



**Safe Patient Care
"Bugs and Drugs"
The ongoing challenge of
MDROs and AMR**



2017
@SPC2016Cork

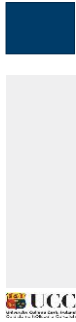
#bugsndrugs

Antimicrobial Stewardship.
Where are we now and where
do we need to go?

Frank O'Riordan
Antimicrobial pharmacist,
MUH & SIVUH

Introduction

- Antibiotic resistance
- Antibiotic use in Ireland
- Antimicrobial stewardship
- Where do we need to go



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Antibiotic resistance-major public health crisis

- Highlighted by
- World health organisation (WHO)- 'major global threat' to healthcare
- US centres for disease prevention and control (CDC)
- European centre for disease control and prevention (ECDC)
- UK review on antimicrobial resistance
- US White House- National action plan for combatting antibiotic resistant bacteria

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Health service facing large bill over lethal superbug threat

[Full Article](#)

Los Angeles Times, May 21, 2017 11:48

The health services are facing a \$40 million annual bill, including "considerable" litigation costs, due to an escalating threat from a potentially lethal superbug, HSE director general Tony O'Brien has warned.

The CPE bug represents a "current and future significant threat" to the health and safety of patients that could cost more than \$20 million a year to tackle. Mr O'Brien noted in an internal memo, seen by *The Irish Times*.

"Litigation costs to the health service are likely to be considerable and would certainly exceed the estimated €20 million cost of controlling even a limited number of outbreaks," he wrote.

A number of Irish hospitals, including Limerick and Tallaght, are currently battling outbreaks of superbug-producing enterobacteriaceae (CPE). Up to 2 per cent of cases detected so far have been invasive, involving septicaemia, meningitis and deep abscesses. Up to 50 per cent of such cases can be fatal.

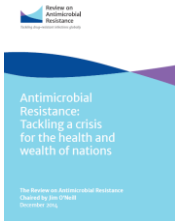


Untreatable gonorrhoea 'superbug' spreading around world, WHO warns

World Health Organization calls on every nation to monitor, detect and containing these bacteria, warn whom all antibiotics can cure gonorrhoea



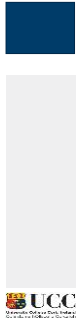
Antibiotic resistance



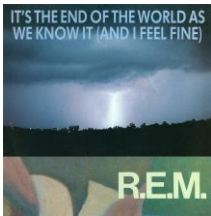


82,300 Croke Park 700,000 Deaths due to antibiotic resistance

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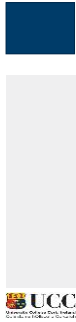


Post antibiotic era?

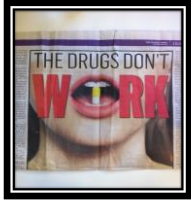


How are we going to treat this patient?

AGENT	RESULT
Amoxicillin	RESISTANT
Co-amoxiclav	RESISTANT
Cefuroxime	RESISTANT
Cefotaxime	RESISTANT
Ceftazidime	RESISTANT
Piperacillin/Tazobactam	RESISTANT
Aztreonam	RESISTANT
Meropenem	RESISTANT
Ciprofloxacin	RESISTANT
Gentamicin	RESISTANT
Tobramycin	RESISTANT
Amikacin	RESISTANT
Tigecycline	RESISTANT
Colistin	SUSCEPTIBLE



Antibiotic resistance



Antibiotic resistance warning



"Penicillin should only be used if there is a properly diagnosed reason and, if it needs to be used, use the highest possible dose for the shortest time necessary. Otherwise antibiotic resistance will develop"

Alexander Fleming, 1945



Antibiotic use and antibiotic resistance



- Unfortunately all antibiotic use causes selective pressure by killing off bacteria
- Appropriate use applies the same selective pressure as does inappropriate use
- The difference is that we can and should stop inappropriate use because it offers no benefit
- In contrast, appropriate antibiotic use is necessary to reduce mortality and morbidity from bacterial infections with the benefit of appropriate antibiotic use to patients and society outweighs the collective harm



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Superbugs!!



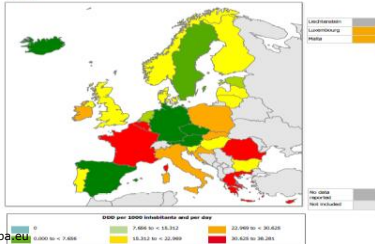
Antibiotic consumption in Ireland

- Comparison with other EU countries
- Recent usage trends
- Data from long term care
- Antibiotic use in agriculture



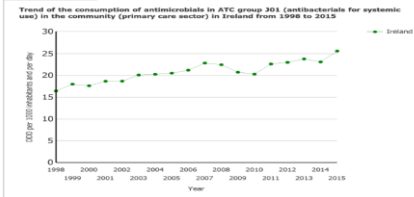
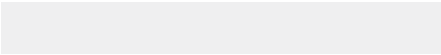
Antimicrobial use in Ireland

Comparison of Antibiotic Use (ATC group J01) in the community and hospital sector in Europe, reporting year 2013



