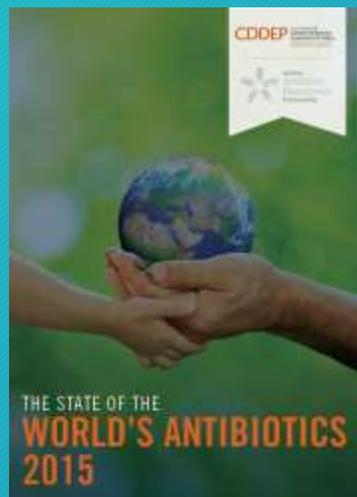


“Contextualização acerca da necessidade de se implementar um Programa de *Stewardship* de antibióticos no CHS”



José M. D. Poças
Diretor do SDI CHS HSB Setúbal

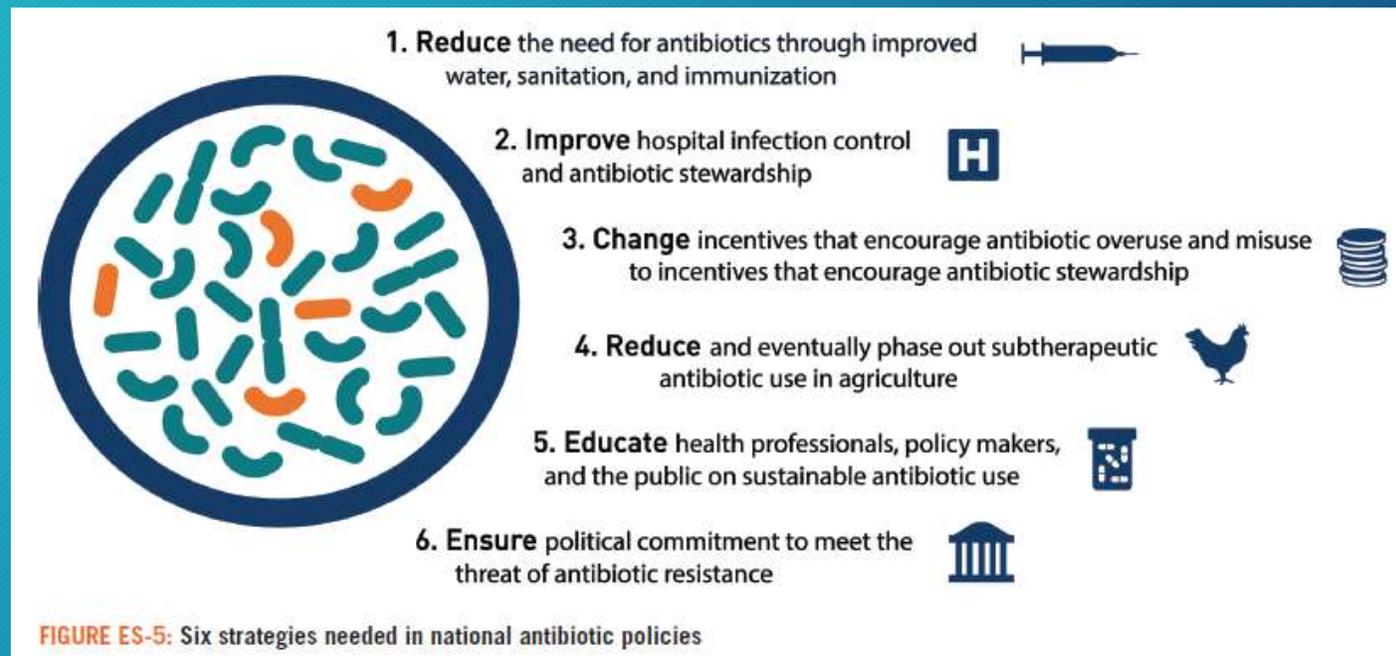


INTRODUÇÃO

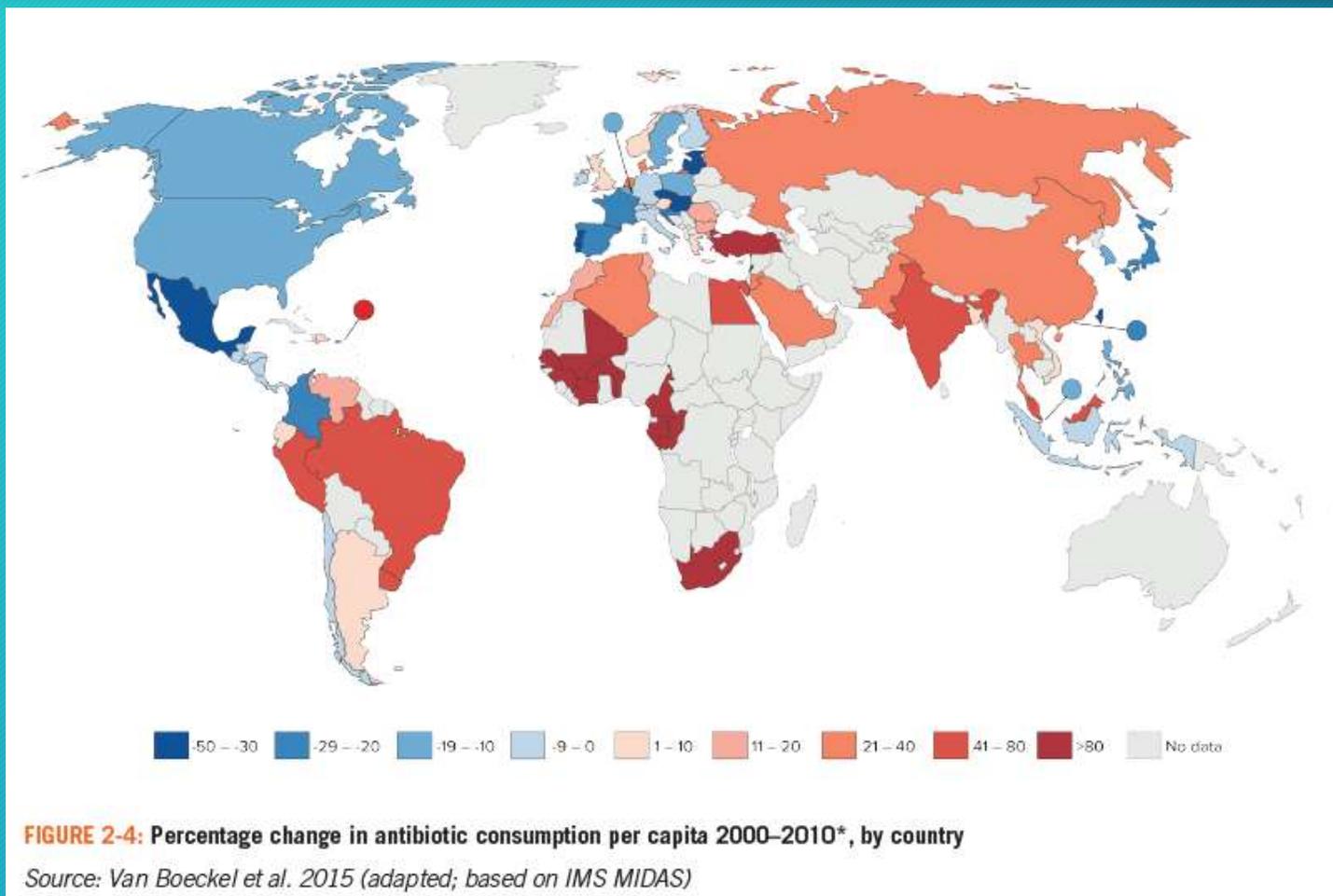


A Contextualização geral

- CEE
 - Impacto da resistência aos ABs
 - 25.000 mortos
 - 1.5 bilhões euros / ano / 2015
 - Em 2050: Redução até 4,5% do PIB
- USA
 - Impacto da resistência aos ABs
 - 2.000.000 inf. / 23.000 mortos
- Mortalidade
 - 26 - 44% (700.000 / ano em 2015)
 - Em 2050: 10.000.000 / ano
- Microorganismos mais problemáticos
 - MRSA
 - VRE
 - Bactérias Gram - ESBL +
 - Enterobactérias produtoras de cabapenemases
 - *Neisseria gonorrhoeae* multirresistente
 - *Clostridium Difficile*



Variação no consumo mundial da ABs



Consumo e Ações em Portugal / Europa

FIGURE 2-5: Antibiotic consumption per capita by class and country, 2000 and 2010

Source: Van Boeckel et al. 2014 (adapted; based on IMS MIDAS)

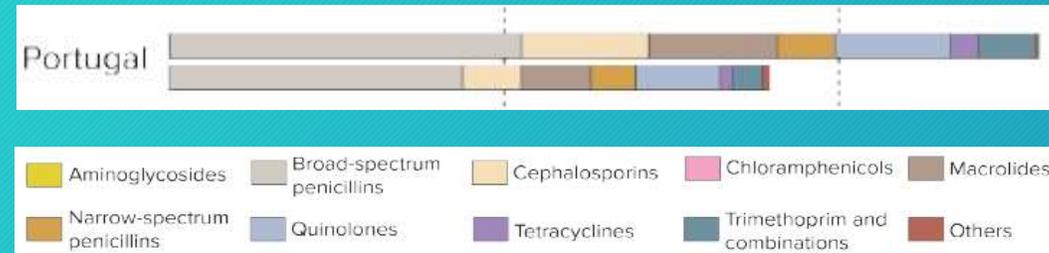
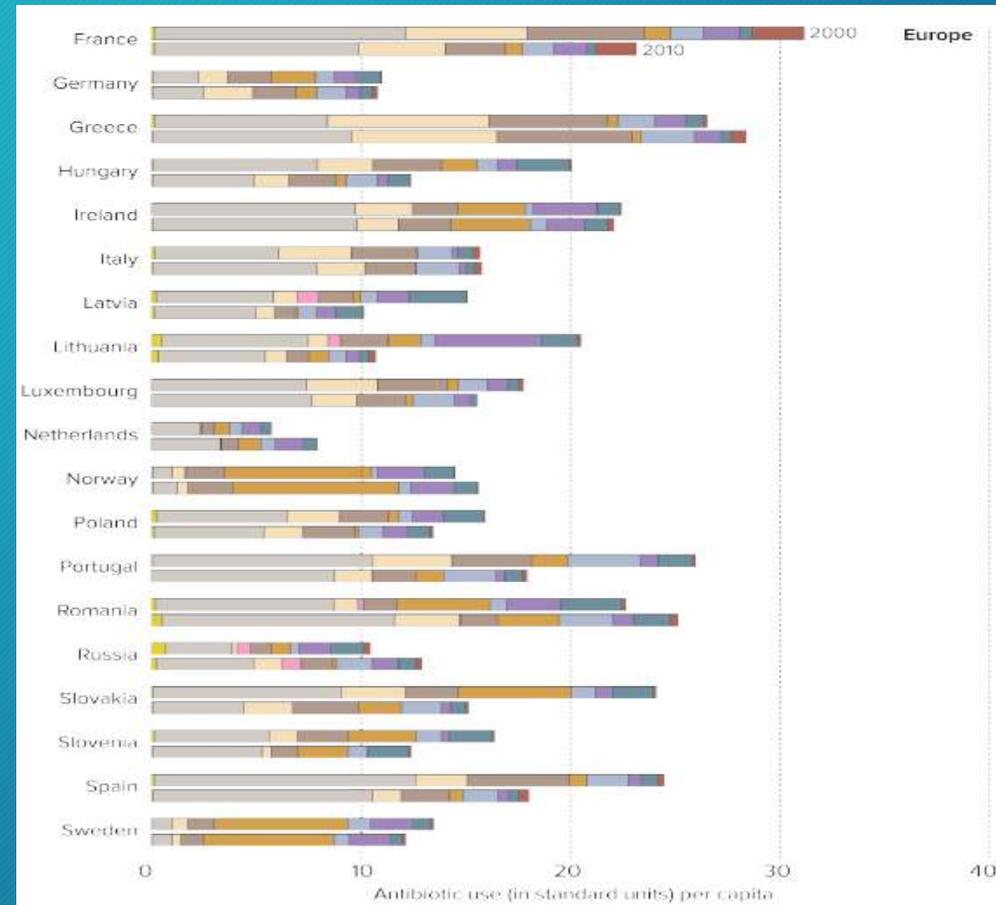


