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Novos desafios dos Grupos PPCIRA na transição do período pandémico - estratégias de gestão da mudança

José Artur Paiva

MD, PhD

Director do Programa de Prevenção e Controle de Infeções e de Resistências a Antimicrobianos

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Did the COVID-19 pandemic increased antimicrobial resistance (AMR) burden ?

We do not know,
as there isn´t enough data yet,
but I am not optimistic

AMR in EU/EEA

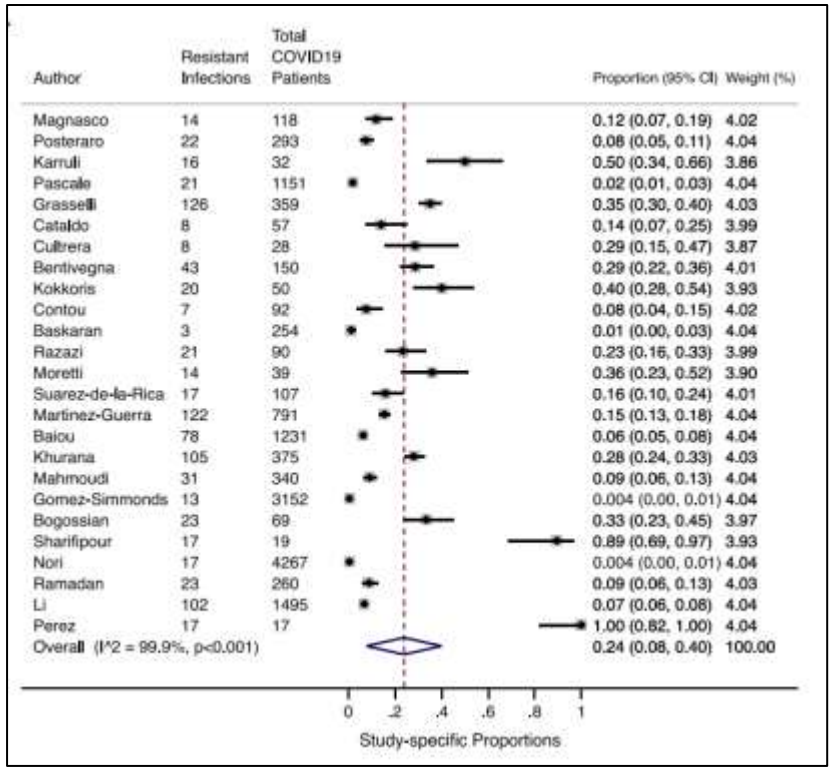
- **No large changes** in AMR percentages at EU/EEA level in EARS-Net in 2020.
- For ***E. coli***, there was a larger **decrease** in the percentages of **resistance to aminopenicillins and third-generation cephalosporins** in 2020 than for each year during the period 2016–2019.
- For ***S. aureus***, **a decrease** in the percentage of MRSA isolates was reported during 2016–2020.
- A **decreasing trend** during 2016–2020 for the percentage of macrolide resistance in ***S. pneumoniae***.
- For a few other bacterial species–antimicrobial group combinations, there were **large increases** in AMR percentages between 2019 and 2020, although an increasing trend during 2016–2020 was reported only for **carbapenem resistance *in K. pneumoniae***.
- **Almost ¼ of EU/EEA countries** reported carbapenem resistance percentages **above 10% in *K. pneumoniae***.
- **Carbapenem resistance** also common in ***P. aeruginosa* and *Acinetobacter* spp**., at a higher % than in *Kp*.
- Mean % of **vancomycin-resistant isolates of *E. faecium***, increased from 11.6% in 2016 to 16.8% in 2020.
- The reported AMR percentages varied widely among countries, with a north-to-south and west-to-east gradient evident. There was no distinct geographical pattern for vancomycin-resistant *E. faecium*.

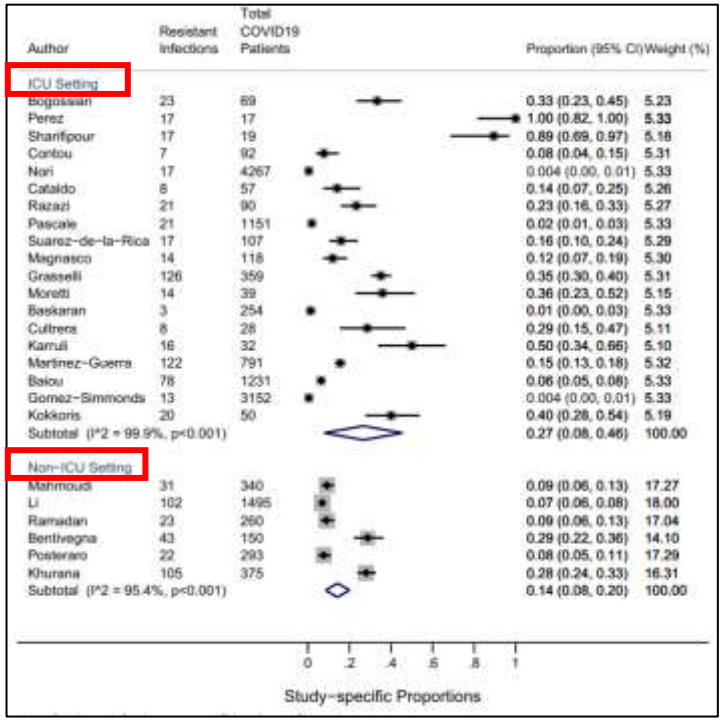
MDR pathogens in COVID-19 patients?

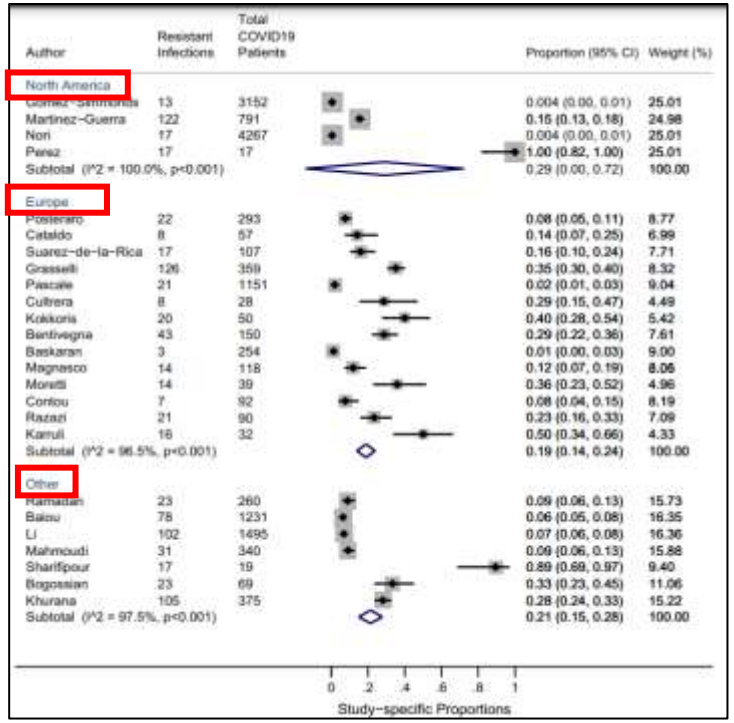
Systematic review and meta-analysis of the first 18 months of the pandemic to quantify resistant co-infecting organisms in patients with COVID-19

- A total of 1959 unique isolates were identified with 29% resistant organisms identified.
- **Co-infection with resistant bacterial or fungal organisms ranged from 0.2 to 100% among included studies**.
- Pooled prevalence of co-infection with **resistant bacterial and fungal organisms was 24% (95% CI 8–40%) and 0.3% (95% CI 0.1–0.6%), respectively.**
- Among MDR organisms, methicillin-resistant *Staphylococcus aureus*, carbapenem-resistant *Acinetobacter baumannii*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and multi-drug resistant *Candida auris* were most commonly reported.
- **Higher proportions of AMR outside of Europe and in ICU settings**, though these results were not statistically signifcant.

Kariyawasam RM, et al. Antimicrobials Resistance & Infection Control 2022; 11:45







The main determinant of AMR is antimicrobial consumption (AMC)

What happened with AMC?

Consumption of antibiotics in the community
Portugal and EU/EEA average 2011-2020

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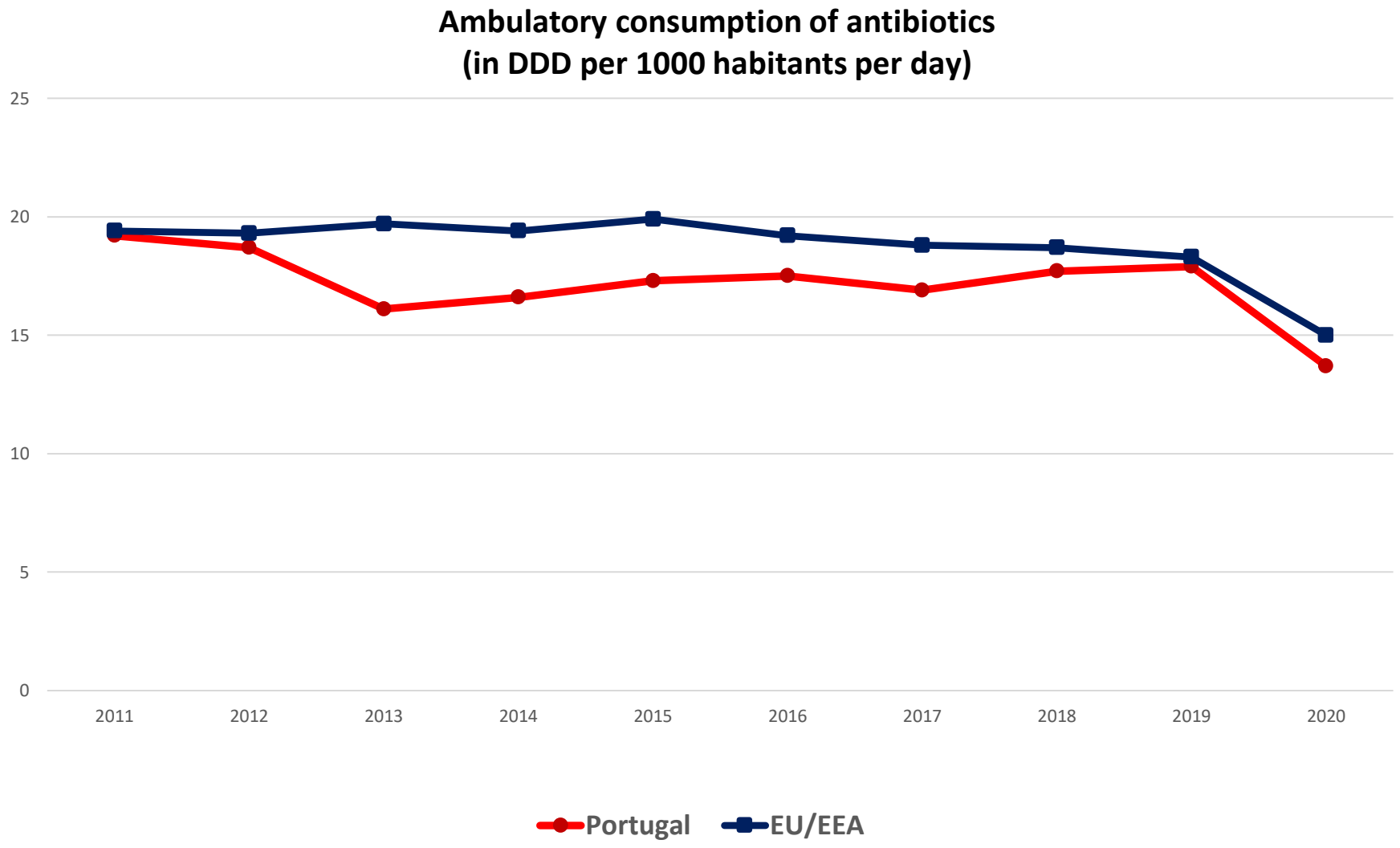

Quinolone consumption in the community Portugal and EU/EEA average 2011-2020

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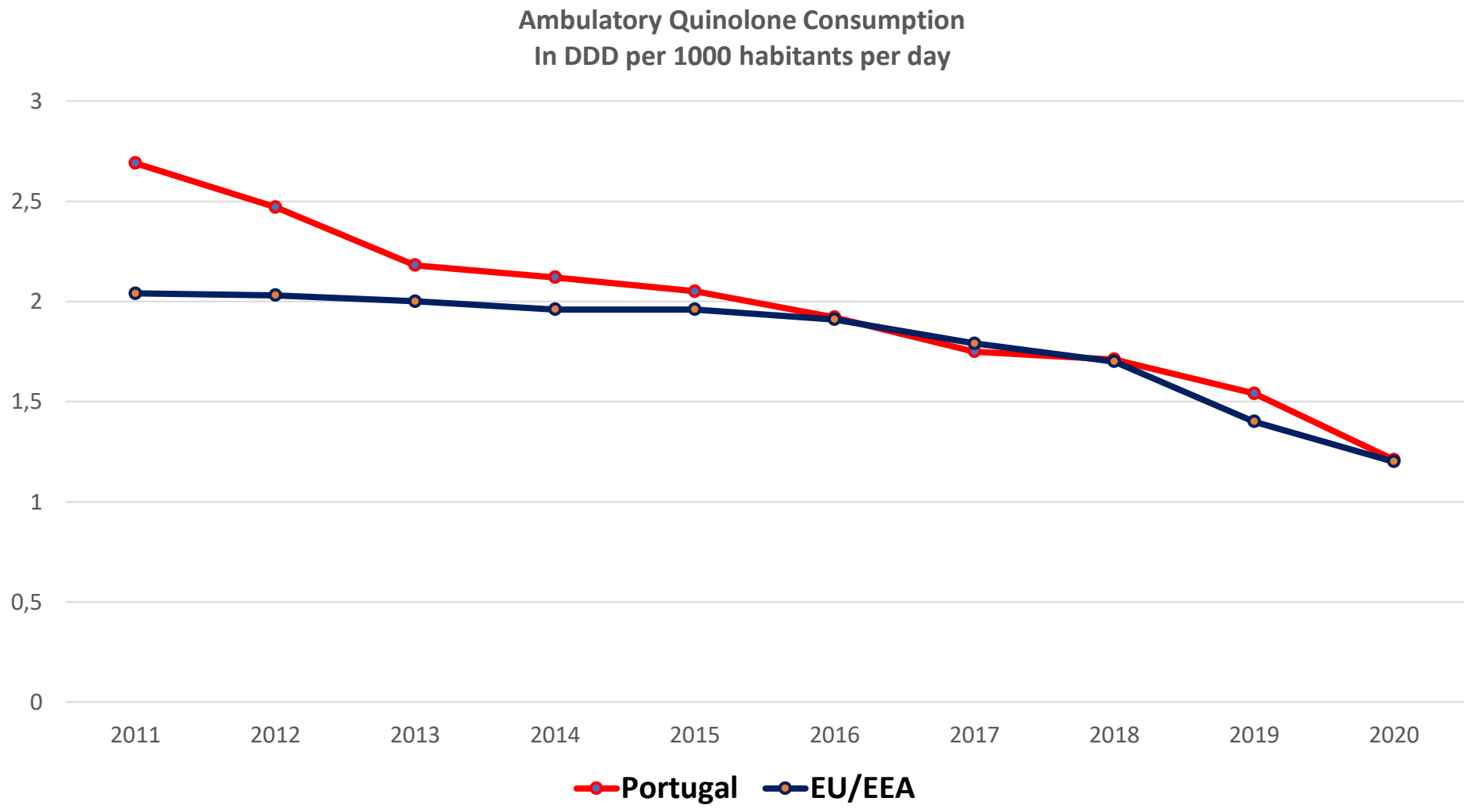

