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Direção-Geral da Saúde



PPCIRA

Programa de apoio à prescrição antibiótica: o que estamos a fazer Resultados nacionais do PPCIRA

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**Where were we in 2011-2012 ?
Before PPCIRA.....**

The situation in 2012

- High rate of health care associated infections
- The highest carbapenem and vancomycin consumption in Europe
- High quinolone consumption in the community setting
- The highest rate of methicillin resistance among *Staph. aureus*
- Endemic XDR *Acinetobacter* spp
- Rising level of ESBL producing *Enterobacteriaceae*
- Outbreaks of carbapenem resistant *Enterobacteriaceae*

Primeira KPC em Portugal foi identificada numa unidade pediátrica do Hospital de Santa Maria, em 2009 (8 anos após isolamento seminal em North Carolina)

RPDI
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127

ARTIGO ORIGINAL / ORIGINAL ARTICLE

Carbapenemase KPC-3 em estirpes de *Klebsiella pneumoniae* numa unidade hospitalar

Klebsiella pneumoniae producing carbapenemase KPC-3 identified in hospital wards

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/ Resumo

A emergência e disseminação global de *Enterobacteriaceae* resistentes aos carbapenemos é uma ameaça à saúde pública, pois estão associadas a altas taxas de morbilidade e mortalidade. Este estudo teve como objectivo caracterizar o gene *bla*_{KPC-3} o seu ambiente genético e outras resistências associadas, em bactérias resistentes e com reduzida susceptibilidade aos carbapenemos no Centro Hospitalar de Lisboa Norte, EPE.

The fight against the situation

**NATIONAL PROGRAM
OF INFECTION
CONTROL**

1999



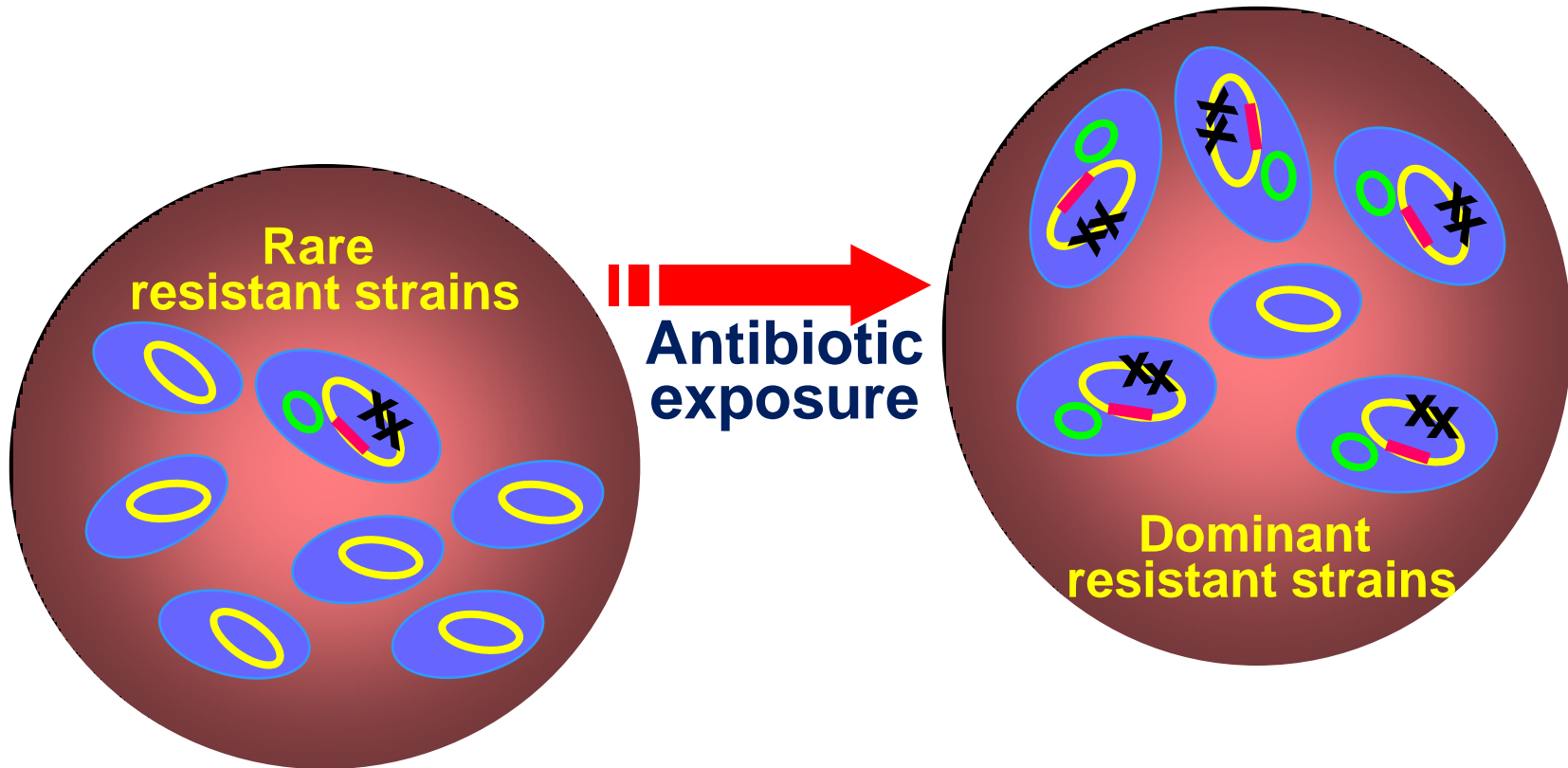
**NATIONAL PROGRAM ON
PREVENTION OF
ANTIMICROBIAL
RESISTANCE**

2008

Weaknesses and threats

- Low level of integration and synergy of the several processes; no holistic vision; too many process leaders
- Understaffing underpowerment of the central and peripheral structures
- Absence of focus in the most relevant issues: MRSA, CRE, carbapenems, quinolones, Standard precautions campaign
- Problems of data sharing among state institutions and of data feedback to the providers
- Difficulties in implementing a collaborative model, increasing capacity building and maximizing participation.
- Reimbursement system not reflecting the indicators and targets and not boosting motivation

Low perception that antimicrobial use is the driver of antimicrobial resistance



Towards pan-resistance

- ❖ A total of 26,4% of all *K. pneumoniae* isolates had AST results for polymyxins. A total of 8.8% of the isolates were resistant to polymyxins. A majority of these originated from Greece, Italy, Romania and Hungary.
- ❖ 26% of all isolates were tested for both carbapenem and polymyxins. Out of these, 6.6% were resistant to both polymyxins and carbapenems. A majority of these isolates were reported from Greece, Italy and Romania.
- ❖ Around 6% of all *K. pneumoniae* isolates were resistant to all classes under EARS-Net surveillance.