TABLE 2-1: PUBLIC CAMPAIGNS TO IMPROVE USE OF ANTIBIOTICS IN OUTPATIENTS

| Country, year | Campaign name or slogan | Organization | Approximate cost per year | Interventions | Comments |
|---------------------|--|--|--|--|---|
| Portugal, 2004-2007 | Antibiotics, use them in an adequate way | Coalition of pharmaceutical industry, department of health, professional organizations | €60 000\$, entire funding provided by Pfizer | Pamphlets, posters, print media, radio, website, letters | Three seasonal campaigns with limited use of mass media |



O que se passa na pecuária

Log10 [(mg/pixel)+1]

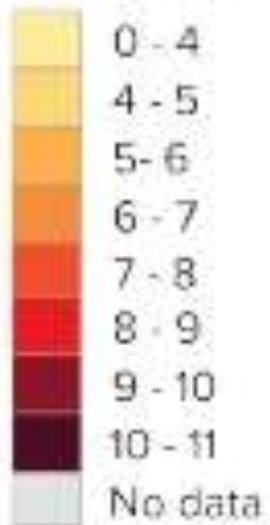


FIGURE 3-1: Global antibiotic consumption in livestock (milligrams per 10 km² pixels) 2010

Source: Van Boeckel et al. 2015

As consequências para o meio ambiente

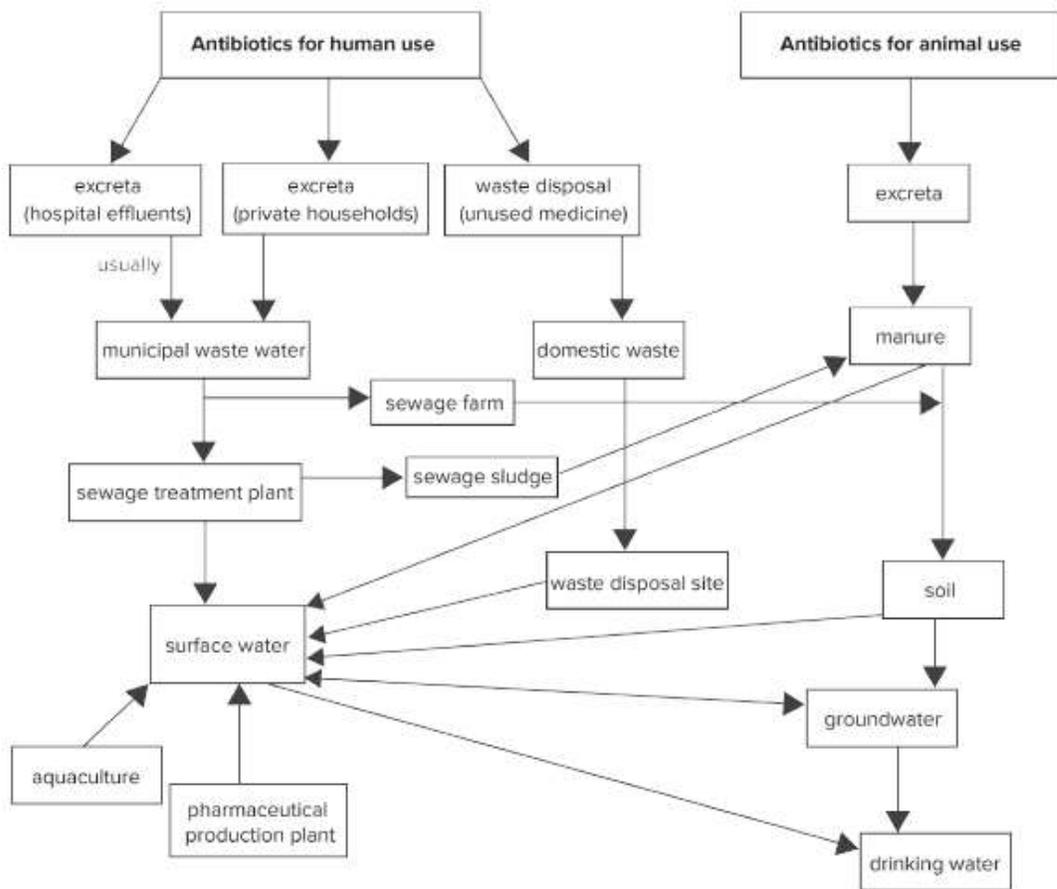
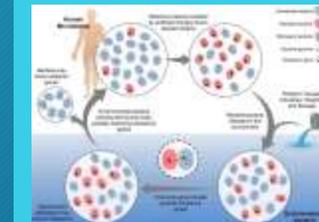
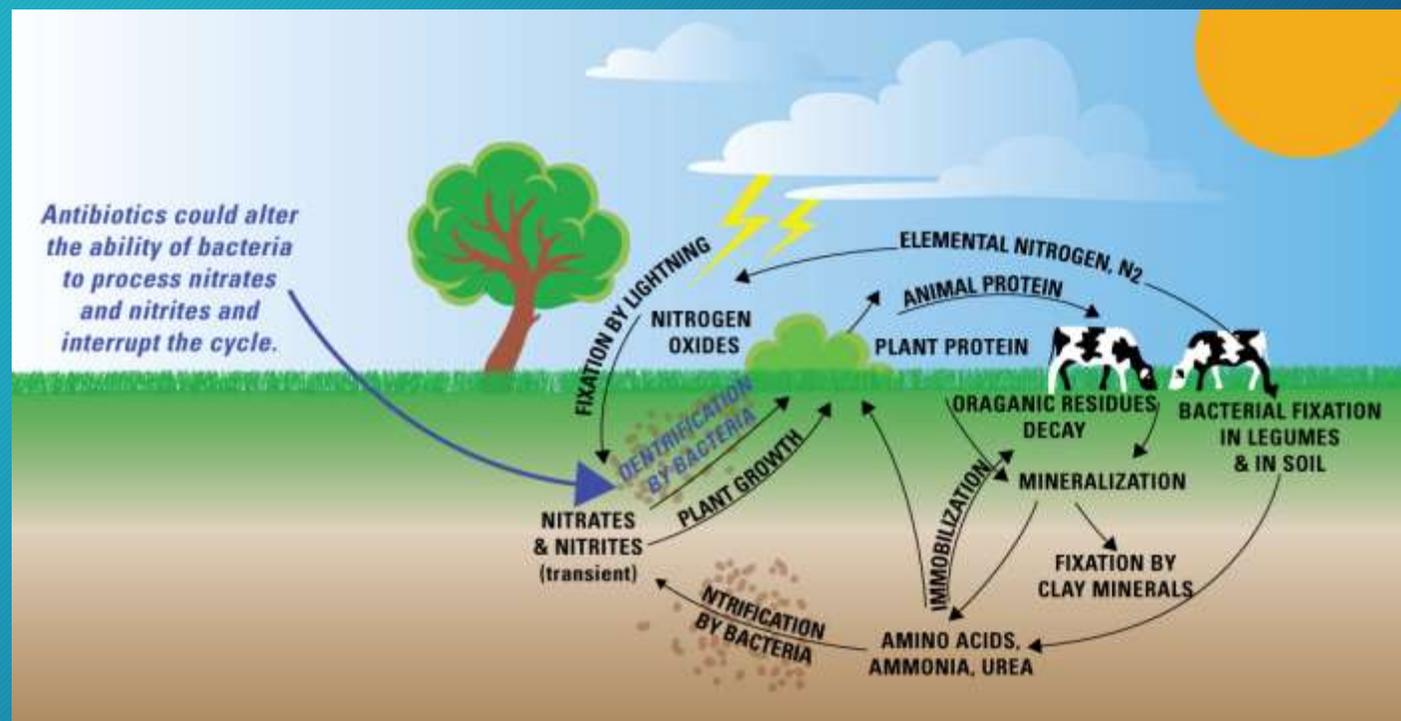


FIGURE 3-5: Sources and pathways for antibiotic contamination of water and soil
Source: Heberer 2002 (adapted)



Antibiotics could alter the ability of bacteria to process nitrates and nitrites and interrupt the cycle.

Utilizar novas metodologias de investigação epidemiológica

SaTScan™

Software for the spatial, temporal, and space-time scan statistics



EUCAST

EUROPEAN COMMITTEE
ON ANTIMICROBIAL
SUSCEPTIBILITY TESTING

European Society of Clinical Microbiology and Infectious Diseases

European Centre for Disease Prevention and Control

European Antimicrobial Resistance Surveillance Network (EARS-Net)

RESEARCH ARTICLE

Use of WHONET-SaTScan system for simulated real-time detection of antimicrobial resistance clusters in a hospital in Italy, 2012 to 2014