Antibiotic consumption in hospitals 2011-2020
Portugal and EU/EEA average

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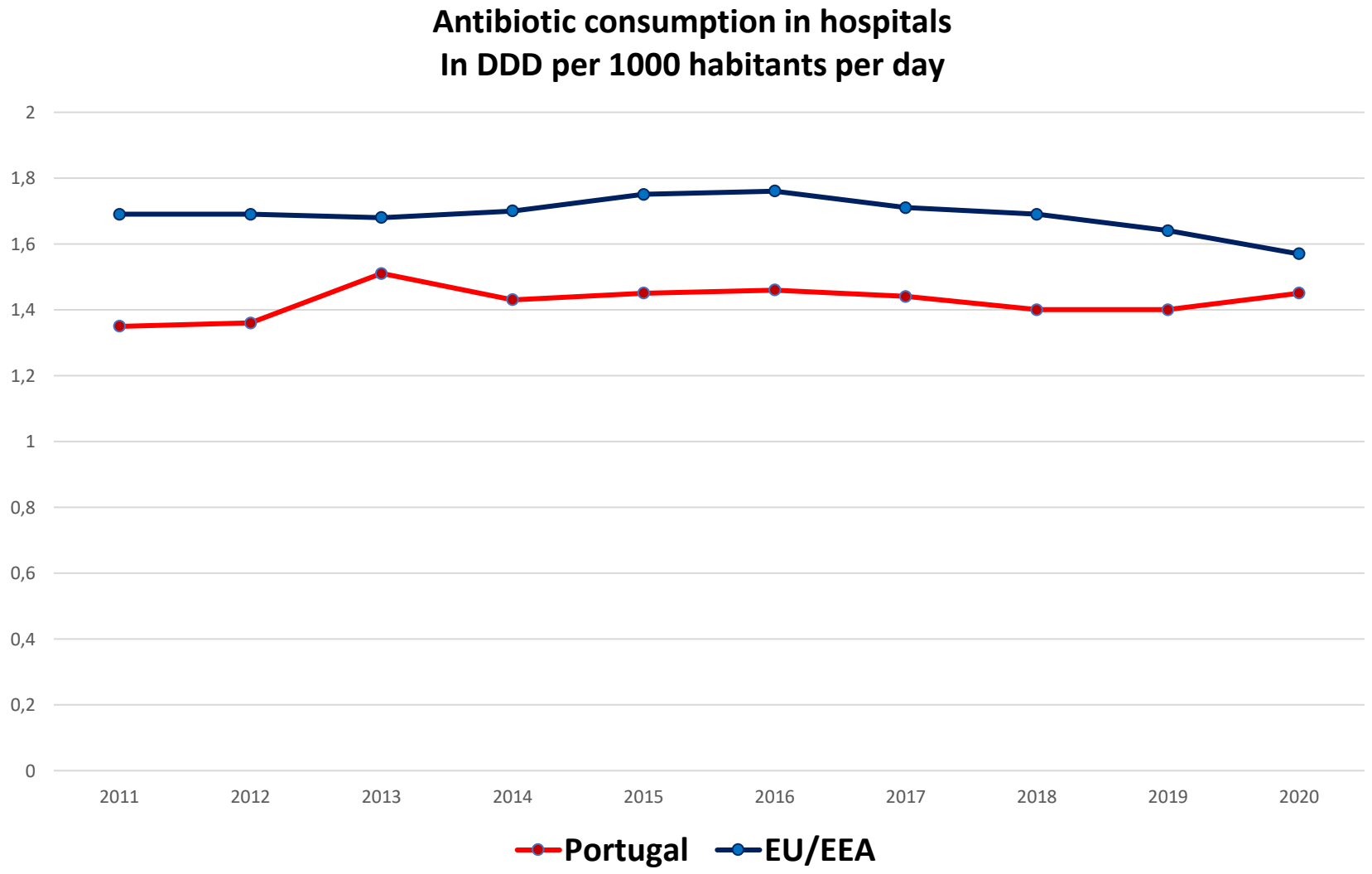

Carbapenem consumption in hospitals Portugal and EU/EEA average, 2011-2020

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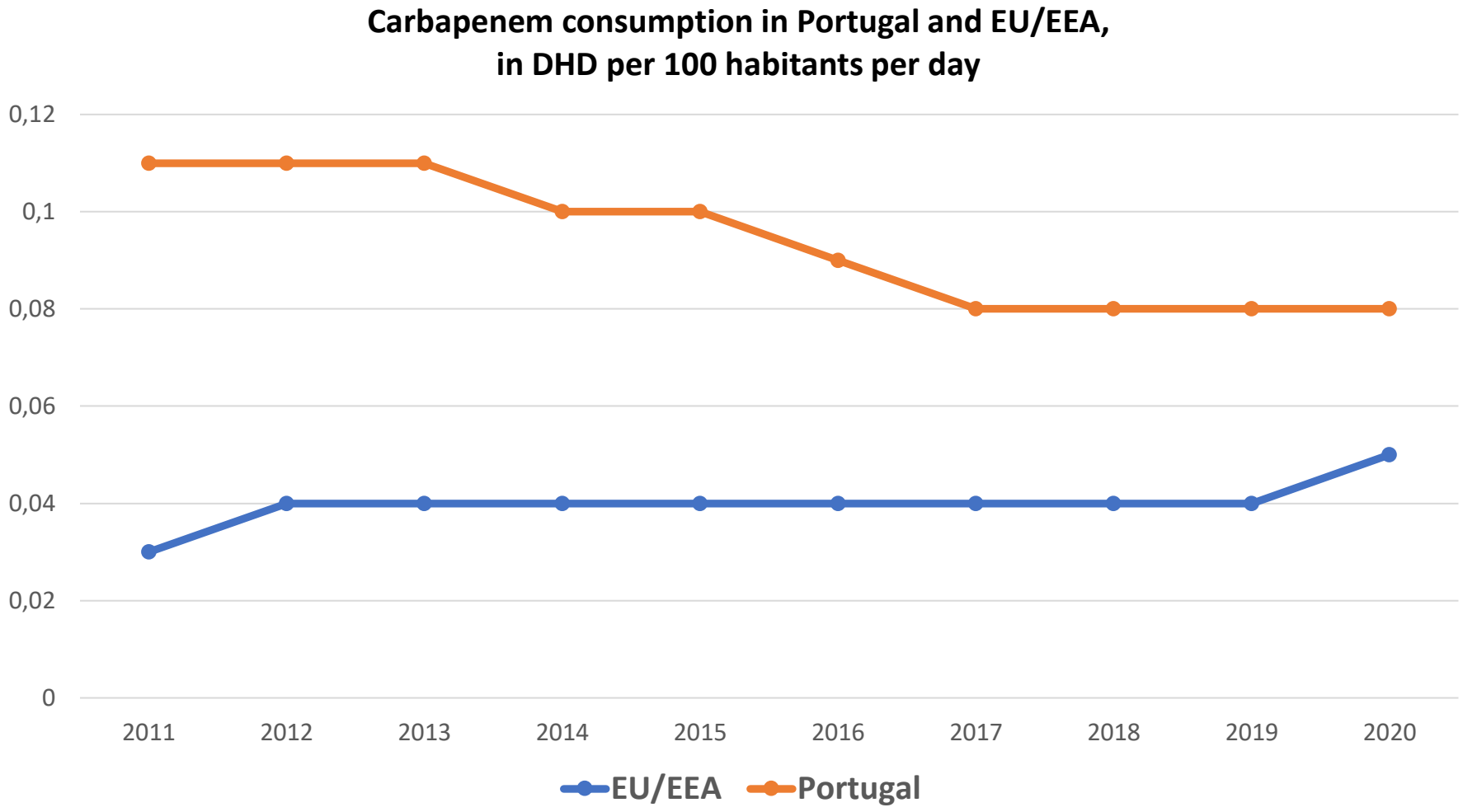


"In 2020, consumption of carbapenems was 0.05 DDD per 1 000 inhabitants per day. **Between 2011 and 2020, the EU/EEA population-weighted mean consumption of carbapenems showed a statistically significant increase**. During the period 2011–2020, a statistically significant increase was observed for 11 countries (Bulgaria, Croatia, Estonia, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Slovakia), and **a statistically decreasing trend was observed in five countries (Belgium, Finland, Norway, Portugal and Slovenia)**"

antibiotics MDPI

Article

Increase of Antimicrobial Consumption in a Tertiary Care Hospital during the First Phase of the COVID-19 Pandemic

Alexandre Castro-Lopes [1,*], Sofia Correia [2,3,4], Cátia Leal [2,3], Inês Resende [5], Pedro Soares [5], Ana Azevedo [2,3,4,6] and José-Artur Paiva [7,8,9]

- **A retrospective before-and-after study in all Centro Hospitalar Universitário São João**.
- Descriptive statistics of discharges, patient-days, and antimicrobial use indicators (DDD/100 discharges, DDD/100 patient-days) were calculated for the **first three months of the pandemic** as a quarterly value, and for each year in 2011–2019, and their annual percentage changes were used to estimate 95% CI.
- **Statistically significant increases occurred in 2020** for total antibacterials, macrolides, cephalosporins, amoxicillin/clavulanic acid, carbapenems, meropenem, and third-generation cephalosporins, while a reduction was seen in cefazolin/cefoxitin.

Antibiotics 2021, 10: 778.
https://doi.org/10.3390/antibiotics10070778

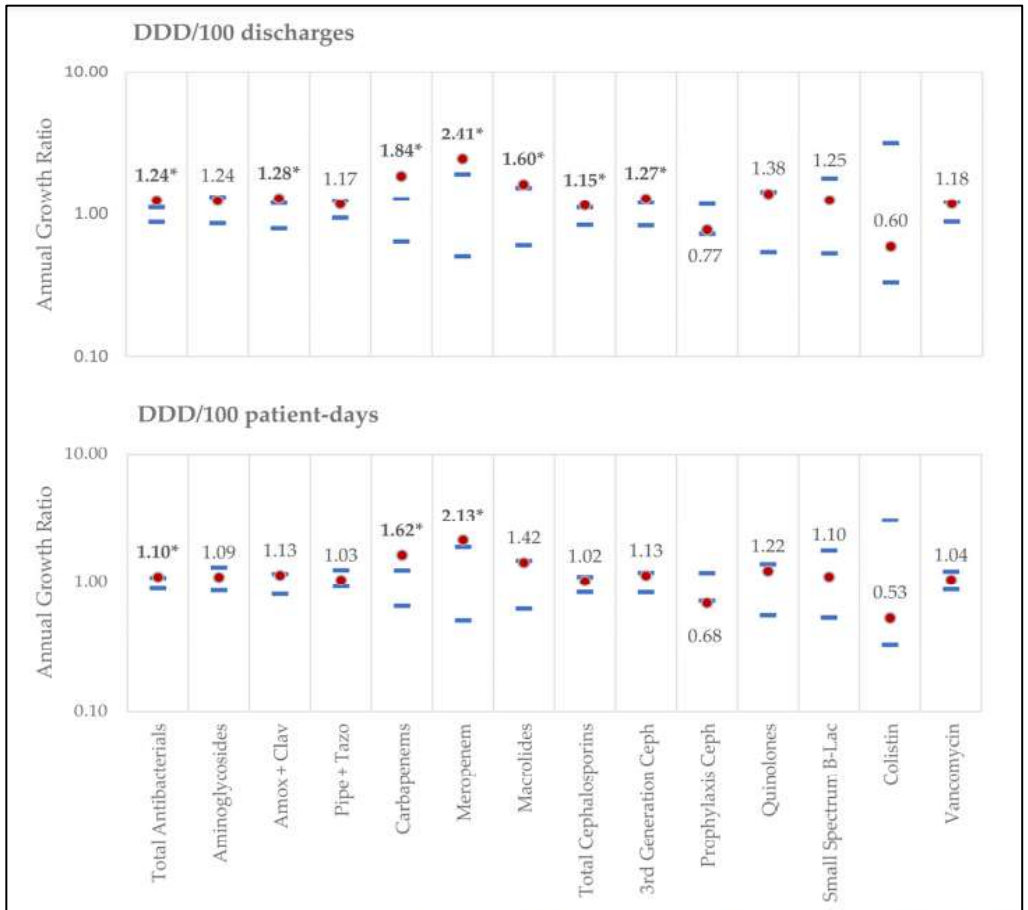
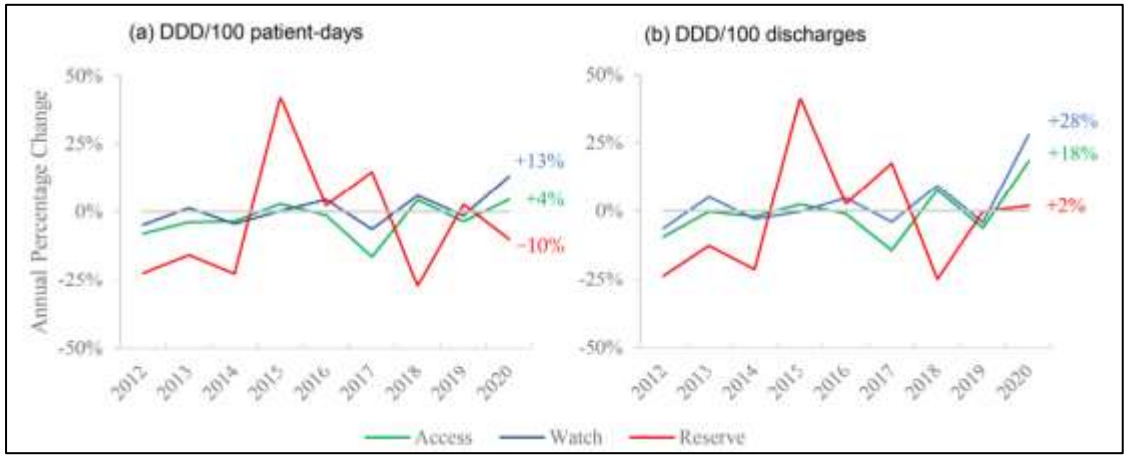
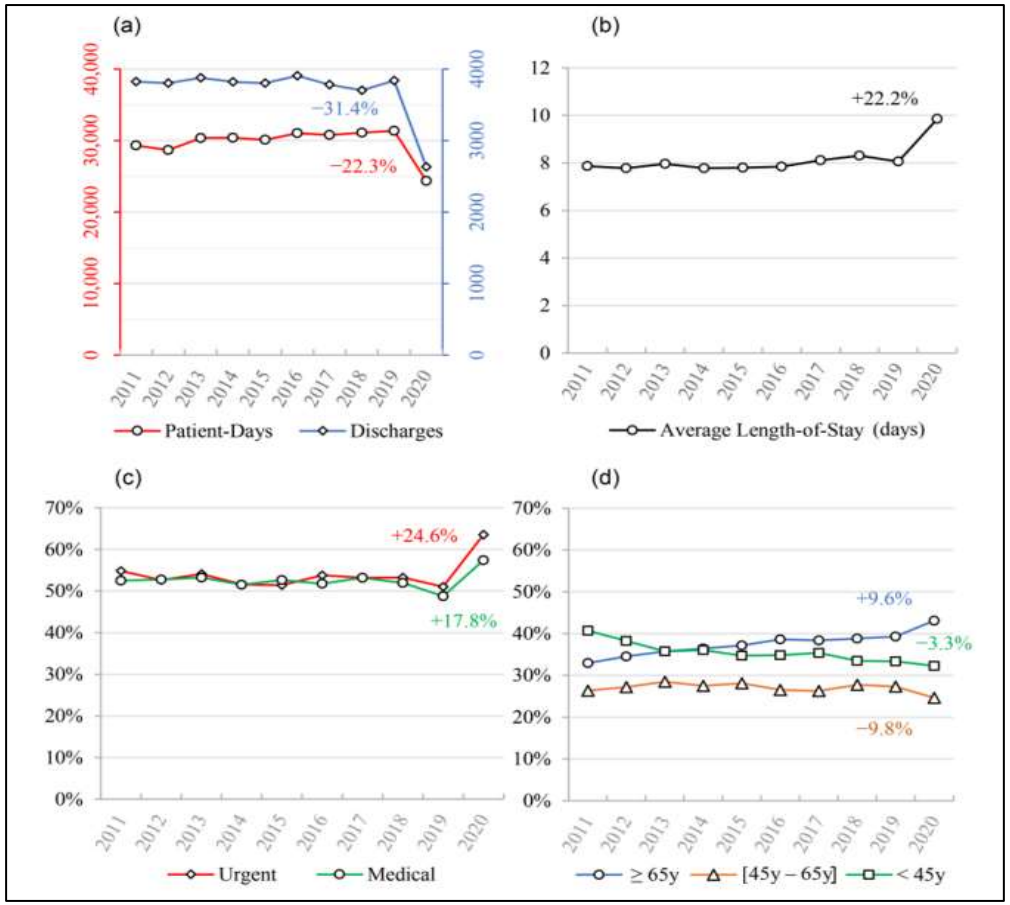


Figure 3. Annual growth ratio in 2020 and expected reference values for the period of 2011–2019. Calculated 2020 growth



- In 2020, a **totally different case-mix**
- Unlike pre-pandemic years, there was a **different impact in DDD/100 discharges and DDD/100 patient-days,** due to increased LOS and longer antimicrobial therapy
- This highlights **the need to use both indicators simultaneously** to better understand the causes of antimicrobial consumption variation and improve the design of effective AMS interventions



