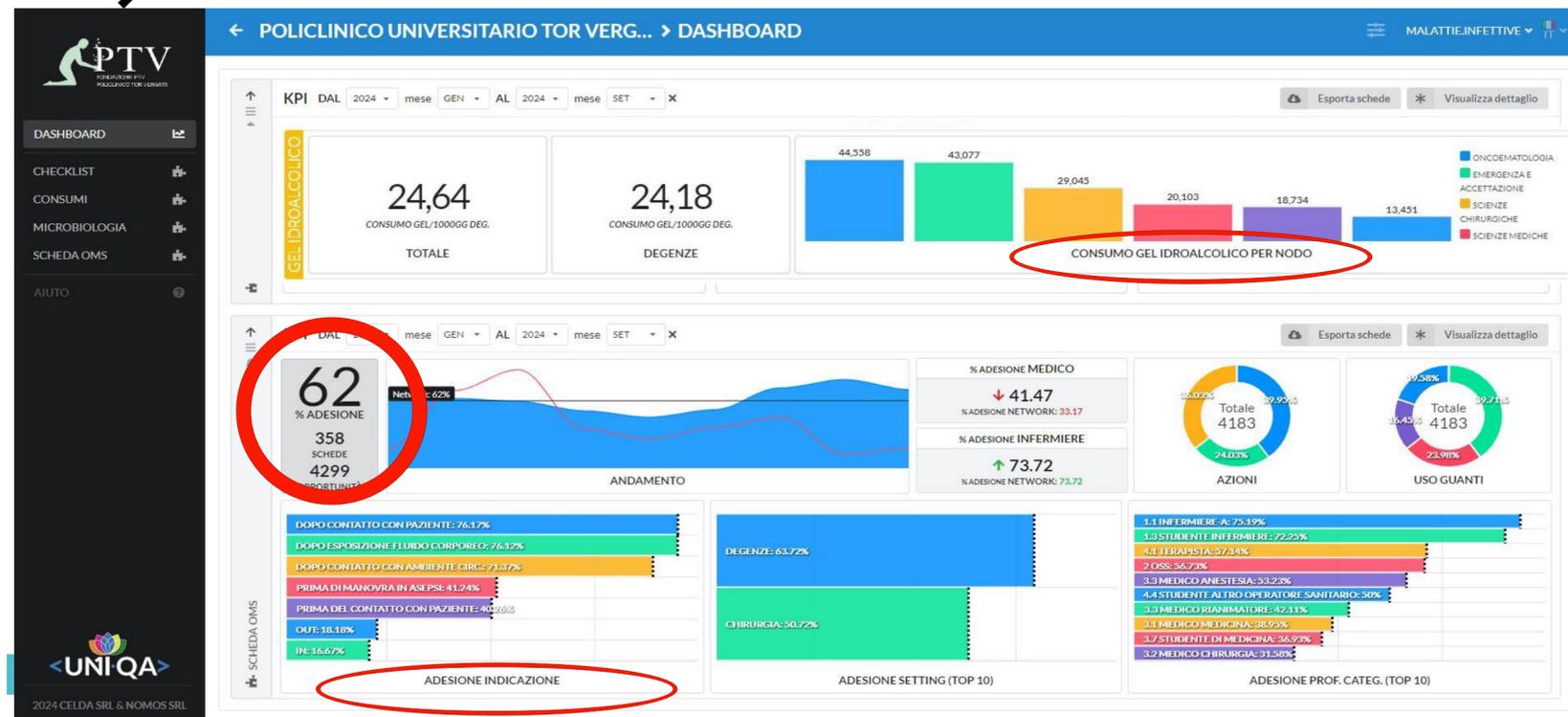


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 What Infection Control Interventions Should Be Undertaken to Control Multidrug-Resistant Gram-Negative Bacteria?
 Anthony D. Harris et al. Clinical Infectious Diseases 2006; 43:S57-61

Infection Prevention and Control (IPC)

