

Health Protection Surveillance Centre

Antimicrobial stewardship: Where do I fit in?

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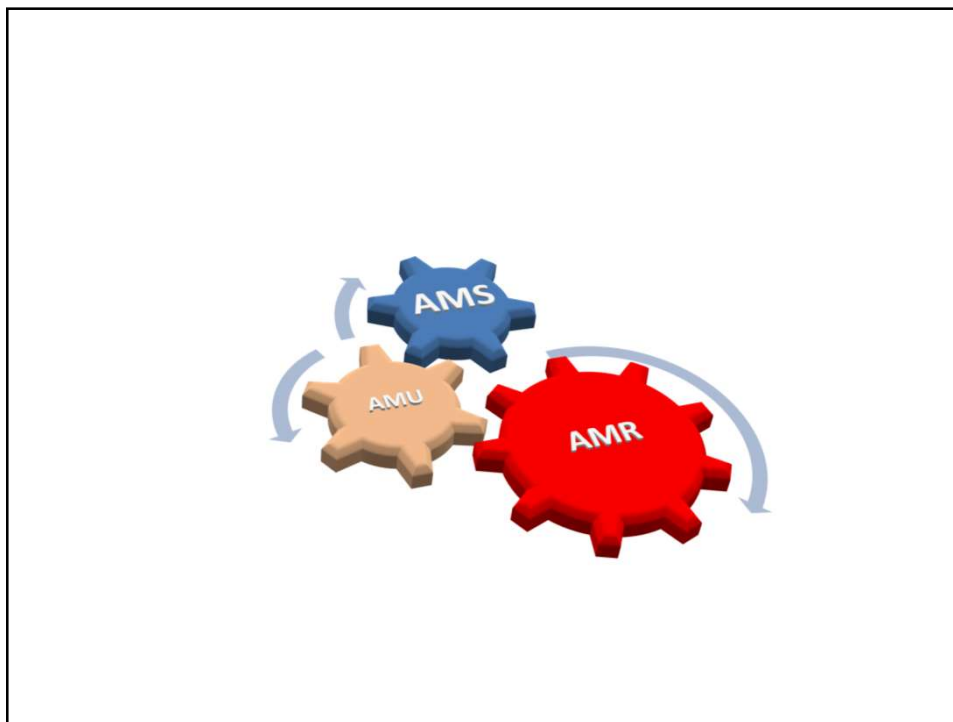
Infection Prevention & Control Course for Frontline Hospital Staff
RCSI, 10th September 2019

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Presentation overview

- 1. Recap on some important concepts**
- 2. What do we know about antimicrobial use in Ireland?**
- 3. Why is stewardship important?**
- 4. Where do I fit into the stewardship team?**
Case studies for discussion

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Presentation overview

1. Some important concepts

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3. Why is stewardship important?

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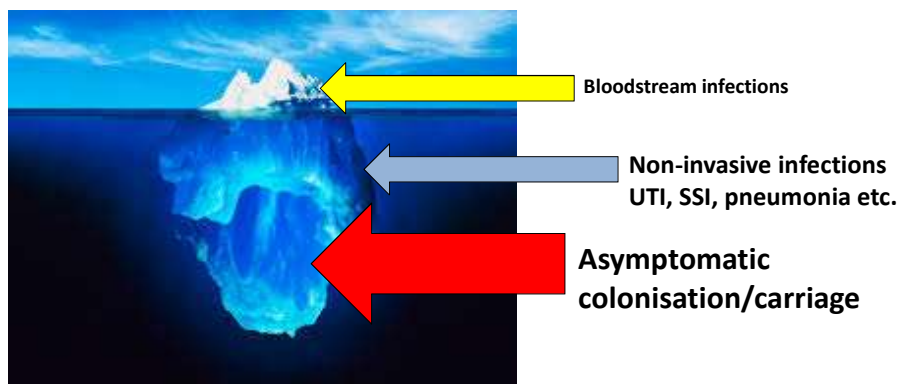
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Important concepts:

- **Antimicrobials** (antibacterials, antivirals, antifungals etc.) are used to treat or prevent infection
- Microorganisms that colonise or infect can be either sensitive/susceptible or resistant to antimicrobials
 - **Sensitive/susceptible (S)** = We'd expect that antimicrobial to work if needed to treat infection
 - **Resistant (R)** = We'd expect that antimicrobial not to work if used to treat infection
- **Antimicrobial resistance (AMR)** occurs when a particular antimicrobial/antimicrobial class is ineffective to treat infection
 - Enterobacterales (*E. coli*, *Klebsiella*) – ESBL, CPE/CRE
 - *Staphylococcus aureus* – MRSA
 - *Enterococcus faecium* - VRE

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Bacteria are the major concern when we talk about AMR





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AMR is a major patient safety issue

33000 deaths

Each year, 33000 people die from an infection due to bacteria resistant to antibiotics. This is comparable to the total number of passengers of more than 100 medium-sized airplanes.



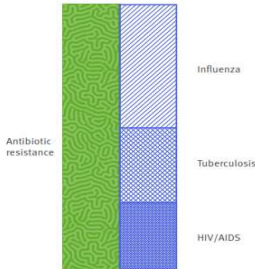


75%


healthcare-associated infections

75% of the burden of bacteria resistant to antibiotics in Europe is due to healthcare-associated infections. This could be minimised through adequate infection prevention and control measures, as well as antibiotic stewardship in healthcare settings.

The burden of infections with bacteria resistant to antibiotics on the European population is comparable to that of influenza, tuberculosis and HIV/AIDS combined.



Infection Type	Relative Burden (Visual)
Antibiotic resistance	High (Green)
Influenza	Medium (Blue)
Tuberculosis	Low (Blue)
HIV/AIDS	Low (Blue)



ecdc.europa.eu
antibiotic.ecdc.europa.eu

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What do we know about AMR in Ireland? Nearly 5000 infections & over 200 deaths per annum

Lancet Infect Dis 2018

Published Online
November 5, 2018

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Strategic Objective 1: Improve awareness and knowledge of antimicrobial resistance

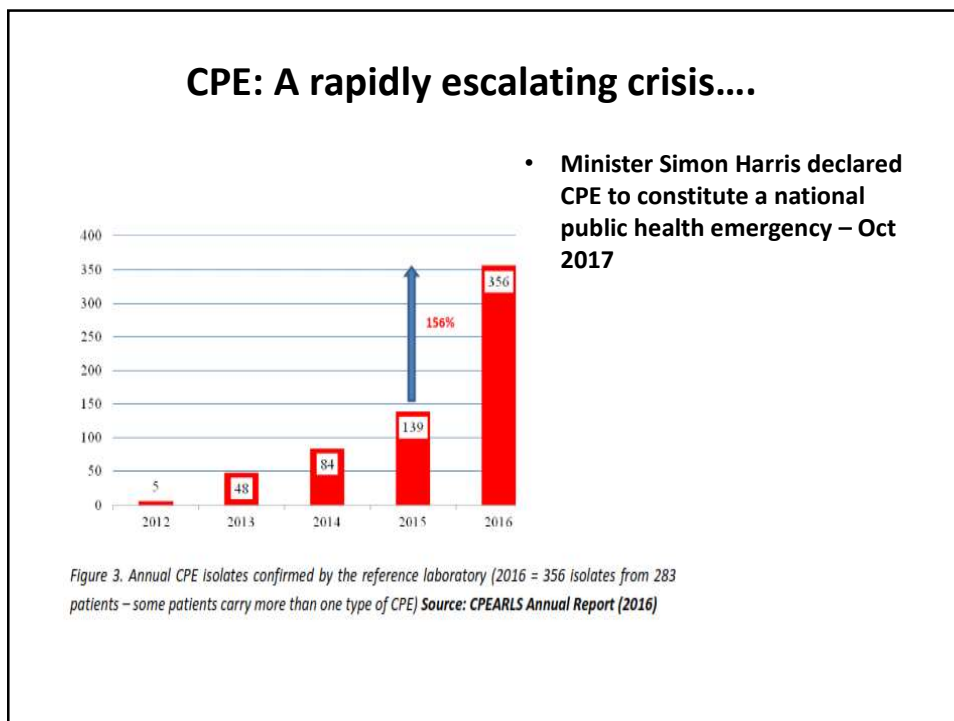
Strategic Objective 2: Enhance surveillance of antibiotic resistance and antibiotic use

Strategic Objective 3: Reduce the spread of infection and disease

Strategic Objective 4: Optimise the use of antibiotics in human and animal health

Strategic Objective 5: Promote research and sustainable investment in new medicines, diagnostic tools, vaccines and other interventions

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Important concepts:

BUT.....

