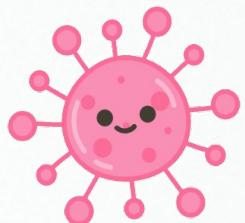




GiViTI - Gruppo italiano per la Valutazione
degli Interventi in Terapia Intensiva

MALATTIE INFETTIVE e TERAPIA INTENSIVA a braccetto...



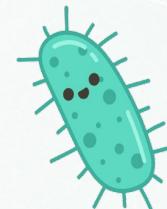
www.giviti.marionegri.it



Ospedale Luigi Sacco
AZIENDA OSPEDALIERA - POLO UNIVERSITARIO

Meeting GiViTI 2025
8 - 9 - 10 ottobre

Dott.ssa Marta Colaneri
Dott.ssa Martina Offer
Dott. Emanuele Palomba



Chi siamo noi?



Dipartimento di Scienze Biomediche e Cliniche



Ospedale Luigi Sacco
AZIENDA OSPEDALIERA - POLO UNIVERSITARIO



Infettivologo
serio

Infettivologa
Ricercatrice
di UNIMI
(non seria)



Statistica
bravissima

**GRUPPO ITALIANO PER LA VALUTAZIONE
DEGLI INTERVENTI IN TERAPIA INTENSIVA**

Registrati all'associazione GiViTI

Ricordiamo che per una corretta iscrizione tutti i campi devono essere compilati



Gruppo infezioni

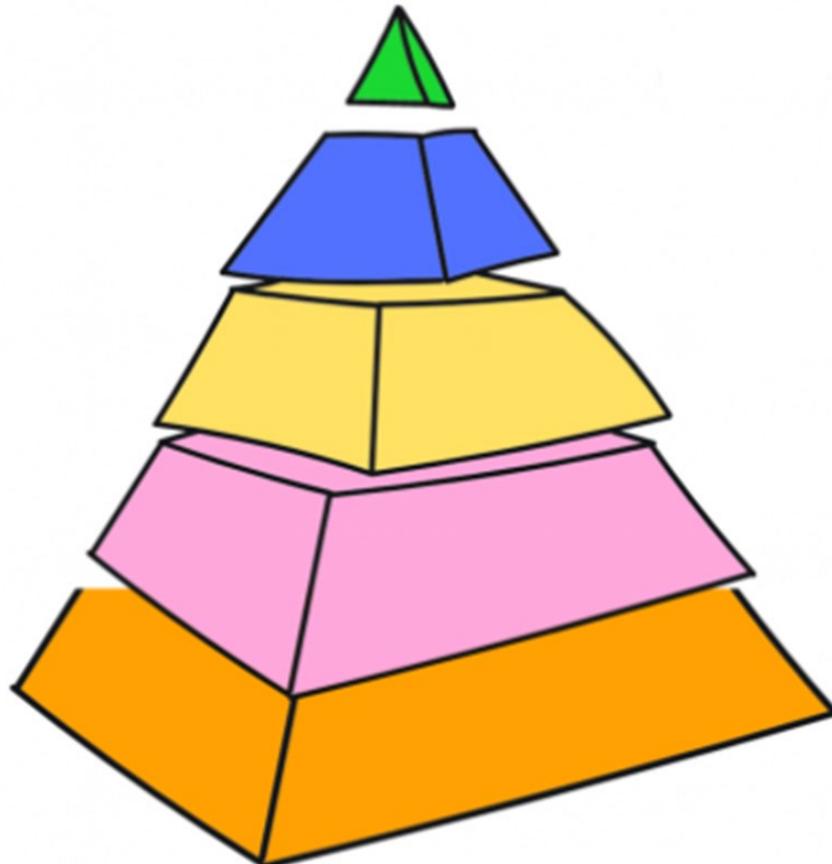


Ogni mese ci riuniamo per risolvere questioni legate alla modalità di compilazione ed alla struttura dei dati (che riguardano le **infezioni!**)

Il fine è quello di una migliore **gestione** dei **pazienti**, del **tempo** del **compilatore**
...ma anche di ottenere input utili ai fini di **ricerca** scientifica..



Approccio di ricerca per persone pazienti... a step!



Studi epidemiologici con focus
microbiologico





OPEN ACCESS

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Understanding the burden of antibiotic resistance: a decade of carbapenem-resistant Gram-negative bacterial infections in Italian intensive care units

Giovanni Scaglione^{1,2†}, Matilde Perego^{3†}, Marta Colaneri^{1,4*},
Camilla Genovese^{1,2}, Fabio Brivio^{1,2}, Alice Covizzi¹,
Bruno Viaggi⁵, Alessandra Bandera^{6,7}, Andrea Gori^{1,2,4*},
Stefano Finazzi^{3‡} and Emanuele Palomba^{1‡}

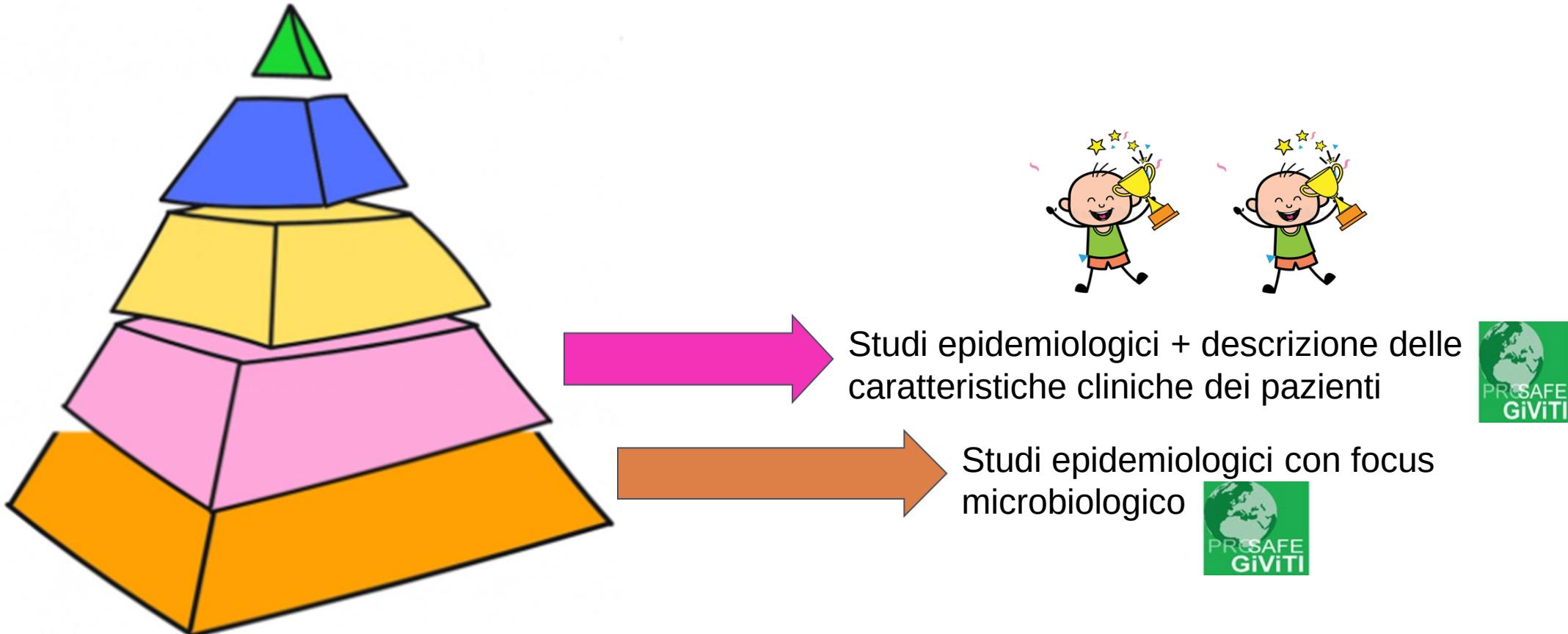
Data from 299,280 () patients involved Italian ICUs between



‘+ted to the
722



Approccio di ricerca per persone pazienti... a steps!





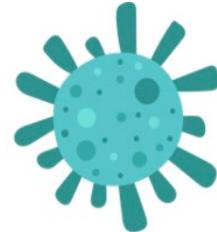
Transplant Infectious Disease

Hospital Acquired Infections Among Solid Organ Transplant Recipients Hospitalized In Intensive Care Unit (2018-2024): A Study Of The GiViTI Group

DOI: 10.1111/tid.70120

Status: In Production

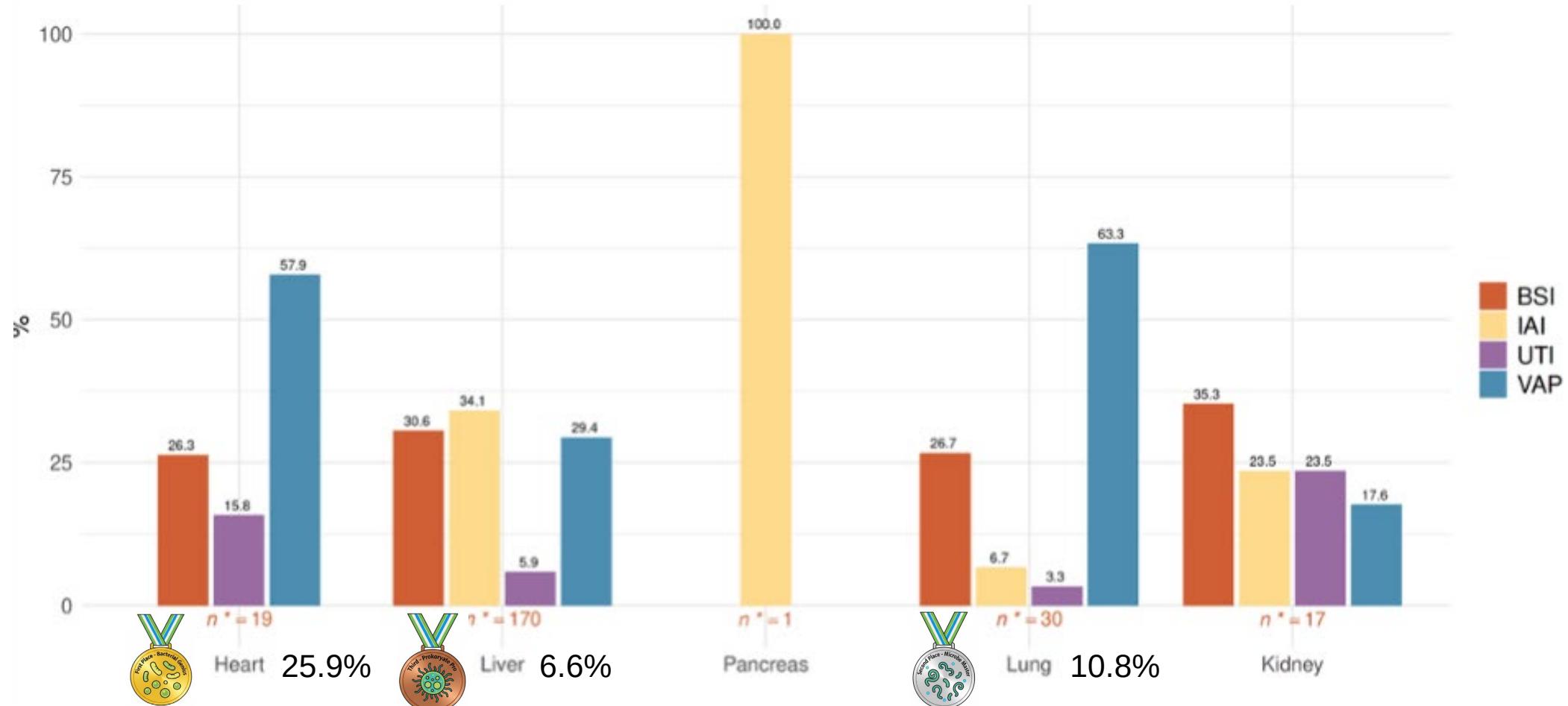
Cosa volevamo studiare?