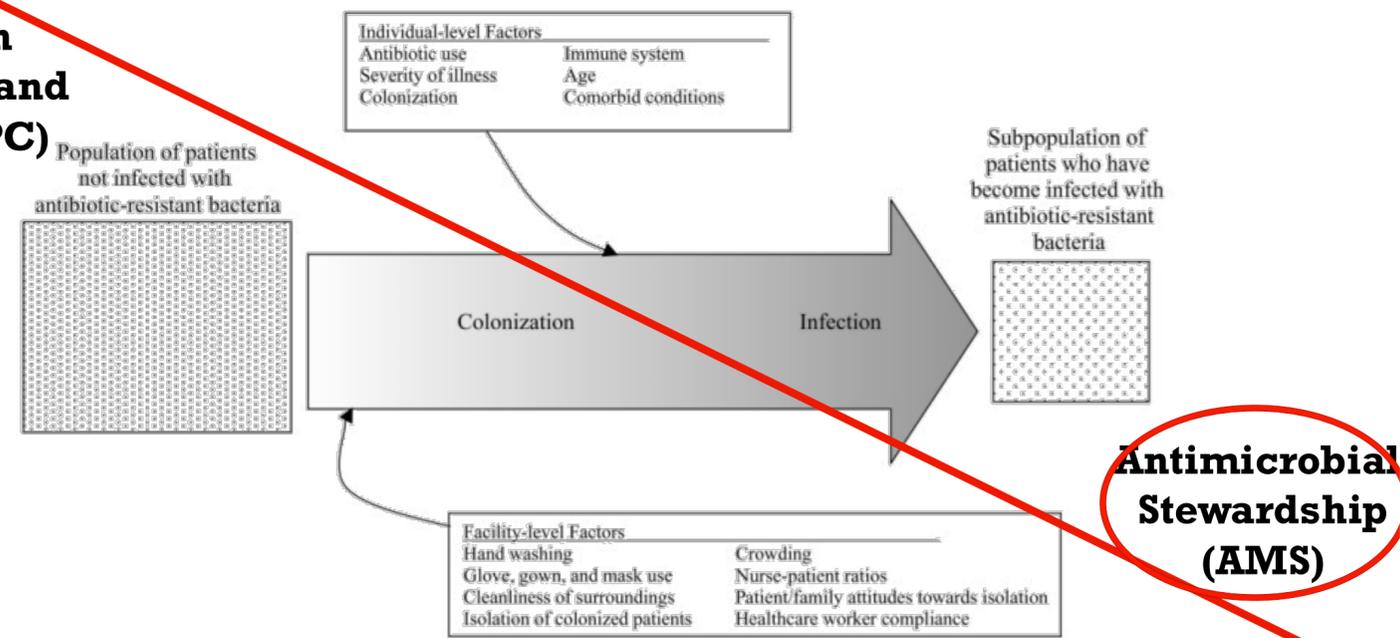
- ❖ **SORVEGLIANZA su ICA e AMR**
- ❖ Sviluppo e aggiornamento di linee guida e procedure operative
- ❖ **Prevenzione e risposta a Outbreak**
- ❖ **Programmi di aggiornamento e training degli operatori sanitari**
- ❖ **Controllo e feedback su compliance con le procedure e linee guida proposte**
- ❖ **Assicura che la cura del paziente avvenga in infrastrutture correttamente igienizzate e pulite e supportata da adeguate infrastrutture**





Fattori di rischio di ICA

Infection Prevention and Control (IPC)



#ForumRisk19
 What Infection Control Interventions Should Be Undertaken to Control Multidrug-Resistant Gram-Negative Bacteria?
 Anthony D. Harris et al. Clinical Infectious Diseases 2006; 43:S57-61

