



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

2017
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CPE



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**CPE – What are we doing & are we
doing it right?**



Map of Ireland.
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Presentation Outline

- The CPE story in Ireland
- Surveillance
- Screening
- Stewardship
- National response – where next?

In Ireland, the terms CRE & CPE are used interchangeably, where we refer to CRE, we are specifically targeting carbapenemase producers

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Back to 2009

First case reported from mid-west – KPC

Rapid communications
FIRST IDENTIFICATION OF CLASS A CARBAPENEMASE-PRODUCING KLEBSIELLA PNEUMONIAE IN THE REPUBLIC OF IRELAND

C Roche*, M Cotter*, N O'Donnell†, B Crowley (bcrowley@ghis James, IRI)*

EUROSURVEILLANCE Vol. 14 - Issue 13 - 2 April 2009

KPC outbreak ensued in MWRH 2011

February 2011 – patient recently discharged from that that hospital admitted to a different hospital,

→ onward KPC transmission

J Antimicrob Chemother 2012; 67: 2367 – 2372
doi:10.1093/jac/dks239 Advance Access publication 28 June 2012

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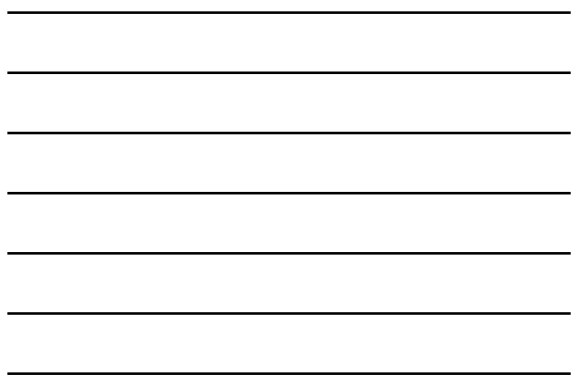
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CRE outbreak: Media 2011 MWRH February 2011



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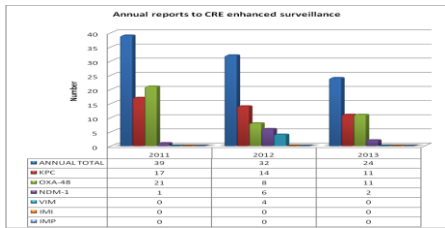
National response 2012

- Invasive CRE infection (sterile site) made notifiable under Infectious Diseases Amendment Regulations
- National carbapenemase producing *Enterobacteriaceae* reference laboratory service launched
- National guidelines published – screening, laboratory methods, IPC



http://www.hpsc.ie/g-z/microbiologyantimicrobialresistance/infectioncontrolandhai/guidelines/File_12922_en.pdf
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Voluntary surveillance = under-reporting

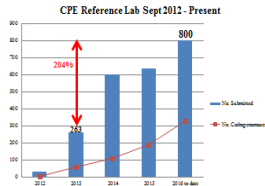


Twice as many carbapenemases confirmed by national reference lab (n=48) than reported to enhanced surveillance in 2013 (n=24)

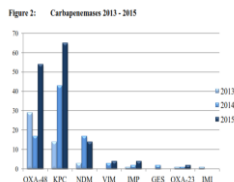
Source: HPSC

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National carbapenemase producing *Enterobacteriaceae* reference laboratory: Exponential increase in referrals and workload



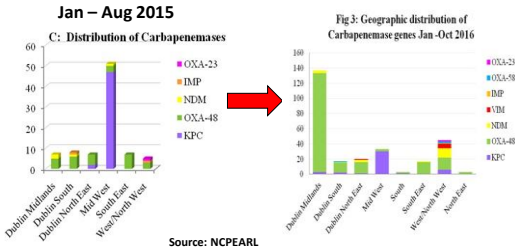
Source: NCPEARL



Source: NCPEARL Annual Report 2015

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**Not only from the mid-west...
The arrival of OXA-48 – A game changer**



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Major OXA-48 outbreak in a tertiary Dublin Hospital: Media 2016/17

Bug which can kill half of those infected forces hospital to restrict visits

The Herald 12/10/16

'More isolation rooms needed' to cope with superbug outbreak

Ian Begley
TALLAGHT Hospital is not capable of dealing with the latest outbreak of an infectious superbug, according to a leading emergency medicine consultant.

Irish Independent 10/01/17

More than 2,000 people exposed to hospital superbug

Tallaght Hospital has declined to specify the extent of the current outbreak.