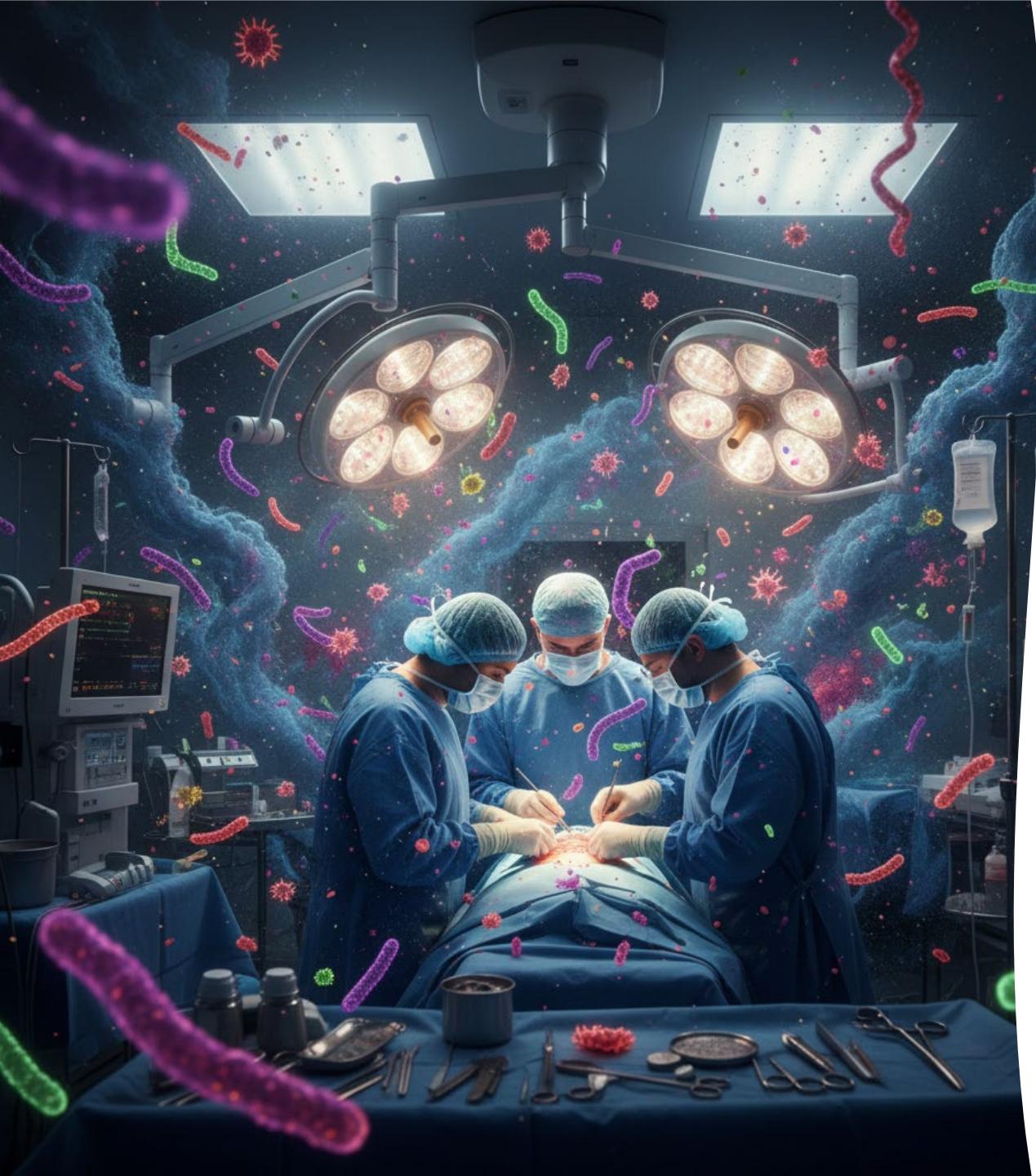


Objectives:

- **Primary:** incidence of ICU-HAIs in patients who underwent SOT during hospitalization and who were admitted to the included ICU from 2018 to 2024.
- **Secondary**
 - o Incidence of MDRO-ICU-HAIs
 - o Outcomes of SOTR with ICU-HAIs and MDR-ICU-HAIs

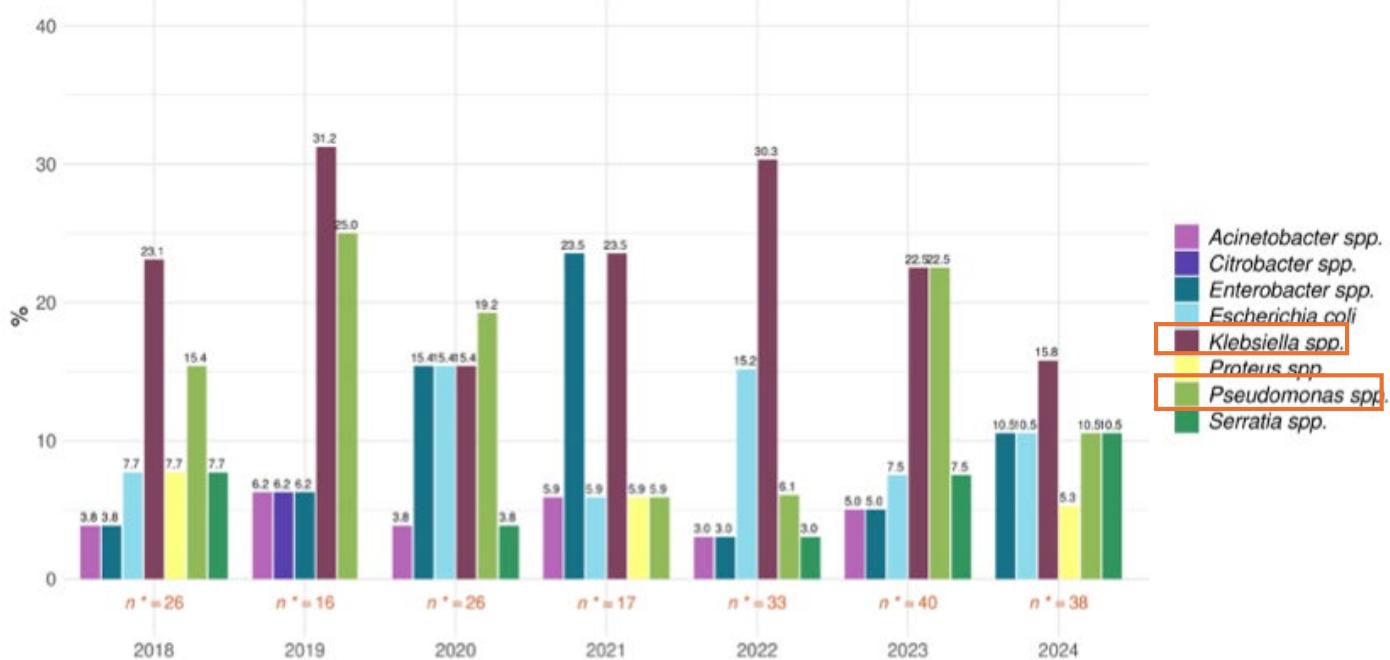
- 2,210 SOTR from 31 ICUs
 - Liver (1717, 77.7%), kidney (291, 13.2%), lung (204, 9.2%) and heart (58, 2.6%)
- **154 (6.97%) developed 193 ICU-acquired infections**
 - Median 6 days (IQR 4, 14)
 - VAP (74, 38.3%), BSI (56, 29%), IAI (46, 23.8%) and UTI (17, 8.8%)
 - MDRO 34/87 (39%)



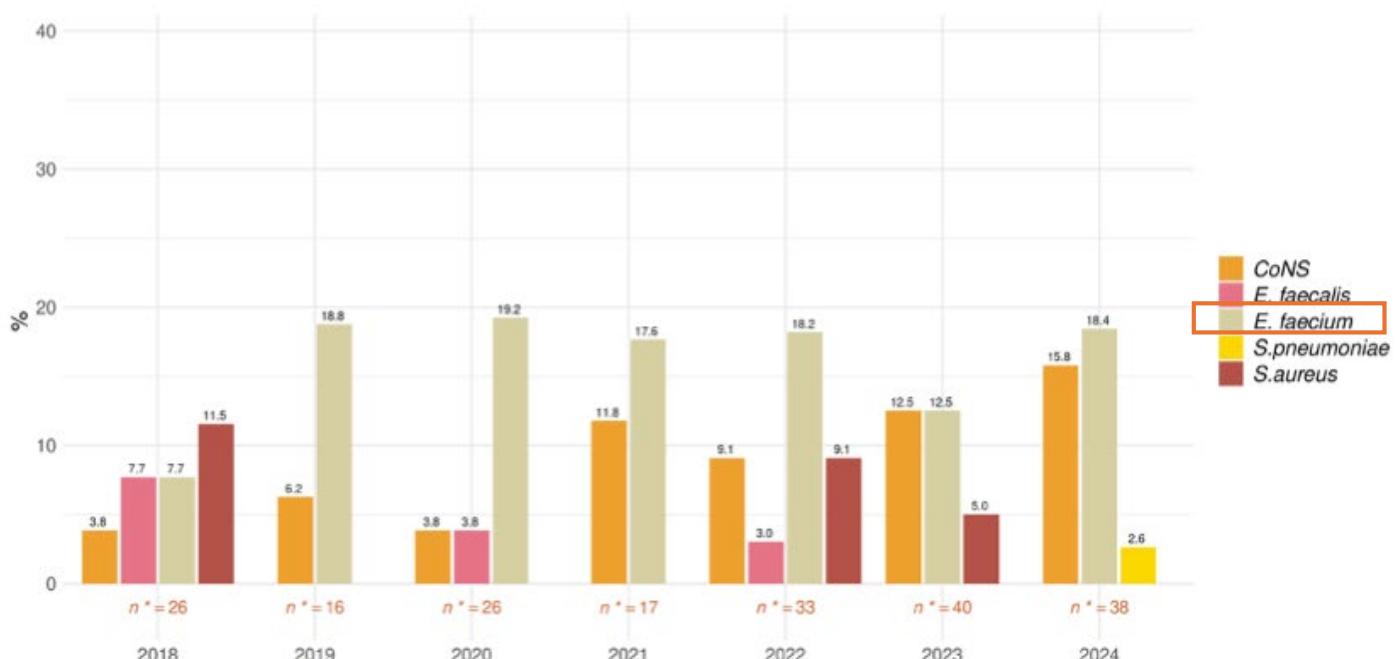


Outcomes

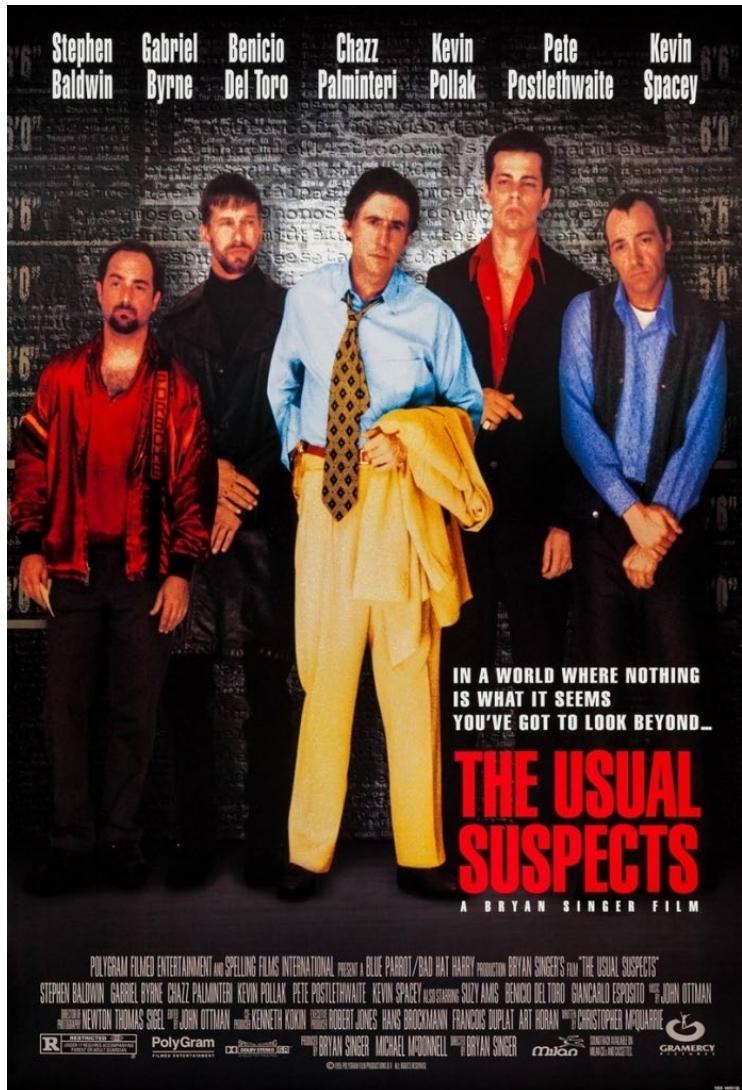
- SOTR with ICU-acquired infections had higher **intra-ICU mortality** (22.4% vs 2.4%; p<0.001), **intra-hospital mortality** (7% vs 1.7%, p<0.001) and longer **ICU LOS** (24 vs 4 days; p<0.001)
- Albeit not significant, MDRO infections had higher mortality (23.5% vs 17%), intra-ICU LOS (33.5 days vs 23) and intra-hospital LOS (76 days vs 52 days).