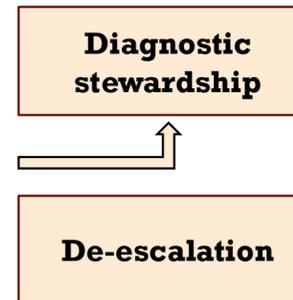


**10 GOLDEN RULES FOR OPTIMAL ANTIBIOTIC USE
 IN HOSPITAL SETTINGS**



**Risk stratification
 mortality / MDR**

- 1 Enhancing infection prevention and control
- 2 Prescribing antibiotics when they are truly needed
- 3 Prescribing the appropriate antibiotic(s) at the right time
- 4 Administering antibiotics in adequate doses and routes
- 5 Initiating, as soon as possible, targeted treatment based on the results of culture and susceptibility testing
- 6 Using the shortest duration of antibiotics based on evidence
- 7 Achieving source control by identifying and eliminating the source of the infection or reducing the bacterial load
- 8 Supporting surveillance of HAIs and AMR, monitoring of antibiotic use, consumption, and the quality of prescribing
- 9 Educating staff and improving awareness
- 10 Supporting multidisciplinary ASPs and enhancing collaboration of healthcare professionals from various disciplines



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**QUANDO
INIZIARE**

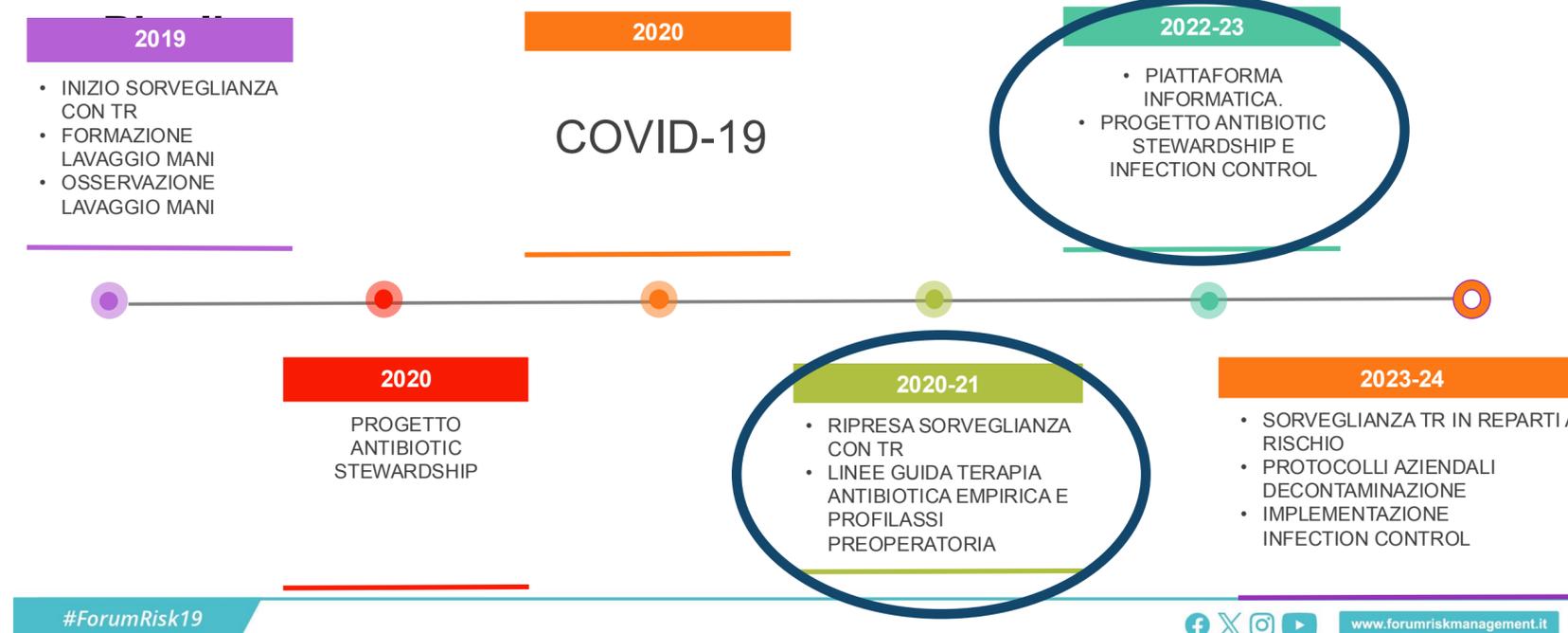


**CON QUALE/I
ANTIBIOTICO/I**



**PER QUANTO
TEMPO**

TOR VERGATA - Misure di contrasto a Antibiotico Resistenza

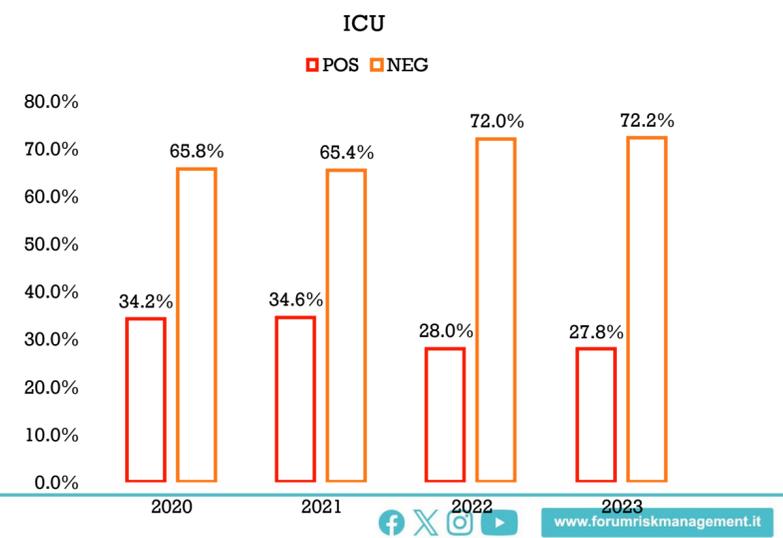
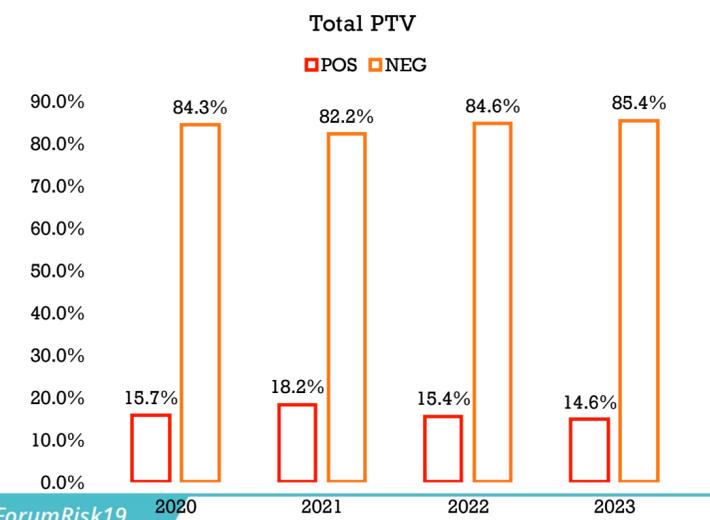