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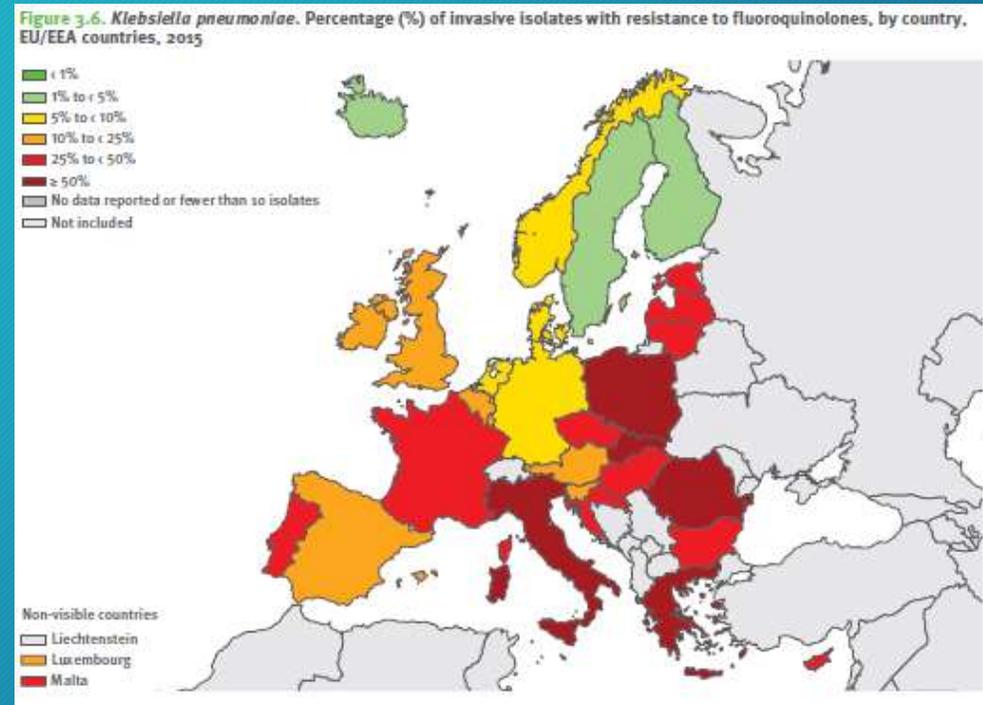
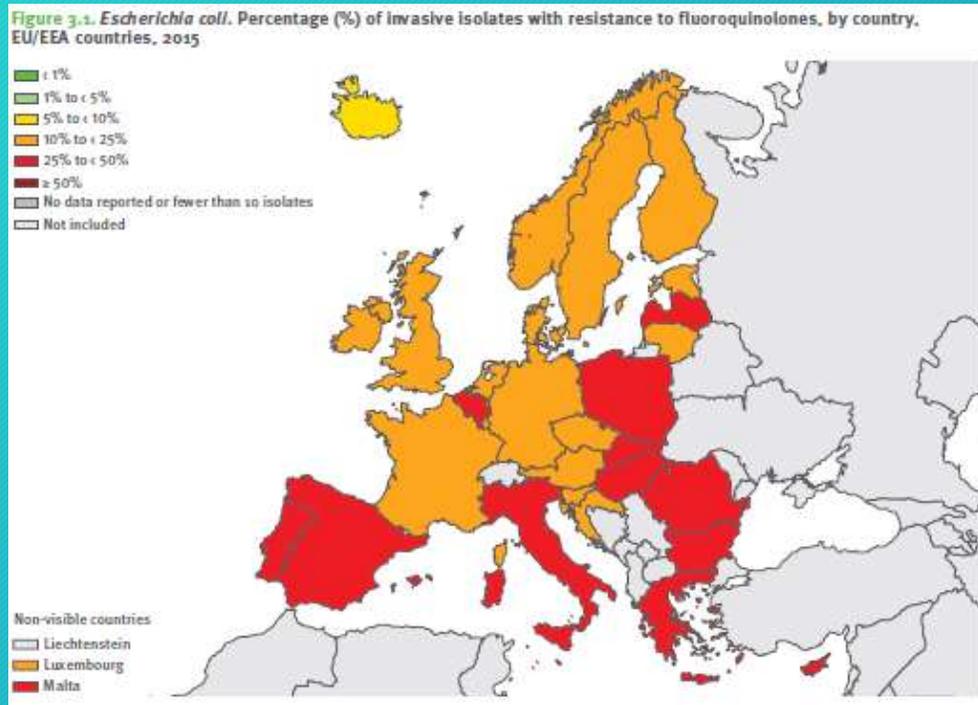
Article submitted on 01 February 2016 / accepted on 21 August 2016 / published on 16 March 2017



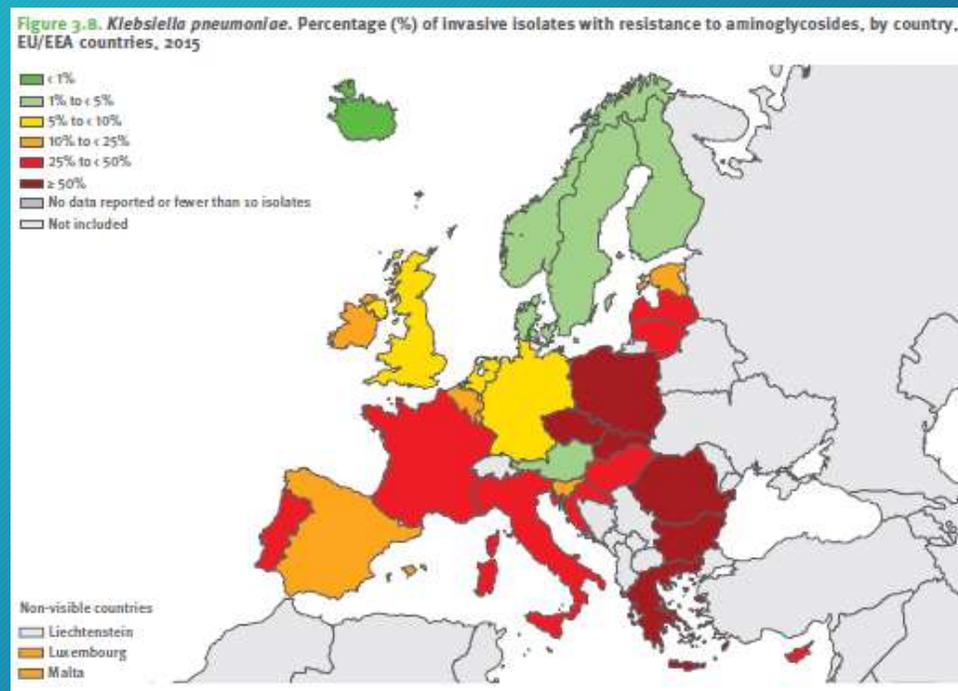
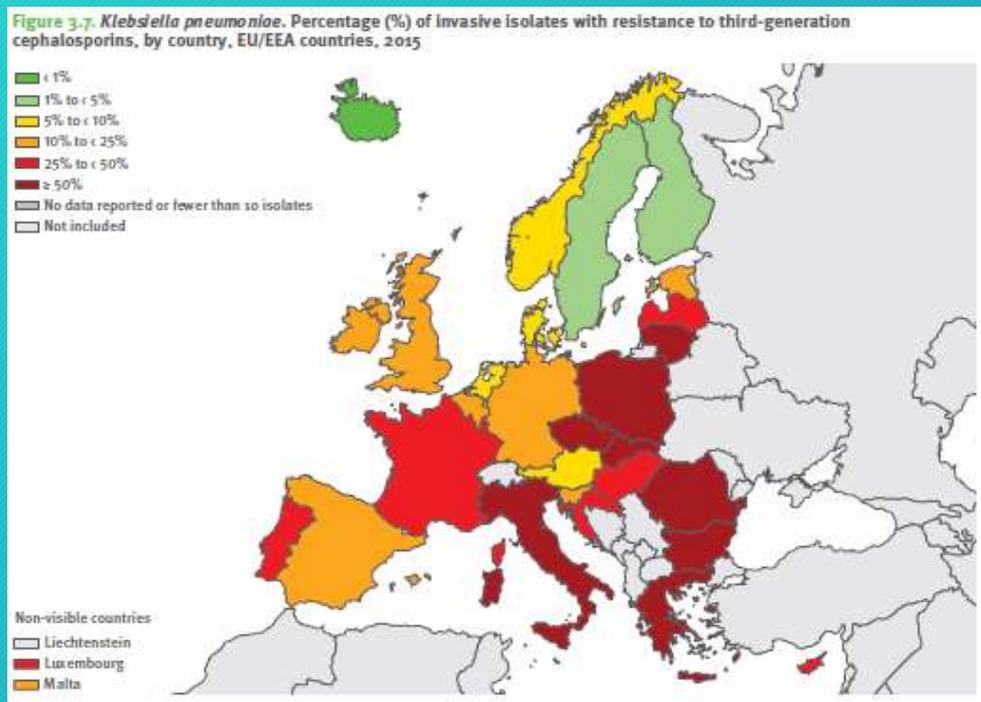
Onde Portugal está pior



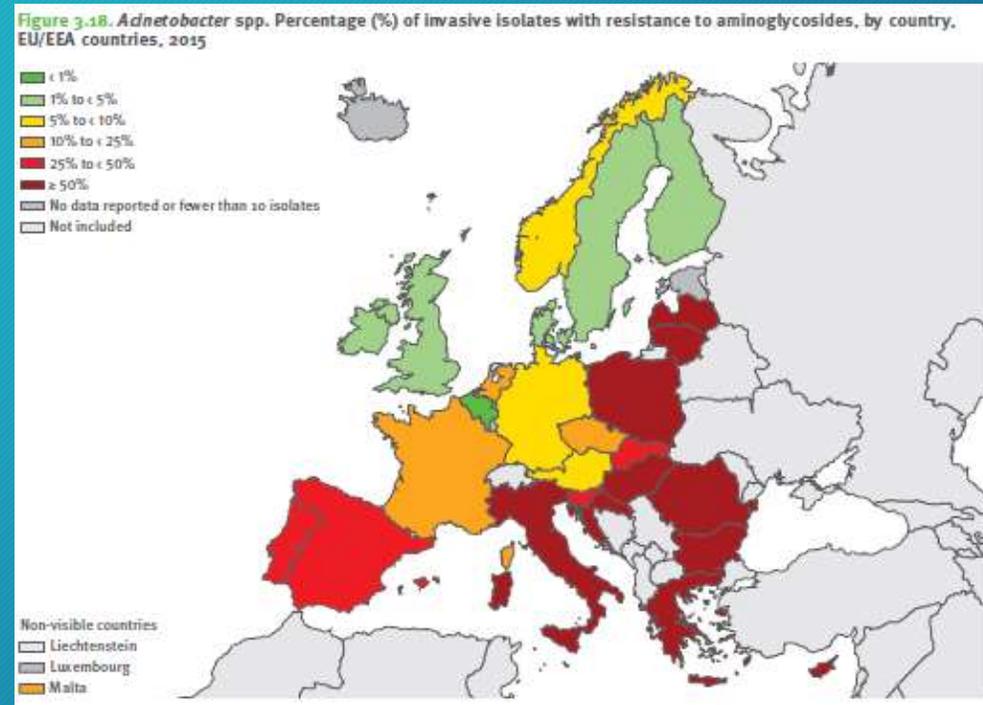
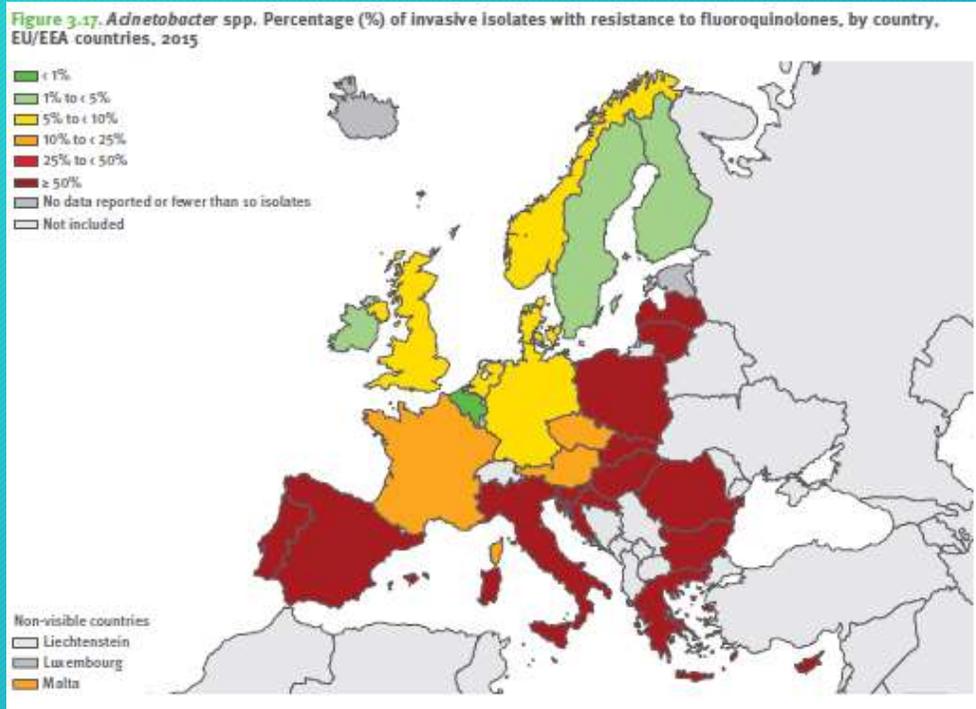
E. Coli e *Klebsiella Pneumoniae*- R. às Fluroquinolonas