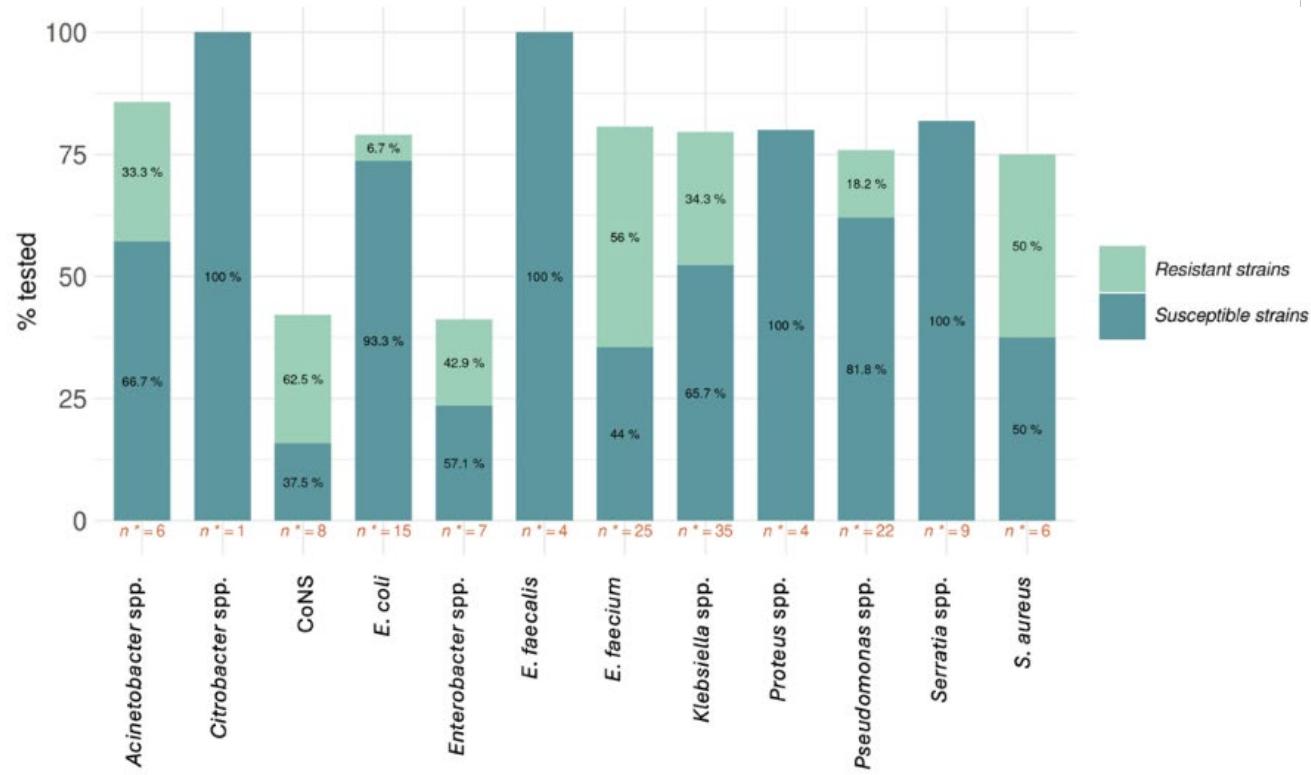
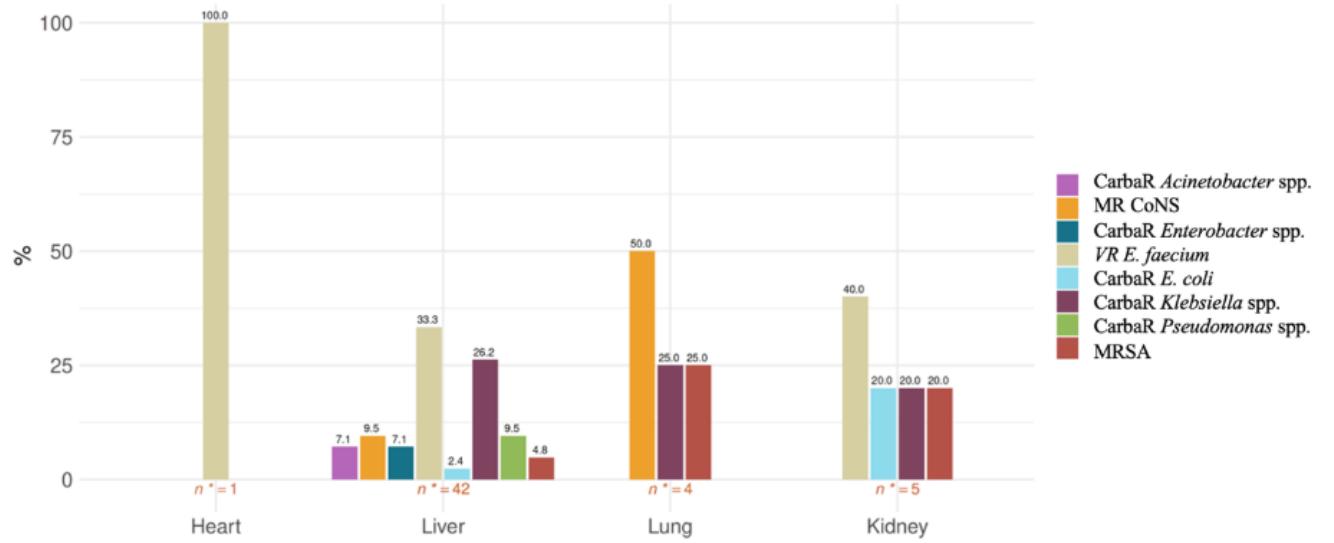


a)

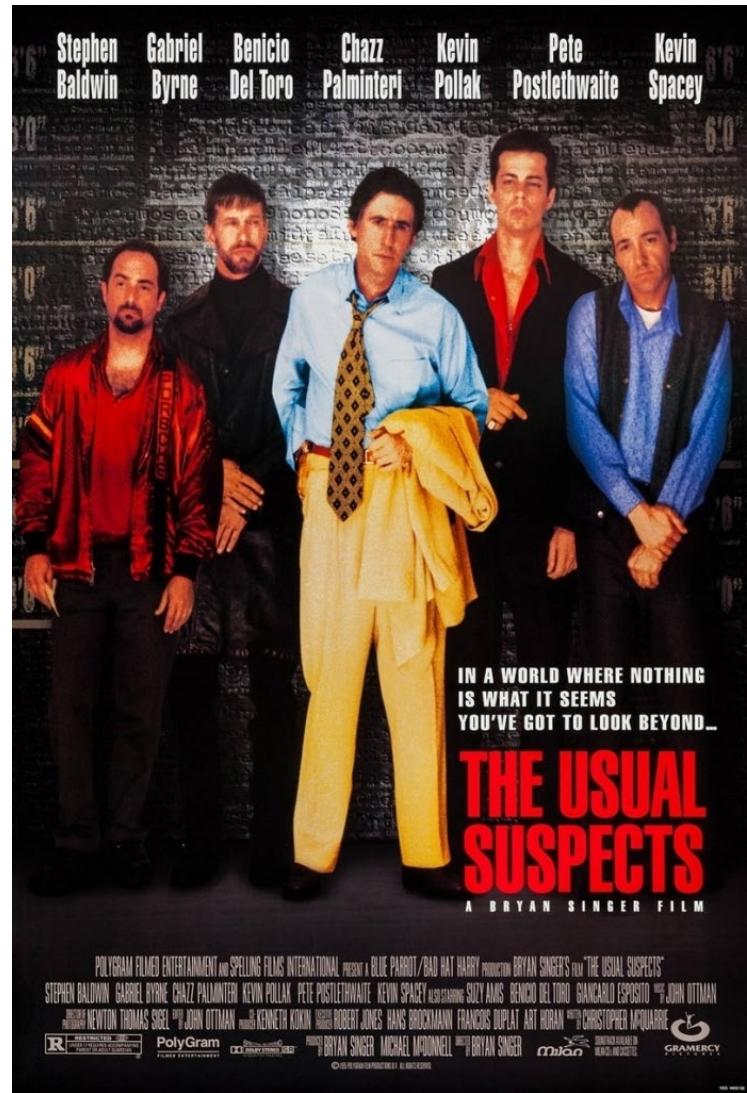


b)





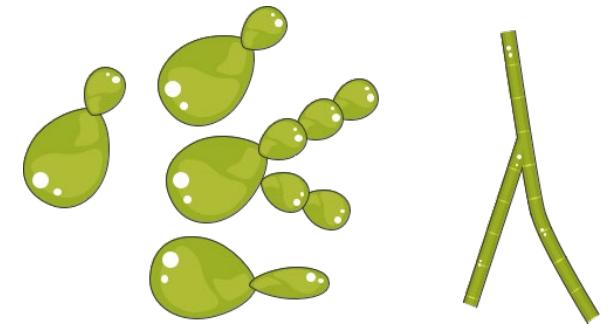
b)



Epidemiology, Resistance Patterns, and Outcomes of Candidemia acquired in Italian Intensive Care Units: Insights from the GIVITI Network (2020-2024)

in writing

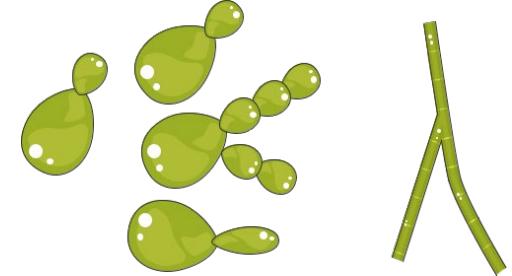
Cosa volevamo studiare?



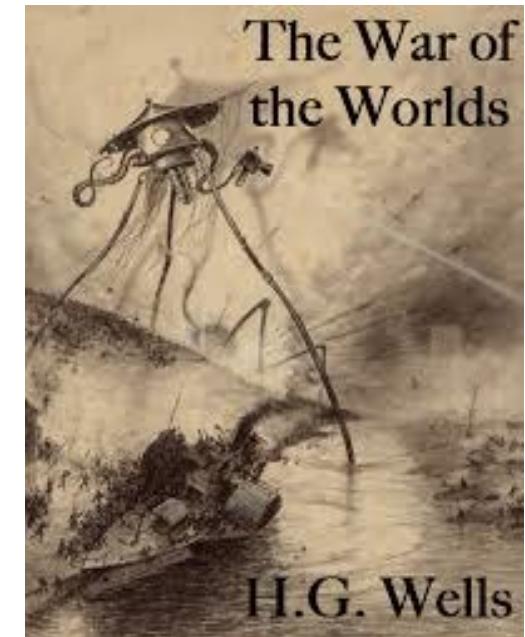
Objectives:

- Primary: incidence of ICU-acquired candidemia from 2020 to 2024.
- Secondary
 - o ICU-acquired candidemia vs. bacterial BSI
 - o Trend of susceptibility patterns of *Candida* spp.
 - o ICU-acquired fluconazole-resistant vs. fluconazole-susceptible candidemia
 - o CR vs. non-CR ICU-acquired candidemia