- We don't often detect the microorganism that's causing the infection: Most of our antimicrobial use is **empiric** – based on a best guess of what bug is likely to be causing the infection
- **Antimicrobial stewardship**: Sensible use of antimicrobials to ensure infection is treated properly, unnecessary use is avoided, unintended consequences of antimicrobials minimised and antimicrobials are preserved for use by future generations

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Surveillance of AMU = How are we doing?

INCIDENCE

PREVALENCE

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Describing AMU

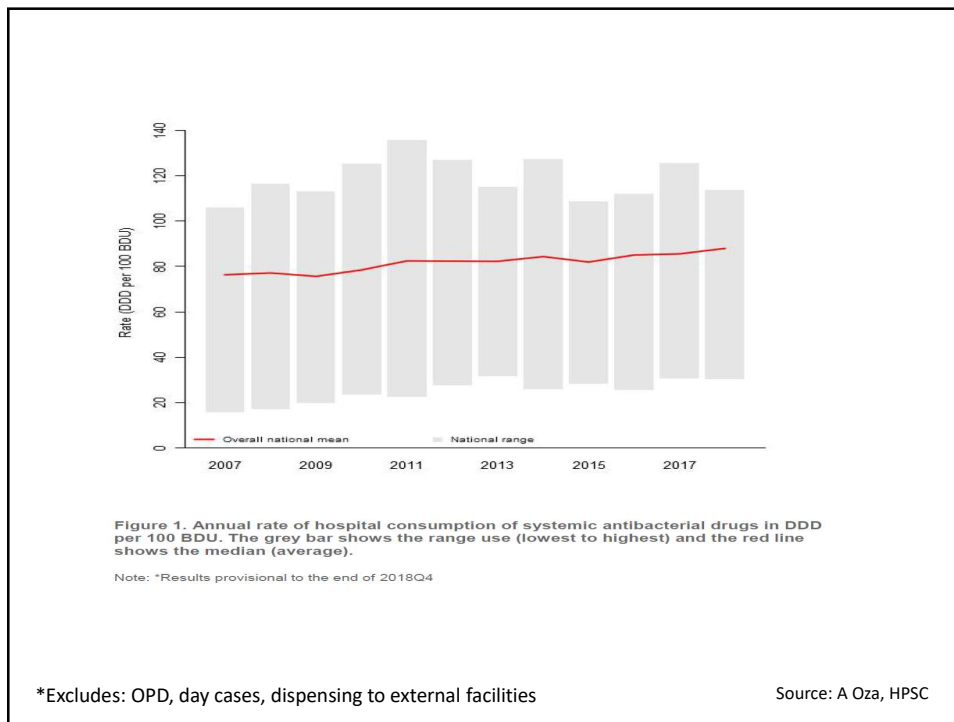
- **What?**
- **When?**
- **How much?**

Quantitative

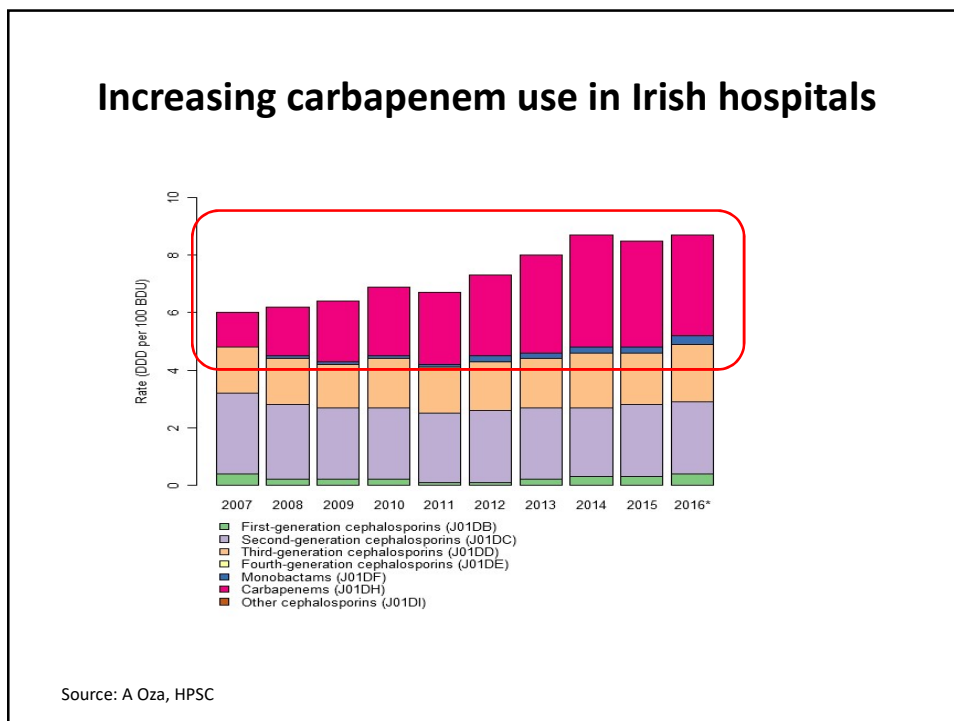
- **Where?**
- **Why?**
- **Who?**
- **How well?**