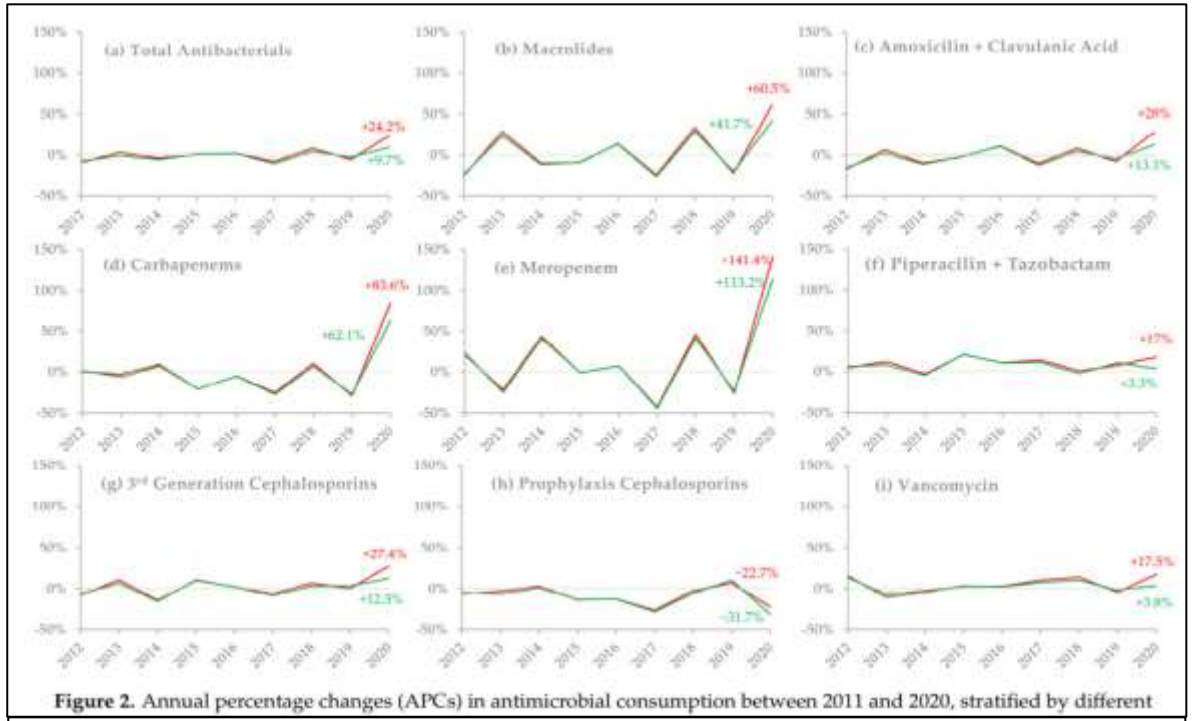
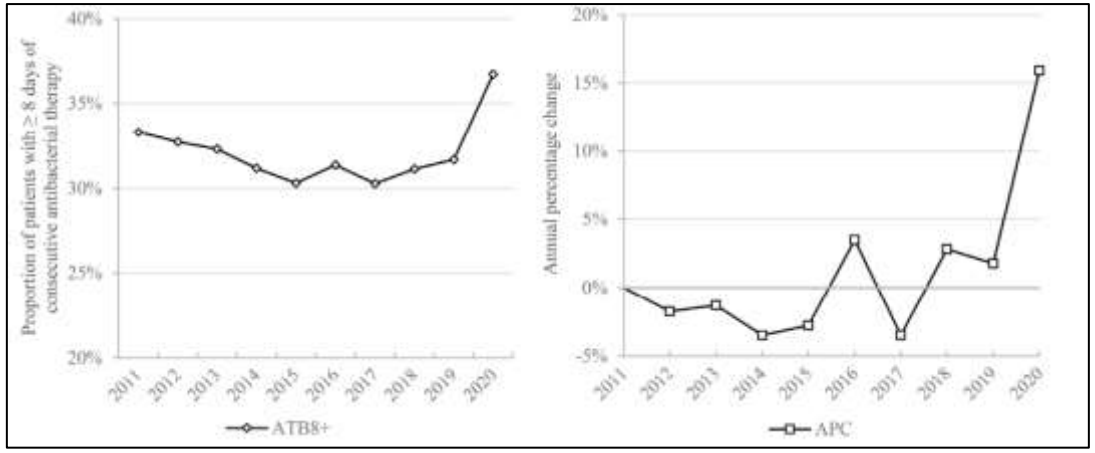


Figure 2. Annual percentage changes (APCs) in antimicrobial consumption between 2011 and 2020, stratified by different

In red, DDD/100 discharges and In green, DDD/100 patient-days



Antibiotics 2021, 10: 778. https://doi.org/10.3390/antibiotics10070778

Antibiotic consumpion CHUSJ 2020-2021

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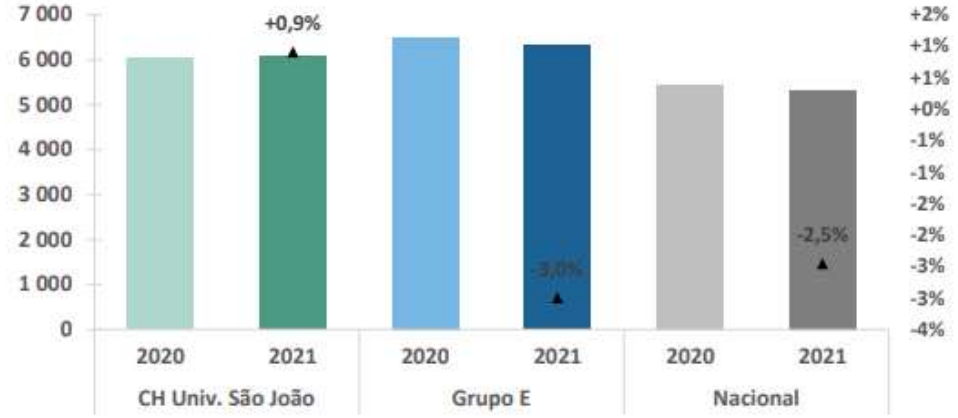
Centro Hospitalar Universitário de São João, EPE

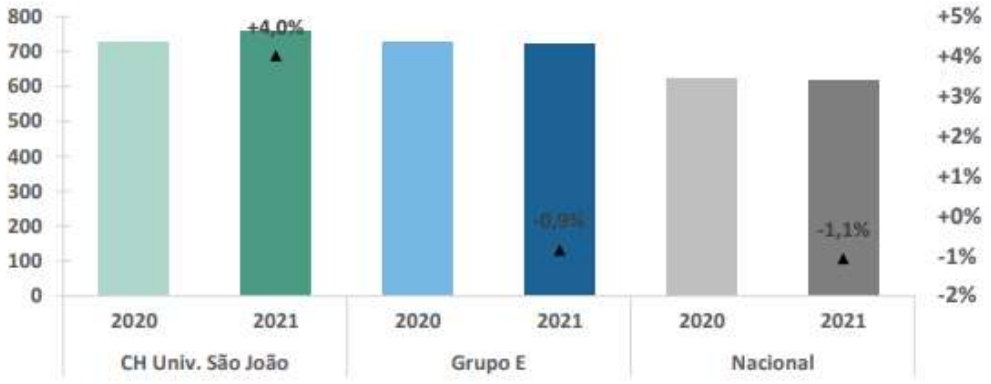
Jan a Dez 2021

ANTIMICROBIANOS

Antibióticos (DDD) por 1000 Doentes Saídos



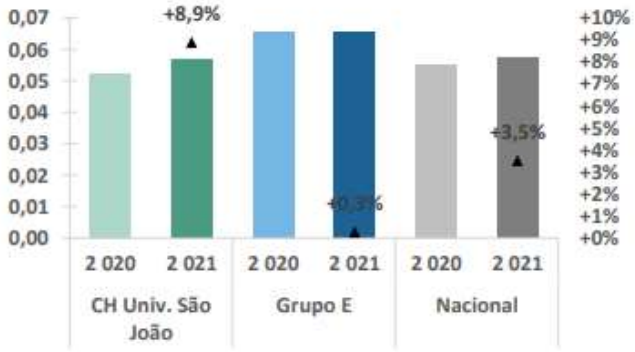
Antibióticos (DDD) por 1000 Dias de Internamento de Doentes Saídos



Carbapenemes (DDD) por 1000 Doentes Saídos

Carbapenemes (DDD) por 1000 Dias de Internamento de Doentes Saídos

Carbapenemes no total dos Antibióticos (J01)



COVID-19: First wave

Alhazzani W, et al. Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019. Intensive Care Med. 2020; 46: 854–87

Table 2 Recommendations and statements

	Recommendation	Strength
43	In mechanically ventilated patients with COVID-19 and respiratory failure, we ***suggest*** using empiric antimicrobials/ antibacterial agents, over no antimicrobials *Remark*: if the treating team initiates empiric antimicrobials, they should assess for de-escalation daily, and re-evaluate the duration of therapy and spectrum of coverage based on the microbiology results and the patient's clinical status	Weak

- COVID-19 patients receiving antimicrobial therapy in different papers: 66,7% (Milan), 80% (Barcelona), 95% (Wuhan).

Vidal CG et al. Clin. Microbiol. Infect., 2021; 27: 83-88
F. Zhou et al., Lancet, 2020; 395: 1054

- In a review of literature, **only up to 8% patients** were reported as experiencing bacterial/fungal co-infection during hospital admission.
- **72% of patients** reported as having received antimicrobial therapy, despite a paucity of evidence for bacterial coinfection.
- No antimicrobial stewardship interventions were described.

Getahun H et al. Bull WHO 2020;98:442—442A. https://doi.org/10.2471/BLT.20.268573
Rawson TM et al., Clin. Infect. Dis. 2020. https://doi.org/10.1093/cid/ciaa530

Clinical Microbiology and Infection 27 (2021) 451–457

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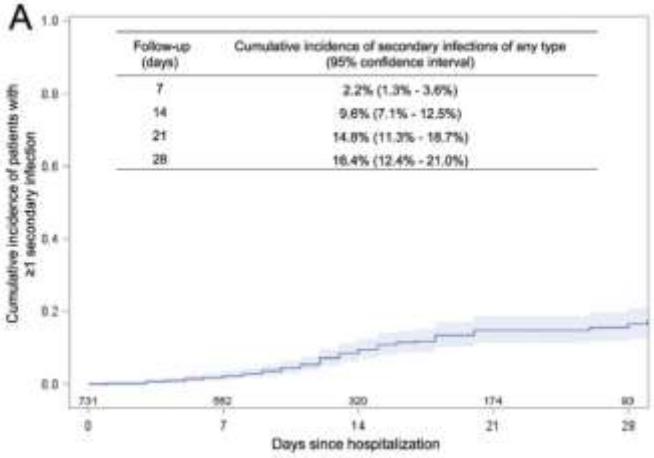
journal homepage: www.clinicalmicrobiologyandinfection.com

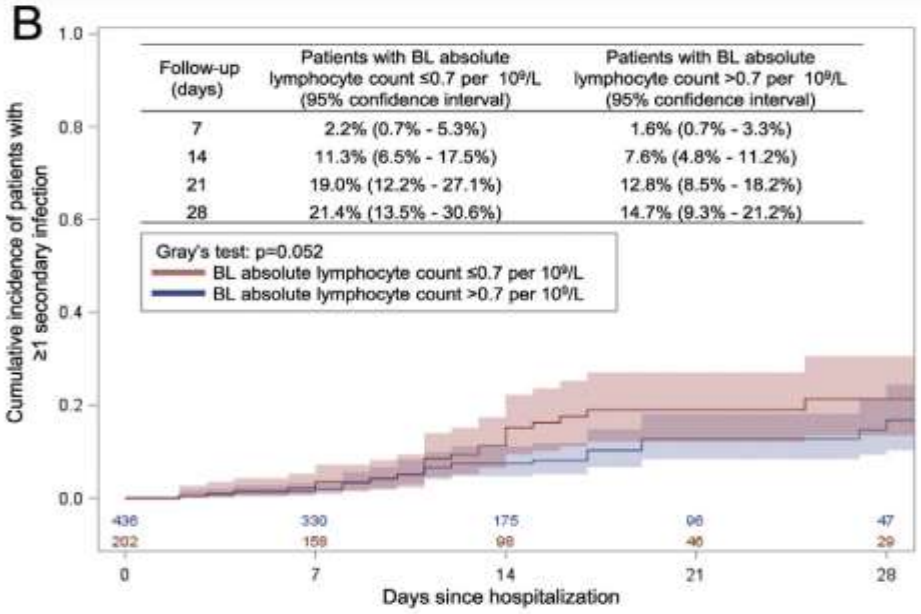
Original article

Secondary infections in patients hospitalized with COVID-19: incidence and predictive factors

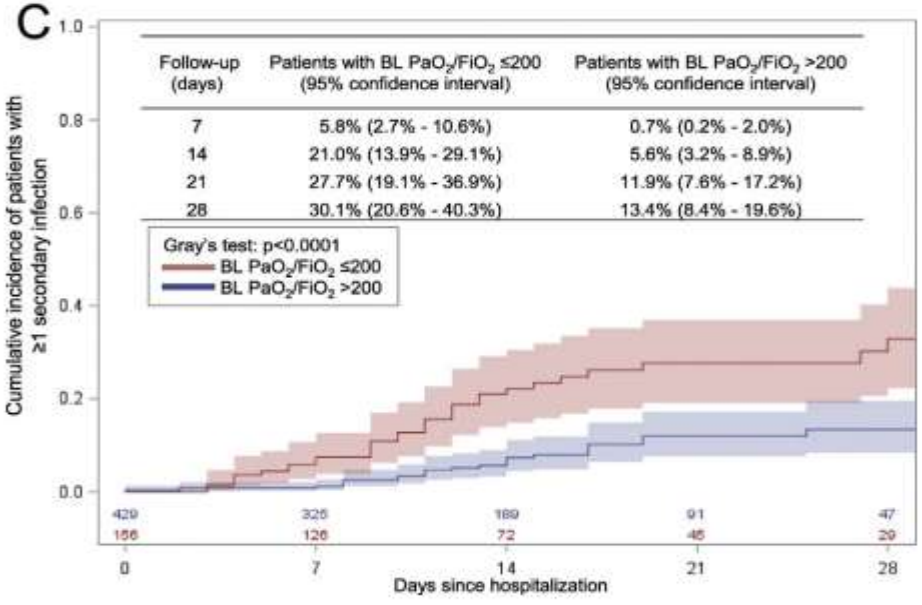
Marco Ripa [1,2,*], Laura Galli [1], Andrea Poli [1], Chiara Oltolini [1], Vincenzo Spagnuolo [1,2], Andrea Mastrangelo [3], Camilla Muccini [2], Giacomo Monti [3], Giacomo De Luca [4], Giovanni Landoni [2,3], Lorenzo Dagna [2,4], Massimo Clementi [2,5], Patrizia Rovere Querini [2,6], Fabio Ciceri [2,7], Moreno Tresoldi [8], Adriano Lazzarin [1], Alberto Zangrillo [2,3], Paolo Scarpellini [1], Antonella Castagna [1,2] on behalf of COVID-BioB study group



Follow-up (days)	Cumulative incidence of secondary infections of any type (95% confidence interval)
7	2.2% (1.3% - 3.6%)
14	9.6% (7.1% - 12.5%)
21	14.8% (11.3% - 18.7%)
28	16.4% (12.4% - 21.0%)



Follow-up (days)	Patients with BL absolute lymphocyte count ≤0.7 per 10^9/L (95% confidence interval)	Patients with BL absolute lymphocyte count >0.7 per 10^9/L (95% confidence interval)
7	2.2% (0.7% - 5.3%)	1.6% (0.7% - 3.3%)
14	11.3% (6.5% - 17.5%)	7.6% (4.8% - 11.2%)
21	19.0% (12.2% - 27.1%)	12.8% (8.5% - 18.2%)
28	21.4% (13.5% - 30.6%)	14.7% (9.3% - 21.2%)



Follow-up (days)	Patients with BL PaO_2/FiO_2 ≤200 (95% confidence interval)	Patients with BL PaO_2/FiO_2 >200 (95% confidence interval)
7	5.8% (2.7% - 10.6%)	0.7% (0.2% - 2.0%)
14	21.0% (13.9% - 29.1%)	5.6% (3.2% - 8.9%)
21	27.7% (19.1% - 36.9%)	11.9% (7.6% - 17.2%)
28	30.1% (20.6% - 40.3%)	13.4% (8.4% - 19.6%)

- 731 patients: **a secondary infection was diagnosed in 9.3%**
- 7.9% had at least one BSI and 3.0% at least one pLRTI.
- **The overall 28-day cumulative incidence of secondary infections was 16.4%** (95%CI 12.4-21.0%).
- Most of the BSIs were due to Gram-positive pathogens (71.7%), more than half of them CNS, LRTIs were caused mainly by Gram-negative pathogens (53.8%).
- Eleven patients were diagnosed with putative invasive aspergillosis.
- At multivariable analysis, **early need for ICU, respiratory failure, and severe lymphopenia were risk factors for secondary infections.**

Ripa M, et al. Clin. Microbiol. Inf. 2021; 27(3): 451-457. doi: 10.1016/j.cmi.2020.10.021

- **Secondary bacterial/fungal infections following COVID-19 were more prevalent than coinfection** and often leading to poorer patient outcomes and longer hospitalizations