PPCIRA: one leadership

**NATIONAL PROGRAM
OF INFECTION
CONTROL**

1999



**NATIONAL PROGRAM ON
PREVENTION OF
ANTIMICROBIAL
RESISTANCE**

2008

MINISTÉRIO DA SAÚDE

Gabinete do Secretário de Estado Adjunto
do Ministro da Saúde

Despacho n.º 2902/2013

**PROGRAM ON PREVENTION AND CONTROL OF
INFECTION AND ANTIMICROBIAL RESISTANCE**

8 Feb
2013

ANTIBIOTIC STEWARDSHIP PROGRAM

STANDARD PRECAUTIONS CAMPAIGN

To reduce the emergence of antimicrobial resistance

Epidemiological surveillance

To reduce the incidence of resistant bacteria

PPCIRA “bundles”

- ✓ Hand hygiene
- ✓ Adequate use of gloves
- Patient/clinical environmental hygiene
- ✓ “Anti-MRSA” policy
- ✓ Surgical antibiotic prophylaxis for no more than 24 h
- ✓ Duration of antibiotic duration limited to 7 days (with exceptions)
- Reduction of quinolone and carbapenem prescription
- ✓ Antimicrobial stewardship program in the first 96 h

Hospital Bundle

Community Bundle

- ✓ Hand hygiene
- ✓ Adequate use of gloves
- Patient/Clinical environmental hygiene
- ✓ Compliance with the vaccination program
- Adequate treatment of wounds
- Reduction in the prescription of quinolones
- Guideline for the treatment of RTI
- ✓ Guideline for the treatment of UTI
- ✓ Antimicrobial stewardship program

- “Train the trainers” course
- In all RHA (7 health regions)
- Topics: strategy, implementation and science
- Two modules, hospital and ambulatory, in two consecutive days
- 4 trainers per course; a total of 8 trainers
- **In October 2014, more than 600 doctors and nurses were trained as trainers**

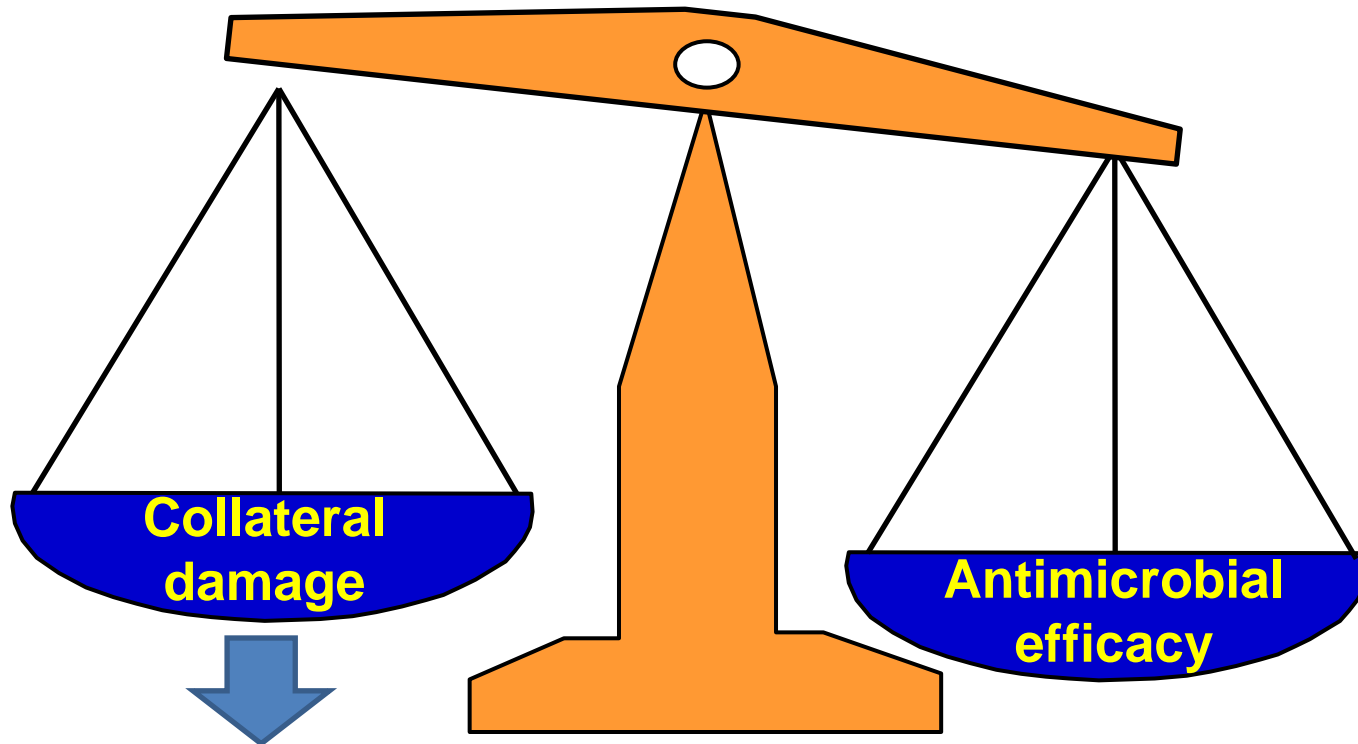
Adhesion to the main interventions

	Launching	2012	2014
Epidemiological surveillance of antimicrobial resistance (Microbiology Lab)	Guideline NRL/DGH 21 February 2013	22	70
Epidemiological surveillance of at least one of the HAI	Law 15423/2013 18 November 2013		85%
Antimicrobial Stewardship Program	Law 15423/2013 18 November 2013	0	40% hospitals
Standard Precautions Campaign	5 May 2014	-	70% hospitals 24% PCC