PAUL CULLEN
Health Correspondent

Ian Begley
Healthcare
A stock/examiner said it v

Irish Times 31/01/17

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Impact on health service

- | | |
|---|---|
| <p>Human</p> <ul style="list-style-type: none"> ▪ Increased mortality and morbidity ▪ Prolonged hospitalisation ▪ Slower recovery ▪ 'feel like leper' ▪ Ongoing screening after discharge ▪ Potential loss of income and work days ▪ Risk to other patients as can carry indefinitely | <p>Financial</p> <ul style="list-style-type: none"> ▪ Loss single room capacity ▪ Increased length of stay ▪ Scheduled and unscheduled care ▪ Patient flow ▪ Consumables ▪ Staff morale ▪ Other staff programmes – IPC team impact ▪ Transfer of patients ▪ Public private income |
|---|---|

Some of estimated costs to date

UHL:

- The estimated cost to the hospital to date is €4 million for 60 cases since 2015
- First 6 months of 2015 - 27 cases identified at a cost of €1,375,000 in total or €2,802 per night
- First 6 months of 2016 for -13 patients it cost €361,000 and €5,000 per night (a patient information system allowed exact identification of patient bed movements)
- Difficult to attract and retain experienced IPC staff

Tallaght:

- The estimated cost to the hospital to date since August 2016 is €2 million
- 700 operations have been postponed to date
- Impact on surgical waiting lists

Donegal LTCF

- €106,000 is the estimated additional cost to manage to date an outbreak affecting five residents in one LTCF in the past 12 months

Outbreaks

2012 – June 2017

13 CPE outbreaks reported

- 7 hospitals
- 2 nursing homes

01/09/17

- Eight acute hospitals with active CPE outbreaks

Source: HPSC

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2017: Transition from voluntary to mandatory laboratory reporting (n=39)

- 118 isolates reported by 19 labs in Q1
- 20 labs reported no carbapenemases

Carbapenemase-producing Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Ireland- Q1 2017

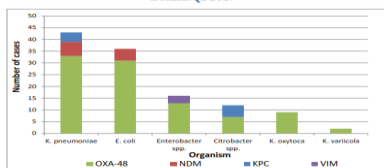


Figure 1. Summary of CRE by organism and carbapenemase type, Q1 2017

<https://www.hpsc.ie/hsc/infectiousdiseases/antibioticresistance/antibioticresistanceandcontrol/antibioticresistanceandcontrol/carbapenemase-producing-enterobacteriaceae-cre/survey.aspx?surveyid=1>

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Potentially deadly superbug found in 17 hospitals

Elina O'Regan
A POTENTIALLY deadly "superbug" - resistant to many antibiotics - was found in 17 hospitals in the first three months of the year, according to a new report.

Irish Independent
28/07/2017

Not just an Acute Hospital Problem Q1 2017

- Inpatients in 17 hospitals: n=86
 - Incomplete reporting of data on patient isolation
 - Where reported, 89% isolated within 24 hours of lab result
 - Incomplete reporting of data on antimicrobials for suspected CRE infection (44% of inpatient cases)
 - Where reported, 73% had required treatment
- Outpatients: n=13
- LTCF residents: n=13
- Primary care (GP) patients: n=5

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Identify scale of the problem National surveillance

1. Need to improve reporting on patient isolation
2. Need to improve reporting on treatment for CPE infection
3. Need data on patient outcome and quantify ultimate size and cost of outbreaks
4. Need to determine whether labs reporting no CPE are actually looking for it
5. Can we progress to more real-time reporting? Quarterly data not timely enough

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Screening guidelines updated 2014

2.0 Updated Screening Recommendations

Screening for carriage of resistant Enterobacteriaceae, using a laboratory method that is capable of detecting BOTH third generation cephalosporin and carbapenem non-susceptible Enterobacteriaceae is advised for the following at-risk patient groups:

1. Patients epidemiologically linked to other cases of resistant Enterobacteriaceae infection or carriage (e.g. sharing an inpatient area with a colonised or infected patient or transferred from a unit with a known resistant Enterobacteriaceae outbreak)
2. Patients directly transferred/repatriated from a healthcare facility in another jurisdiction (including Northern Ireland)
3. Patients with a history of admission as an inpatient in another jurisdiction (including Northern Ireland)
4. Patients admitted to high risk areas (such as a critical care unit or neonatal intensive care unit, haematology, oncology or transplant ward), on admission and weekly thereafter
5. Patients admitted from long-term care residences
6. Patients with a history of admission to another Irish hospital should be screened, as necessary, after consideration of the source hospital history and unit(s) to which the patient will be admitted. Advice should be obtained from the local infection prevention and control team

In particular circumstances, screening of additional patient groups may be appropriate, based on local epidemiology and guidance of the infection prevention and control team.

http://www.hpsc.ie/a-z/microbiology/antimicrobialresistance/infectionscontrolandha/guidelines/file14724_en.pdf

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Survey on compliance with national CRE screening guidelines (2016) n=22