Klebsiella Pneumonia: R. às Cefalosporinas 3ª Geração e aos Aminoglicosidos



Acinetobacter: R. às Fluroquinolonas e aos Aminoglicosidos

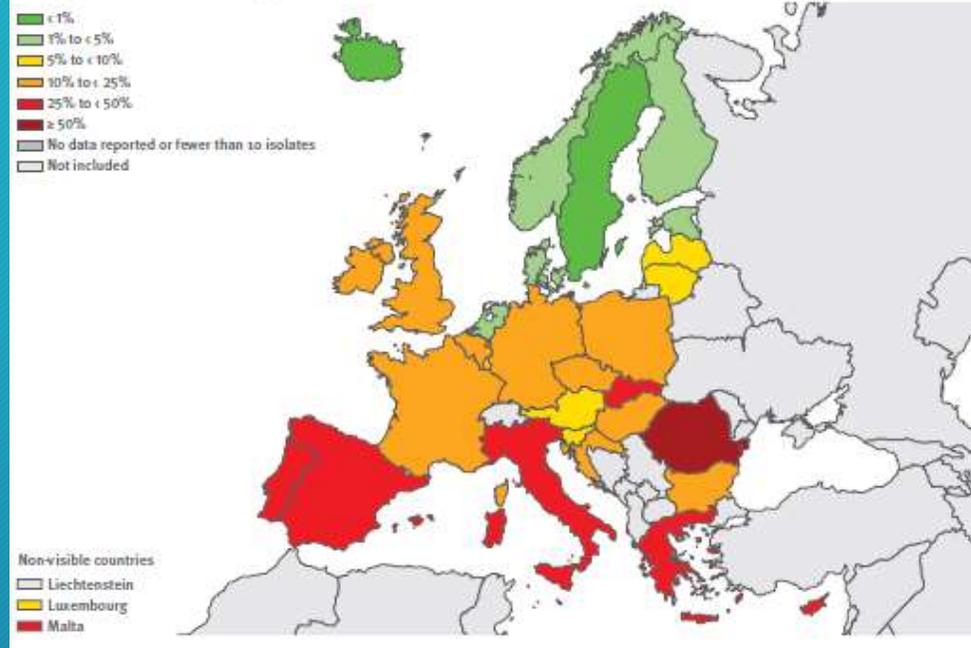


Acinetobacter R. aos Carbapenems / *Estafilococos Aureus* R. à Meticilina

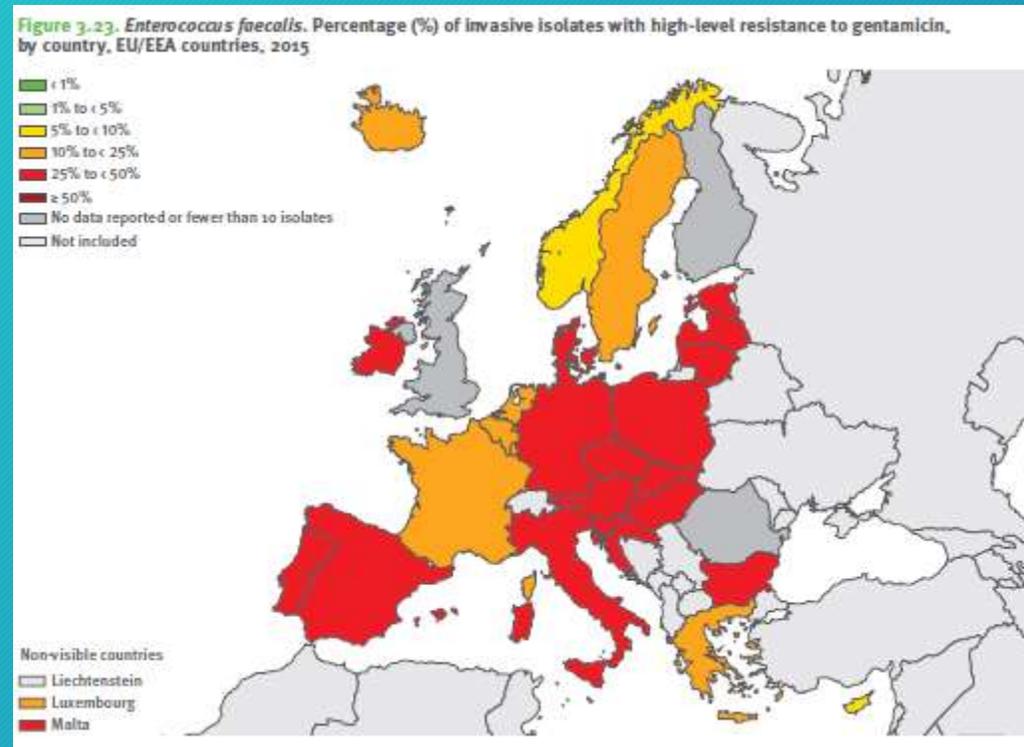
Figure 3.19. *Acinetobacter* spp. Percentage (%) of invasive isolates with resistance to carbapenems, by country, EU/EEA countries, 2015



Figure 3.22. *Staphylococcus aureus*. Percentage (%) of invasive isolates with resistance to meticillin (MRSA), by country, EU/EEA countries, 2015



Enterococcus Faecalis R. à Gentamicina



A análise das estirpes zoonóticas *Salmonella Typhimurium* e *Campylobacter*: R. à Fluroquinolonas

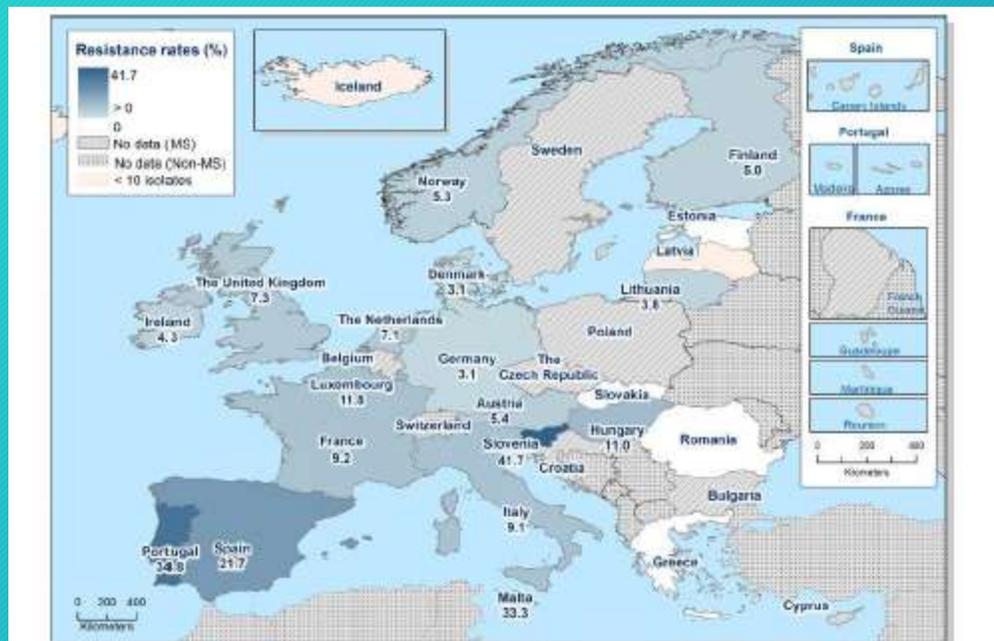


Figure 11: Spatial distribution of (fluoro)quinolone resistance among *S. Typhimurium* from human cases in reporting countries in 2015