September 2014
PPCIRA /DGH

Best antimicrobial selection

Treat adequately & with the least possible collateral damage



**emergence of resistance
selection of pathogenic organisms (CD)
drug adverse events**



Morality of the use of scarce resources

- One is allowed to take something from nature and make it own property only where there is enough and as good left in common for others

Antibiotics are scarce resources

Antibiotic dilemma

Inappropriate antibiotic therapy is linked to increased mortality

Overuse of antibiotics is linked to increased emergence of resistance

The expectation of the patient to maximum treatment and shared decisions

The right of future patients to effective treatment

Justice between persons and between generations

Education on the prudent use of antibiotics

PRESCRIBERS of ANTIBIOTICS

Undergraduate curriculum
18-25 y

Internship/
foundation year
20-25 y

Professional training
20-30 y

Medical doctors, nurses, midwives, dentists,
veterinarians

≥ 30 y

POSTGRADUATE EDUCATION
intervention strategies



**All doctors, from all specialties,
prescribe antibiotics, unlike other drugs**

Possible Strategies for the prudent use of antimicrobials

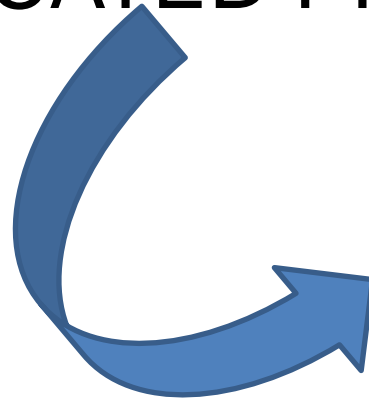


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- Education, education, education
- Education but please also create

A DEDICATED PROCESS / TEAM

**USE
BOTH**



**ANTIMICROBIAL
STEWARDSHIP
PROGRAMME**

Strategies and Prescription Pattern

**MULTIDISCIPLINARY ANTIMICROBIAL STEWARDSHIP TEAM:
Physician champion, microbiologist, pharmacist, ICP nurse**

- **Restrictive strategies**

produce quicker results

but not sustainable

- **Persuasive strategies**

take longer to impact

but the effect lasts longer



Interaction, communication and commitment

**Microbiology
Laboratory
/ Clinicians Interaction**

**Infectious Disease or
Antibiotic Champion /
Clinicians Interaction**

**Director
and
Head
Nurse**

At a Service/Department level

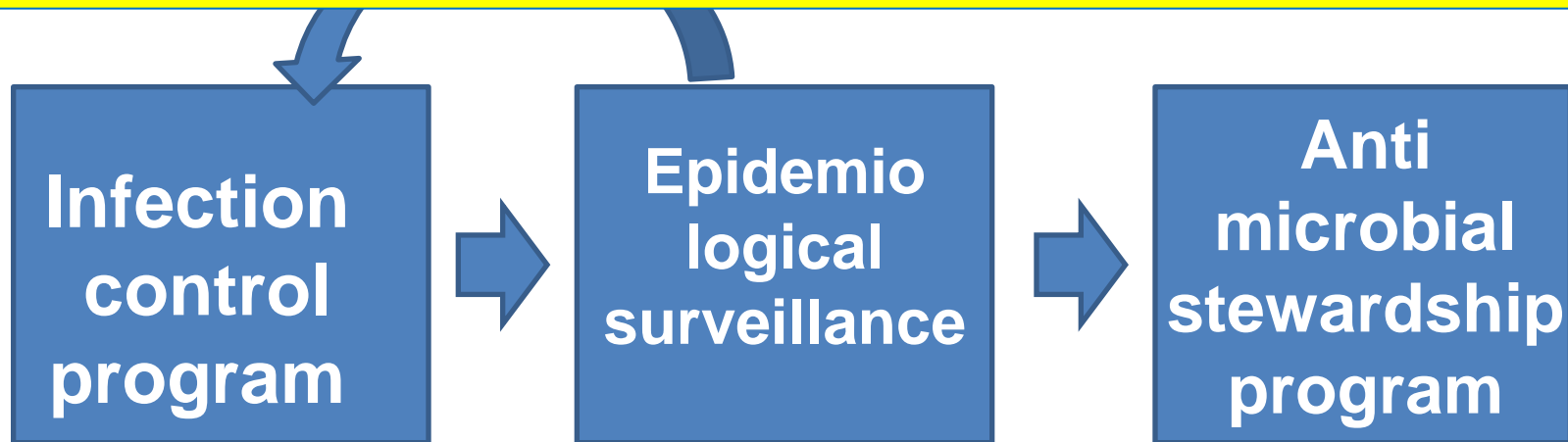
At an individual level

A marriage of infection control and antimicrobial management



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The successful implementation of ASP and ICP complement each other in limiting the number of infections caused by MDR pathogens



Synergistic processes

Antimicrobial stewardship interventions

- No antibiotics when there is no bacterial infection
- Avoid antibiotics with high collateral damage
- Reduce quinolone and carbapenem use (and cephalosporins)
- Promote amox/clav and pip/taz use in some infections caused by ESBL+ *Enterobacteriaceae*
- Targeted / Escalation therapy in low risk patients
- De-escalation therapy in high risk patients
- Use PK/PD concepts
- Limit surgical prophylaxis to not more than 24 hours
- Reduce duration of antimicrobial therapy

ASP metrics selection (3 domains)