POLICLINICO TOR VERGATA
Infection Prevention and Control



PTV T.RETT	2020	2021	2022	2023
POS	931	1419	1028	925
NEG	5007	6399	5628	5398
TOT	5938	7786	6656	6323



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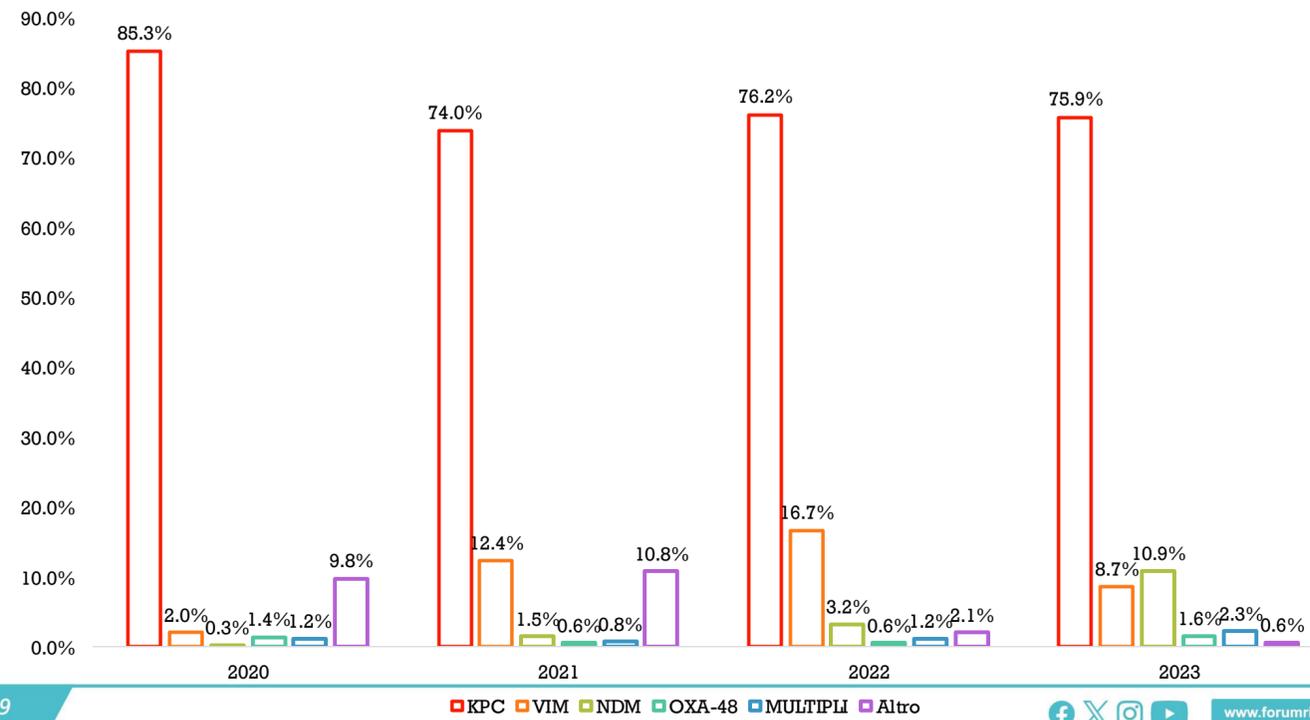
POLICLINICO TOR VERGATA
Infection Prevention and Control

Man:
obiettivo sanità & salute

AREZZO FIERE E CONGRESSI



Carbapenemases detection



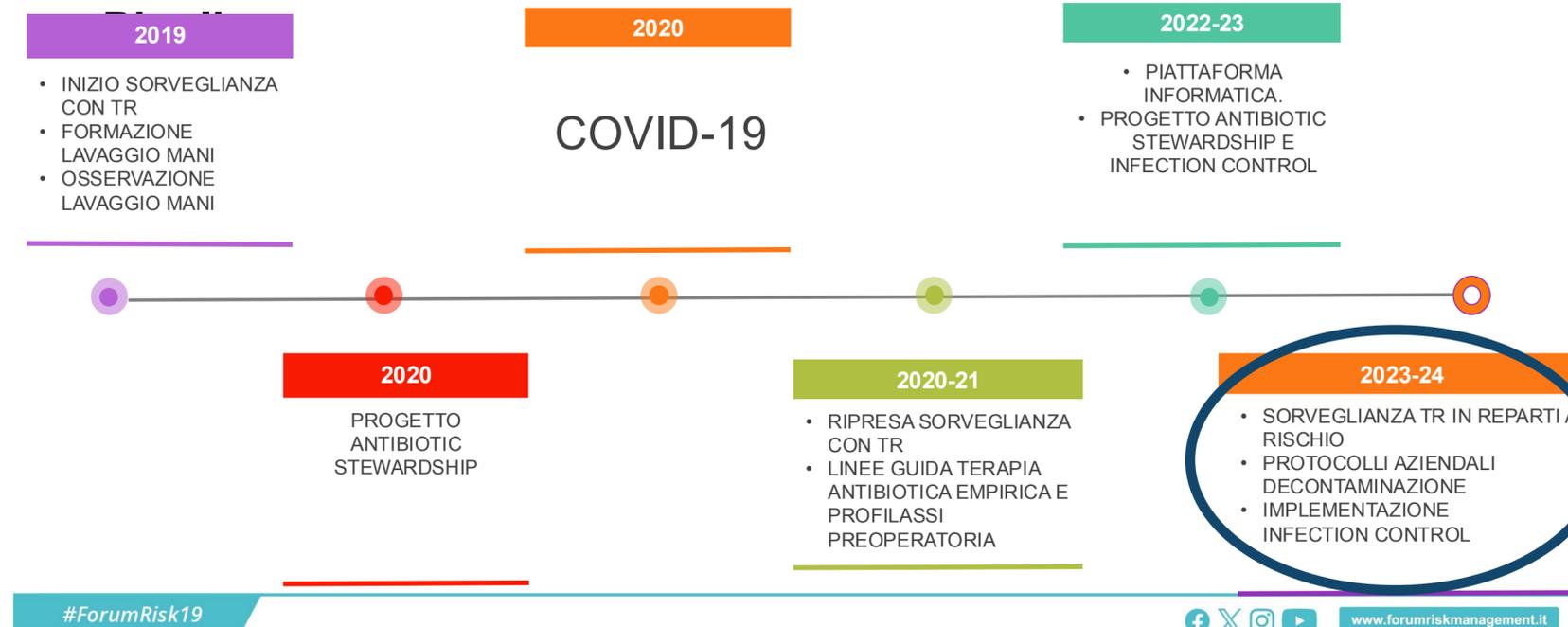
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■ KPC ■ VIM ■ NDM ■ OXA-48 ■ MULTIPLI ■ Altro