Marco Ripa et al., Clin Microbiol Infect 2021; 27(3):451-457
MA Hendaus, et al. J Biomol Strct Dyn 2021; 39:4185-4191
Kathleen McMullen et al. Am J Infect Control 2020; 48: 1409-11

COVID-19: 2nd-3rd waves

- The use of immunosuppressive drugs – ex. dexamethasone and tocilizumab – has increased the incidence of secondary infections, and led to further use of antibiotics.
- Moreover, an exponential growth in biocide use worldwide occurred.
- Strong selective pressure on bacterial pathogens, leading to **an increased rate of severe secondary infections caused by drug-resistant pathogens**

But then, it is not just a problem of antimicrobial use and its metrics/indicators

It is a problem of an increased incidence of HAI

ICU patients with COVID-19 are at higher risk of developing infectious complications during their ICU stay

- **Viral respiratory diseases** predispose to secondary respiratory infections
- COVID-19 patients frequently develop **multiple organ failure** with need for long duration of mechanical ventilation, vasopressors, RRT and, in some cases, ECMO, leading to long ICU stay
- COVID19 per se is associated with **significant dysfunction of the patient's immune system** - both innate and acquired immunity: reduction in both CD4+ T and CD8+ T lymphocyte counts, reduction in IFN-γ serum concentrations, excess pro-inflammatory cytokines, inhibition of NK cells and cytotoxic lymphocytes and morphological and phenotypical alterations of monocytes
- **Treatment with systemic corticosteroids, cytokine inhibitors, JAK inhibitors or complement inhibitors**
- **Increased use of femoral lines** for central access (safer, easier, RRT)
- **Prone positioning** (pulling, tugging and friction at central line insertion sites and less visualization of the insertion site for BSI and worse mouth hygiene and more microaspiration)

Grasselli et al. Crit Care 2021; 25: 317
Schimdt M et al. Intensive Care Med. 2021; 47: 60–73
Zheng M et al. Cell Mol Immunol. 2020; 17: 533–5

Studies describing secondary infections in patients with COVID-19

Study [ref]	Sample size	Setting	Incidence of secondary infections, %	Type and site of infection (%)	Microorganisms isolated (%)
Giacobbe et al. [27]	78	ICU	40	BSI (100)	Coag-neg staphylococci (24) *E. faecalis* (18) *S. aureus* (13)
He et al. [46]	918	Hospital	7	Pneumonia (32) BSI (25) UTI (22)	Coag-staphylococci (28) *A. baumannii* (21) *P. aeruginosa* (14)
Sharifipour et al. [26]	19	ICU	100[a]	VAP (100)	*A. baumannii* (90) *S. aureus* (10)
Fu et al. [47]	36	ICU	14	VAP (100)	*S. mantophilia* (40)
Li et al. [48]	1495	Hospital	7	Pneumonia (86) BSI (34) UTI (8)	*A. baumannii* (36) *K. pneumoniae* (31) *S. mantophilia* (6)
Rouzé et al. [24]	568	ICU	51	VAP (71) VAT (29)	*P. aeruginosa* (22) *Enterobacter* spp. (18) *S. aureus* (12)
Buetti et al. [28]	321	ICU	15	BSI	Coag-staphylococci (36) *Enterobacterales* (13) *P. aeruginosa* (13)
Dudoignon et al. [49]	54	ICU	37	VAP (75)	*P. aeruginosa* (33) *Enterobacteriaceae* (33) *S. aureus* (20)
Ripa et al. [50]	731	Hospital	9	BSI (85) LRTI (32)	Coag-staphylococci 70% of BSI *A. baumannii* 30% of LRTI

Grasselli et al. Crit Care 2021; 25:317

- **A multicenter, observational trial conducted in several European countries**
- 4244 critically ill COVID-19 patients
- Most with prolonged IMV, high incidence of ARDS, frequent immunossupressive drugs (37,3% on steroids)
- **The incidence of VAP in intubated patients was 58%**

Schmidt M, et al. Intensive Care Med. 2021; 47: 60–73

Not only VAP; BSI was frequent

- Cumulative risk of developing an episode of BSI of nearly **25% after 15 days** of ICU stay and higher than **50% after 30 days**.
- Treatment with tocilizumab or with methylprednisolone was independently associated with the development of BSI.

Giacobbe DR, et al. Eur J Clin Invest. 2020; 50: e13319

- A case control study comparing BSIs in 235 COVID-19 and 235 non-COVID 19 ICU patients
- Incidences of **14.9%** and 3.4%, respectively.
- In patients infected with SARS-CoV-2, BSIs occurred a median of **12 days after ICU admission.**
- A significant increase in the risk of BSIs, in COVID-19 patients treated with tocilizumab or anakinra

Buetti N, et al. For the OUTCOMEREA network. Intensive Care Med. 2021; 47: 180–7

And also fungal infections

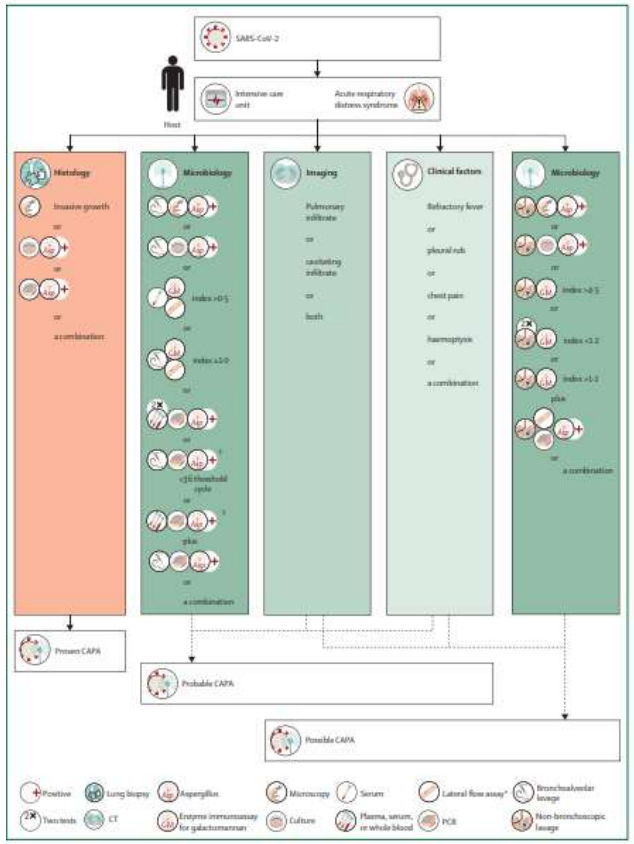
- *Candida* BSI
- *Candida auris*
- Aspergillosis > CAPA

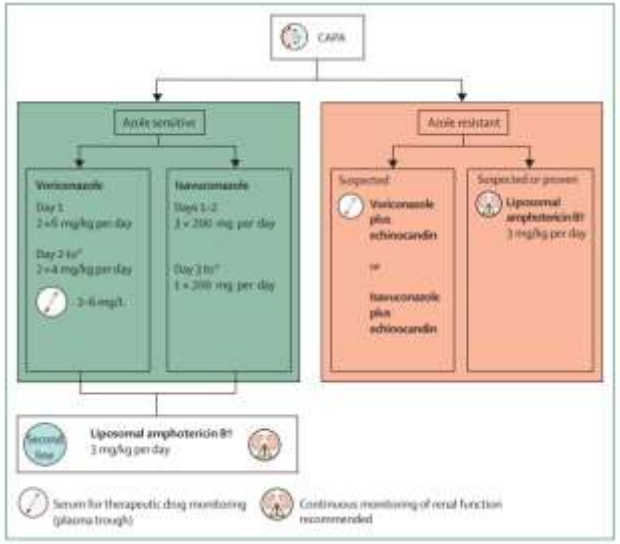
Review

Defining and managing COVID-19-associated pulmonary aspergillosis: the 2020 ECMM/ISHAM consensus criteria for research and clinical guidance

Philipp Koehler, Matteo Bassetti, Arunaloke Chakrabarti, Sharon C A Chen, Arnaldo Lopes Colombo, Martin Hoenigl, Nikolay Klimko, Cornelia Lass-Flörl, Rita O Oladele, Donald C Vinh, Li-Ping Zhu, Boris Böll, Roger Brüggemann, Jean-Pierre Gangneux, John R Perfect, Thomas F Patterson, Thorsten Persigehl, Jacques F Meis, Luis Ostrosky-Zeichner, P Lewis White, Paul E Verweij, Oliver A Cornely, on behalf of the European Confederation of Medical Mycology, the International Society for Human and Animal Mycology, the Asia Fungal Working Group, the INFOCUS LATAM/ISHAM Working Group, the ISHAM Pan Africa Mycology Working Group, the European Society for Clinical Microbiology and Infectious Diseases Fungal Infection Study Group, the ESCMID Study Group for Infections in Critically Ill Patients, the Interregional Association of Clinical Microbiology and Antimicrobial Chemotherapy, the Medical Mycology Society of Nigeria, the Medical Mycology Society of China Medicine Education Association, Infectious Diseases Working Party of the German Society for Haematology and Medical Oncology, and Association of Medical Microbiology and Infectious Disease Canada

Lancet Infect Dis 2021; 21: e149–62





ICU acquired infections and hospital acquired bacteremia

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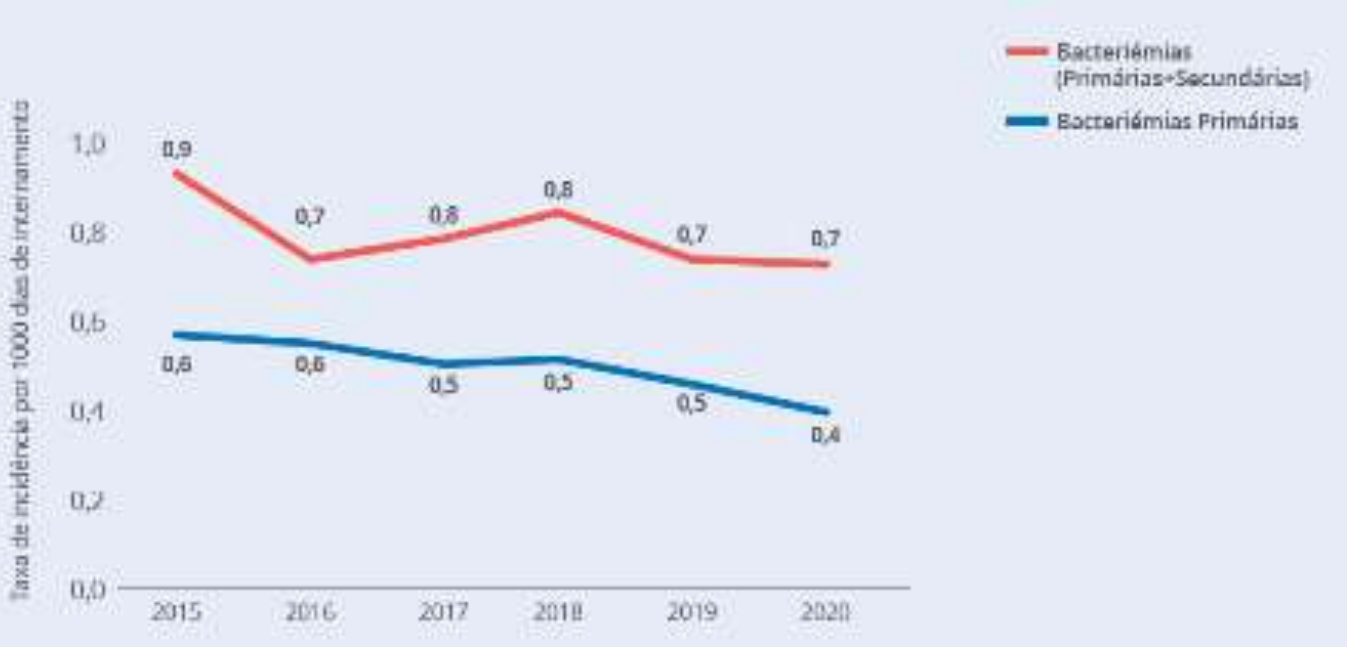
INCS Portugal 2015-2020



HAI Net ICU Portugal 2015-2020

Neonatal ICU acquired infections

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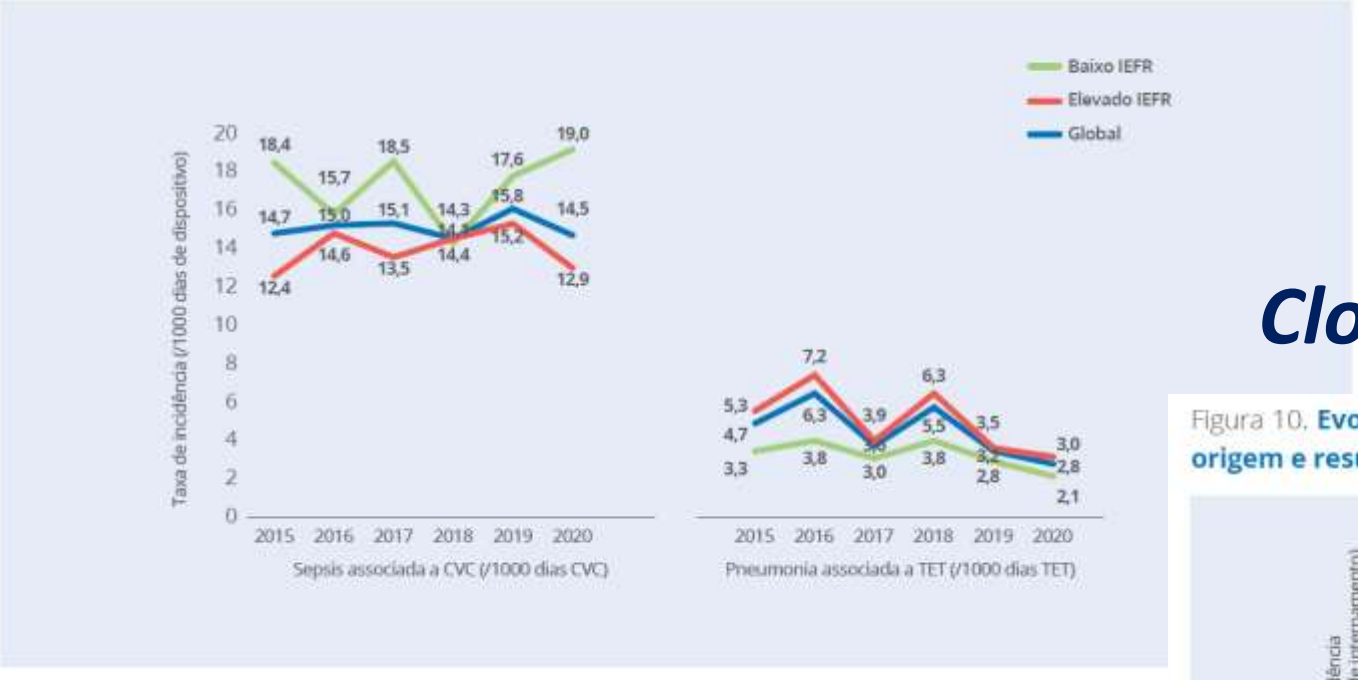
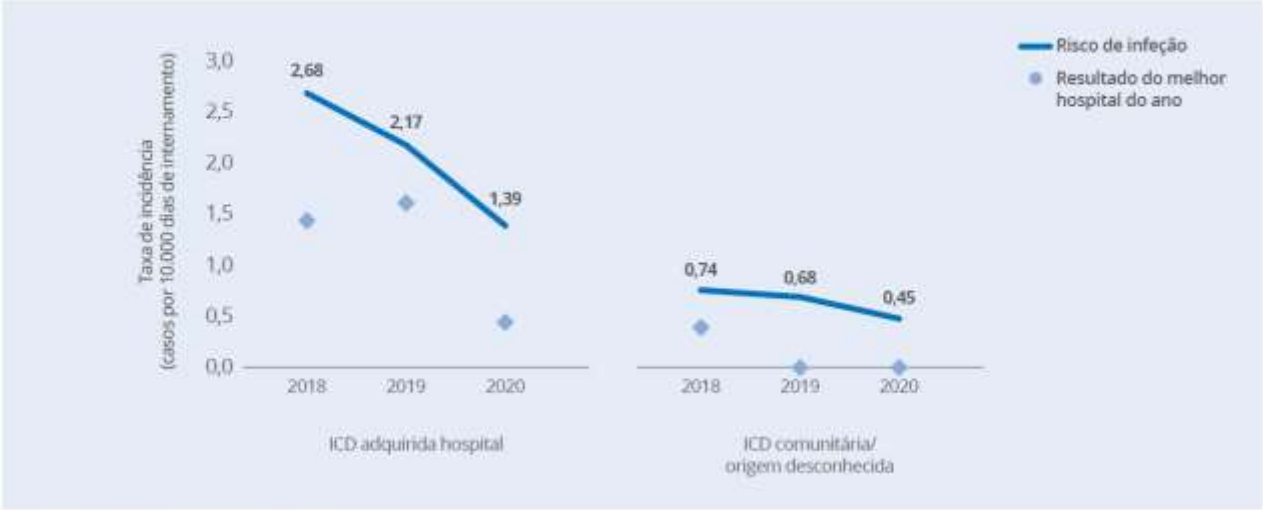
Figura 6. **Taxa de incidência de sepsis relacionada com CVC e de pneumonia relacionada com TET em UCIN (2015-2020).**