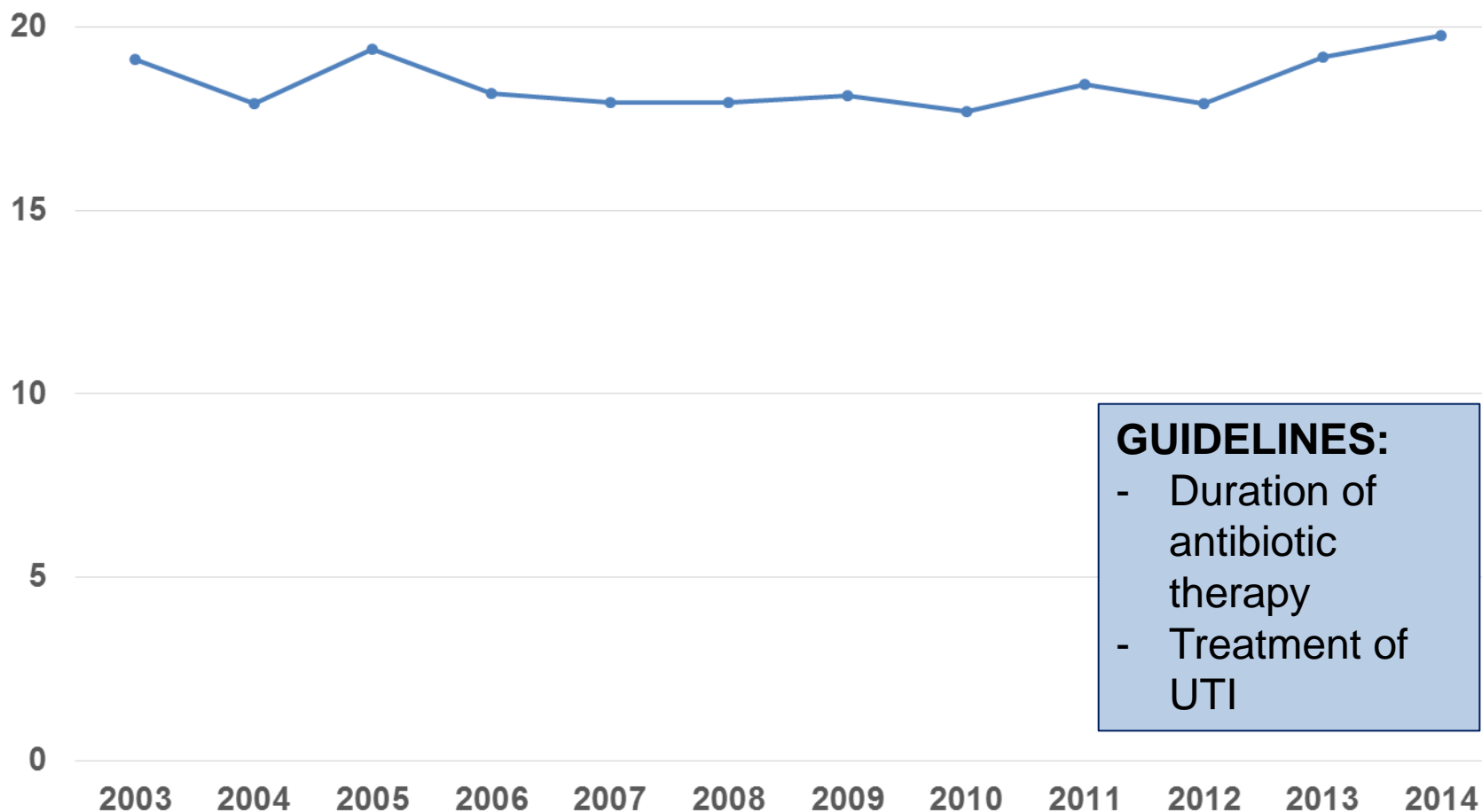
Domain	Metric	Description*
Consumption	Expenditures	-Dollars spent from purchased, dispensed or administered data
	Grams	-Grams used from purchased, dispensed or administered data
	Defined Daily Doses (DDD)	-Grams used (as above) divided by WHO** approved DDD values
	Days Of Therapy (DOT)	-Number of days that patient receives at least one dose of an antibiotic summed for each antibiotic
	Length of Therapy (LOT) "treatment period"	-Number of days that patient receives therapy regardless of number of different drugs or doses
Patient Outcomes	Health care associated infections	-% of patients with infection -ASP intervention/acceptance rates
Resistance	Antibiotic resistant organisms	-% of patients with resistant organism(s) -Antibiogram