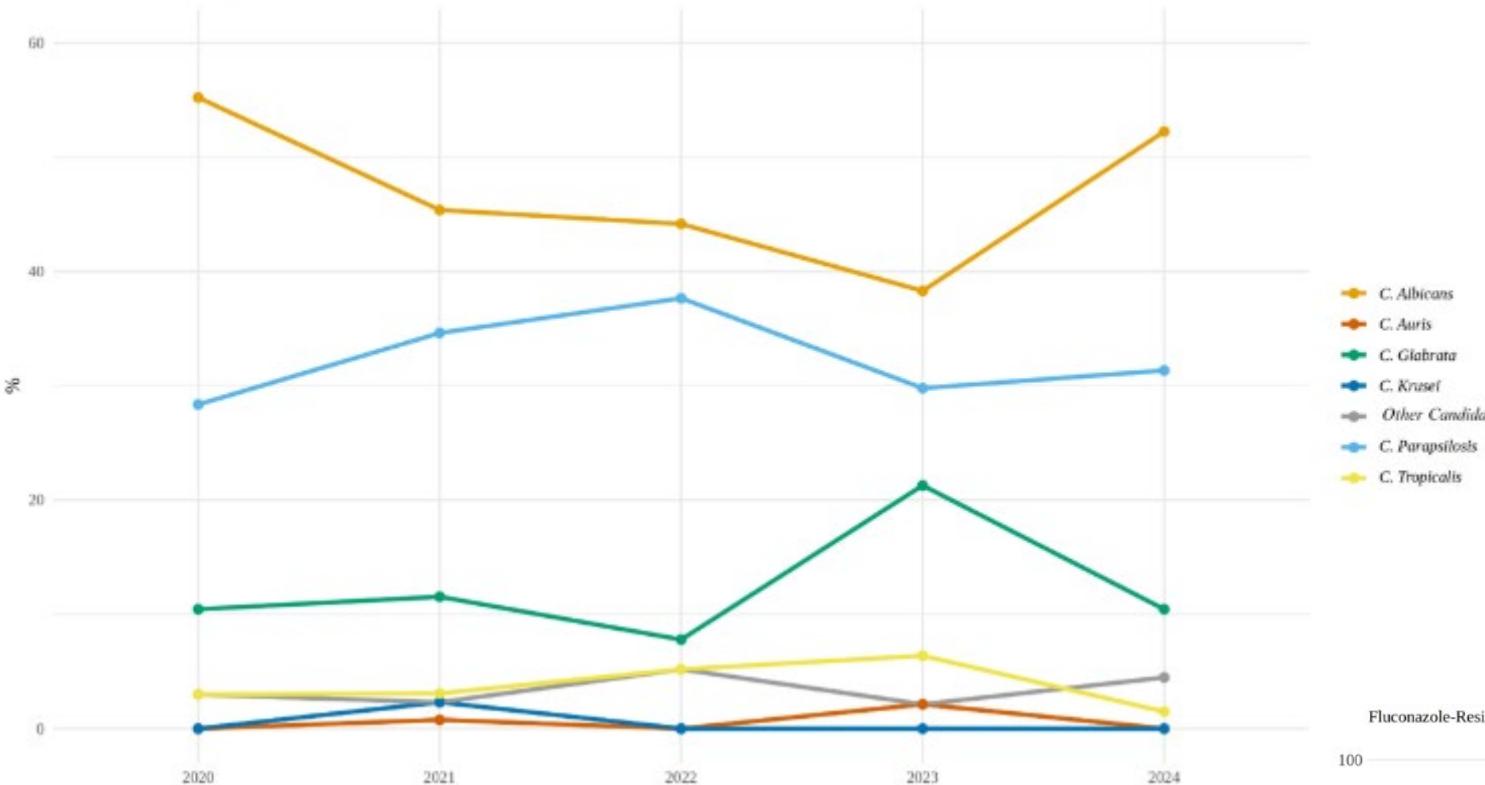
Results



- 95,662 patients “at-risk” of ICU-acquired candidemia, 373 (**3.9 per 1,000 at risk-ICU admissions**)
 - 1,559 patients experienced at least one episode of candidemia, either at ICU admission or diagnosed during their ICU stay, corresponding to a **cumulative incidence of 8.7 per 1,000 ICU-admissions**
 - Yearly cumulative incidence highest in 2021 (0.6%), and ranged between 0.2% and 0.4% in the remaining years
- **Candidemia vs bacterial BSI**
 - **Fragile**: immunosuppression, cardiological conditions, and diabetes
 - **Severity** at admission: SOFA and SAPSII scores
 - Prevalences of **other infections** (respiratory, CNS, IAI, skin and soft tissues)
 - Empirical **antibiotic therapy** at admission
 - **Hemodialysis and parenteral nutrition** at admission
 - Prolonged **ICU LOS** (32 days vs 24), **intra-hospital LOS** (44 days vs 36)
 - **Intra-ICU mortality** (41.3% vs 28.7%); **in-hospital mortality** (50.3% vs 34.1%)



Isolated *Candida* species over time (2020-2024)

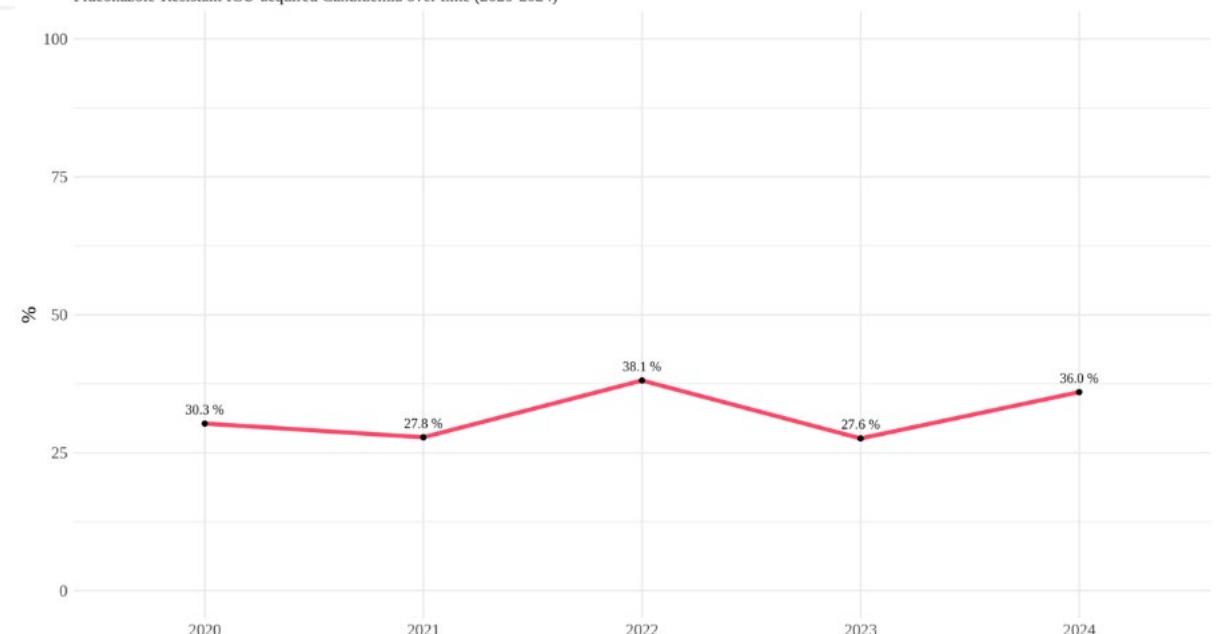


C. albicans susceptible to fluconazole in over 90% of cases (81/89, 91.0%)

Fluconazole-resistance in non-albicans strains

- *C. glabrata* (9/22, 40.9%)
- *C. parapsilosis* (44/82, 53.7%)
- *C. tropicalis* (6/8, 75.0%).

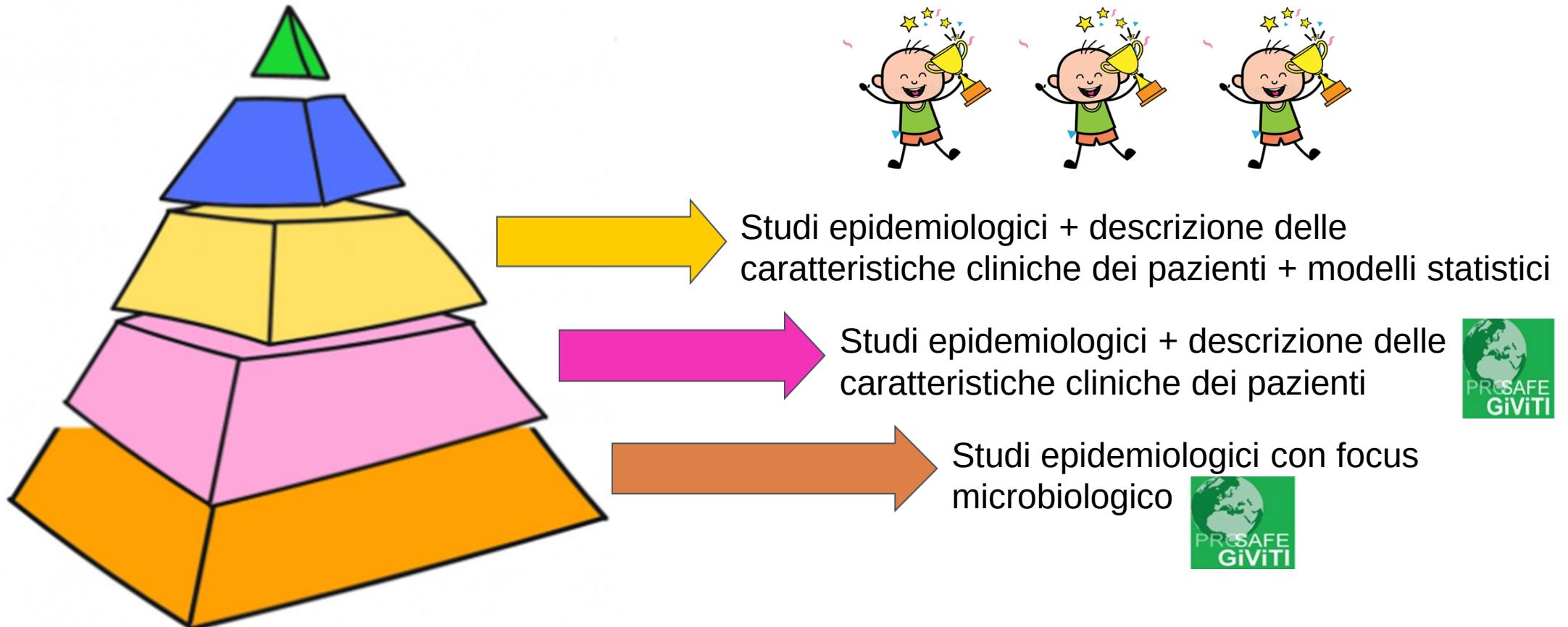
Fluconazole-Resistant ICU-acquired Candidemia over time (2020-2024)



- Fluconazole-resistant vs susceptible candidemia
 - 65/208, 31.2% fluconazole-resistant
 - No differences in baseline characteristics
 - Longer Intra-ICU LOS (36 days vs 31, $p=0.014$) and intra-hospital LOS (47.5 days vs. 41.5 $p=0.146$)
 - No differences in mortality
- CR vs non-CR candidemia
 - 176/373, 47.2% CR events
 - Most frequent source of ICU-acquired candidemia in the years 2021 and 2022
 - Medical wards and the emergency department, receiving antibacterial agents for a pre-existing infection
 - Higher Intra-ICU LOS (34 days vs 30.0), no difference in intra-hospital
 - Higher intra-ICU mortality (46.7% vs. 35.2%, p -value = 0.025) and intra-hospital mortality (57.0% vs 42.9%, p -value = 0.007)



Approccio di ricerca per persone pazienti... a step!





ELSEVIER

Contents lists available at ScienceDirect

Clinical Microbiology and Infection

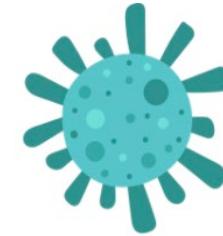
journal homepage: www.clinicalmicrobiologyandinfection.org

Original article

Incidence, microbiology, and mortality of ventilation-associated pneumonia in a large Italian cohort of critically ill patients: results from the PROSAFE project

Marta Colaneri ^{1,2,3}, Giorgia Montrucchio ^{4,5}, Giovanni Scaglione ¹, Gianpaola Monti ⁶,
Giovanni Tricella ⁷, Camilla Genovese ¹, Fulvio Agostini ⁵, Francesca Dore ⁷, Bruno Viaggi ⁸,
Luca Brazzi ^{4,5}, Valentina Sanna ⁴, Andrea Gori ^{1,2,3}, Emanuele Palomba ^{1,3,*},
Martina Offer ², Stefano Finazzi ⁷ on behalf of the Infection Surveillance Study Group of the
Italian Group for Evaluation of Interventions in Intensive Care Medicine

Cosa volevamo studiare?