Qualitative

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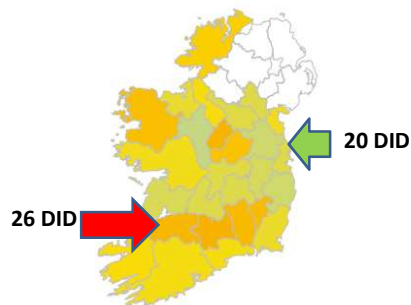
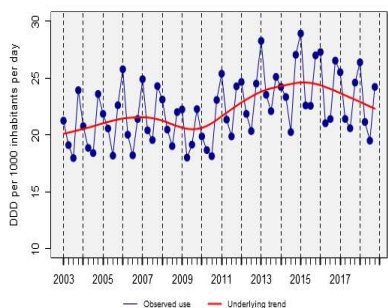


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Community AMU: 90% of all AMU is in the community with regional & seasonal variation



	2014	2015	2016	2017	2018†	2018 v 2017
Community antimicrobial consumption (DDD/1,000 inhabitants/day - DID), overall	23.8	25.3	24.1	23.1	22.9	Rate ↓

Source: A Oza, HPSC Provisional data to end 2018

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National AMU point prevalence surveys (PPS)

Acute Hospitals

LTCF



Point Prevalence Survey of Hospital-Acquired Infections & Antimicrobial Use in European Acute Care Hospitals: May 2017

Point Prevalence Survey of Healthcare-Associated Infections & Antimicrobial Use in Long-Term Care Facilities (HALT): May 2016

NATIONAL REPORT:
IRELAND – DECEMBER 2018

IRELAND: NATIONAL REPORT – MARCH 2017
Report Authors: Sarah Hennessy, Helen Murphy & Karen Burns, HPSC

60 hospitals
10,333 inpatients

Report Authors: Stephen Murchan, Helen Murphy & Karen Burns, HPSC

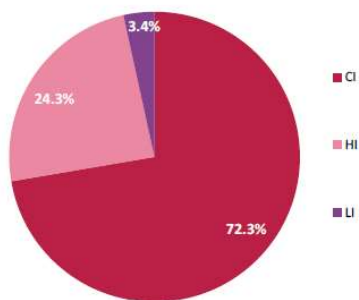
SUGGESTED CITATION: HEALTH PROTECTION SURVEILLANCE CENTRE, POINT PREVALENCE SURVEY OF HEALTHCARE-ASSOCIATED INFECTIONS & ANTIMICROBIAL USE IN LONG-TERM CARE FACILITIES: MAY 2016 – IRELAND NATIONAL REPORT: MARCH 2017

224 LTCF
10,044 residents

Suggested Citation: Health Protection Surveillance Centre, Point Prevalence Survey of Hospital Acquired Infections & Antimicrobial Use in European Acute Care Hospitals, May 2017: National Report Ireland.

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PPS 2017: Why were treatment antimicrobials used?