- **Common denominator:** 1000 patient days,

Where are we ? PPCIRA results

Antibiotic consumption the ambulatory setting

DHD

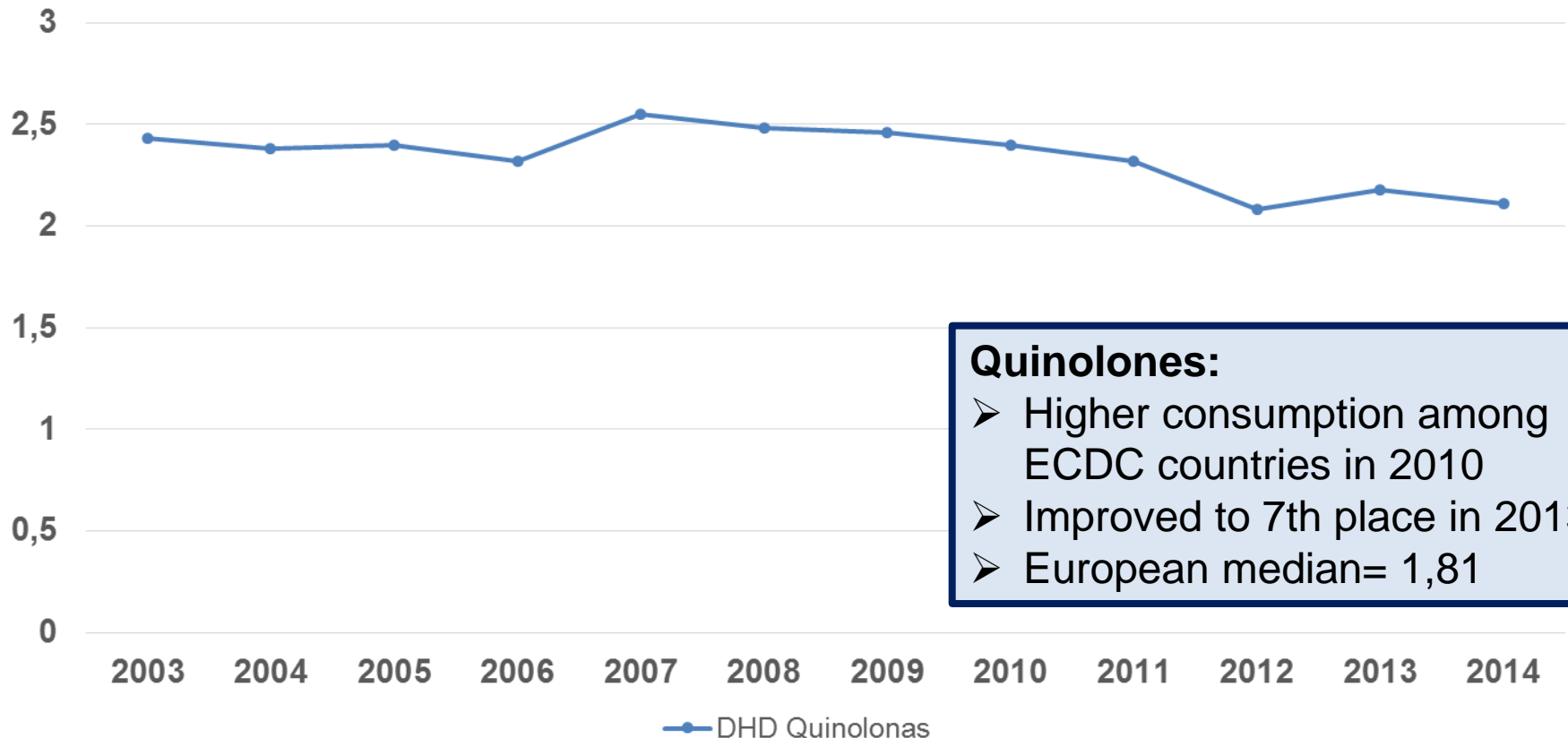


GUIDELINES:

- Duration of antibiotic therapy
- Treatment of UTI

Reduction of quinolone consumption in the ambulatory setting

DHD Quinolonas
(DDD per 1000 habitants per day)



Quinolones:

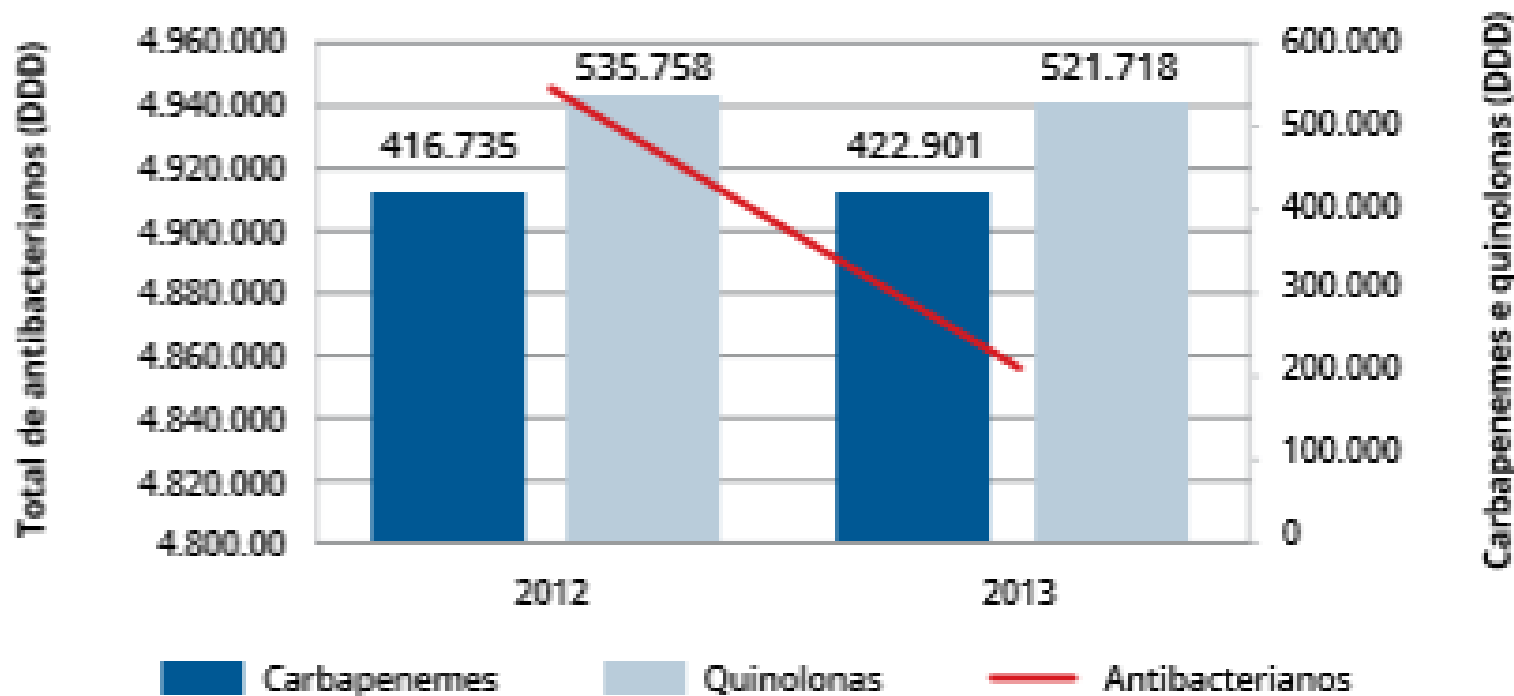
- Higher consumption among ECDC countries in 2010
- Improved to 7th place in 2013
- European median= 1,81

Reduction of antibiotic consumption in portuguese hospitals 2012-2013



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Consumo anual de antibacterianos nos hospitais do SNS (DDD)



GUIDELINES:

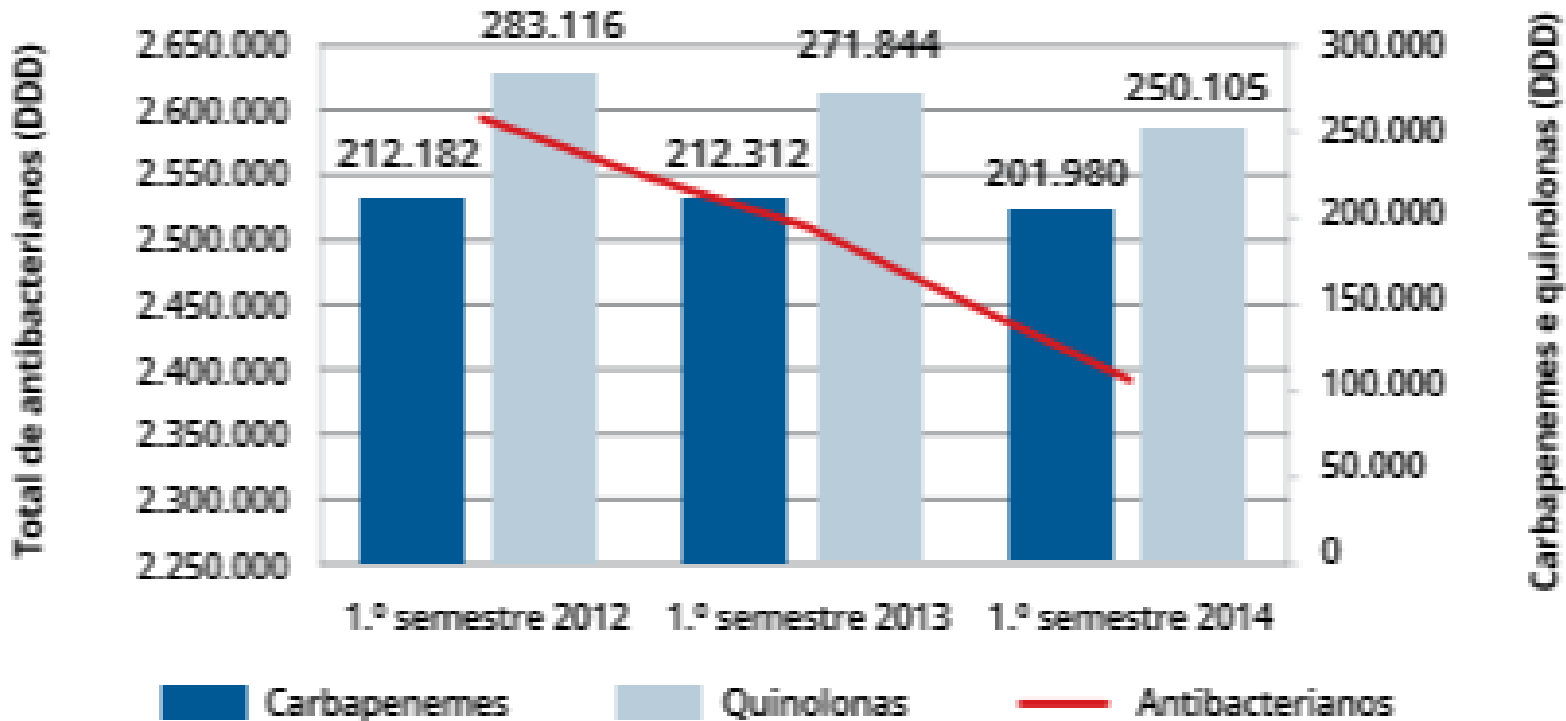
- Duration of antibiotic treatment
- Treatment of UTI
- Surgical antibiotic prophylaxis

Reduction of antibiotic consumption in the hospital setting



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Hospital antibiotic consumption in the 1st semester of the year