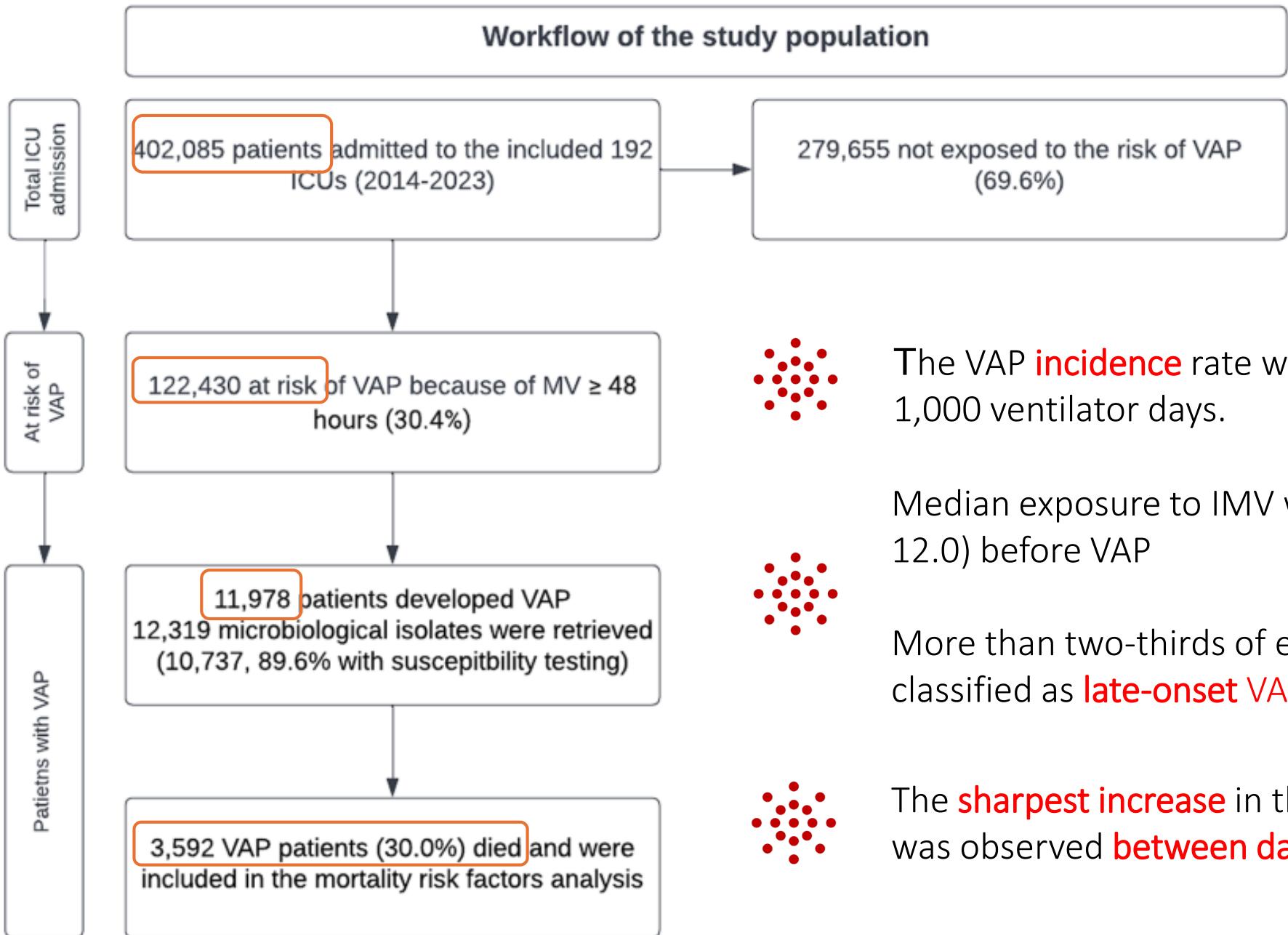


The primary objective was to estimate VAP incidence across Italian ICUs.

Secondary objectives included describing microbiological characteristics and their evolution in an MDRO-prevalent setting...



and identifying factors associated with intra-ICU mortality
in patients with VAP.



The VAP **incidence** rate was **10.5** (10.3–10.7) cases per 1,000 ventilator days.



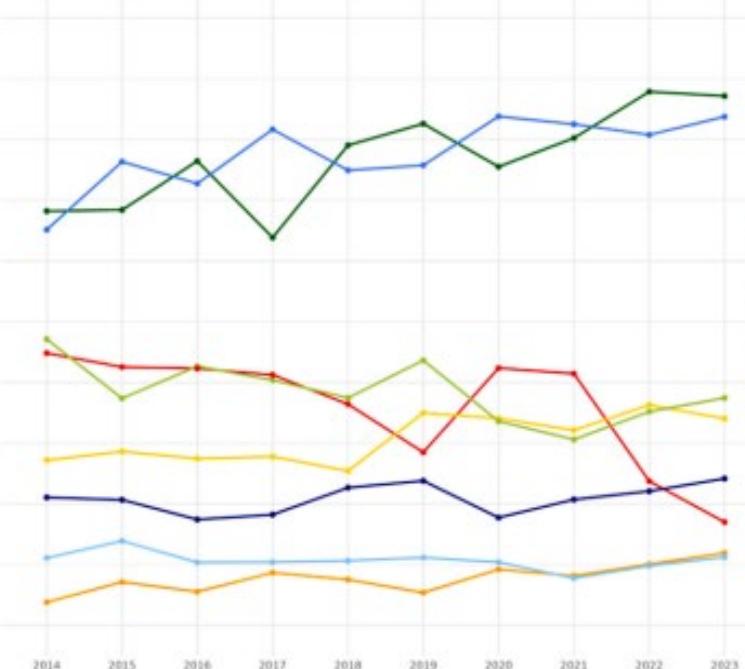
Median exposure to IMV was **7 days** (Q1–Q3: 4.0–12.0) before VAP



More than two-thirds of episodes (8,149, 68.0%) were classified as **late-onset VAP**.

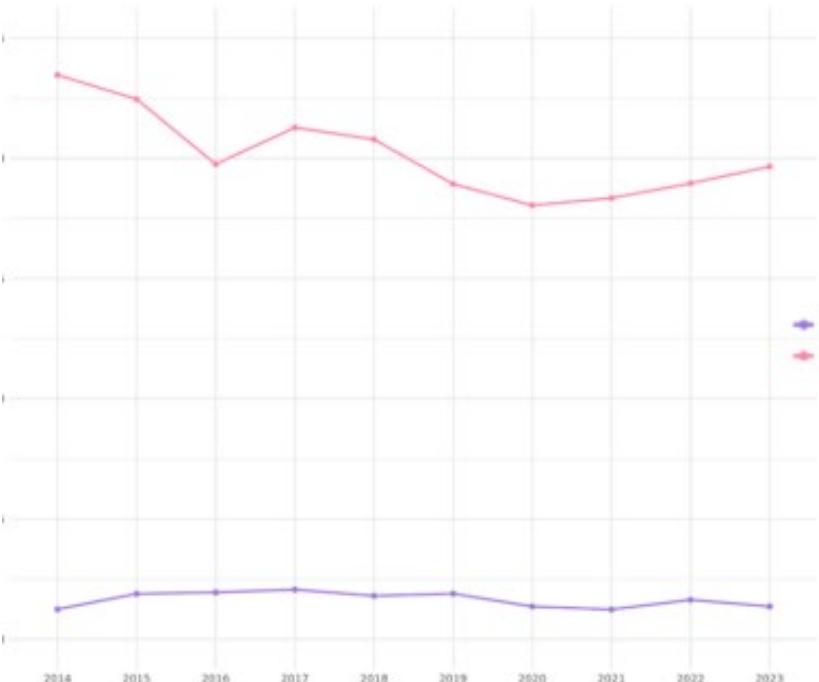
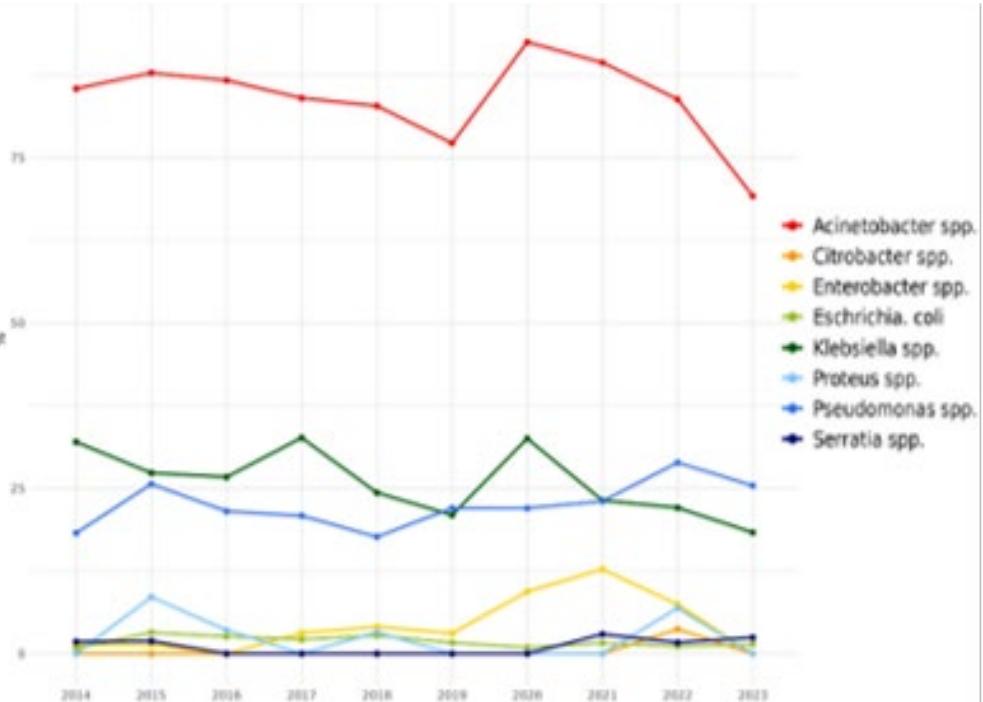
The **sharpest increase** in the number of VAP diagnoses was observed **between days 3 and 4 of IMV**

Fig. 1. Study flowchart. ICU, intensive care unit; MV, mechanical ventilation; VAP, ventilator-associated pneumonia.



Acinetobacter spp.
Citrobacter spp.
Enterobacter spp.
Escherichia. coli
Klebsiella spp.
Proteus spp.
Pseudomonas spp.
Serratia spp.