	Yes (%)	n
Epidemiologically linked patients	95.24%	20
Patients with previous colonisation/infection with MDR Gram-negative bacteria	71.43%	15
Patients transferred from another country	100.00%	22
Patients transferred from another Irish hospital	72.73%	16
Patients with a history of hospitalisation in the last year in another country	76.19%	16
Patients admitted to high risk areas	68.18%	15
Patients admitted from long-term care	23.81%	5
Patients with hx of hospitalisation in the last year in Ireland	38.18%	8

Survey results courtesy of B Lynch & K Schaffer

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Screening guidelines updated 2017

Requirements for screening of Patients for Carbapenemase Producing *Enterobacteriaceae* (CPE)¹ in the Acute Hospital Sector: June 10 2017

Priority 1 [target implementation by end of July 2017]

- a. All contacts of a patient with CPE. Where patients have been discharged their record should be marked to ensure screening on next admission^{3,3}.
- b. All patient admitted from nursing homes or other long term care facilities known to have residents with CPE².
- c. All admissions to critical care areas (Intensive Care Units, High Dependency Units), on admission and weekly thereafter³
- d. All admissions to haematology and transplant wards on admission and monthly thereafter
- e. All patients who were transferred from any other hospital in Ireland or elsewhere.
- f. All patients known as previously positive for CPE colonisation or infection on readmission³.

Priority 2 [target implementation by end of September 2017]

- g. All patients who have been in-patients in any hospital in Ireland or elsewhere anytime in the previous twelve months.^{2,6}
- h. All patients who normally reside in a long term care facility.²

M Cormican MCRN 011105 hcainternational.lead@hcai.ie

HSE National Lead for Health Care Associated Infection and Antimicrobial Resistance.

http://www.hse.ie/eng/about/Who/QID/national_safety_programmes/HCAIAMR_CPE_Screening_guidance-May-2017.pdf

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Antibiotics

- Natural treasure but running out as bacteria become more resistant to antibiotics
- Work together to protect these vital agents for our children
- If people and animals carry antibiotic resistant bacteria in their gut, they pass out billions of these antibiotic resistant bacteria every day when they go to the toilet.
- Pass onto one another and into the sewage and slurry which can then pass between people and between people and animals

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Antimicrobial resistance

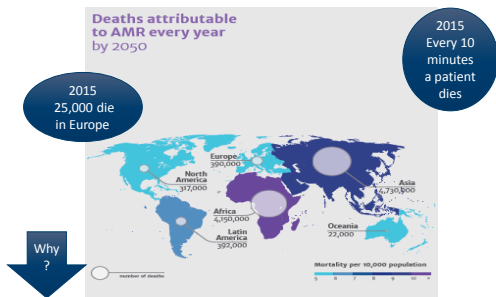
- One of the greatest threats to human health
- Bacteria
 - may be intrinsically resistant to antimicrobial agents
 - may acquire resistance as a consequence of genetic change
- Antimicrobial resistant genes are often located on mobile genetic elements (plasmids)
- Allows for rapid transfer of resistance between bacteria of different species and within difference environmental niches
- Carbapenemase producing *Enterobacteriaceae* (CPE)- resistant to last resort antibiotics

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10 million deaths attributable to AMR worldwide by 2050 if current trends continue



Because antibiotics are no longer effective against the bacteria responsible for the infection



Resistance linked to antibiotic use

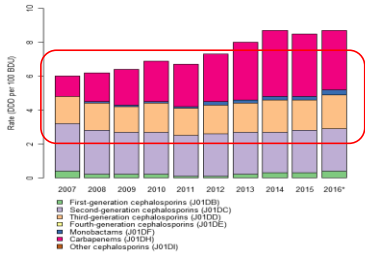
- Antimicrobials used for decades in humans and animals
- Total annual world-wide antimicrobial market consumption - 100,000 – 200,000 tons (Wise, R. 2002)
- On any given day, about one in every three patients in a major hospital in Ireland is taking an antibiotic
- Or on several antibiotics simultaneously
- Same for LTCFs – HALT (2016) found that 1 in 10 residents of 244 LTCFs included in survey were taking an antibiotic
- And 1 in 3 in palliative care LTCFs

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Increasing carbapenem use in Irish hospitals



Source: HPSC

Significant increase in carbapenem (e.g., meropenem) use in Ireland

Source: HPSC

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Stewardship

National Policy on Restricted Antimicrobial Agents

Health Service Executive

Developed By	On behalf of National Taskforce on HCAI AMR
Version Date	04/07/2016

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

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

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the medical independent

Ireland 'running out of time' on CRE – leading microbiologists

CATHERINE REILLY

ber, a HSE report described the hos- suffer ill-effects arising from CRE
pital as "antibiotic-resistant" ho- colonization. However, antibiotic

27 March 2017 | Issue 7 Volume 8 |

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Thank you for your attention

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