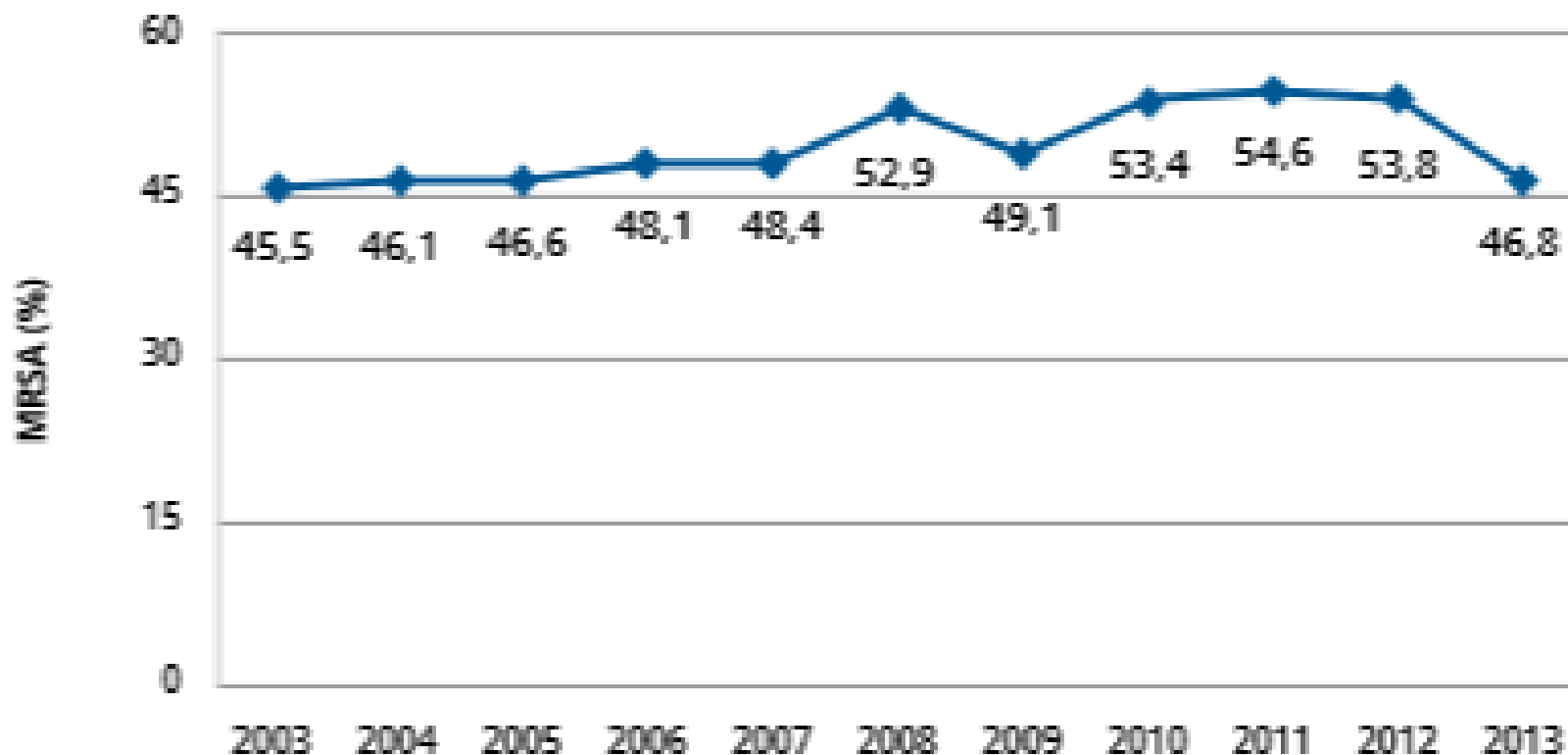


Antibiotic stewardship

Feedbacking data to hospitals

Reduction of the rate of *Staphylococcus aureus* resistance to methicillin (MRSA)

% of the invasive *Staph aureus* isolates resistant to methicillin



Acinetobacter spp resistant to carbapenems by EU/EEA country, 2012-13

Country	2012			2013		
	N	%R (95% CI)		N	%R (95% CI)	
Finland	.	. (-.-)		35	0 (0-10)	
Norway	25	0 (0-14)		36	0 (0-10)	
Netherlands	67	6 (2-15)		65	1.5 (0-8)	
Denmark	64	9.4 (4-19)		61	1.6 (0-9)	
United Kingdom	80	2.5 (0-9)		149	2 (0-6)	
Ireland	.	. (-.-)		85	2.4 (0-8)	
Czech Republic	.	. (-.-)		91	4.4 (1-11)	
Sweden	.	. (-.-)		72	5.6 (2-14)	
France	389	3.3 (2-6)		406	5.9 (4-9)	
Austria	.	. (-.-)		51	7.8 (2-19)	
Germany	121	6.6 (3-13)		173	9.2 (5-15)	
Slovenia	25	24 (9-45)		25	24 (9-45)	
Slovakia	.	. (-.-)		142	45.8 (37-54)	
Poland	209	38.3 (32-45)		189	49.7 (42-57)	
Hungary	418	48.1 (43-53)		481	50.1 (46-55)	
Bulgaria	58	60.3 (47-73)		89	59.6 (49-70)	
Cyprus	23	56.5 (34-77)		33	60.6 (42-77)	
Portugal	168	79.2 (72-85)		229	69 (63-75)	
Romania	54	81.5 (69-91)		137	85.4 (78-91)	
Croatia	.	. (-.-)		114	89.5 (82-94)	
Greece	1254	87.8 (86-90)		848	90.6 (88-92)	
Iceland	2	# (#-#)		.	. (-.-)	
Belgium	.	. (-.-)		3	# (#-#)	
Luxembourg	5	# (#-#)		1	# (#-#)	
Malta	6	# (#-#)		7	# (#-#)	

CRE alert surveillance system

1.8% of all *Enterobacteriaceae*

Mechanisms of carbapenem resistance		Number of isolates (%)
Production of acquired carbapenemase		
	GES-type	5
	KPC-type	195
	VIM-type	9
	KPC-type, GES-type	2
	NDM-type	1
Subtotal		212 (40%)
Other mechanisms		
	ESBL and/or AmpC production associated with impermeability mechanism	214
	Imipenem resistance mechanism inherent to te species	23
	Probable impermeability mechanism	3
Subtotal		240 (45,3%)
Isolates susceptible to the carbapenems		76
Non-viable isolates		2
Subtotal		78 (14,7%)
TOTAL		530

Next months.....

Antibiotic stewardship

- Increase hospital coverage
- Reach primary / community care and LTCF
- So much easy in na ULS organization.....

- ❖ The presence of CRE carriage has been described in a number of investigations involving patients from postacute care facilities, particularly long-term acute care hospitals
- ❖ Perez et al found that greater than 50% of patients with carbapenem-resistant gram-negative organisms were admitted from postacute care facilities, suggesting that these settings may be important reservoirs for the transmission and dissemination of these organisms.
- ❖ In an investigation of 3 patients with KPC-producing CRE infection transferred to a hospital from a LTACH, active surveillance cultures from residents in the same LTACH unit as the case-patients identified CRE colonization among 49% of residents (unpublished CDC data).

HCAI in long term care institutions

GUIDELINES:

- Standard precautions
- Prevention of surgical site infection
- Prevention of chronic wound infection

	Convalescência	Média duração	Longa duração	Paliativos	Total
Infeção urinária	11 (24,4%)	22 (19,5%)	27 (15,2%)	-	60 (17,5%)
Confirmada	11 (24,4%)	24 (21,2%)	34 (19,1%)	-	69 (20,0%)
Provável	-	-	-	-	-
Infeção respiratória	2 (4,4%)	5 (4,4%)	7 (3,9%)	1 (16,6%)	15 (4,5%)
Superior	8 (17,7%)	20 (17,7%)	28 (15,7%)	2 (33,3%)	58 (16,9%)
Inferior	-	-	-	-	-
Infeção da pele e tecidos moles	6 (13,3%)	26 (23%)	47 (26,4%)	3 (7,5%)	82 (23,8%)
Infeção fúngica	-	3 (2,6%)	4 (2,2%)	-	7 (2,0%)
Infeções gastrointestinais	2 (4,4%)	5 (4,4%)	10 (5,6%)	-	17 (4,9%)
Infeção por <i>C. difficile</i>	2 (4,4%)	-	-	-	2 (0,6%)
Infeções oculares	2 (4,4%)	5 (4,4%)	12 (6,7%)	-	19 (5,5%)
Infeção do nariz, ouvido e boca	1 (2,2%)	-	4 (2,2%)	-	5 (1,5%)
Infeção da corrente sanguínea	-	1 (0,9%)	-	-	1 (0,3%)
Síndrome febril inexplicado	-	2 (1,8%)	5 (2,8%)	-	(2,0%)
Outras	1	-	1	-	2 (0,6%)
Total	45 (10%)	113 (13,2%)	178 (10,5%)	6 (15%)	344 (11,3%)