- About 1-in-4 of treatment antimicrobials prescribed in Irish hospitals are for HAI
- No HAI = No need to treat a HAI

Figure 4.22. Breakdown of infection treatment prescriptions by origin of infection (n=4,579)

<http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/surveillance/hospitalpointprevalencesurveys/2017/nationalppsreports/>

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Clinical practice guidelines for antimicrobial prophylaxis in surgery

DALE W. BRATZLER, E. PATCHEN DELLINGER, KEITH M. OLSEN, TRISH M. PERL, PAUL G. AUWAERTER, MAUREEN K. BOLON, DOUGLAS N. FISH, LENA M. NAPOLITANO, ROBERT G. SAWYER, DOUGLAS SLAIN, JAMES P. STEINBERG, AND ROBERT A. WEINSTEIN

Am J Health-Syst Pharm. 2013; 70:195-283

Surgical site infection

prevention and treatment of surgical site infection

National Collaborating Centre for Women's and Children's Health

Commissioned by the National Institute for Health and Clinical Excellence

October 2008

SIGN 104 • Antibiotic prophylaxis in surgery

A national clinical guideline

July 2008, updated April 2014



GLOBAL GUIDELINES FOR THE PREVENTION OF SURGICAL SITE INFECTION

© World Health Organization 2016

JAMA Surgery | Special Communication

Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017

Sandra I. Berrios-Torres, MD, Craig A. Umscheid, MD, MSCE, Dale W. Bratzler, DO, MPH, Brian Leas, MA, MS, Eric C. Stone, MA, Rachel R. Kelz, MD, MSCE, Caroline E. Rienke, MD, MSH-P, Sherry Morgan, RN, MLS, PhD, Joseph S. Solomkin, MD, John E. Mazuski, MD, PhD, E. Patchen Dellinger, MD, Kamal M. F. Izam, MD, Erik F. Barrett, MD, John Sargent, MD, Javad Parvaz, MD, Juan Blanchard, MS, RN, RN, CNOR, CIC, George Allen, PhD, CIC, CNOR, Jan A. J. W. Kluytmans, MD, Rodney Donlan, PhD, William P. Schectler, MD, for the Healthcare Infection Control Practices Advisory Committee

1E. In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. (Category IA—strong recommendation; high-quality evidence.)

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PPS 2017: Surgical antimicrobial prophylaxis

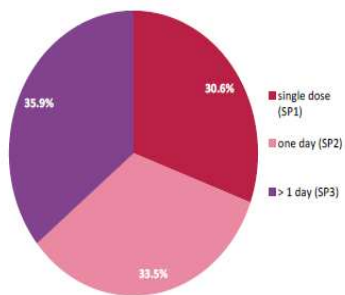
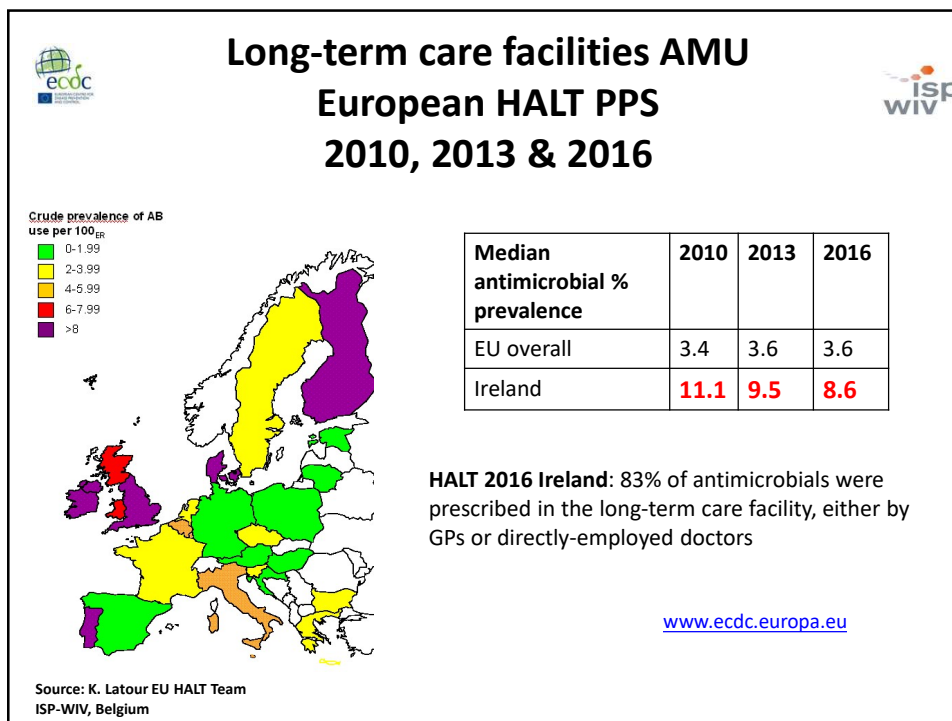