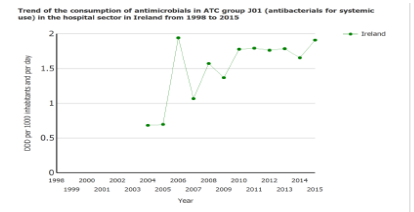
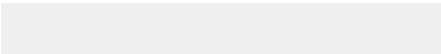
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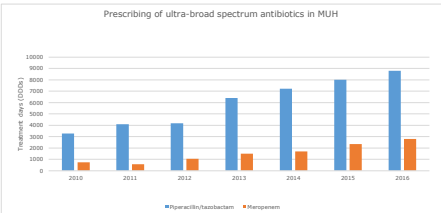




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Ultra broad spectrum usage trends



Tazocin manufacturing plant



HALT PPS 2016 findings

- The national crude antimicrobial use prevalence was 9.8%
- 59% of antimicrobials were prescribed to treat infection.
- However, antimicrobial prophylaxis accounted for the majority of prescriptions in intellectually disabled LTCF (54%)
- rapidly increasing national incidence of antimicrobial resistant bacteria, such as multi-drug resistant *Klebsiella pneumoniae* (MDRKP) and carbapenem producing *Enterobacteriaceae* (CPE), with cases and outbreaks in Irish LTCF reported



HALT PPS 2016 findings

- (98%) reported having no active local antimicrobial stewardship committee (ASC), training on antimicrobial prescribing was not provided by 94% and 56% of LTCF reported having no local antimicrobial prescribing guidelines
- Prescriber feedback regarding local antimicrobial consumption was available in just 14% of LTCF
- LTCF with a designated coordinating physician were significantly more likely to demonstrate positive local antimicrobial stewardship practices such as; an active ASC, training for prescribers and local prescribing guidelines

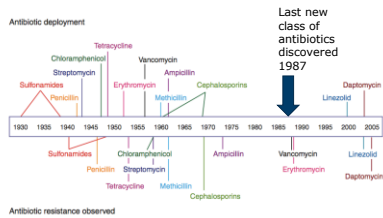


Antimicrobial use in agriculture

- EU is due to introduce restrictions on antibiotic use in food animals over the next three years.
- In 2014 Ireland used 90.2 tonnes of antibiotics in agriculture (HPRA)
- EU report shows that Ireland is near the bottom of the European league in the use of antibiotics in animals
- Lowering antibiotic use in agriculture-better use of vaccinations to enable disease prevention, improved building design and better training for farmers on antibiotic and medicines use



Antibiotic discovery and resistance timeline





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New antibiotics?



Why has the pipeline of new drugs run dry?

- Scientific difficulties in developing new antibiotics
- Financial and regulatory hurdles
- Lack of incentive to develop new antibiotics
- Patients will only receive short courses
- Once developed specialists will restrict use to save lives
- Resistance will eventually develop anyway
- Patent will run out
- Need for incentives from policy makers



Antimicrobial stewardship

- Everybody needs to use antibiotics more responsibly
- 'Highly effective AMS programmes aim to empower all prescribers by ensuring that they have sufficient expertise, knowledge, and access to information to deal with the majority of clinical scenarios independently of expert advice. Ready access to high quality, up to date empiric guidelines-coupled with effective education and training, and feedback on performance through audit-are critical parts of such an approach' HIQA-report of the review of antimicrobial stewardship in public acute hospitals July 2016

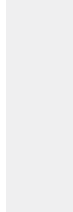


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Nationally

- National action plan to address antimicrobial resistance is being developed following an initiative during the Dutch Presidency of the EU
- Council of the EU requirements state that this plan should adopt a 'one-health' approach and include the healthcare, agricultural and veterinary sectors to come together to contribute to the formulation and implementation of a national plan in this area
- Expected to be published in September 2017

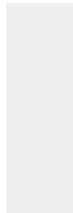


Where we are now

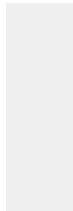
- Well established AMS programmes in hospitals
- Prescribing guidelines in primary care-work being done by the ICGP & Dr. Nuala O'Connor
- Resources are an issue in establishing them in the long term care setting and the community
- Better education of the general public
- Vaccinations
- Role of new diagnostic tests

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Education



Improved diagnostics and biomarkers

- Complex relationship between patients, infections and the organisms causing the infection
 - Filmarray blood culture identification
 - Point of care testing of CRP
 - Procalcitonin testing to withhold or shorten antibiotic course lengths
- To realise the full benefits of new diagnostic tests to improve patient care they must be supported by ams interventions



What can we do?

- Multidisciplinary approach where all healthcare workers involved in antibiotic management understand and support the principles of antimicrobial stewardship
 - Collaboration between healthcare professionals to ensure consistency in approach, shared knowledge and widespread diffusion in practice
- Antibiotic stewards
 - Hand hygiene

JAC 2010;65:2275-77

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Health care professionals



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Promoting antibiotic resistance-is not keeping our patients safe



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To conclude





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Thank you for your time



"Don't forget to take a handful of our complimentary antibiotics on your way out."