Fonte: Healthcare-Associated Infection and Antimicrobial Use in Long-Term Care Facilities, HALT 2, Inquérito de prevalência de infeção nas unidades de cuidados continuados, 2014, DGS <http://www.dgs.pt/documentos-e-publicacoes/inquerito-de-prevalencia-de-infecao-e-uso-de-antimicrobianos-nas-unidades-de-cuidados-continuados-2013.aspx>

PPCIRA

institutional assessment

1. To have PPCIRA-Local Coordinating Group in accordance with 15423/2013 law
2. To participate in the epidemiological surveillance of antimicrobial resistance, through LCG and Microbiology Labs.
3. To participate in the 4 epidemiological surveillance programs on HAI
4. To analyse institution's data on antimicrobial consumption, relating them to antimicrobial resistance patterns
5. To have a Antimicrobial Stewardship Program
6. To participate in the Standard Precautions Campaign
7. To reduce mean duration of antibiotic treatment course
8. To reduce to zero surgical antibiotic prophylaxis > 24h
9. To increase antibiotic free days
10. To reduce carbapenem consumption in hospitals
11. To reduce % patients that acquire colonization or infection by MDR in hospitals
12. To reduce hospital MRSA rate
13. To avoid increase in CRE rate
14. To reduce % of patients on antibiotic treatment for chronic wound
15. To reduce quinolone consumption in the ambulatory setting

Citizen's awareness Winter 2013

Sabia que tomar antibióticos tem riscos significativos?

Poucas pessoas sabem que sempre que se toma um antibiótico sem necessidade, ou não cumprindo as instruções médicas, aumenta a resistência das bactérias que deveria combater e, portanto, reduz a eficácia do antibiótico.

Sabia que as infeções por bactérias resistentes são mais difíceis de curar e transmitem-se a outras pessoas?

As bactérias resistentes sobrevivem na presença do antibiótico e continuam a multiplicar-se, causando uma doença mais grave e mais difícil de tratar. Estas bactérias podem transmitir-se de pessoa para pessoa, quer seja directamente ou através do meio ambiente.

Sabia que infeções causadas por vírus não devem ser tratadas com antibióticos?

A maioria das infeções comuns, tais como as constipações e as gripes, são causadas por vírus e não por bactérias e portanto não são curadas por antibióticos.

NÃO SE DEVE TOMAR ANTIBIÓTICOS NO CASO DE:

-  X CONSTIPAÇÃO
- X GRIPE
- X DOR DE GARGANTA
- X PINGO NO NARIZ
- X TOSSE SECA

Como posso saber se devo tomar um antibiótico?

Apenas o médico pode fazer o diagnóstico correcto e decidir se é necessário receitar antibiótico e, nesse caso, qual o antibiótico aconselhado. **Não deve, em caso algum, automedicar-se.** Se lhe for prescrito um antibiótico cumpra as instruções do médico, em termos de dose, horário das tomas e duração do tratamento. Se sobram comprimidos no fim do tratamento, devolva-os à farmácia.



LEMBRE-SE
tomar antibióticos torna as bactérias resistentes
AJUDE A ELIMINAR ESTE PROBLEMA



LEMBRE-SE

antibióticos a mais
saúde a menos

aconselhe-se com o seu médico

 PRESERVE OS ANTIBIÓTICOS - CAMPANHA DE SENSIBILIZAÇÃO DO CIDADÃO 

LEMBRE-SE

os antibióticos não curam
constipações e gripes



 PRESERVE OS ANTIBIÓTICOS - CAMPANHA DE SENSIBILIZAÇÃO DO CIDADÃO 



ANTIBIÓTICOS A MAIS, SAÚDE A MENOS
aconselhe-se com o seu médico

NÃO ABUSE

só deve tomar antibióticos
quando receitados pelo seu médico

 PRESERVE OS ANTIBIÓTICOS - CAMPANHA DE SENSIBILIZAÇÃO DO CIDADÃO 



ANTIBIÓTICOS A MAIS, SAÚDE A MENOS
aconselhe-se com o seu médico

NÃO ESQUEÇA

não guarde antibióticos
em casa; devolva-os à farmácia

 PRESERVE OS ANTIBIÓTICOS - CAMPANHA DE SENSIBILIZAÇÃO DO CIDADÃO 



ANTIBIÓTICOS A MAIS, SAÚDE A MENOS
aconselhe-se com o seu médico

Conclusions: the problem

We still have, in our hospitals:

- High unnecessary carbapenem consumption
- High incidence of carbapenem resistant *Acinetobacter* spp (69%) and of XDR *Acinetobacter* (56%)
- High incidence of carbapenem resistant *Pseudomonas aeruginosa* (21%), although combined resistance is clearly lower (12%)
- Low but rising incidence of KPC and outbreaks of CRE

Conclusions: the response

- **Create and develop an antimicrobial stewardship program**
- Make it **multidisciplinary** and efficient
- **Customize** it to different services and hospitals
- Define AMS physician champions as **leaders** and increase the interaction with microbiology
- Make it persuasive and **pedagogical**
- Assure **accountability**, defining goals and metrics in 3 domains: decrease antibiotic consumption, hospital acquired infections and antimicrobial resistance
- **Communicate** results to the staff

Thanks !



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