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TOR VERGATA - Misure di contrasto a Antibiotico Resistenza



TIPO DI INTERVENTO → Antimicrobial Stewardship Ward Round

Inizio: 2022

Attività: Valutazione **giornaliera** di tutti i pazienti ricoverati in ICU dal punto di vista infettivologico

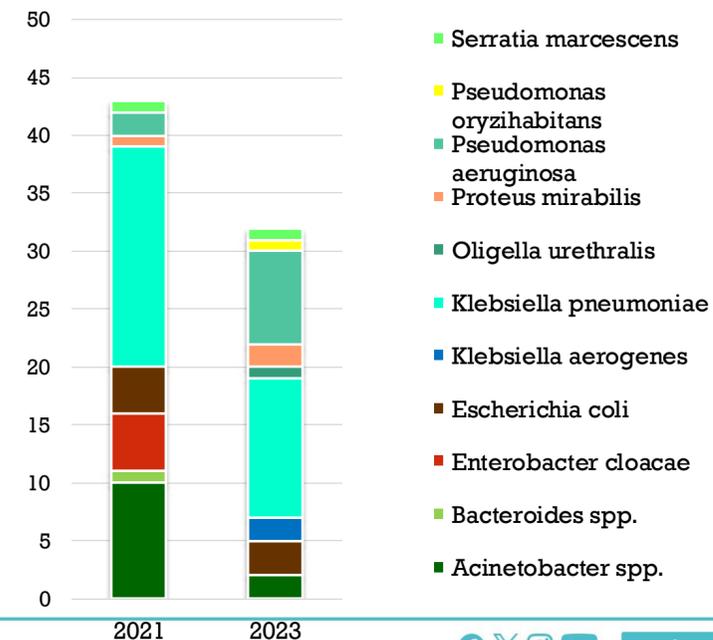
In particolare:

- Supporto nella diagnostica microbiologica
- Segnalazione tempestiva di germi Alert (entro 24h) con attivazione di misure di isolamento (dialogo costante con la microbiologia)
- Riduzione di terapia empirica il più possibile (dialogo costante con la microbiologia)
- Terapia mirata il prima possibile (dialogo costante con la microbiologia)
- Controllo giornaliero della durata della terapia con sospensione dopo massimo 14 giorni salvo diverse indicazioni

GNBSI in riduzione dall'introduzione di AMS



	2021 (%)	2023 (%)
BSI monomicrobiche Totali	130	89
Gram-negativi	43 (100)	32 (100)
Acinetobacter baumannii	9 (20,9)	2 (6,3)
Acinetobacter lactucae	1 (2,3)	0
Bacteroides caccae	1 (2,3)	0
Enterobacter cloacae	5 (11,6)	0
Escherichia coli	4 (9,3)	3 (9,4)
Klebsiella aerogenes	0	2 (6,3)
Klebsiella pneumoniae	19 (44,2)	12 (37,5)
Oligella urethralis	0	1 (3,1)
Proteus mirabilis	1 (2,3)	2 (6,3)
Pseudomonas aeruginosa	2 (4,6)	8 (25)
Pseudomonas oryzihabitans	0	1 (3,1)
Serratia marcescens	1 (2,3)	1 (3,1)