1
2
3



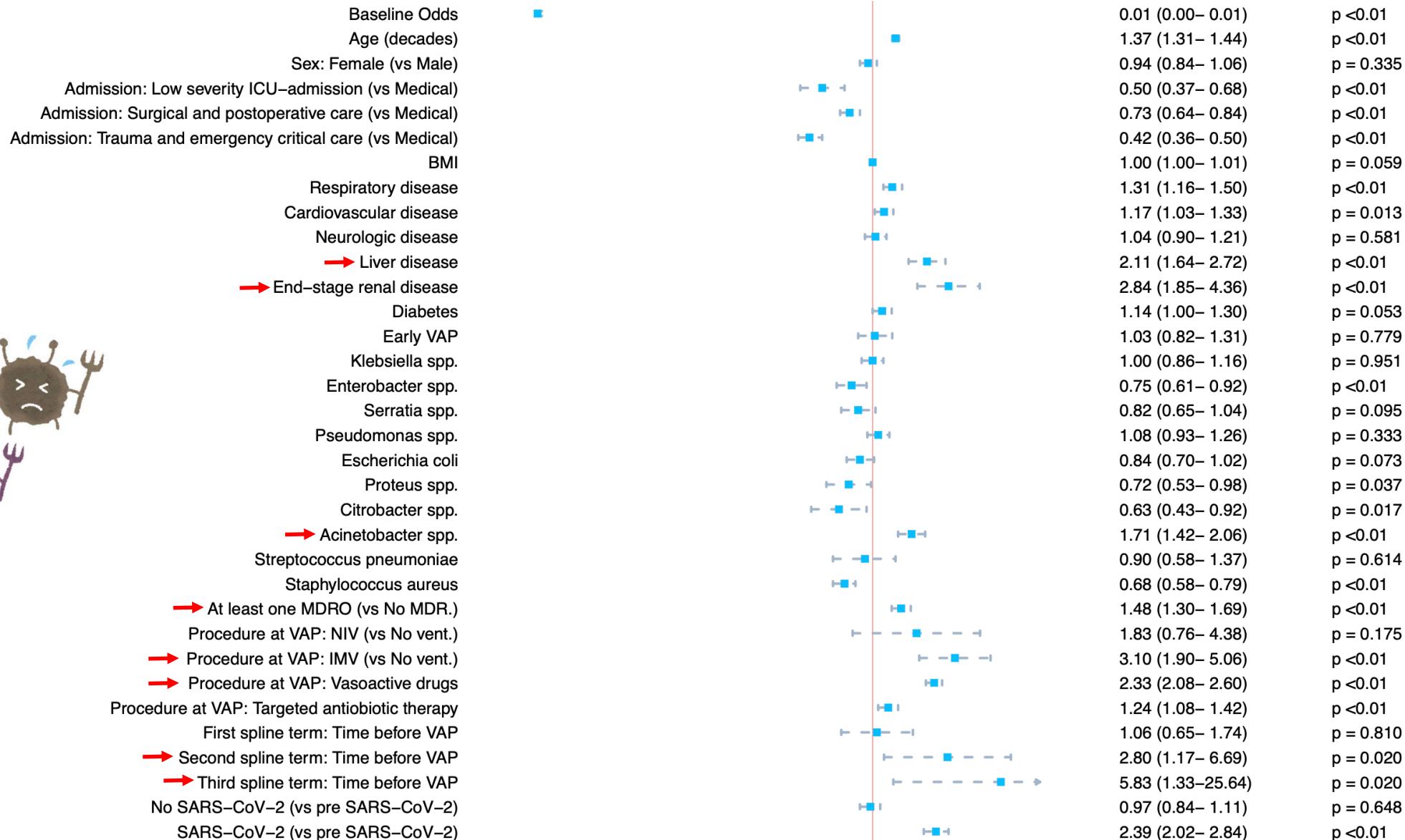
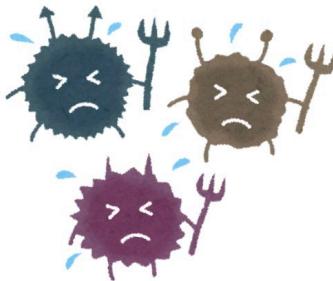
S.pneumoniae
S.aureus



PR S.pneumoniae
MRSA



Forest plot - expected ICU mortality at VAP



Modello logistico

BSI in Italian ICUs



GiViTI



Gruppo Italiano per la Valutazione degli Interventi in Terapia Intensiva

BLOODICU bloodstream infections and their outcomes in ICU patients: insights from the PROSAFE study

02. Bacterial infection & disease

02b. Severe sepsis, bacteraemia & endocarditis (incl epidemiology, diagnosis, host biomarkers, treatment, and outcome prediction)

C. Genovese¹, M. Offer², G. Tricella³, G. Scaglione¹, E. Palomba¹, G. Montrucchio⁴, F. Agostini⁵, F. Dore³, G. Monti⁶, B. Viaggi⁷, A. Gori¹, S. Finazzi³, M. Colaneri².

¹Department of Infectious Diseases, ASST Fatebenefratelli Sacco University Hospital - Milan (Italy), ²Department of Biomedical and Clinical Sciences "L. Sacco", University of Milan - Milan (Italy), ³Laboratory of Clinical Data Science, Department of Public Health, Mario Negri Institute for Pharmacological Research IRCCS - Ranica (Italy),

⁴Department of Surgical Sciences, University of Turin - Turin (Italy), ⁵Anesthesia and Intensive Care 3, University Hospital City of Science and Health, CTO Hospital - Turin (Italy), ⁶Dipartimento di Anestesia e Rianimazione, ASST Grande Ospedale Metropolitano Niguarda - Milan (Italy), ⁷Department of Anaesthesiology, Neuro-Intensive Care Unit, Careggi University Hospital - Florence (Italy)



Congress of the European Society of Clinical Microbiology and Infectious Diseases

- 10-years retrospective analysis
- 211'491 included patients
- 192 Italian ICUs



BSI

Bloodstream Infection



Popolazione

Tutti i pazienti con ammissione in TI tra 2014 e 2024



Evento

Pazienti con **BSI ICU-acquired** con isolamenti solo da microrganismi selezionati insorte nei primi 30 giorni dall'ingresso in TI



Obiettivo

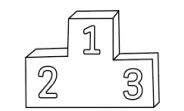
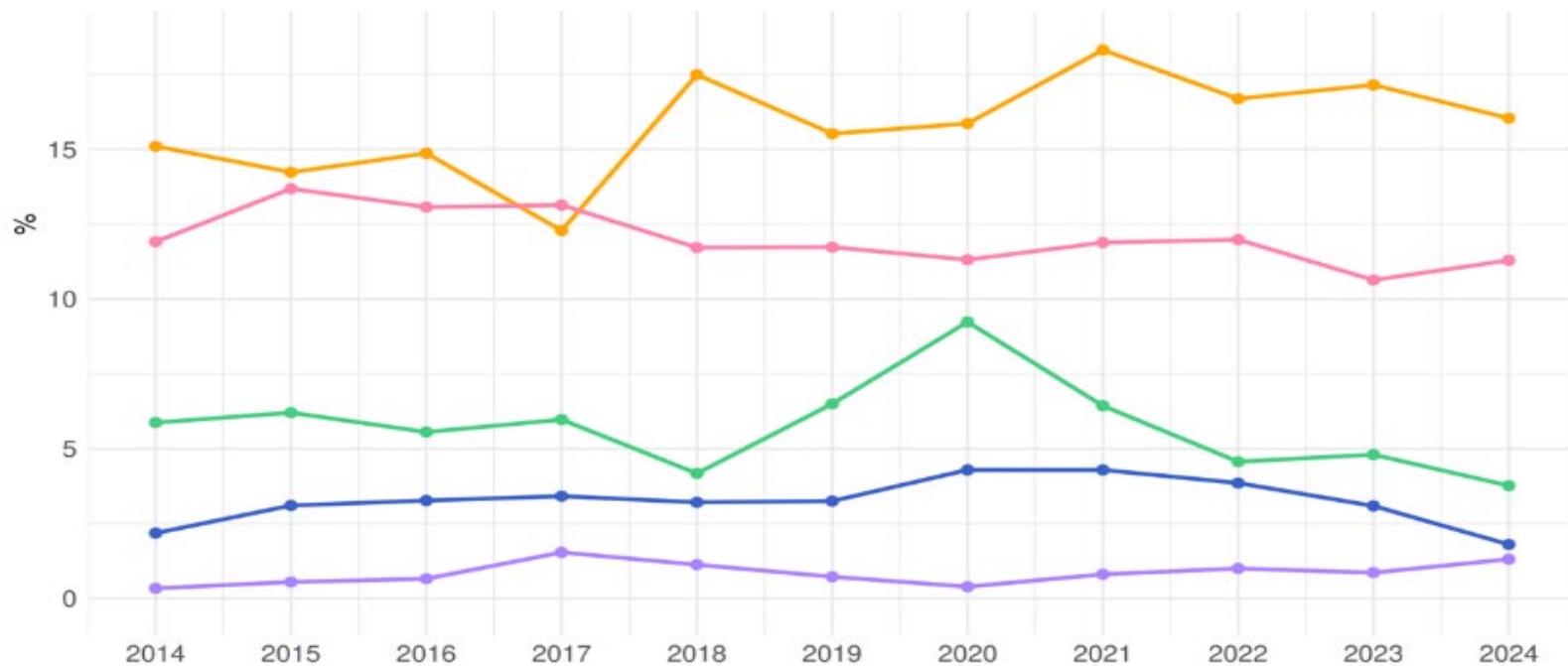
Caratteristiche cliniche dei pazienti infetti e descrizione degli outcomes (mortalità e durata della degenza)

Identificazione dei **fattori di rischio** per l'insorgenza di BSI

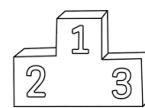
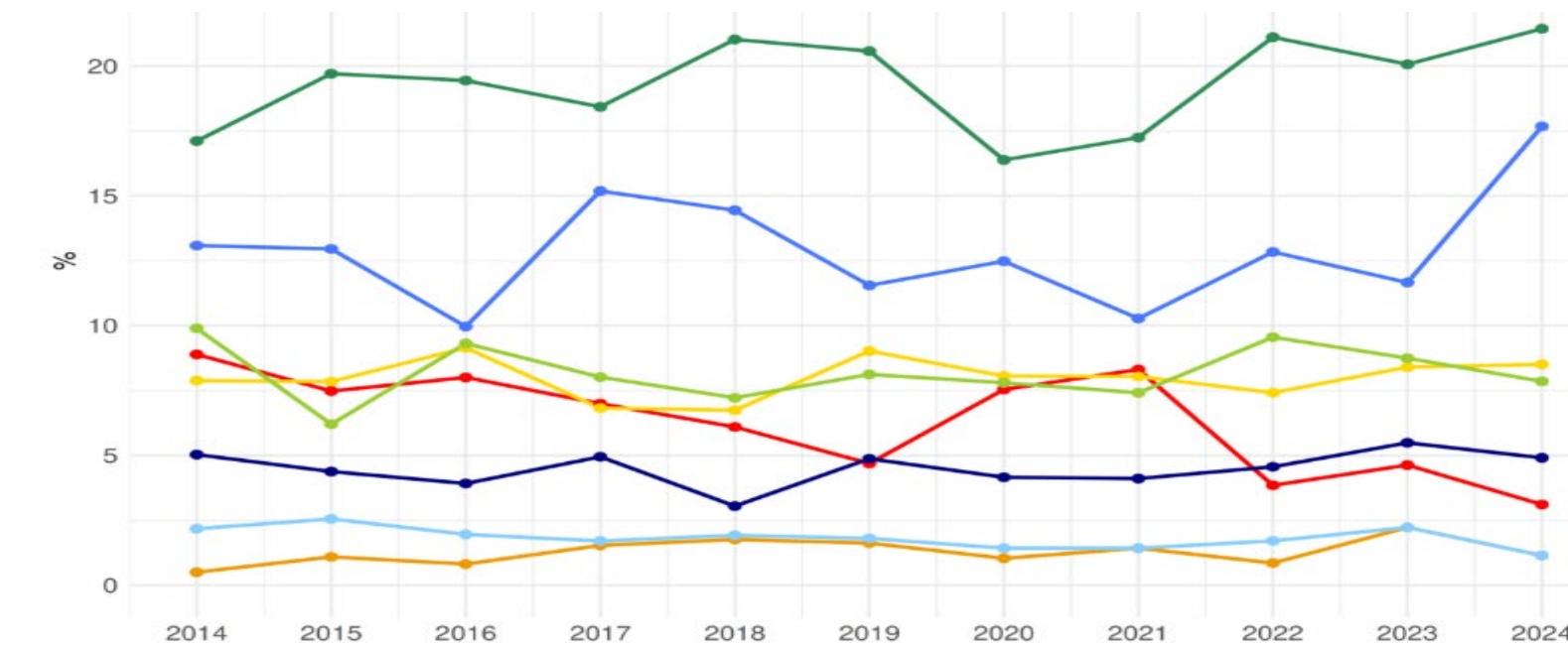
	Total (N=214046)	Other Patients (N=207979)	Patients with BSI (events) (N=6067)	p value
Surgery (n, %)	74684 (34.9%)	73247 (35.2%)	1437 (23.7%)	< 0.001
Trauma (n, %)	29649 (13.9%)	28431 (13.7%)	1218 (20.1%)	< 0.001
Obesity (n, %)	39988 (18.9%)	38618 (18.8%)	1370 (22.9%)	< 0.001
Missing	2261	2181	80	
BMI (Median, IQR)	25.8 (23.2, 29.3)	25.7 (23.2, 29.3)	26.2 (24.1, 30.1)	< 0.001
Missing	1511	1445	66	
Respiratory disease (n, %)	50444 (23.6%)	49201 (23.7%)	1243 (20.5%)	< 0.001
Neurologic disease (n, %)	35984 (16.8%)	35121 (16.9%)	863 (14.2%)	< 0.001
Cardiologic disease (n, %)	138111 (64.5%)	134395 (64.6%)	3716 (61.2%)	< 0.001
Liver disease (n, %)	10552 (4.9%)	10253 (4.9%)	299 (4.9%)	0.996
Chronic kidney disease (n, %)	23376 (10.9%)	22825 (11.0%)	551 (9.1%)	< 0.001
Diabetes (n, %)	44557 (20.8%)	43373 (20.9%)	1184 (19.5%)	0.011
Immunosuppression (n, %)	38159 (17.8%)	37333 (18.0%)	826 (13.6%)	< 0.001
SOFA (Median, IQR)	6.0 (4.0, 9.0)	6.0 (3.0, 9.0)	7.0 (5.0, 10.0)	< 0.001
Missing	1	1	0	
				