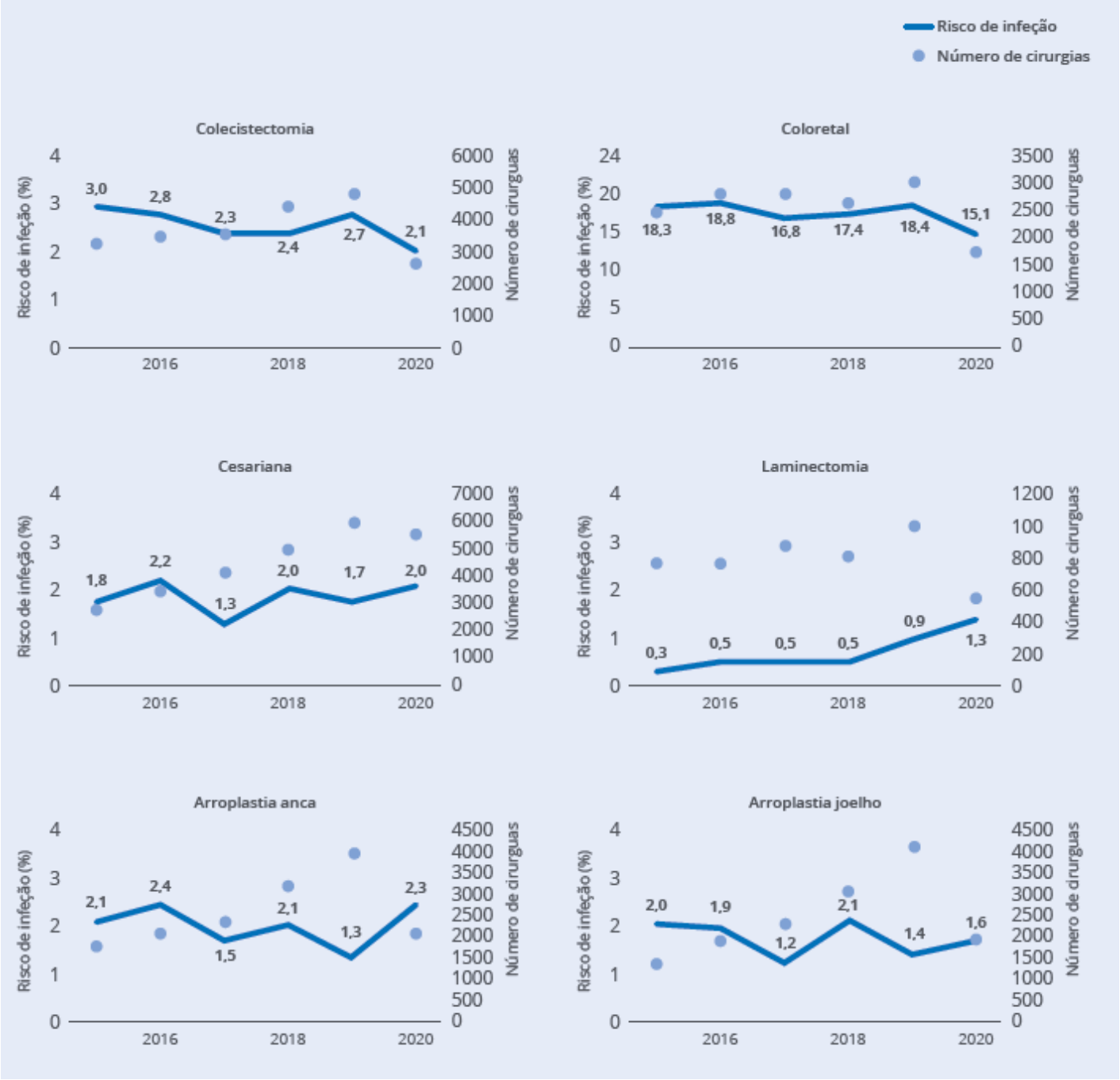
Clostridioides difficile infections

Figura 10. **Evolução da taxa de incidência de infeção por Clostridioides (*Clostridium*) *difficile* pela origem e resultado do melhor hospital do ano (símbolo losango) (2018 e 2020).**



Símbolo losango de cor azul – *benchmarking*.

Surgical site infections



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HAI Net Portugal 2015-2020

Baccolini et al. Antimicrob Resist Infect Control (2021) 10:87
https://doi.org/10.1186/s13756-021-00959-y

Antimicrobial Resistance and Infection Control

RESEARCH Open Access

The impact of the COVID-19 pandemic on healthcare-associated infections in intensive care unit patients: a retrospective cohort study

V. Baccolini[1*†], G. Migliara[1†], C. Isonne[1], B. Dorelli[1], L. C. Barone[1], D. Giannini[1], D. Marotta[1], M. Marte[1], E. Mazzalai[1], F. Alessandri[2], F. Pugliese[2,3], G. Ceccarelli[1], C. De Vito[1], C. Marzuillo[1], M. De Giusti[1] and P. Villari[1]

- 104 patients admitted to the main ICU of the Umberto I hospital of Rome, from March 1st and April 4th 2020 were compared with patients hospitalized in 2019.
- 59 HAIs were recorded, 32 of which occurred in the COVID19 group.
- **Patients admitted in 2020 were found to be positively associated with both HAI and dr-HAI onset** (SHR: 2.66, 95% CI 1.31–5.38, and SHR: 10.0, respectively).
- A greater proportion of dr-HAIs seemed to occur in COVID-19 patients, especially VAP and CAUTI, but this was not statistically significant.
- **Increase in the incidence of HAIs and dr-HAIs in 2020, for both populations**

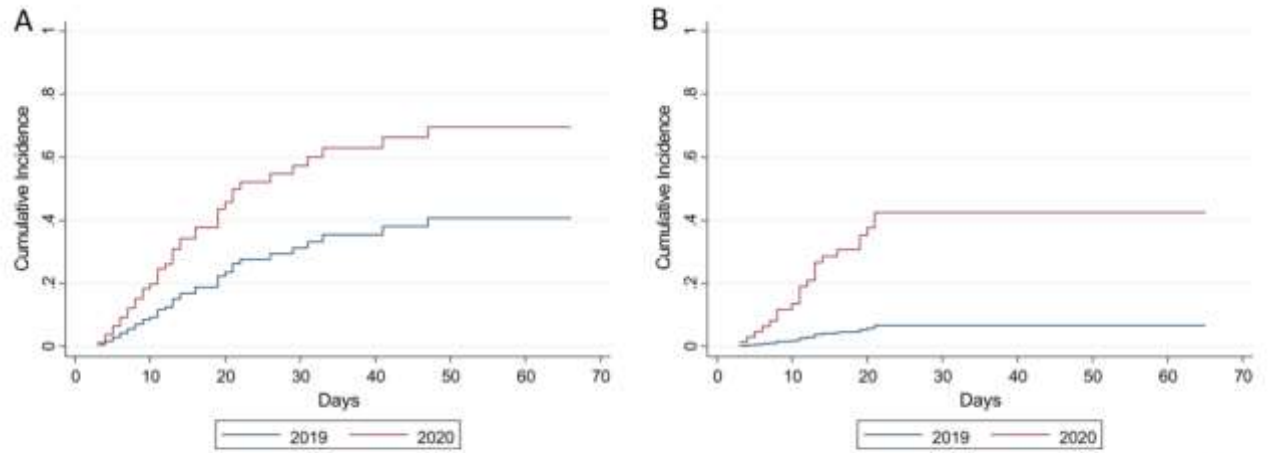

Fig. 1 Cumulative incidence function for first healthcare-associated infection (**a**) or first device-related healthcare-associated infection (**b**) among the patients admitted to the main Intensive Care Unit (ICU) of Umberto I teaching hospital of Rome between 1st March and 4th April 2019 and 1st March and 4th April 2020

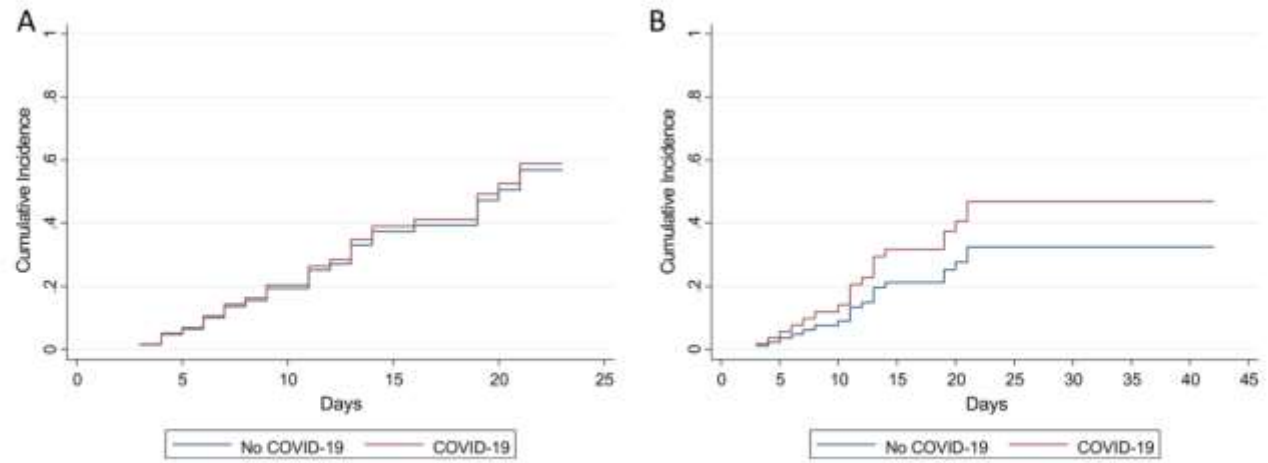

Fig. 2 Cumulative incidence function for first healthcare-associated infection (**a**) or first device-related healthcare-associated infection (**b**) among the patients admitted to the main intensive care unit of Umberto I teaching hospital of Rome between 1st March and 4th April 2020

But then, it is not just a problem of AMC and higher incidence of HAI, which real burden has yet to be quantified…

Organizational issues may be a strong determinant

Hand higyene

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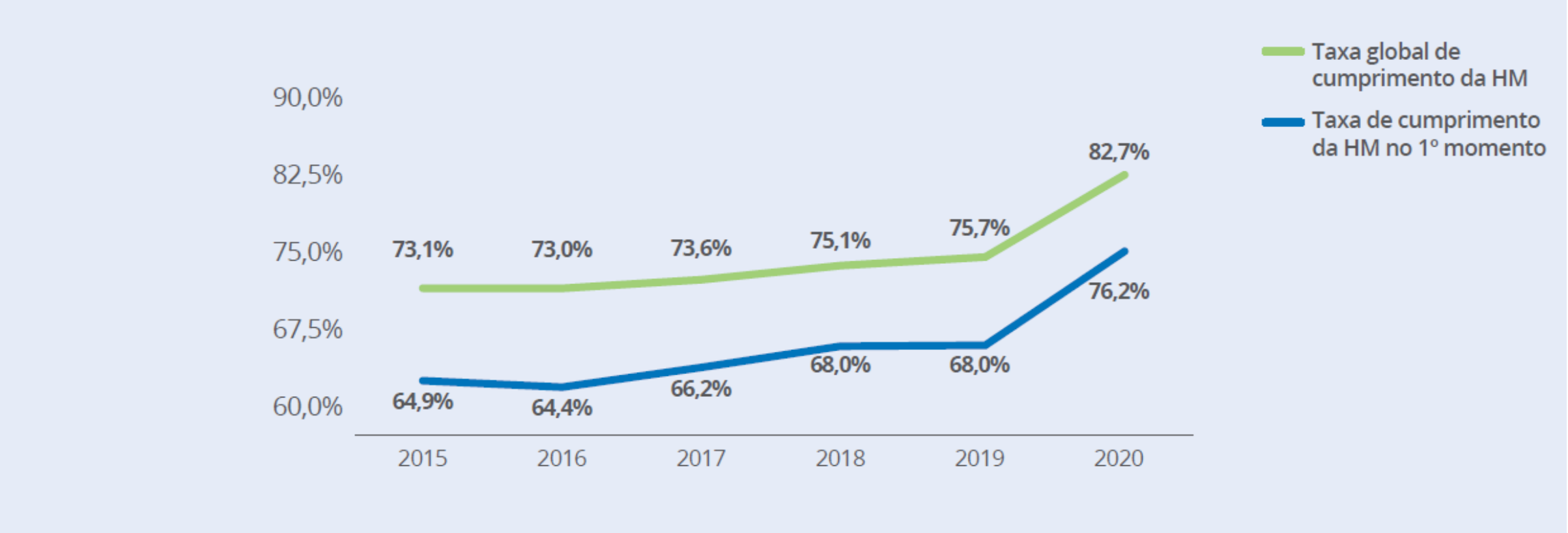


Fonte: Plataforma DGS/PPCIRA/EM-PBC.

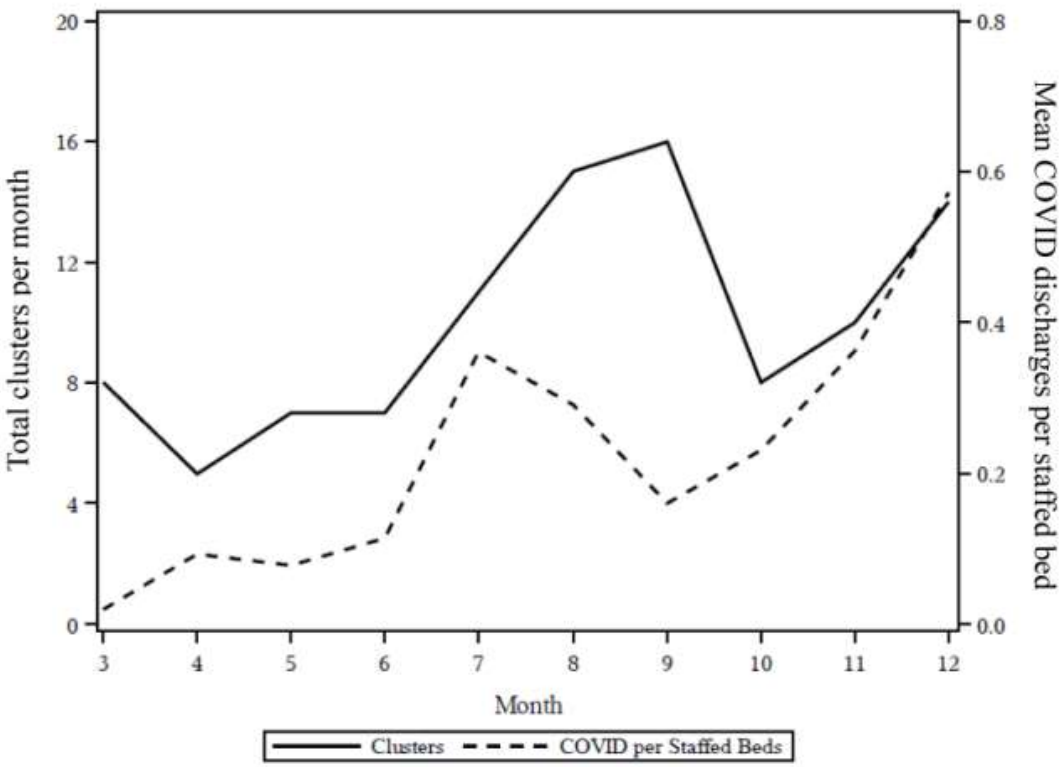
Organizational issues are relevant

- **More tasks during each visit to the room** and fatigue during these care visits could lead to rushing through important time-critical tasks
- Although hand hygiene at the end of care during PPE removal was very much complied with, **hand hygiene needs will be increased, and easier to miss,** during those long episodes of patient care that have been **batched into many tasks at one visit**
- **Large number of patients**
- **Use of ward areas converted into ICUs**
- Need to **pull support staff from noncritical care areas** where experience with prevention practices may be lower
- **Exhaustion and burn-out**

Adapted from Kathleen McMullen et al. Am J Infect Control 2020; 48: 1409-11

COVID-19 surges adversely impact HAI rates and clusters of infections within hospitals

- In 148 HCA hospitals, 3/1/2020-9/30/2020, and a subset of hospitals with microbiology and cluster data through 12/31/2020, the association between COVID-19 surges and HAIs, hospital-onset pathogens, and cluster rates were evaluated, using negative binomial mixed models.
- **CLABSI, CAUTI and MRSA bacteremia increased as COVID-19 burden increased**.
- There were 60% (95% CI, 23-108%) more CLABSI, 43% (95% CI, 8-90%) more CAUTI, and 44% (95% CI, 10-88%) more cases of MRSA bacteremia than expected over 7 months based on predicted HAIs had there not been COVID-19 cases.
- *Clostridioides difficile* infection was not significantly associated with COVID-19 burden.
- **Rates of BSI and MDR organisms** - MRSA, VRE and MDR GNB - **were each significantly associated with COVID-19 surges.**
- **Clusters of hospital-onset pathogens increased as the COVID-19 burden increased**, suggesting **increased healthcare-associated transmission as one possible mechanism to account for increases in HAI**



Meghan Baker et al. CID 2021.
doi: 10.1093/cid/ciab688

A global crash of AMS programmes

Journal of Hospital Infection 106 (2020) 401–403

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin

Editorial

Antimicrobial stewardship: a COVID casualty?