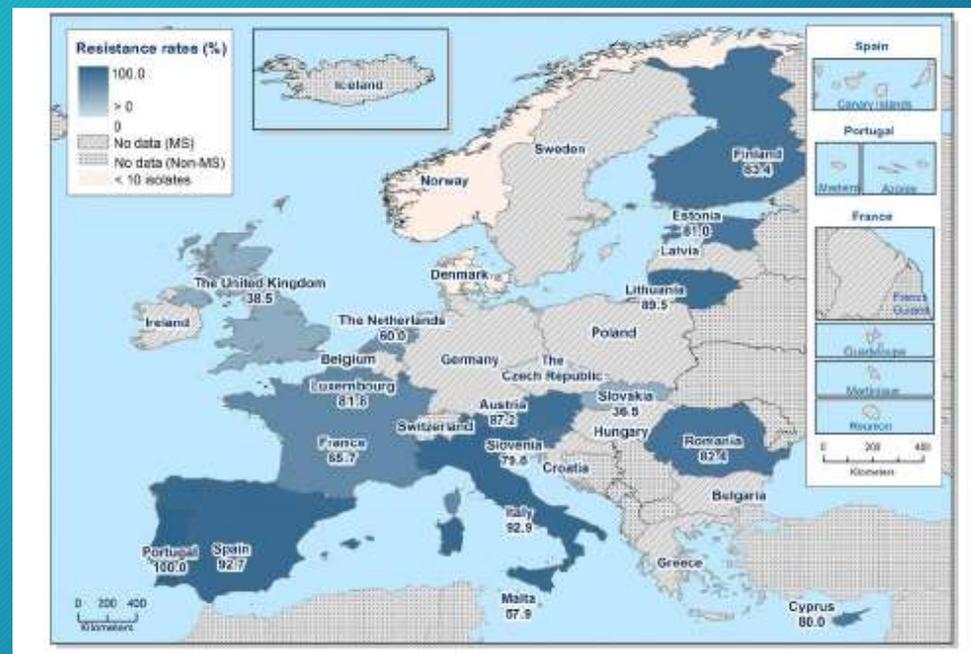
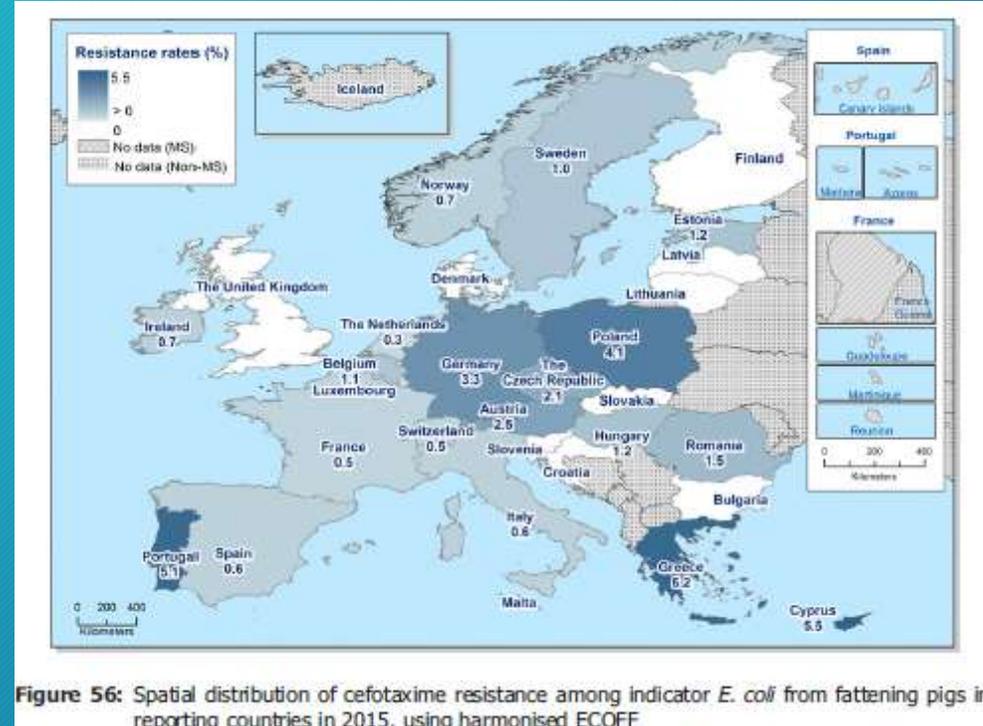
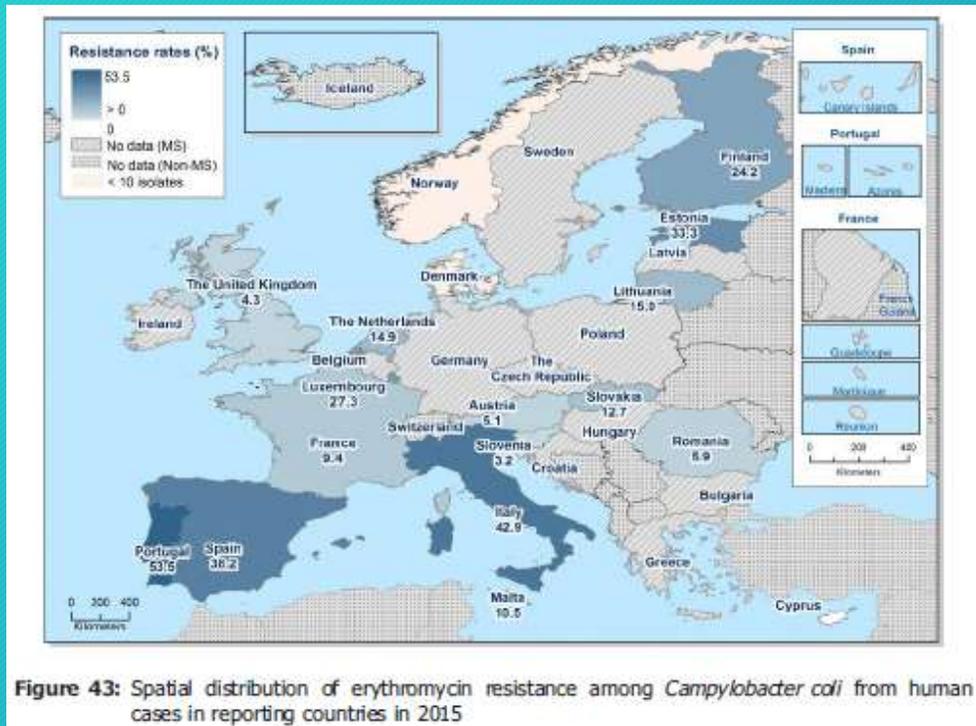


Figure 42: Spatial distribution of ciprofloxacin resistance among *Campylobacter coli* from human cases in reporting countries in 2015

Campylobacter R. à Eritromicina e a *E. Coli* R. às Cefalosporinas de 3^a Geração



E. Coli (ESBL+) em suínos

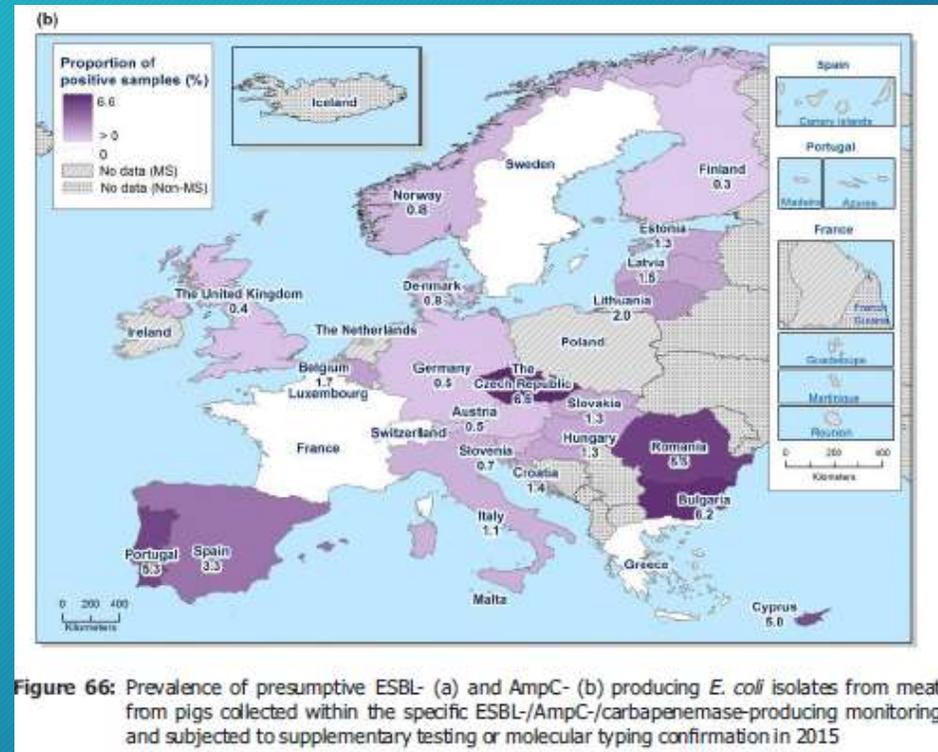
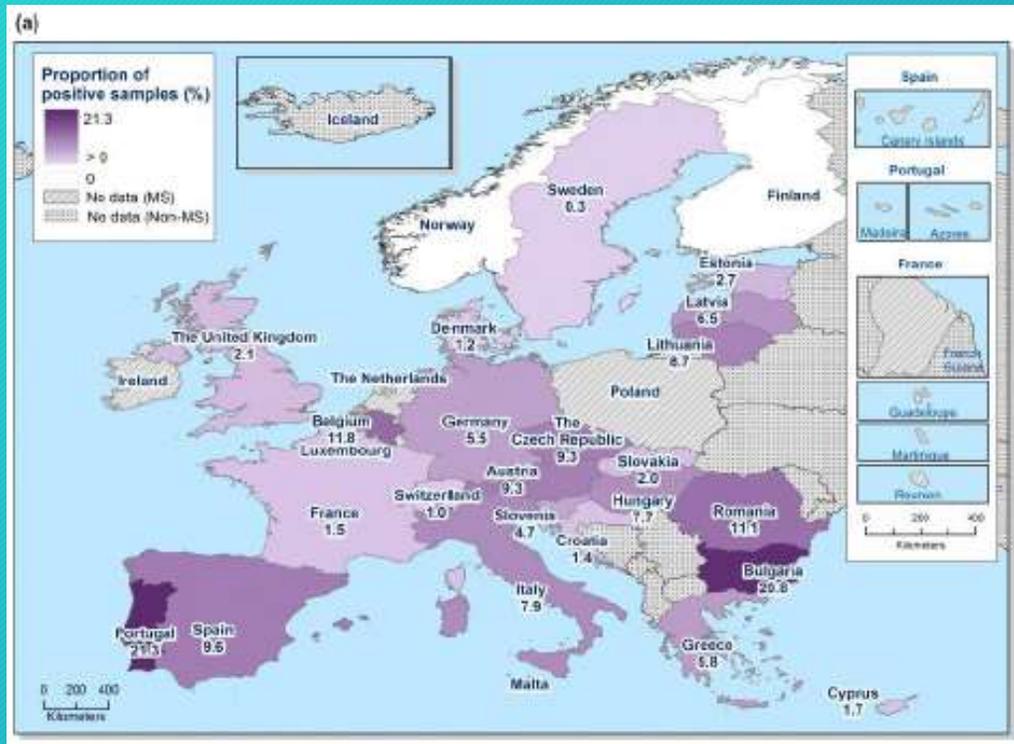


Figure 66: Prevalence of presumptive ESBL- (a) and AmpC- (b) producing *E. coli* isolates from meat from pigs collected within the specific ESBL-/AmpC-/carbapenemase-producing monitoring and subjected to supplementary testing or molecular typing confirmation in 2015