				
	Total (N=214046)	Other Patients (N=207979)	Patients with BSI (events) (N=6067)	p value
Invasive ventilation (n, %)	150071 (70.7%)	144929 (70.3%)	5142 (84.8%)	< 0.001
CVC (n, %)	161240 (76.0%)	155886 (75.6%)	5354 (88.2%)	< 0.001
PICC line (n, %)	3365 (1.6%)	3278 (1.6%)	87 (1.4%)	0.337
Hemodialysis (n, %)	3060 (1.4%)	2973 (1.4%)	87 (1.4%)	0.957
Hemofiltration (n, %)	4610 (2.2%)	4434 (2.2%)	176 (2.9%)	< 0.001
ECMO (n, %)	786 (0.4%)	726 (0.4%)	60 (1.0%)	< 0.001
Enteral nutrition (n, %)	38218 (18.0%)	36216 (17.6%)	2002 (33.0%)	< 0.001
Parenteral nutrition (n, %)	21531 (10.1%)	20806 (10.1%)	725 (11.9%)	< 0.001

Total (N=214046)	Other Patients (N=207979)	Patients with BSI (events) (N=6067)	p value
<i>Infections at ICU-admission</i>			
Central nervous system infection (n, %)	1545 (0.7%)	1503 (0.7%)	42 (0.7%)
Respiratory infection (n, %)	28659 (13.4%)	27490 (13.2%)	1169 (18.1%)
Intra-abdominal infection (n, %)	14353 (6.7%)	14088 (6.8%)	265 (4.1%)
Skin and soft tissue infection (n, %)	3078 (1.4%)	2999 (1.4%)	79 (1.2%)
Bone and joint infection (n, %)	567 (0.3%)	560 (0.3%)	7 (0.1%)
Urinary tract infections (n, %)	4536 (2.1%)	4438 (2.1%)	98 (1.5%)
<i>Intra-ICU outcomes</i>			
Mortality (n, %)		36960 (17.3%)	35105 (16.9%)
Missing		1	0
<i>Outcome (n, %)</i>			
Dead		36019 (16.8%)	34217 (16.5%)
transfSameHosp		152365 (71.2%)	149275 (71.9%)
transfOthHosp		23090 (10.8%)	21605 (10.4%)
dischargeHome		1630 (0.8%)	1609 (0.8%)
terminal		941 (0.4%)	888 (0.4%)
Missing		1	0
LOS (Median, IQR)		5.0 (3.0, 10.0)	5.0 (3.0, 10.0)
Missing		25.0 (16.0, 38.2)	< 0.001
<i>Intra-Hospital outcomes</i>			
Mortality (n, %)		51928 (24.5%)	49698 (24.2%)
Missing		2230 (35.1%)	< 0.001
LOS (Median, IQR)		17.0 (9.0, 30.0)	17.0 (9.0, 29.0)
Missing		38.0 (24.0, 56.0)	< 0.001
Missing		2165	2074
Missing		91	





- CoNS
- E.Faecalis
- E.Faecium
- S.Pneumoniae
- S.Aureus



- Acinetobacter spp.
- Citrobacter spp.
- Enterobacter spp.
- Escherichia. coli
- Klebsiella spp.
- Proteus spp.
- Pseudomonas spp.
- Serratia spp.



A scene from Toy Story showing Woody and Buzz Lightyear. Woody, on the left, has a concerned expression and is looking towards the right. Buzz, on the right, is in a dynamic pose with one arm raised, wearing his signature green and purple space ranger suit. The background shows a room with a door and some yellow stars on the wall.

Non è tutto rose e fiori

Difficoltà - Limiti

Finestra temporale: 2014-2024

Cambi di crf, non compatibilità
dei dati negli anni



Prosafe è ottimizzato per raccogliere informazioni statiche e per monitorare l'outcome finale (la mortalità), ma non per **seguire l'evoluzione giorno per giorno** degli eventi intermedi, come le complicanze infettive (*problemi con sequenza degli eventi e la relazione temporale fra esposizioni e complicanze*)

Batteriemie secondarie

Info ereditate dall'infezione primaria
(data di insorgenza, micro, ...)



SCELTA DEL MODELLO



"Ogni giorno so che ho un paziente vivo senza BSI, voglio sapere qual è il suo rischio di sviluppare un'infezione, per poterlo trattare."



Modello di sopravvivenza: Cox model (cause-specific hazard)

Outcome BSI ICU-acquired (1)

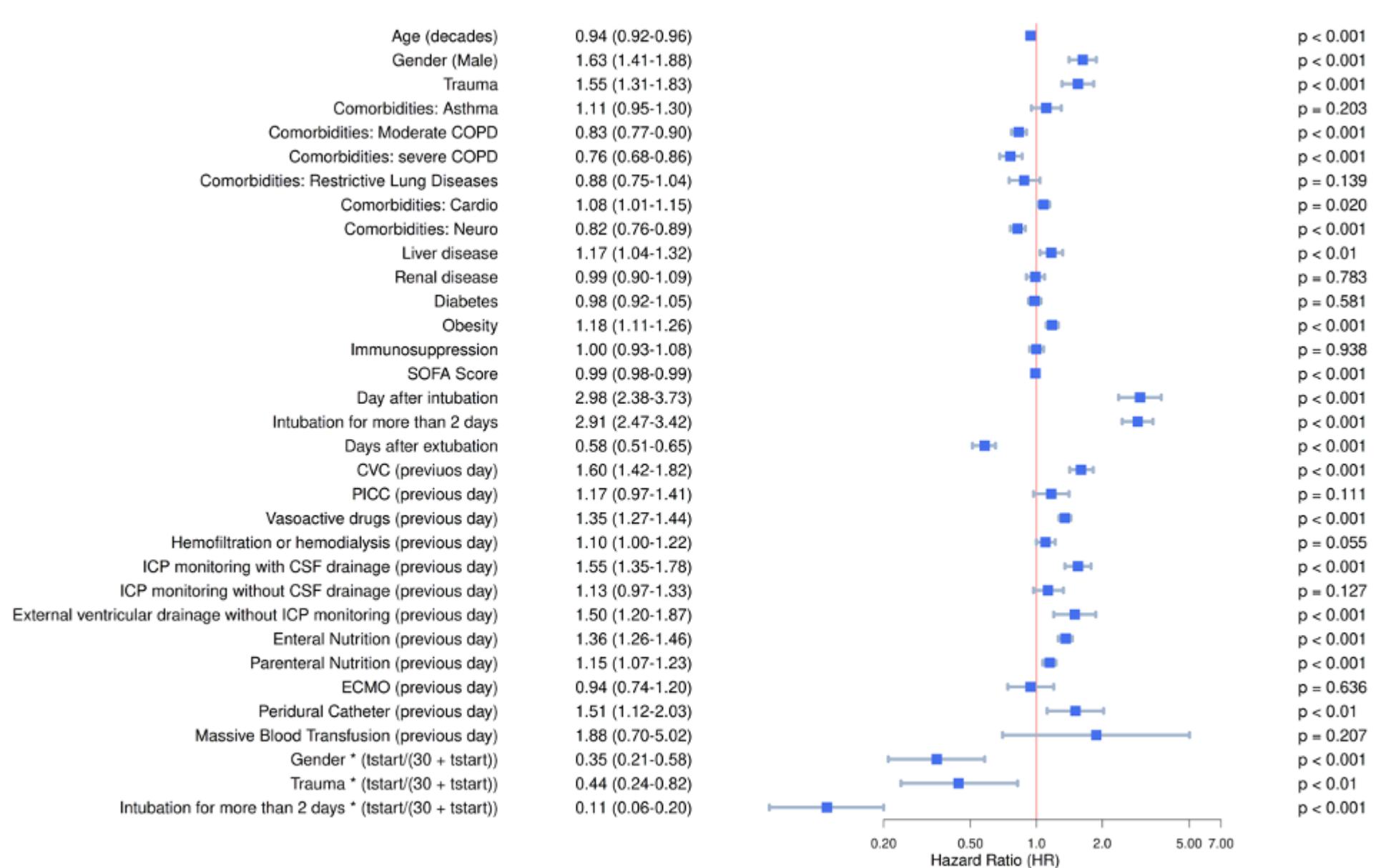
*L'evento (BSI) è stato considerato solo se insorto entro
30 giorni dall'inizio dell'osservazione*



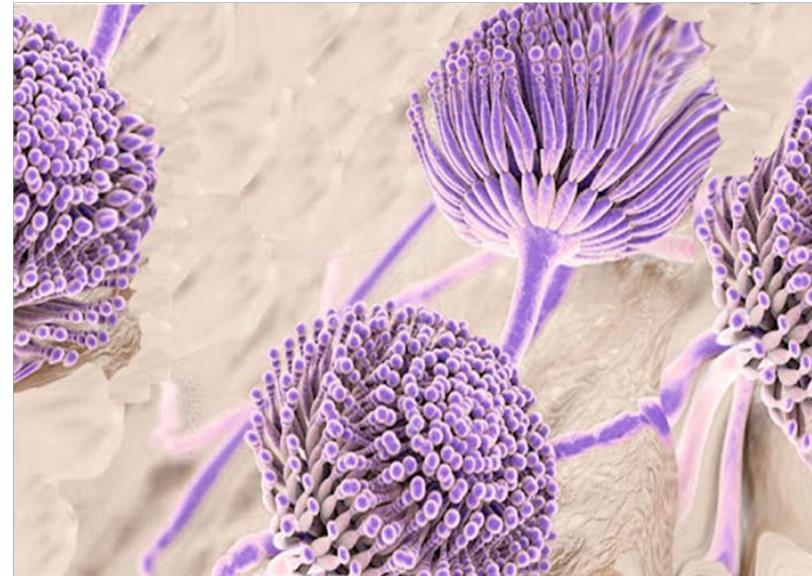
- 💡 Il dataset è strutturato in modo **tempo-dipendente** (una riga per ciascun giorno di degenza di ogni paziente)
Per ogni giorno di degenza vengono riportate la presenza (1) o l'assenza (0) delle procedure cliniche selezionate. Sono poi riportate le variabili non tempo-dipendenti.
- 💡 I pazienti vengono osservati a partire **dal giorno 2** della degenza (at risk)
- 💡 Le **procedure** (*CVC, PICC, emodialisi, ECMO, ...*) sono state inserite nel modello con un **lag di 1 giorno**
- 💡 Interazioni con il tempo