"AMS has become a casualty of the COVID-19 pandemic for various reasons. AMS programmes will have been disrupted by the far-reaching changes in clinical service delivery during the pandemic, whilst other contributory factors include disruption to global antibiotic supply chains and a tendency to over-treat hospitalised COVID-19 patients with antibiotics (sometimes repurposing antibiotics such as azithromycin as anti-viral drugs)."

Chris Lynch et al. J Hosp Infect 2020; 106: 401-403

AMS in the hospital setting, in Portugal, in 2020

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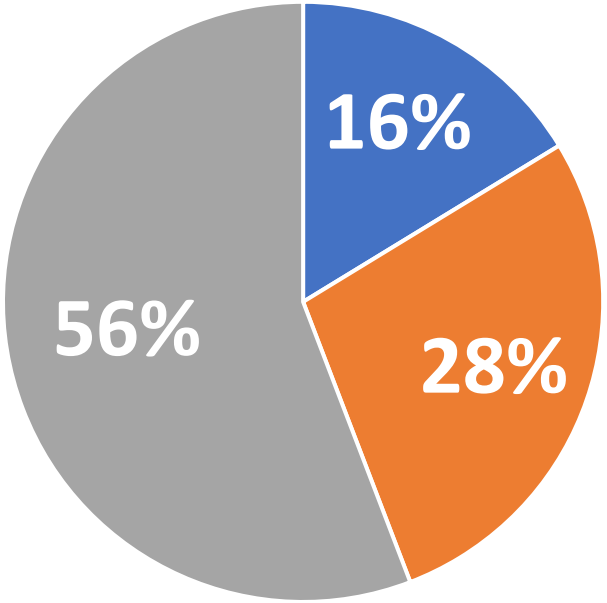
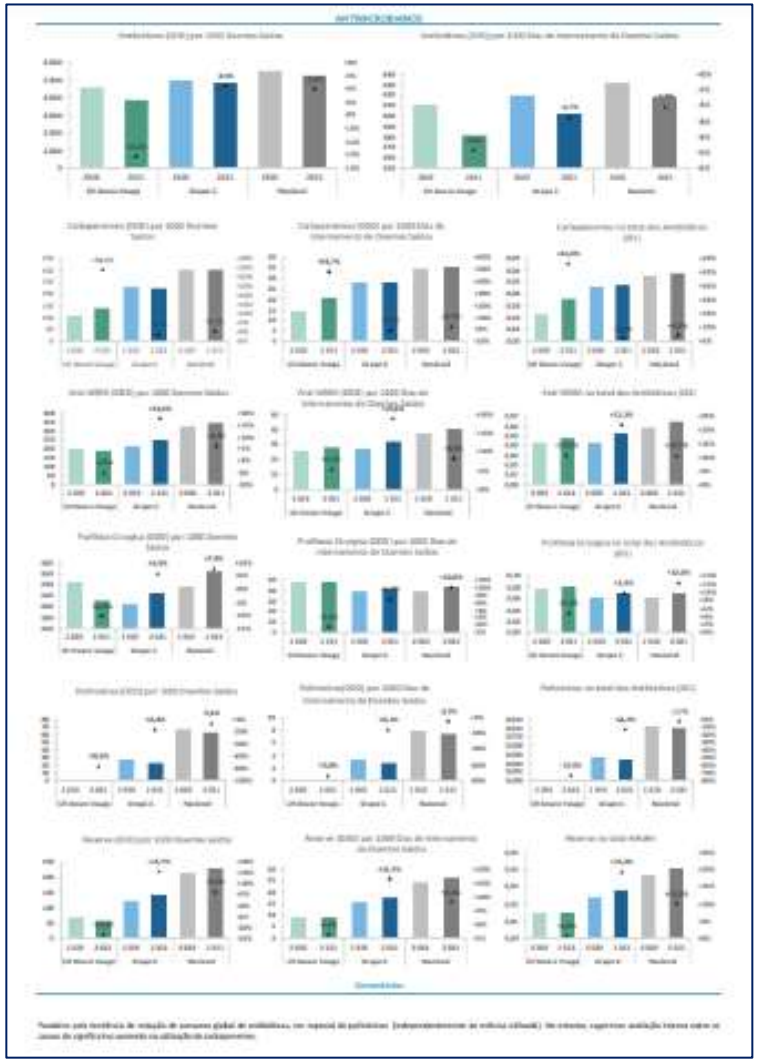
Infarmed

Has the hospital an AMS as defined in the Decree 15423/2013?



- Yes, acting in less than 50% of the services
- No
- Yes, acting in at least 50% of the services

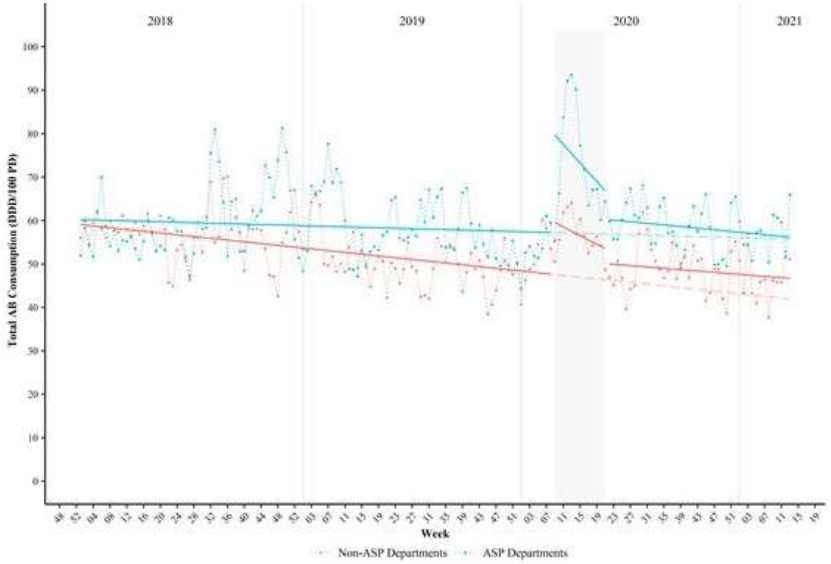
72%



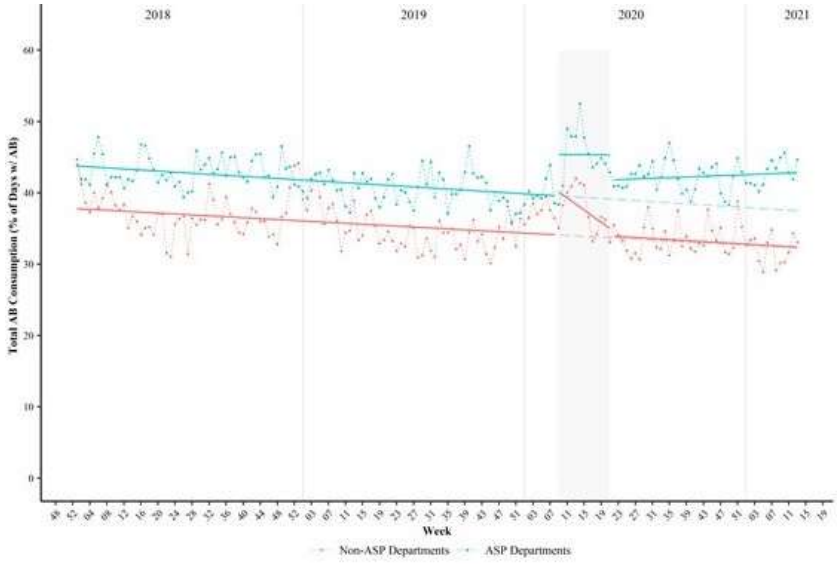
Impact of antimicrobial stewardship programs suspension on antibiotic consumption after COVID-19: an interrupted time series analysis

SÃO JOÃO HOSPITAL

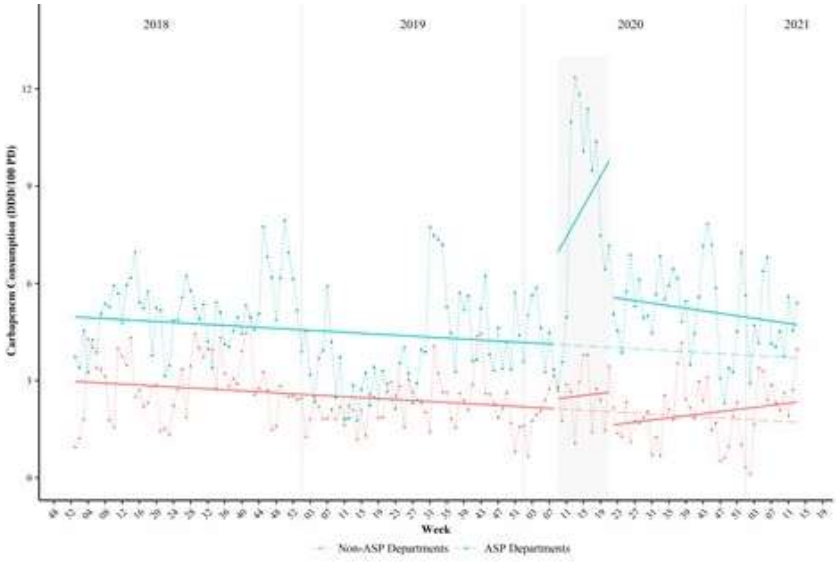
Antibiotic consumption



Days with antibiotic (%)



Carbapenem consumption



ASP departments **Non-ASP departments** * ICU and COVID-19 patients excluded

- ASP withdrawal is associated with increased antimicrobial consumption, with a potential long-lasting impact

UPCIRA Team CHUSJ

ECCMID 2022;
Abstract number: 04199

But then, it is not just a problem of AMC
and higher incidence of HAI,
and of organizational problems posed by the pandemic

The context and the culture may be strong determinants

The context – COVID-19 just reveals and emphasizes

- Current experience suggesting that **secondary infections in COVID-19 patients are likely to reflect local microbiology and resistance patterns.**
- And that services in which lack of alignement between microbiological diagnosis and antimicrobial use existed saw the **problem magnified by limitations in safe sampling methods and heavy work load, during the pandemic**

- It is currently unknown whether new or evolving antibiotic resistance in areas with low previous rates will emerge in COVID-19 patients
- This should be assessed in retrospective and prospective clinical and microbiology studies.

J Rodriguez-Bano et al. Trans R Soc Trop Med Hyg 2021; 115: 1122–1129
Cantón R, et al. Curr Opin Crit Care. 2020; 26(5): 433–41
Porretta AD, et al. Pathogens 2020; 9(8): E635

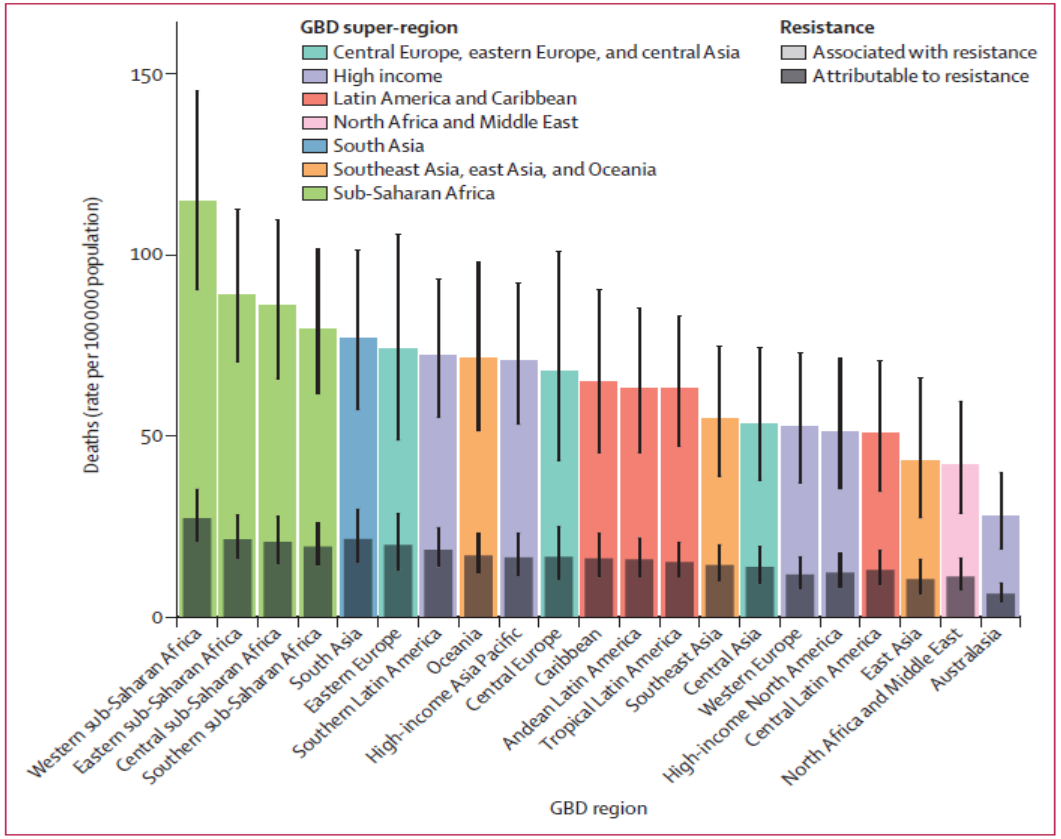
Did the COVID-19 pandemic increase antimicrobial resistance (AMR) burden ?

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

Antimicrobial Resistance Collaborators*

Methods: We estimated deaths and disability-adjusted life-years (DALYs) attributable to and associated with bacterial AMR for 23 pathogens and 88 pathogen–drug combinations in 204 countries and territories in 2019. We obtained data from systematic literature reviews, hospital systems, surveillance systems, and other sources, covering 471 million individual records or isolates and 7585 study-location-years. We used predictive statistical modelling to produce estimates of AMR burden for all locations, including for locations with no data.

- An estimated **4·95 million** (3·62–6·57) deaths associated with bacterial AMR in 2019, including **1·27 million** (95% UI 0·911–1·71) deaths attributable to bacterial AMR
- Bacterial AMR is a health problem whose magnitude is at least as large as major diseases such as HIV and malaria, and potentially much larger.
- Bacterial AMR is a problem in all regions; in 2019, the highest rates of AMR burden were in sub-Saharan Africa.



Antimicrobial Resistance Collaborators. Lancet 2022. https://doi.org/10.1016/S0140-6736(21)02724-0

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

Antimicrobial Resistance Collaborators*

- **Six pathogens accounted for 73·4% (66·9–78·8%) of deaths attributable to bacterial AMR**.
- **Seven pathogen–drug combinations** each caused more than 50,000 deaths, highlighting the importance of developing policies that specifically target the deadliest pathogen–drug combinations.