Figure 4.33. SAP duration

- **PPS 2012:** 73% >single dose
- **PPS 2017:** 69% >single dose

<http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/surveillance/hospitalpointprevalencesurveys/2017/nationalppsreports/>

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Treatment versus prophylaxis by site: HALT IE

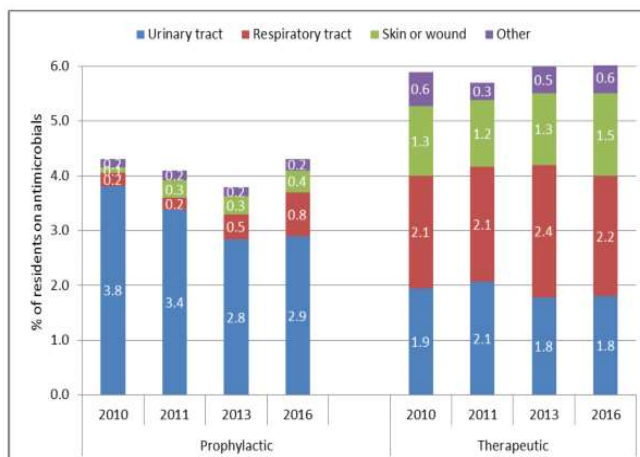


Figure 4.1.4 Reasons for prescribed antimicrobials by body site: 2010 – 2016.

http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/surveillance/hcaiinlongtermcarefacilities/haltreports/2016report/File_16218.en.pdf

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Where do I fit in?

1. Community acquired pneumonia – Day 4 IV co-amoxiclav TDS & PO clarithromycin BD
2. 85 years, awaiting LTC, urinary catheter *in situ*, dark urine with strong odour reported by night staff at handover
3. 65 years, had elective laparoscopic cholecystectomy on Friday. Continues IV cefuroxime and IV metronidazole on Monday
4. 77 years. CCF. *C. difficile* infection treated in early July. Chesty and short of breath 20th August
5. 55 years. Cellulitis lower limb. On IV flucloxacillin 2gm QDS day 9

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Information for action

National Policy on Restricted Antimicrobial Agents

Health Service Executive

Reference Number		Developed By	On behalf of National Taskforce on HCAI AMR
Version Number	V0.1	Version Date	04/07/2016
Approval Date		Approved By	
Responsibility for Implementation	Hospital Groups	Responsibility for Review and Audit	
Review Date			

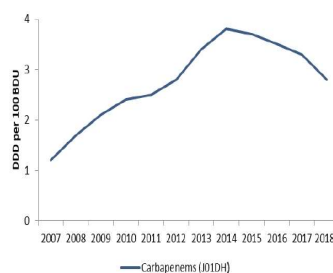


Figure 15. Annual national carbapenem use in acute HSE hospitals (results are provisional for *2018 data to end Q4). Source: HPSC

Access to following antimicrobial class must be restricted, as per the policy statement above:

- Carbapenems (e.g. meropenem, imipenem, ertapenem)

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Know your role as an antibiotic guardian

1. Promote IV to PO switch – No IV line = no IV line infection
2. Do your bit to prevent HAI – No HAI = No treatment for HAI needed
3. Highlight long treatment courses on ward rounds
4. Question when patients return from theatre on antibiotics when surgery wasn't done for suspected infection
5. Remind prescribers if your patient has a history of *C. difficile* infection

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Conclusion

- **Difficult to prevent antimicrobials being started**
 - Ageing population, increased acute activity, greater complexity of care and co-morbidities
 - **BUT** we must have a good reason for starting them and know the risks of collateral damage
- **Vital to play a role in getting them stopped when no longer needed**
- **PS – Get your annual flu vaccine:**
 - No flu = no secondary bacterial infection = no antibiotics needed

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Thank you for your attention



'There is no other instance in medicine where treatment given to an individual patient affects other patients and society at large' Paul M et al. Antimicrob Agents Chemother 2010;54:4860