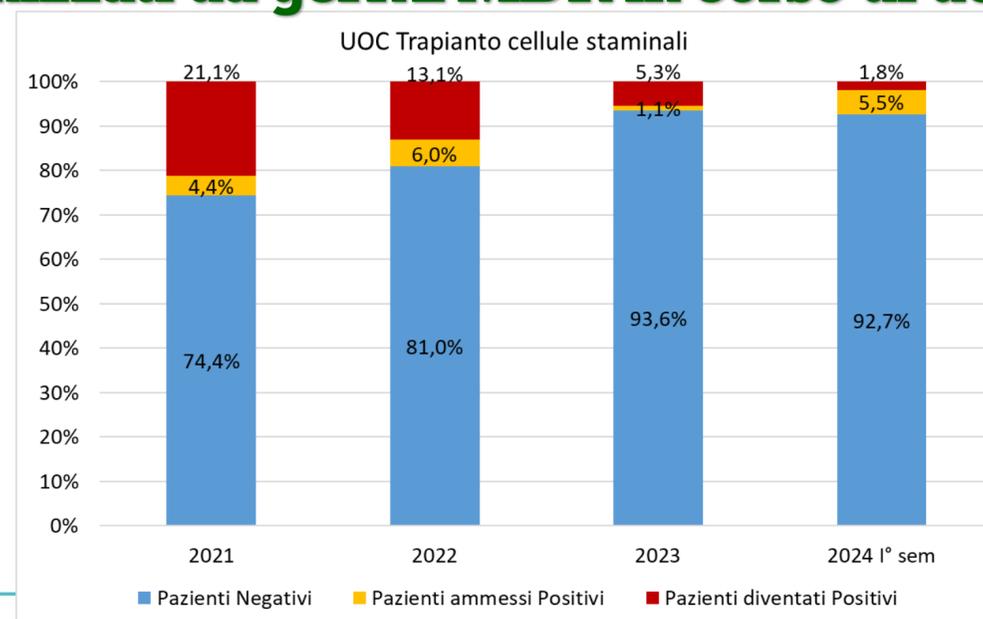


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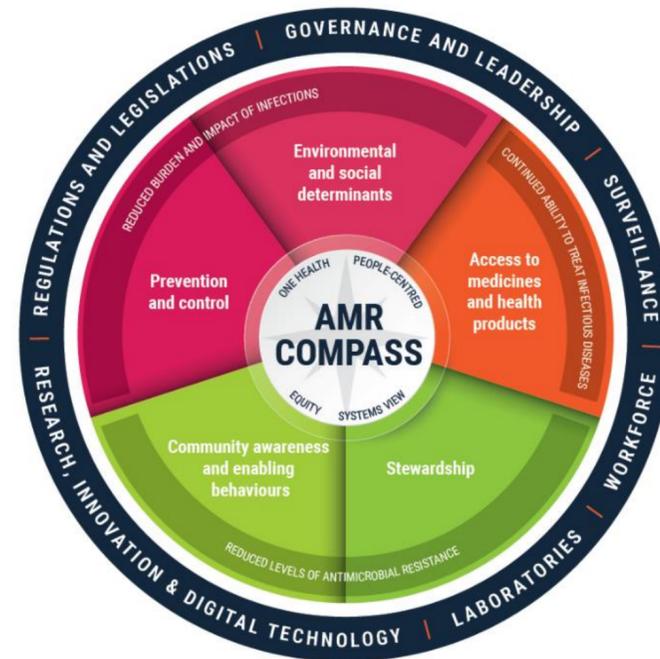
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HSCT WARD - Riduzione dei pazienti colonizzati da germi MDR in corso di degenza



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COMUNICAZIONE
 e
FORMAZIONE CONTINUA

DISPONIBILITA' di DATI

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