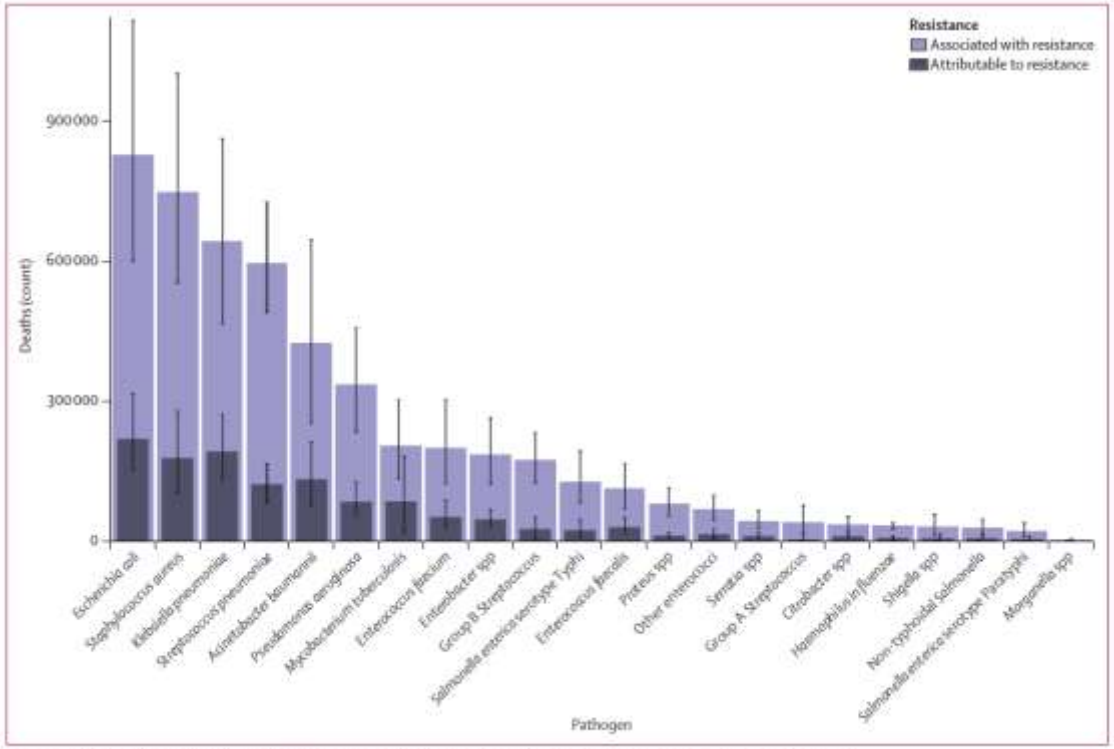


Figure 4: Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by pathogen, 2019

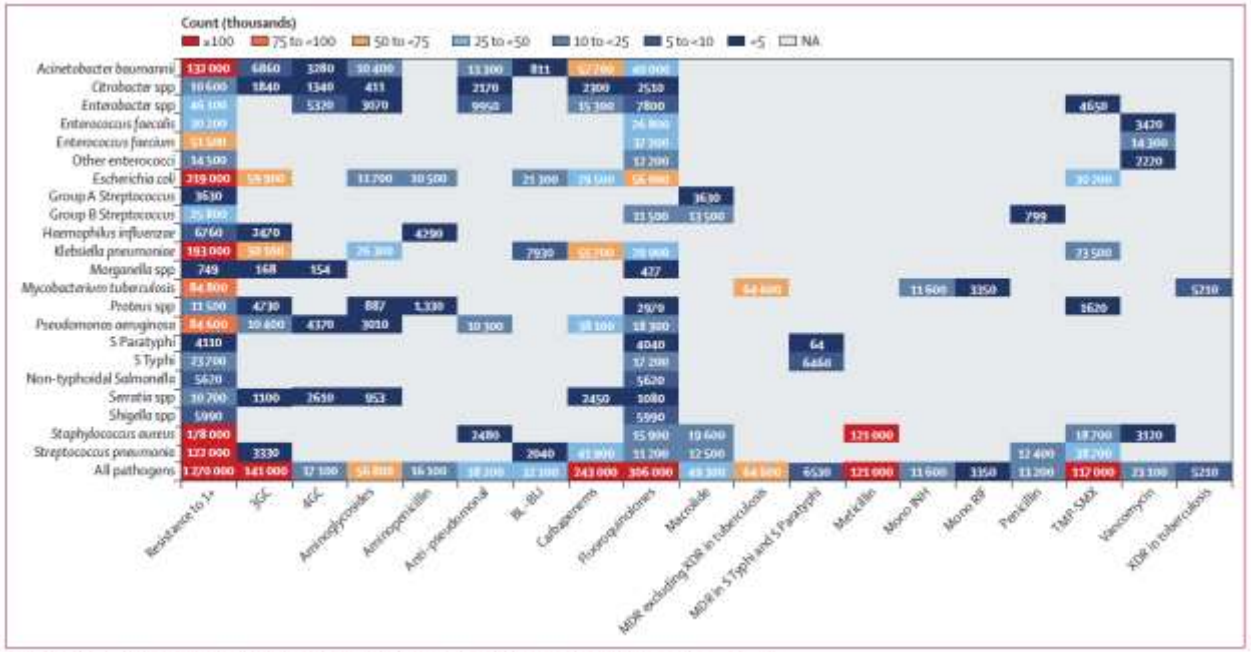


Figure 6: Global deaths (counts) attributable to bacterial antimicrobial resistance by pathogen-drug combination, 2019

Antimicrobial Resistance Collaborators Lancet 2022. https://doi.org/10.1016/S0140-6736(21)02724-0

Portugal
Antimicrobial resistance 2012-2020

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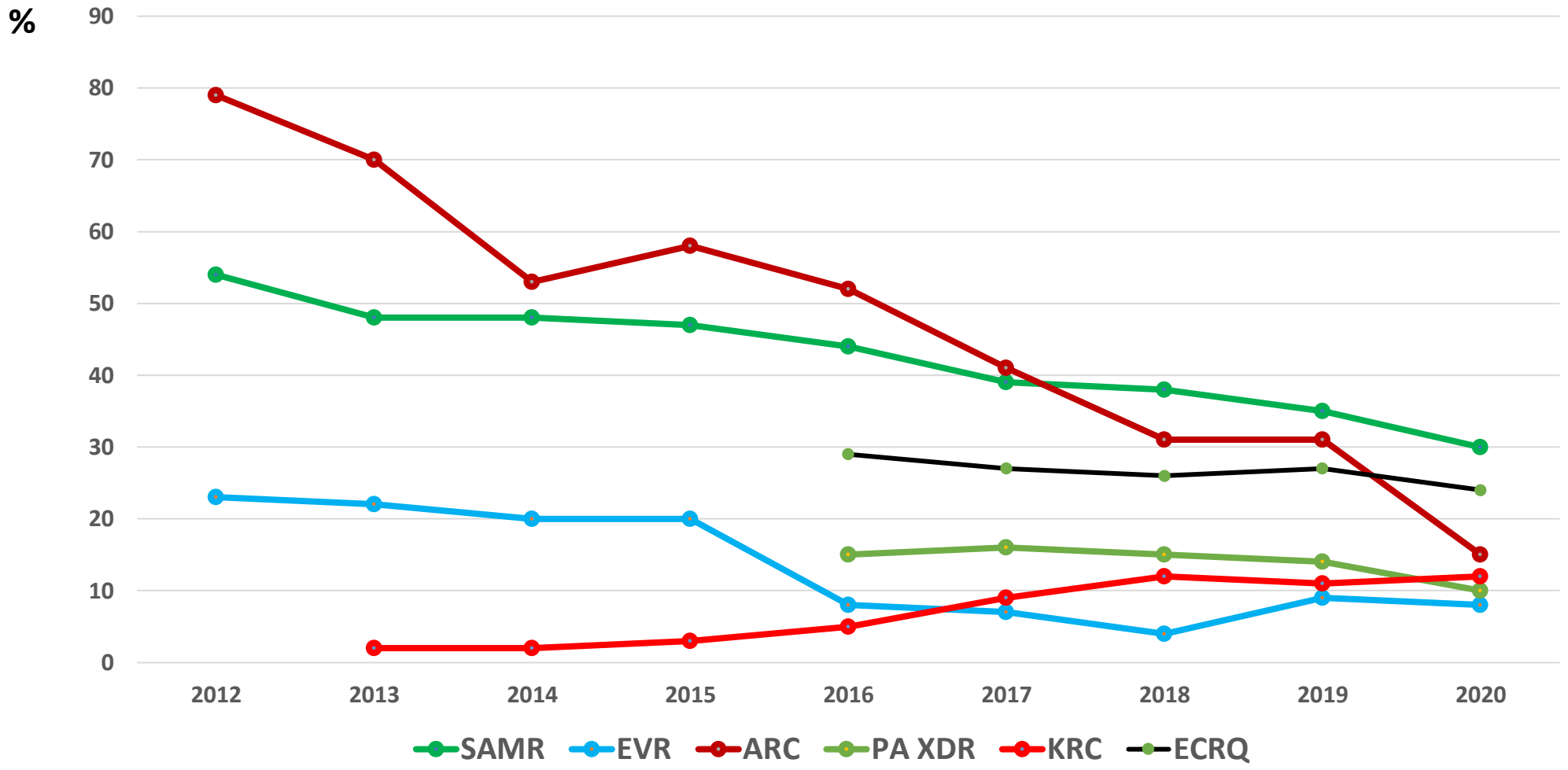
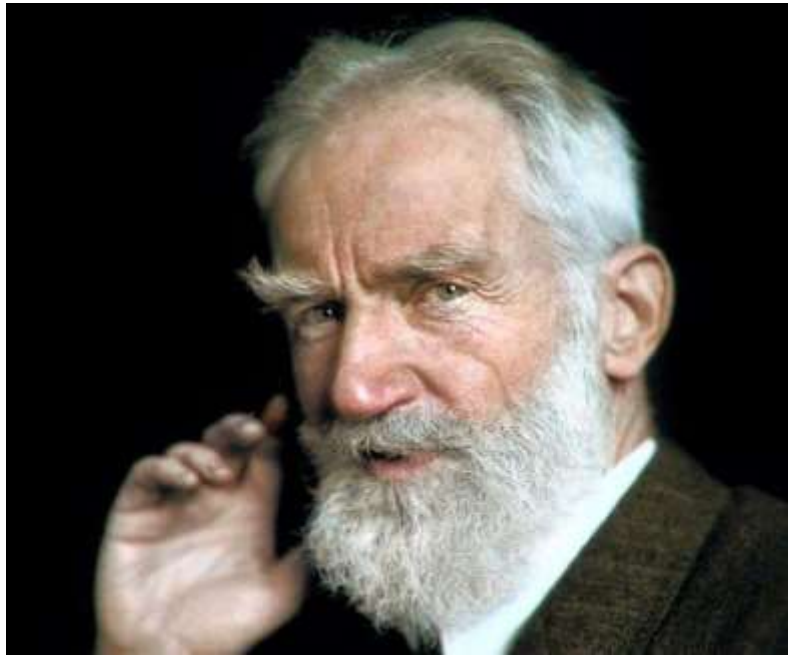


Did the COVID-19 pandemic increased antimicrobial resistance (AMR) burden ?

We do not know, as there isn´t enough data yet,
but COVID-19 pandemic pushed Intensive Care Medicine to their limits
in terms of organizational challenge and human resources work load,
and AMC seem to have incresead, namely due to an increased rate of HAI,
caused by difficult-to-treat pathogens,
both in COVID-19 and non-COVID-19 criticaly ill patients.

The impact of all this, in contexts with different cultures and rates of AMR resistance,
is yet to be studied and unveiled.

The time to act is now! There is no time lo lose.
Because later may be too late and because now we have the right momentum.

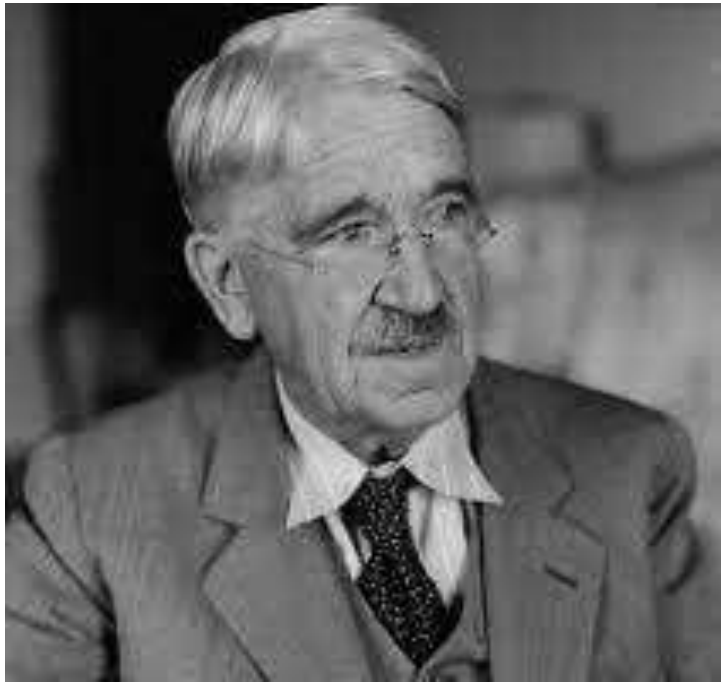


“If history repeats itself
and the unexpected always happens,
how incapable must Man be
of learning from experience”

George Bernard Shaw (1856-1950)

“We do not learn from experience….
we learn from reflecting on experience”

John Dewey (1859-1952)



The time to act is now !
Seize the moment!

Central PPCIRA

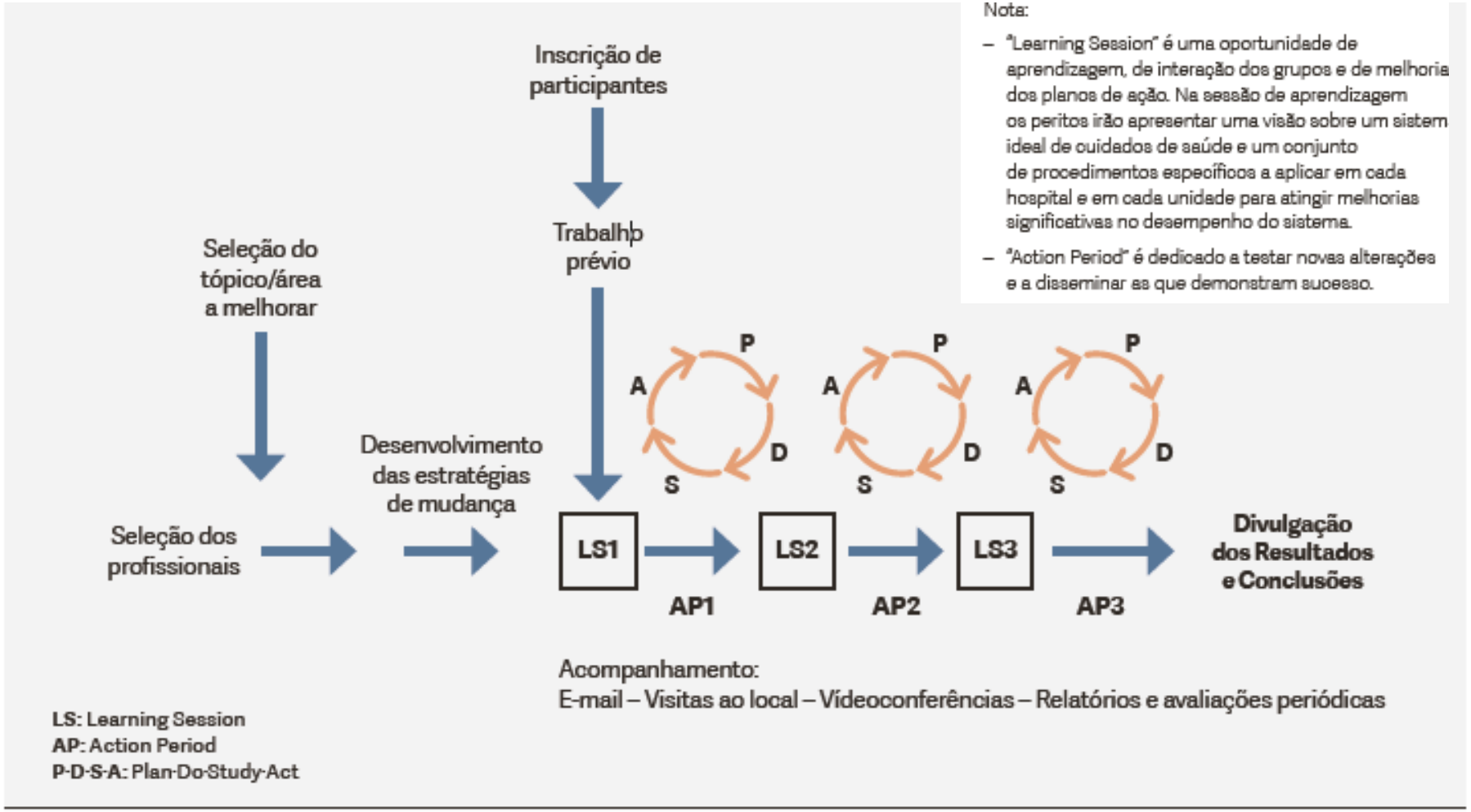
Reducing hospital infections

STOP-Hospital Infection 2.0 !
2022-2025

Programa de Prevenção e Controlo de Infeções e de Resistência aos Antimicrobianos

FUNDAÇÃO CALOUSTE GULBENKIAN

Institute *for* Healthcare Improvement



Acting on long-term care facilities: ITUCCI

Programa de Prevenção
e Controlo de Infeções
e de Resistência aos Antimicrobianos

parfoundation.org/grantees-2021-funding-for-projects-in-ghana-portugal-and-sweden/

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PPCIRA (National Program for Infection and Antimicrobial Resistance Prevention), Portugal, receives one million SEK (approximately EUR 100 000) for a project to prevent urinary tract infections in Portuguese care facilities for elderly. In comparison to Sweden, Portugal has a high antibiotic consumption per capita, and urinary tract infection is one of the most common causes of antibiotic treatment among elderly. The project focuses on training and methods to achieve behaviour change among healthcare staff and relatives of the patients.