E. Coli (ESBL+) em vacas

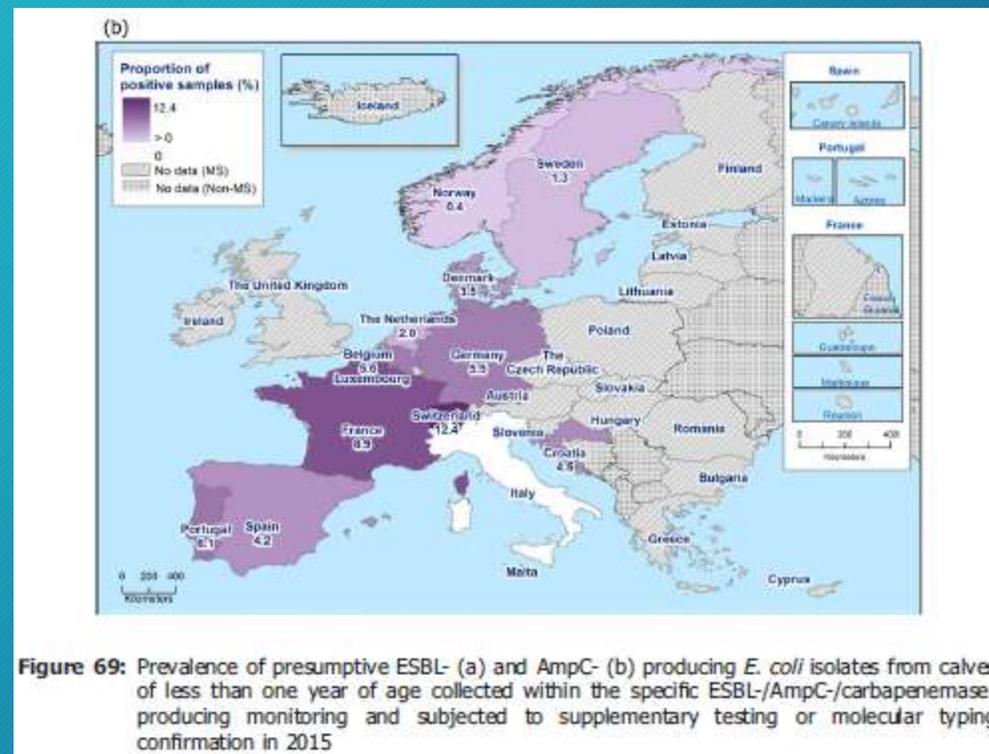
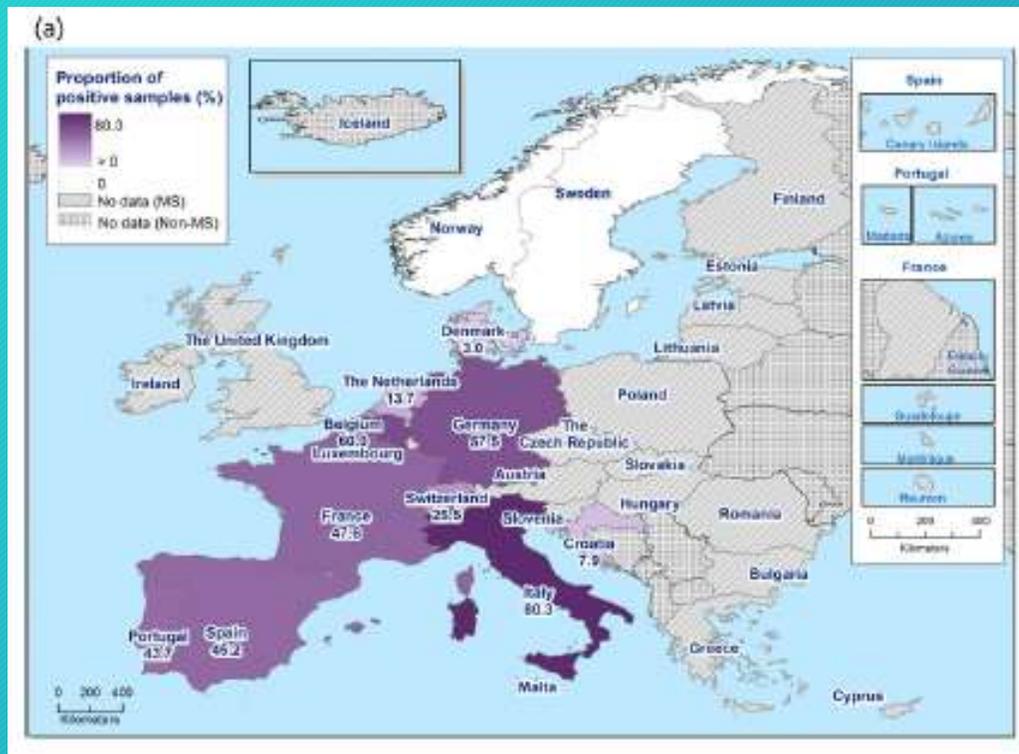


Figure 69: Prevalence of presumptive ESBL- (a) and AmpC- (b) producing *E. coli* isolates from calves of less than one year of age collected within the specific ESBL/AmpC/carbapenemase-producing monitoring and subjected to supplementary testing or molecular typing confirmation in 2015

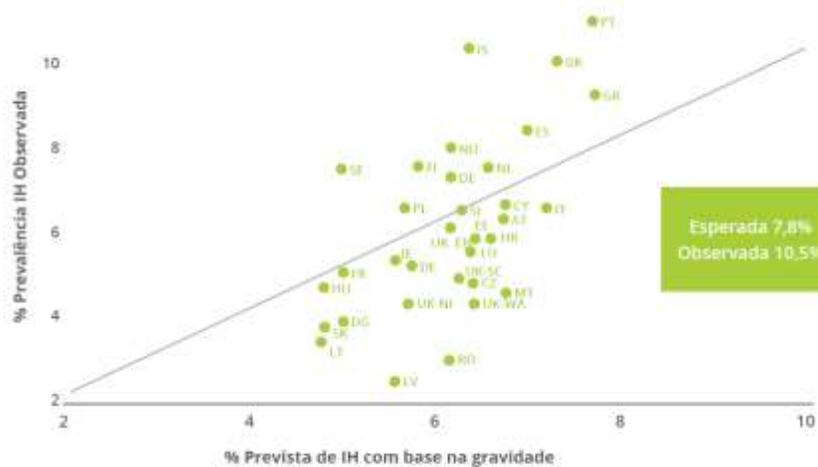
O Impacto da multirresistência

QUADRO 1 | ELEVADA PREVALÊNCIA DE INFECÇÕES HOSPITALARES E DE CONSUMO DE ANTIBIÓTICOS, 2011-2012

| | PREVALÊNCIA DE INFECÇÃO HOSPITALAR | | USO DE ANTIBIÓTICOS | |
|------------------|------------------------------------|------|---------------------|-------|
| | Portugal | UE | Portugal | UE |
| Homem | 12,4% | 7,2% | 48,3% | 39,2% |
| Mulher | 8,8% | 5,4% | 42,3% | 33,2% |
| População Global | 10,5% | 6,1% | 45,3% | 35,8% |

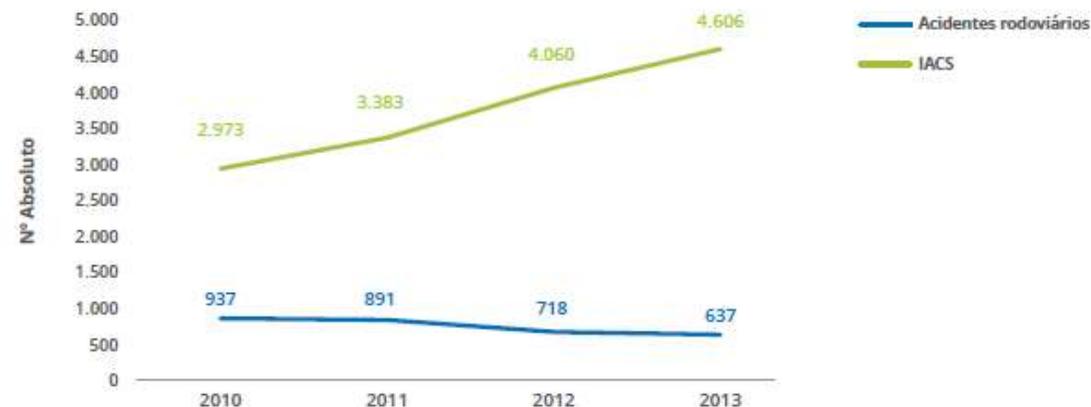
Fonte: Point Prevalence Study PPCIRA/DGS, ECDC 2012

FIGURA 2 | PORTUGAL: INFECÇÃO HOSPITALAR (IH) OBSERVADA/ESPERADA COM BASE NA GRAVIDADE, 2011-2012.



Fonte: Adaptado de Point Prevalence Study of HAI and antimicrobial use in European acute care hospitals, 2011-2012

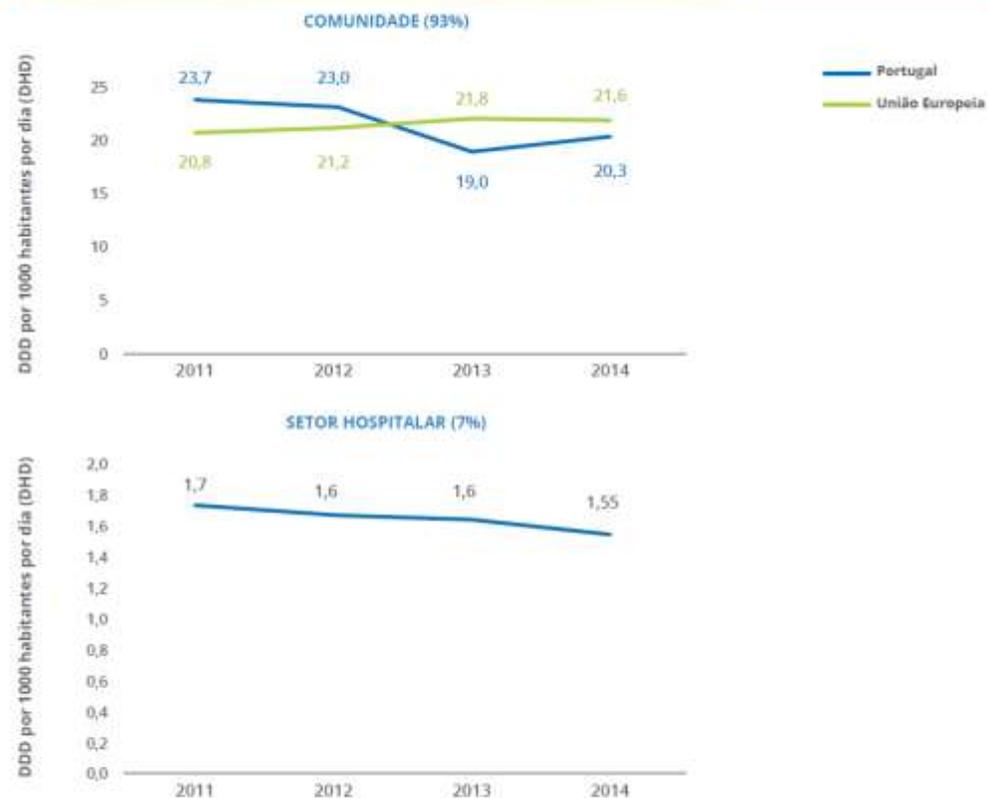
FIGURA 3 | MORTALIDADE ASSOCIADA A IACS VERSUS ASSOCIADA A ACIDENTES DE VIAÇÃO



Nota: IACS - Infecções Associadas aos Cuidados de Saúde
Fonte: ANSR e PPCIRA/DGS, 2014

Consumo da Abs Global

FIGURA 9 CONSUMO DE ANTIBIÓTICO EM PORTUGAL (DDD/1000 HABITANTES/DIA)



DDD: Dose Diária Definida

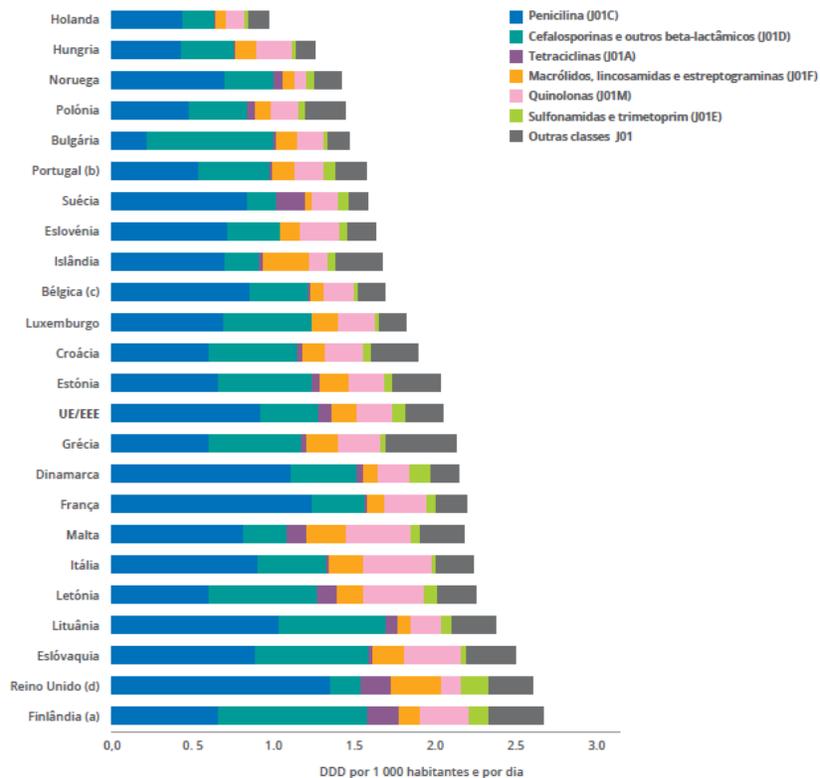
DHD: Dose Diária Definida por 1000 habitantes e por dia