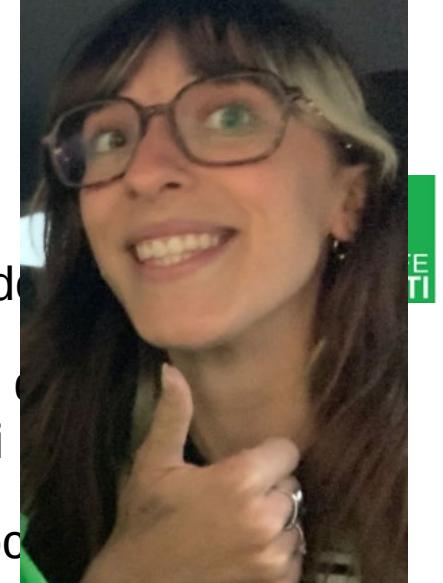
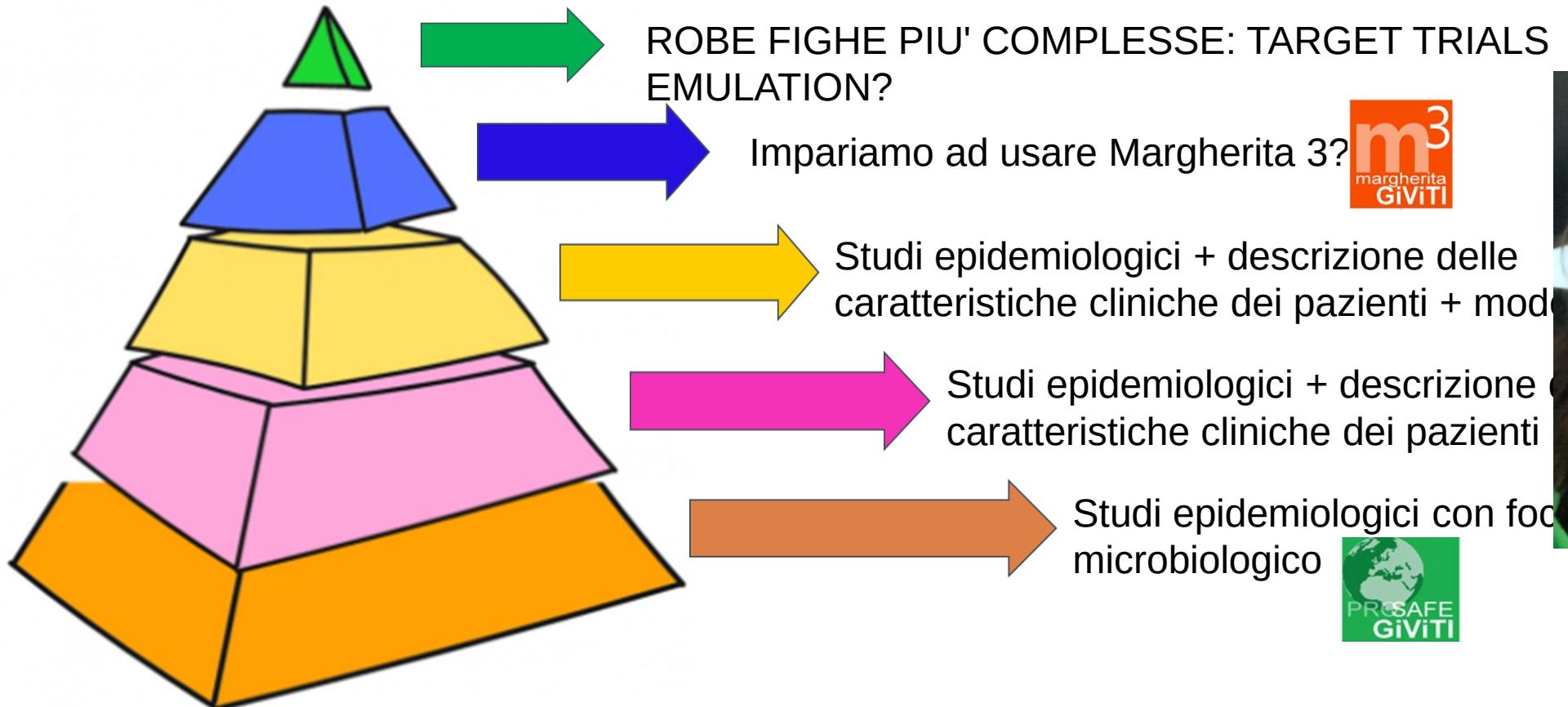
Forest plot – Risk factors for ICU-acquired BSI (Cox Model)



Stanno per arrivare bellissimi dati su
infezioni intra addominali e aspergillosi
invasiva in ICU!



Approccio di ricerca per persone pazienti... a step!



m³
margherita
GiViTI

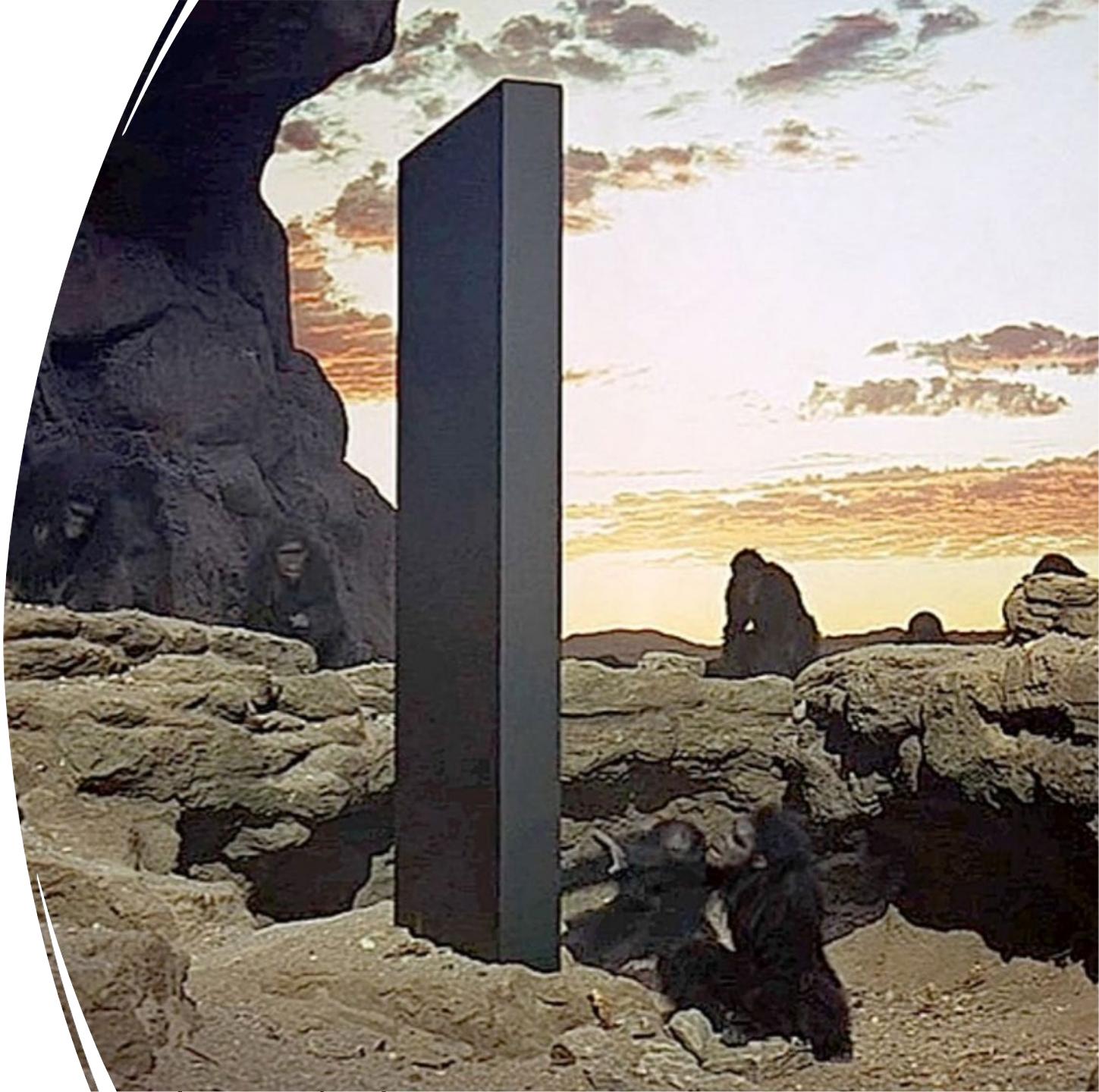
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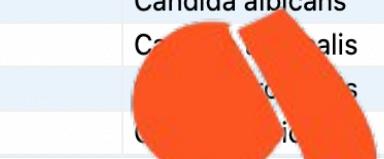
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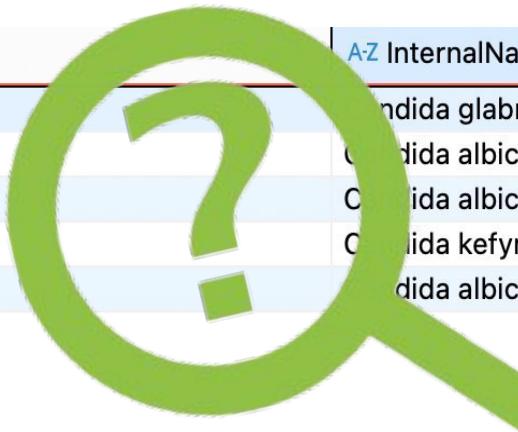
A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Material	A-Z InternalName_micro
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida glabrata
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	tampone inguinale	Candida parapsilosis

A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Material	A-Z InternalName_micro
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	aspirato gastrico	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	aspirato gastrico	Candida albicans
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	aspirato gastrico	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	aspirato gastrico	Candida parapsilosis
Broncoaspirato	Broncoaspirato	Lieviti	Lieviti	aspirato gastrico	Candida parapsilosis

A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Material	A-Z InternalName_micro
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	essudato auricolare	
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	liquido peritoneale	
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	liquido peritoneale	
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	liquido peritoneale	
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	liquido peritoneale	
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	protesi	



A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Material	A-Z InternalName
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	bile	Candida glab
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	bile	Candida albic
Broncolavaggio alveolare	Broncolavaggio alveolare	Ricerca batteri aerobi e miceti	Ricerca batteri aerobi e miceti	bile	Candida albic
Broncoaspirato	Broncoaspirato	Microrganismi	Microrganismi	Bile	Candida kefy
Broncoaspirato	Broncoaspirato	Microrganismi	Microrganismi	Bile	Candida albic



A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Material	A-Z InternalName_micro
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	tampone da (inserire nota)	Candida albicans
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	tampone da ferita chirurgica	Candida albicans
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	broncoaspirato	Candida albicans
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	broncolavaggio	Candida albicans
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	essudato nasale	Candida albicans
Tampone rettale	Tampone rettale	Esame colturale	Esame colturale	tracheoaspirato	Candida albicans

A-Z NomeEsame	A-Z NomeEsito	A-Z InternalName	A-Z InternalName_outcome	A-Z Mate	A-Z InternalName_micro
Stato Acido Base	SBEc	BAS	BAS		Candida krusei
Stato Acido Base	SBEc	BAS	BAS		Candida krusei
Stato Acido Base	SBEc	BAS	BAS		Candida lusitaniae
Stato Acido Base	SBEc	BAS	BAS		Candida lusitaniae

Candida diagnostic score

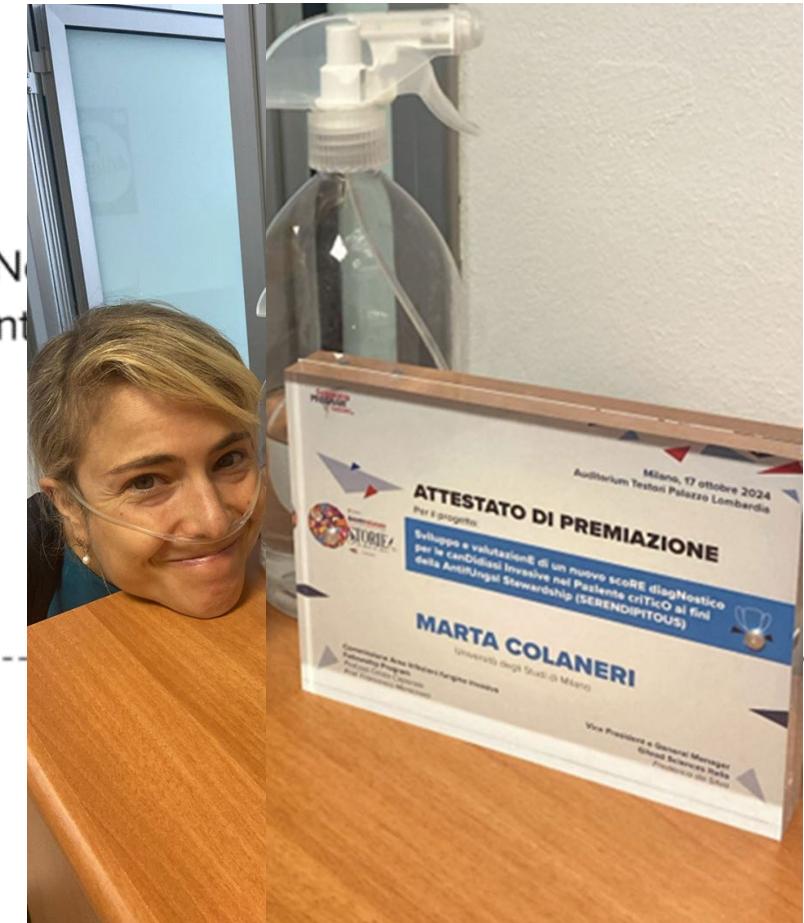


University of Milan

Titolo:Sviluppo e valutazionE di un nuovo scoRE diagNostico per le candidiasi Invasive nel Paziente criTicO ai fini della AntI-UrgenStewardship (SERENDIPITOUS)

Numero identificativo della borsa:24996

Stato:



GRAZIE PER L'ATTENZIONE



Se volette contattarci per studiare qualche bella
infezione insieme in ICU, ora, purtroppo per voi,
sapete dove trovarci!

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...o nel bosco dell'Ospedale Luigi Sacco di Milano