– We thank PAR Foundation for the support. This grant is very important for the Portuguese Program on Healthcare Associated Infections and Antimicrobial Resistance Prevention, as it will allow us to address a relevant problem – catheter associated urinary tract infection (CAUTI) – in a frail population, those living in long term care facilities. We aim to decrease the use of urinary catheters, minimize the incidence of CAUTI and its overdiagnosis, reduce antimicrobial consumption and, consequently, the emergence of antimicrobial resistance, says Margarida Valente from the PPCIRA team.

- Reducing urinary tract infections (UTI) in residents of LTC facilities
- Reducing the overdiagnosis of UTI
- Reducing antibiotic use
- Reducing selection of MDR bacteria

PAR THE FOUNDATION TO PREVENT ANTIBIOTIC RESISTANCE

Development of infections resistant to antibiotics is a threat to modern healthcare. We support efforts to prevent antibiotic resistance.

6.7. Projeto Vigilância epidemiológica integrada (2CIACSN)

Objetivo: Facilitação e integração da vigilância epidemiológica de infeções associadas a cuidados de saúde, consumo de antimicrobianos e resistências a antimicrobianos, através da implementação de um sistema integrador de VE em plataforma de matriz única, com capacidade para avaliação em tempo real e formulação de ciclos de qualidade.

Parceiros: DGS/PPCIRA e ARS Norte (projeto 2CIACS-N de 15 de junho 2020)

Ações: está em curso a implementação, em todas as instituições hospitalares da ARSN, de plataforma de matriz única que permite vigilância epidemiológica integrada. O PPCIRA/DGS tem como objetivo, a extensão deste projeto a todas as ARS, seja através de contratualização com SPMS seja através de abertura de concurso pública para aquisição de plataforma informática, entre as existentes no mercado.

Citizen’s literacy

Programa de Prevenção
e Controlo de Infeções
e de Resistência aos Antimicrobianos

Finantial incentive
Top leadership commitment

PPCIRA Quality Score

Bonus to the income of hospitals associated with quality performance in terms of:

- PPCIRA and ASP structures
- Adherence and implementation of guidelines
- Adherence to epidemiological surveillance
- Improvement in incidence of HCAI, antimicrobial consumption and antimicrobial resistance

Instituto Nacional de Saúde Doutor Ricardo Jorge

ACSS ADMINISTRAÇÃO CENTRAL DO SISTEMA DE SAÚDE, IP

Infarmed

SPMS EPE Serviços Partilhados do Ministério da Saúde

Programa de Prevenção e Controlo de Infeções e de Resistência aos Antimicrobianos

9254-(2) Diário da República, 2.ª série – N.º 52 – 15 de março de 2018

PARTE C

SAÚDE

Gabinete do Secretário de Estado Adjunto e da Saúde

Despacho n.º 3844-A/2018

O XXI Governo Constitucional estabeleceu como prioridade a defesa do Serviço Nacional de Saúde (SNS) e, nesse âmbito, identificou a necessidade de combater as Infeções Associadas aos Cuidados de Saúde (IACS), as quais são responsáveis por custos que excedem a cerca de 300 milhões de euros anuais, só na componente de infeções hospitalares.

A infeção adquirida em internamento hospitalar e o aumento das resistências bacterianas aos antibióticos são problemas relacionados, cada agravamento à escala mundial é doença preocupante para os serviços de saúde, para os profissionais de saúde e para os cidadãos em geral, na perspetiva da preservação da segurança do doente e da saúde das populações.

Em fevereiro de 2013, foi criado o Programa de Prevenção e Controlo de Infeções e de Resistência aos Antimicrobianos (PPCIRA), com carácter de programa prioritário de saúde, e qual tem vindo a liderar a estratégia de combate a estes problemas de saúde pública, na Direção-Geral da Saúde (DGS) e em ligação com o Centro Europeu de Prevenção e Controlo das Doenças (ECDC), orientando três vetores de intervenção principais: o conjunto de procedimentos básicos de controlo da infeção, o programa de apoio à prescrição antibiótica e a vigilância epidemiológica de IACS, de consumo de antimicrobianos e de resistências a antimicrobianos.

Para este processo de vigilância epidemiológica são necessários dados e indicadores obtidos através de diferentes serviços e organismos do Ministério da Saúde, nomeadamente a DGS, o Instituto Nacional de Saúde Doutor Ricardo Jorge, I. P., o INFARMED — Autoridade Nacional do Medicamento e Produtos de Saúde, I. P., a Administração Central do Sistema de Saúde, I. P., e só a sua análise e interpretação integrada permite a otimização de conclusões e a definição de estratégias adequadas para cada área.

Só o conhecimento, por parte das unidades de saúde, dos seus dados relativos a infeções associadas aos cuidados prestados, resistências bacterianas e IACS (pneumonia associada à ventilação, infeção relacionada com cateter venoso central em medicina intensiva, infeção da corrente sanguínea, infeção urinária associada a algálias e infeção neonatal) [illegible]

4 — Os dados e indicadores referidos no número anterior constituem o denominado "índice de qualidade PPCIRA", o qual é composto pelos seguintes variáveis, em relação às quais se definem objetivos para o triénio 2017-2019, nomeadamente:

a) Consumo hospitalar global de antibióticos, medido em DDD por 1000 doentes saídos dos cuidados: redução de 10 % ao ano;

b) Consumo hospitalar global de carbapenemes, medido em DDD por 1000 doentes saídos dos cuidados: redução de 10 % ao ano;

c) Taxa de Staphylococcus aureus resistente à meticilina (MRSA) em total de Staphylococcus aureus isolados em amostras invasivas (sangue e líquor) (objetivo: redução de 5 % ao ano);

d) Taxa de Klebsiella pneumoniae produtora de carbapenemase em total de Klebsiella pneumoniae isolados em amostras invasivas (objetivo: ≥ 1 %);

e) Ambiente de surto de Enterobacteriaceae produtora de carbapenemase [illegible]

f) Implementação de [illegible] de doentes com pelo menos um teste de caso de MRSA, conforme Norma anti-MRSA 010/2014, de 9 de dezembro de 2014, atualizada a 27 de abril de 2015, do PPCIRA/DGS;

g) Taxa de adesão ao feixe de intervenções (bundle) de prevenção de infeção de local cirúrgico conforme Norma 020/2015, de 15 de dezembro de 2015, do PPCIRA/DGS (objetivo: n.º de cirurgias com adesão a todas as medidas do feixe/n.º total de cirurgias > 75 %);

h) Taxa de adesão ao feixe de intervenções (bundle) de prevenção de infeção urinária associada a algália, conforme Norma 019/2015, de 15 de dezembro de 2015, do PPCIRA/DGS (objetivo: n.º de algálias com cumprimento de todas as medidas do feixe/n.º total de algálias > 75 %);

i) Taxa de adesão ao primeiro momento da higiene das mãos (objetivo: > 70 %);

j) Participação nos programas de vigilância epidemiológica da infeção relacionada com cateter, de pneumonia associada a ventilador, de infeção de local cirúrgico e de infeção neonatal da corrente sanguínea (objetivo: comprometer doentes vigilâncias em pelo menos 9 dos 12 meses)

Homologo

Nuno Lacasta
Presidente

Homologo
31/10/2019

Fernando Bernardo
Diretor Geral

Aprovo/Homologo
31/10/2019

Graça Freitas
Diretora-Geral da Saúde

PLANO NACIONAL DE COMBATE À RESISTÊNCIA AOS ANTIMICROBIANOS 2019-2023

2019

"UMA SÓ SAÚDE"

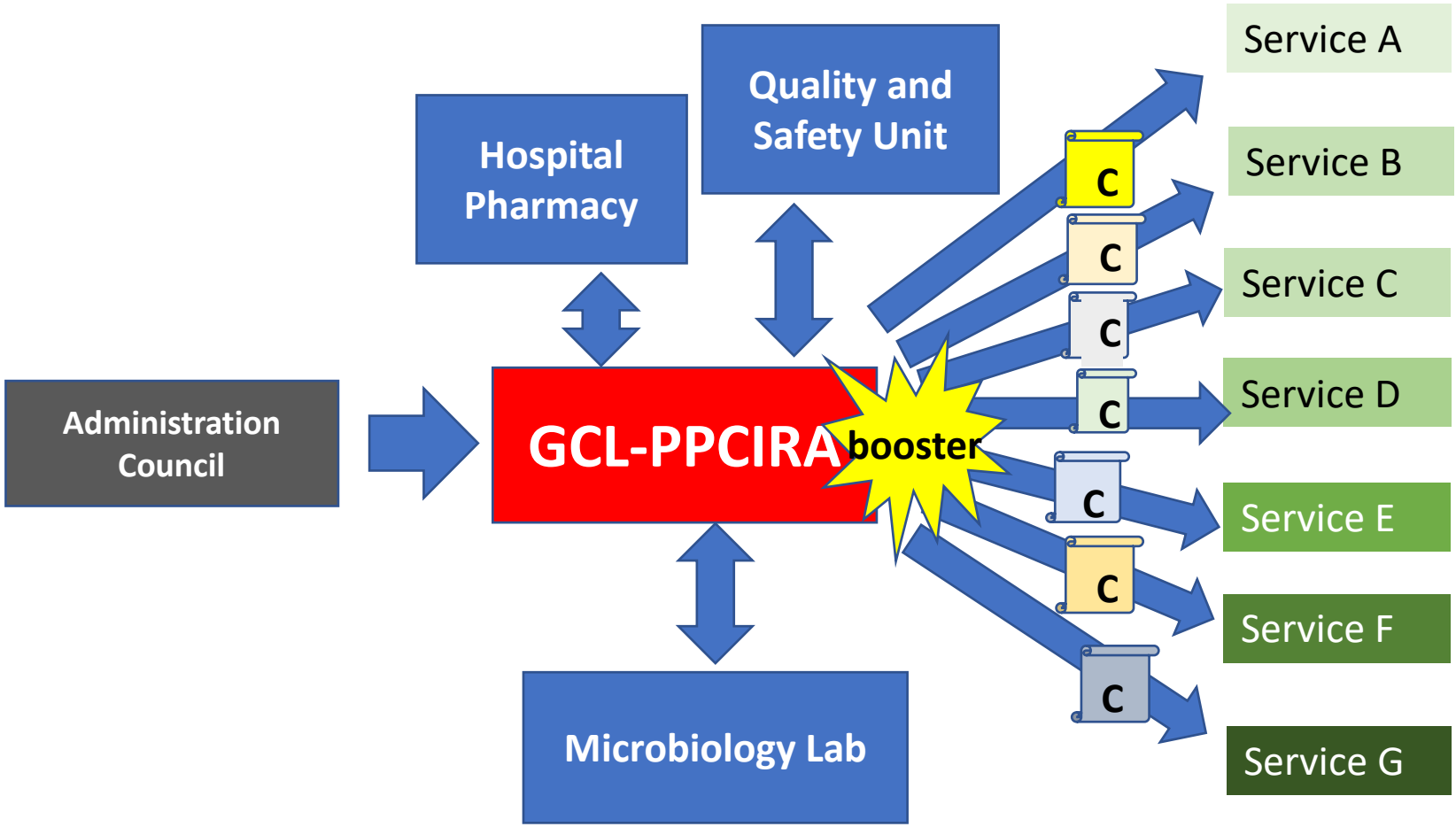
The time to act is now !
Seize the moment!

Local PPCIRA

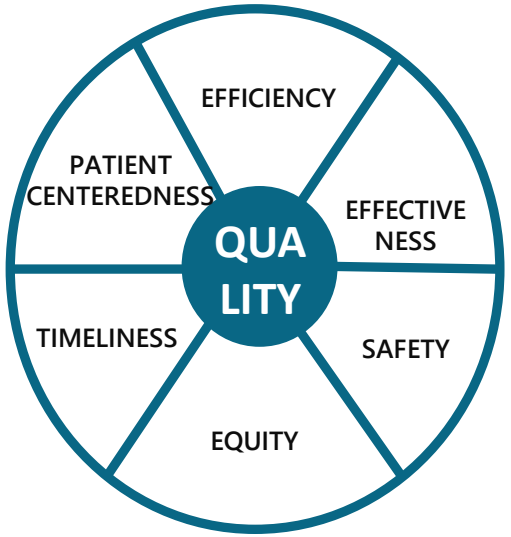
All crisis reveal…..

- GCL-PPCIRA have never been so needed, empowered and respected
- And never before had they a better and so profound knowledge of the hospital and the services
- **Please, leverage on that**

Engage the Service – establish a contract

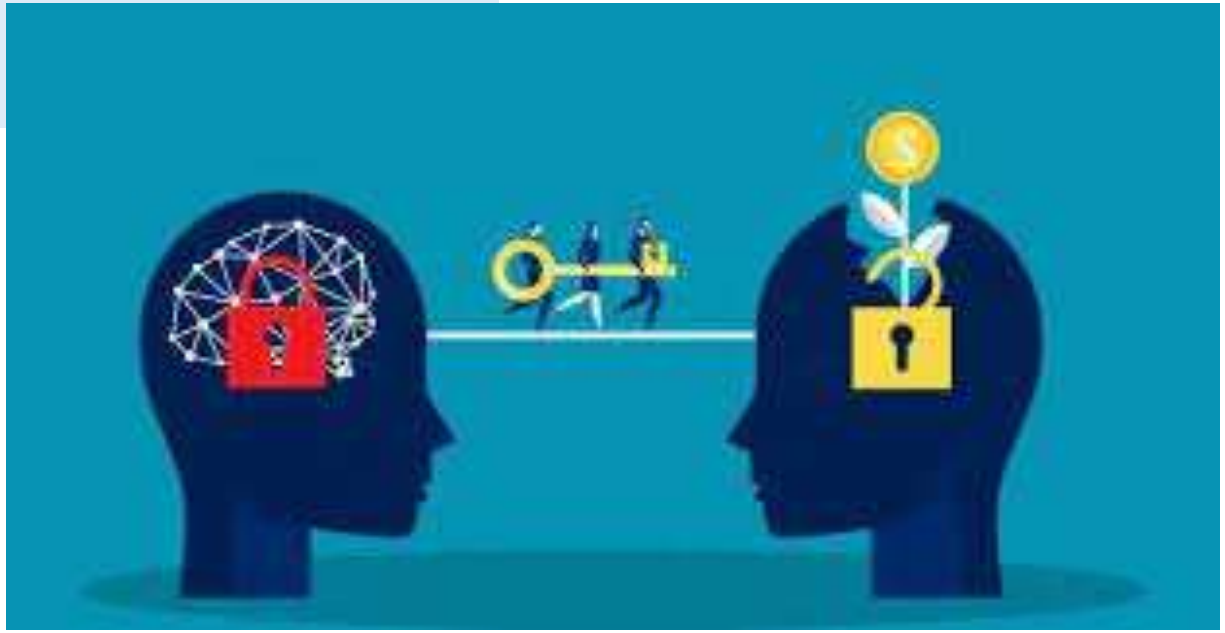


Analyze the local (service) system



- Investigate habitual behaviour as a first step to changing it
- **Understanding as a prerequisite for change**
- Working with the environment, versus working against
- Customize

Charani E, et al. Clin Infect Dis. 2013;57(2):188-96



- Focus on better, not on less, therapy
- **Need of buy-in by the service**
- It's all about QUALITY
- **Acknowledge and respect clinician´s fear** of risking inappropriate therapy
- Understand that fear and ignorance are different drivers

Time to act is now! Our ten commandments

1. **Analyse data** on HAI/AMC/AMR during COVID-19 pandemic, in different AMR contexts
2. **Implement admission triage tools** for the early identification of patients colonised or infected with high risk or emergent MDR microorganisms
3. **Improve infection control practices**, limiting disease spread and microorganism transmission
4. **Recognize diagnosis as the key step** and promote faster and accurate microbiological diagnosis, to attain better antibiotherapy decison algorithms and tailoring of anti-infective therapy
5. **Ressuscitate and reinforce AMS**, focusing on the individual patient, using enabling strategies and trying to change the prescriber and not only the precription
6. **Put surveillance (HAI/AMC/AMR) into your daily practice**, making it easier and allowing a continuos collaborative quality improvement mantra
7. **Go** from quantitative indicators to **qualitative indicators of antibiotic consumption**
8. **Continue public and political engagement** on infectious diseases – **maintain science and policy collaboration**
9. **Promote AMR research**, using COVID-19 networks – AI and ML serving implementation research, but avoid "publish or perish" and "report or perish"
10. **Balance COVID-19 related demands with routine hospital infection prevention, merging the two processes and promoting preparedness as opposed to response** - **Adaptability**

Share between GCL-PPCIRA and innovate

- Share experiences
- Analyses blockers
- Discuss solutions and interventions
- **Bias towards innovation**

And make it a collaborative