Nota: Em 2013 existiu uma quebra de série devido à inclusão de subistemas públicos (e consequente alargamento da base populacional), o que dificulta a análise da evolução e comparações ao nível internacional

Fonte: INFARMED, 2015

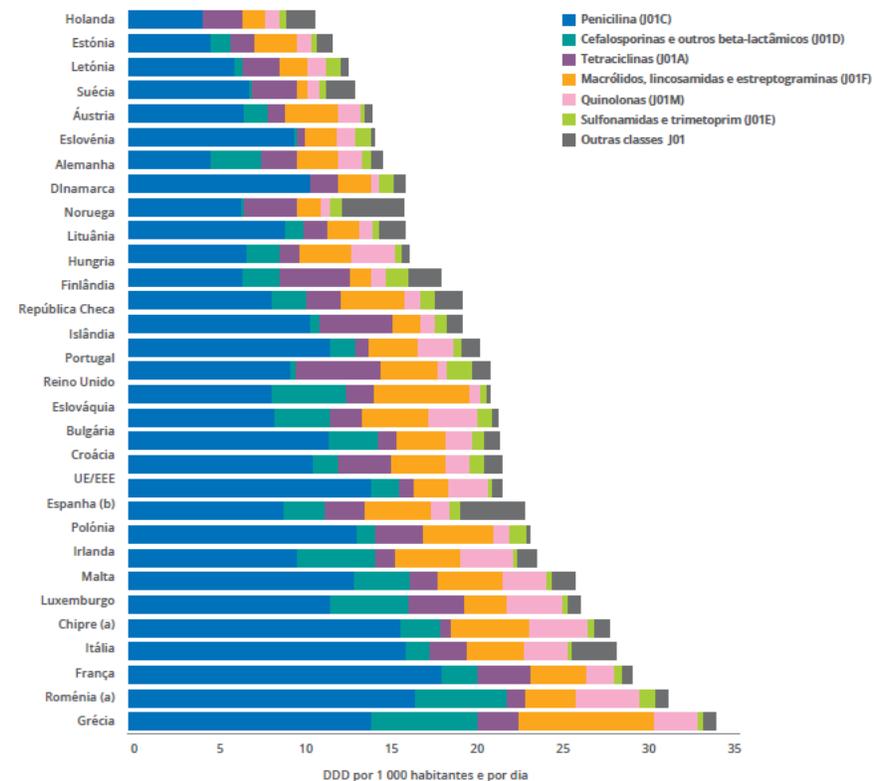
Consumo de ABs: Hospital / Ambulatório

FIGURA 11 CONSUMO DE ANTIBIÓTICOS NO SECTOR HOSPITALAR, EM 23 PAÍSES UE E EEE, EM 2014, EXPRESSA EM DDD POR 1000 HABITANTES E POR DIA



(a) Finlândia: dados incluem consumo em centros de saúde periféricos e lares; b) Portugal: Dados apenas dos hospitais públicos; c) Bélgica: dados relativos a 2013; Reino Unido: dados não incluem a Irlanda do Norte)
 DDD: Dose Diária Definida
 Fonte: ESAC-Net, ECDC 2015

FIGURA 10 CONSUMO DE ANTIBIÓTICOS NA COMUNIDADE EM 30 PAÍSES UE E EEE EM 2014, EXPRESSA EM DDD POR 1000 HABITANTES E POR DIA



a) Chipre e a Roménia forneceram dados relativos à totalidade da prestação de cuidados (i.e. incluindo o setor hospitalar).
 b) Espanha forneceu dados de comparticipação (i.e., não incluindo o consumo de antibióticos obtidos sem receita e outras vias de aquisição não comparticipadas).
 DDD: Dose Diária Definida
 Fonte: ESAC-Net, ECDC 2015

Participação de Portugal: O Menos mal...

Figure A1.1. Number of participating laboratories returning EQA reports 2015, by country

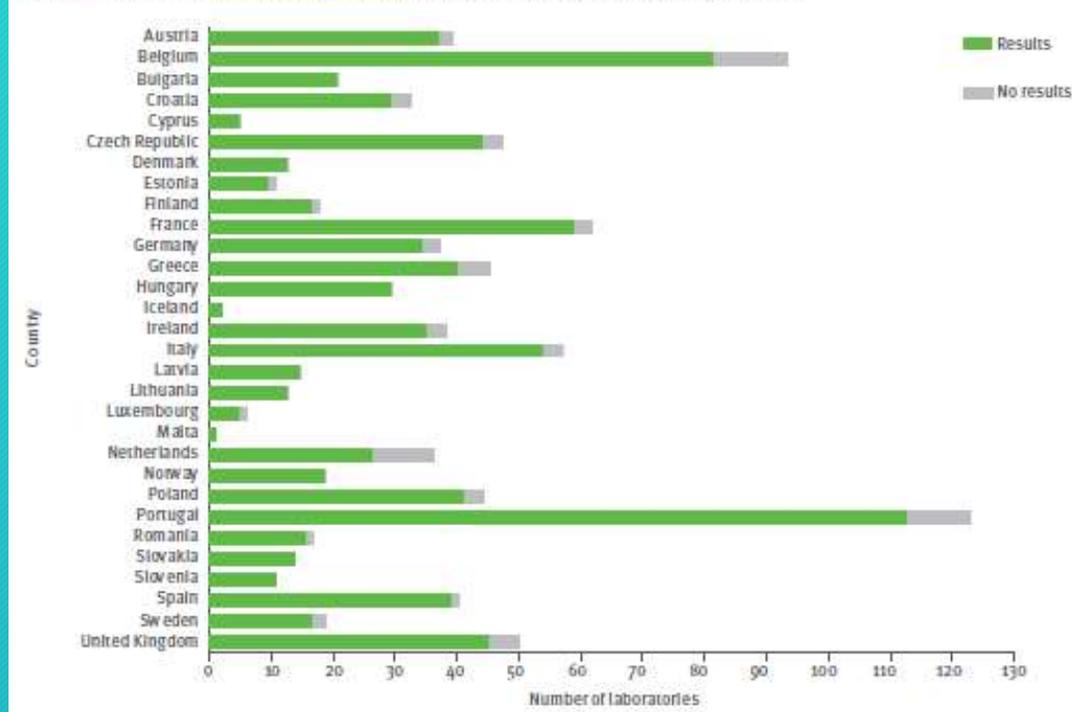
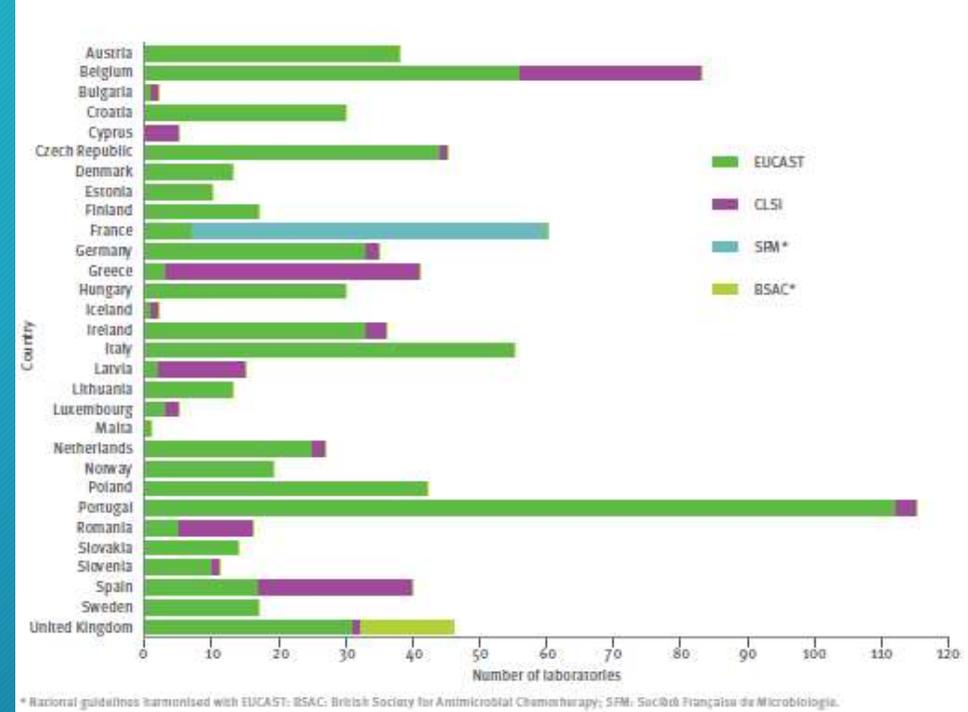


Figure A1.2. Clinical guidelines reported to be used by laboratories: number of laboratories per country, 2015



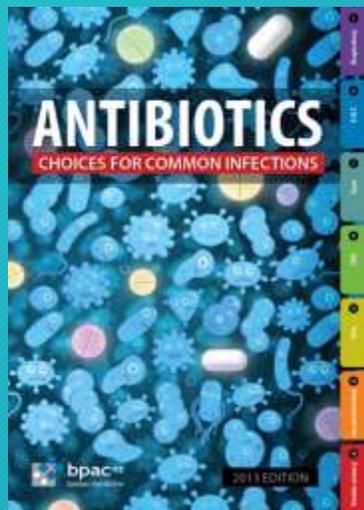
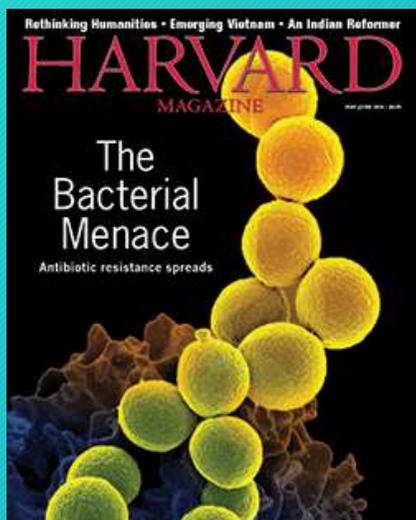
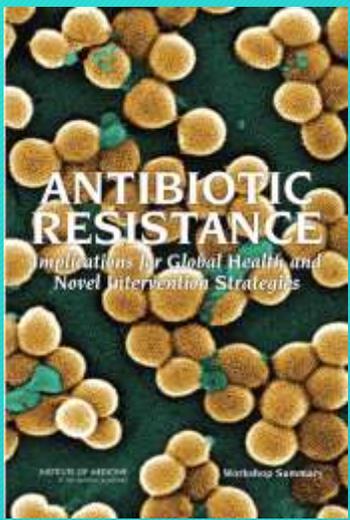
* Rational guidelines harmonised with EUCAST: BSAC: British Society for Antimicrobial Chemotherapy; SPM: Société Française de Microbiologie.

Portugal: EARNs-Net

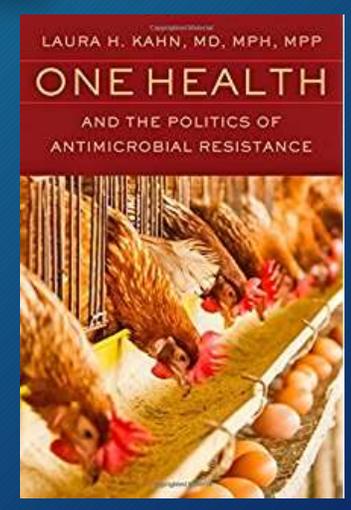
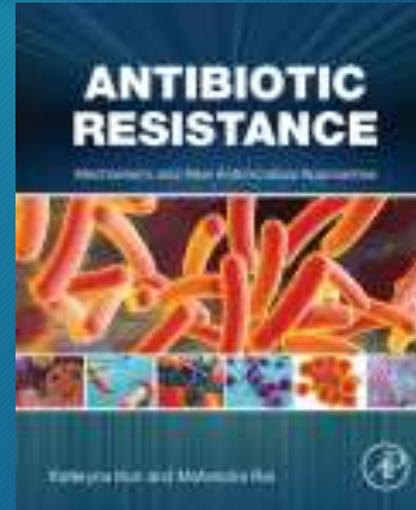
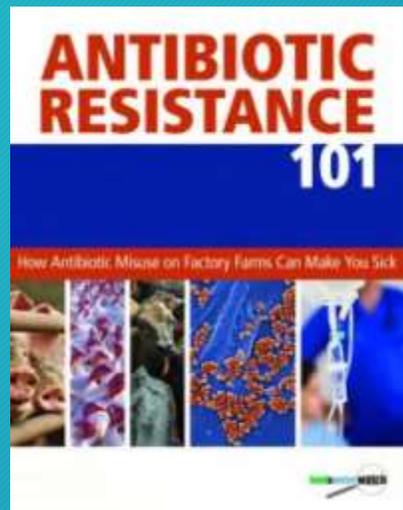
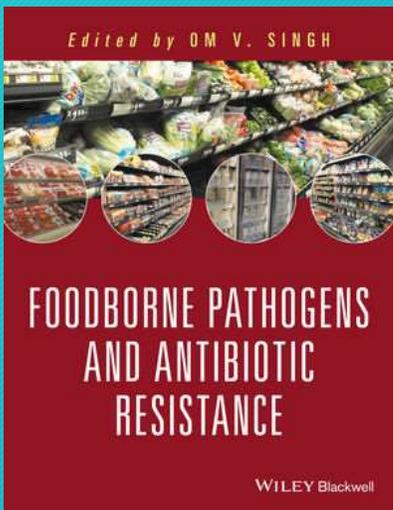
Annual number of reporting laboratories* and number of reported isolates, 2000–2015

| Year | <i>S. pneumoniae</i> | | <i>S. aureus</i> | | <i>E. coli</i> | | Enterococci | | <i>K. pneumoniae</i> | | <i>P. aeruginosa</i> | | <i>Acinetobacter spp</i> | |
|------|----------------------|----------|------------------|----------|----------------|----------|-------------|----------|----------------------|----------|----------------------|----------|--------------------------|----------|
| | Labs | Isolates | Labs | Isolates | Labs | Isolates | Labs | Isolates | Labs | Isolates | Labs | Isolates | Labs | Isolates |
| 2000 | 11 | 97 | 8 | 151 | – | – | – | – | – | – | – | – | – | – |
| 2001 | 16 | 155 | 16 | 521 | 13 | 418 | 12 | 185 | – | – | – | – | – | – |
| 2002 | 14 | 185 | 16 | 544 | 17 | 444 | 13 | 101 | – | – | – | – | – | – |
| 2003 | 12 | 95 | 22 | 1033 | 21 | 792 | 18 | 398 | – | – | – | – | – | – |
| 2004 | 14 | 166 | 23 | 1063 | 19 | 761 | 19 | 410 | – | – | – | – | – | – |
| 2005 | 13 | 202 | 19 | 1153 | 19 | 1171 | 17 | 405 | 1 | 1 | – | – | – | – |
| 2006 | 15 | 183 | 17 | 1306 | 18 | 1331 | 17 | 464 | 13 | 315 | 11 | 266 | – | – |
| 2007 | 12 | 202 | 20 | 1383 | 20 | 1432 | 19 | 518 | 18 | 370 | 16 | 340 | – | – |
| 2008 | 14 | 260 | 20 | 1557 | 21 | 1625 | 20 | 588 | 21 | 543 | 19 | 467 | – | – |
| 2009 | 17 | 237 | 20 | 1824 | 20 | 2040 | 19 | 675 | 20 | 564 | 18 | 536 | – | – |
| 2010 | 12 | 156 | 18 | 1633 | 19 | 1980 | 19 | 621 | 19 | 596 | 19 | 548 | – | – |
| 2011 | 17 | 455 | 18 | 1507 | 18 | 1963 | 18 | 684 | 18 | 619 | 18 | 526 | – | – |
| 2012 | 16 | 330 | 18 | 1455 | 18 | 2158 | 18 | 687 | 19 | 781 | 18 | 588 | 15 | 169 |
| 2013 | 37 | 504 | 44 | 2450 | 34 | 2687 | 41 | 963 | 32 | 913 | 40 | 737 | 34 | 234 |
| 2014 | 50 | 668 | 53 | 3241 | 56 | 5027 | 51 | 1958 | 53 | 1714 | 51 | 1064 | 40 | 266 |
| 2015 | 51 | 843 | 57 | 3645 | 58 | 5377 | 54 | 1440 | 58 | 2099 | 56 | 1192 | 43 | 312 |

* Number of laboratories reporting at least one isolate during the specific year. Please note that the total number of laboratories participating in EARS-Net might be higher.



CONCLUSÕES



O que se pode (e deve) fazer

- Ao nível geral
 - Novos meios de combate
 - Vacinas e Bacteriófagos
 - Resultados microbiológicos
 - Mais precisos e Rápidos
 - Políticas de utilização de ABs
 - Didáticas / Restritivas
 - Políticas de controlo de infeção adequadas e exigentes
 - Acesso à inovação terapêutica mais rápido (reabilitação de ABs “antigos”)
 - Programas informáticos de apoio à prescrição e divulgação / análise crítica dos resultados País / Hospital / Serviço e Médico
- Ao nível institucional
 - Detecção à entrada dos D. c/ microrganismos resistentes e seu isolamento (SU)
 - Apetrechar o Laboratório de Microbiologia e os S. Farmacêuticos c/ instalações adequadas e c/ meios Humanos e Técnicos
 - Implementar alertas das culturas + nas 1^{as} 72h e rever todas as prescrições nas 1^{as} 72h
 - Institucionalizar regras de paragem automática conforme as NOCs e de uma consultadoria especializada obrigatória p/ o TT de D. c/ microrganismos MR e/ ou p/ a utilização dos ABs do grupo 3
 - Auditar a implementação de NOCs de Dx. e TT das infeções graves e rever diariamente as justificações das prescrições de ABs

O exemplo do recomendado para o setor de ambulatório

Morbidity and Mortality Weekly Report (MMWR)

Core Elements of Outpatient Antibiotic Stewardship

Recommendations and Reports / November 11, 2016 / 65(6);1-12

FIGURE 1. Clinician checklist for core elements of outpatient antibiotic stewardship

| | |
|--|--|
| <p>CDC recommends that outpatient clinicians take steps to implement antibiotic stewardship activities. Use this checklist as a baseline assessment of policies and practices that are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually).</p> | |
| Commitment | |
| 1. Can your facility demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety related to antibiotics? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which of the following are in place. (Select all that apply.)</p> <input type="checkbox"/> Write and display public commitments in support of antibiotic stewardship. | |
| Action | |
| 2. Have you implemented at least one practice to improve antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which practices which you use. (Select all that apply.)</p> <input type="checkbox"/> Use evidence-based diagnostic criteria and treatment recommendations. <input type="checkbox"/> Use delayed prescribing practices or watchful waiting, when appropriate. | |
| Tracking and Reporting | |
| 3. Do you monitor at least one aspect of antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which of the following are being tracked. (Select all that apply.)</p> <input type="checkbox"/> Self-evaluate antibiotic prescribing practices. <input type="checkbox"/> Participate in continuing medical education and quality improvement activities to track and improve antibiotic prescribing. | |
| Education and Expertise | |
| 4. Do you provide education to patients and seek out continuing education on antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate how you provide antibiotic stewardship education. (Select all that apply.)</p> <input type="checkbox"/> Use effective communications strategies to educate patients about when antibiotics are and are not needed. <input type="checkbox"/> Educate about the potential harms of antibiotic treatment. <input type="checkbox"/> Provide patient education materials. | |



FIGURE 2. Facility checklist for core elements of outpatient antibiotic stewardship

| | |
|---|--|
| <p>CDC recommends that outpatient care facilities take steps to implement antibiotic stewardship activities. Use this checklist as a baseline assessment of policies and practices that are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually).</p> | |
| Commitment | |
| 1. Can your facility demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety related to antibiotics? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which of the following are in place. (Select all that apply.)</p> <input type="checkbox"/> Identify a single leader to direct antibiotic stewardship activities within a facility. <input type="checkbox"/> Include antibiotic stewardship-related duties in position descriptions or job evaluation criteria. <input type="checkbox"/> Communicate with all clinic staff members to set patient expectations. | |
| Action | |
| 2. Has your facility implemented at least one policy or practice to improve antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which interventions are in place. (Select all that apply.)</p> <input type="checkbox"/> Provide communications skills training for clinicians. <input type="checkbox"/> Require explicit written justification in the medical record for nonrecommended antibiotic prescribing. <input type="checkbox"/> Provide support for clinical decisions. <input type="checkbox"/> Use call centers, nurse hotlines, or pharmacist consultations as triage systems to prevent unnecessary visits. | |
| Tracking and Reporting | |
| 3. Does your facility monitor at least one aspect of antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate which of the following are being tracked. (Select all that apply.)</p> <input type="checkbox"/> Track and report antibiotic prescribing for one or more high-priority conditions. <input type="checkbox"/> Track and report the percentage of all visits leading to antibiotic prescriptions. <input type="checkbox"/> (If already tracking and reporting one of the above) Track and report, at the level of a health care system, complications of antibiotic use and antibiotic resistance trends among common outpatient bacterial pathogens. <input type="checkbox"/> Assess and share performance on quality measures and established reduction goals addressing appropriate antibiotic prescribing from health care plans and payers. | |
| Education and Expertise | |
| 4. Does your facility provide resources to clinicians and patients on evidence-based antibiotic prescribing? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>If yes, indicate how your facility provides antibiotic stewardship education. (Select all that apply.)</p> <input type="checkbox"/> Provide face-to-face educational training (academic detailing). <input type="checkbox"/> Provide continuing education activities for clinicians. <input type="checkbox"/> Ensure timely access to persons with expertise. | |

O cenário catastrófico que se pretende evitar, se tomarmos agora as medidas adequadas

FIGURA 1

PREVISÃO DE MORTALIDADE ANUAL ATRIBUÍVEL A RESISTÊNCIA A ANTIBIÓTICOS EM 2050



Fonte: Adaptado de *Review on Antimicrobial Resistance. Antimicrobial Resistance: Tackling a Crisis for the Health and Wealth of Nations*. 2014.