



## HPSC SURVEILLANCE REPORT: OCTOBER 2019

(Data to end Q2 2019<sup>†</sup> other than enhanced CPE, acute hospital, community AMU & ABHR use, which is to end Q4 2018)

### KEY PATHOGENS CAUSING BLOODSTREAM INFECTIONS (BSI) TO END OF Q2 2019<sup>†</sup>

- ***Escherichia coli***: A reduction in the proportion of patients with BSI caused by extended-spectrum  $\beta$ -lactamase (ESBL)-producing *E. coli* to 10.4%<sup>†</sup>, while multi-drug resistant (MDR) *E. coli* (displaying resistance to three or more antimicrobial classes) remained stable at 6.3%<sup>†</sup> [Figures 1 & 2]. There were no reported cases of carbapenemase-producing *E. coli* BSI, with three reported in 2018
- ***Klebsiella pneumoniae***: A reduction in the proportion of patients with BSI caused by MDR-*K. pneumoniae* (MDRKP) to 6.4%<sup>†</sup> compared with 8.3% in 2018 [Figure 3]. Three reported cases of carbapenemase-producing *K. pneumoniae* BSI (two OXA-48 type, one KPC), with four reported in 2018
- ***Staphylococcus aureus***: Reductions in both the proportion and rate of *S. aureus* BSI that were methicillin resistant (i.e. MRSA) were observed: 12.4% (2018) to 11.7%<sup>†</sup> and 0.034 (2018) to 0.031<sup>†</sup> cases per 1,000 bed days used (BDU). Reduction in the rate of MSSA BSI from 0.248 (2018) to 0.235<sup>†</sup> cases per 1,000 BDU [Figures 4 & 5]
- ***Enterococcus faecium***: Reduction in the proportion of *E. faecium* BSI that were vancomycin resistant (i.e., VRE) from 40.2% (2018) to 38.6%<sup>†</sup>, having peaked at 45.9% in 2015. Ireland still has one of the highest proportions in Europe of VRE causing BSI [Figures 6 & 7]
- ***Pseudomonas aeruginosa***: Increase in the proportion of *P. aeruginosa* BSI that were MDR to 7.9%<sup>†</sup> from 3.1% (2018)

### CLOSTRIDIODES DIFFICILE INFECTION (CDI) TO END OF Q2 2019

- Increase in the national rate of new hospital-acquired CDI increased to 2.5 cases per 10,000 BDU from 2.1 (2018) [Figure 8]

### CARBAPENEMASE-PRODUCING ENTEROBACTERIALES (CPE) TO END Q4 2018

- In January 2017, mandatory enhanced CPE surveillance replaced a voluntary system, with 449 isolates reported. In 2018, 564 isolates were reported, 87% from screening specimens (rectal swab or faeces). The majority (n=514; 91%) were inpatients, with hospital outpatients (n=19), long-term care facility residents (n=17) and patients attending general practice (n=15) also reported  
<https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceae/surveillanceofcpeinireland/cpeannualreports/>
- A national Public Health Emergency Team (NPHET) was convened upon declaration of CPE as a public health emergency by the Minister of Health in October 2017. Monthly reporting of CPE data started in Q4 2017 (Latest published data July 2019)  
<http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceae/surveillanceofcpeinireland/cpemonthlysurrveillanceports/>
- In 2018, 536 CPE were confirmed by the national CPE reference laboratory service (NCPERLS), representing a 24% increase from 2017 (433), with OXA-48 type carbapenemases predominating in Ireland, followed by KPC and NDM-1 [Figures 16 & 17]
- Since August 2017, acute public hospitals are required to report monthly CPE-related performance indicator data to the HSE Business Information Unit for inclusion in the CPE monthly report

## SURVEILLANCE OF ANTIMICROBIAL USE TO END Q4 2018







- **Acute Hospitals: An increase in the median rate of antimicrobial use to 89.3 defined daily doses (DDD) per 100 BDU** from 86.3 in 2017 [Figure 9 & 10]
  - **Carbapenem use: Reduced to 2.8 DDD per 100 BDU** from 3.3 in 2017, having peaked at 3.8 (2014) [Figure 18]
- **Community: A reduction in the rate of antimicrobial use to 22.9 DDD per 1,000 inhabitants per day (DID)** from 23.1 DID in 2017 [Figure 11]  
<http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/EuropeanSurveillanceofAntimicrobialConsumptionESAC/PublicMicroBReports/>



## ACUTE HOSPITALS HAND HYGIENE COMPLIANCE AUDIT (MAY/JUNE 2019) & ALCOHOL-BASED HAND RUB USE TO END Q4 2018

- **Hand hygiene compliance audit: At 92.3%, the overall compliance score for acute hospitals in May/June 2019 (Period 17) exceeded the national target of 90%, representing a small increase** on prior audits [Figures 12 to 14]
- **Alcohol-based hand rub (ABHR) use:** This is an indirect measure of hand hygiene. For 2018, **an increase in ABHR use to 32.4 litres per 1,000 BDU was observed** versus 30.9 for 2017 [Figure 15]
- HPSC delivered lead hand hygiene auditor training for 23 acute hospital staff in March 2019, with further training scheduled in November 2019

## OTHER NEWS

- ***C. difficile*: A new name for an old bug, but still a difficult challenge:** *Clostridium difficile* has been renamed *Clostridioides difficile*
- **Point prevalence survey (PPS) of hospital acquired infections (HAI) & antimicrobial use in acute hospitals:** An additional report on the adult intensive care unit (ICU) population included in the May 2017 PPS was published in July 2019. There were 196 patients admitted to 32 ICUs of 29 participating hospitals. In the PPS, 24% met a case definition for an active HAI, with pneumonia accounting for 54.5% of HAI in adult ICU patients. Antimicrobials were prescribed for 70.4% of adult ICU patients. The full report may be viewed at: <http://www.hpsc.ie/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHAI/Surveillance/HospitalPointPrevalenceSurveys/>  
The European PPS report is expected to be published in Q4 2019
- **The annual PPS of antimicrobial use in acute hospitals** has been performed across Ireland during September 2019
- **One Health Country Visit:** In October 2019, Ireland will welcome colleagues from the European Centre for Disease Prevention & Control (ECDC) as part of a visiting delegation that will evaluate Ireland's response to the threat of antimicrobial resistance to both human and animal health. The delegation will spend five days in Ireland, with the objective of producing a report on the findings of the visit and recommendations on optimising the national response. This report will be helpful in guiding the next steps for Ireland's national action plan on AMR (iNAP)
- **The RCSI/HPSC Annual Safe Patient Care 'Infection Prevention & Control Course – Frontline Hospital Staff':** The 10<sup>th</sup> anniversary of this popular course took place in September 2019, with 142 staff registered to attend over four days. Lectures from the course are available on the HPSC website: <https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/educationconferencesrelatingtoinfectioncontrol/2019rcsihpscsafepatientcarecourse/>

	2014	2015	2016	2017	2018	2019†	2019 v 2018
<b>Patients with bloodstream infection (BSI)</b>							
<b>Total BSI due to key EARS-Net pathogens*</b>	<b>5425</b>	<b>5372</b>	<b>5971</b>	<b>6304</b>	<b>6451</b>	<b>3257</b>	
<b><i>E. coli</i> (Figs 1 &amp; 2)</b>							
- Patients with <i>E. coli</i> BSI	<b>2702**</b>	<b>2647**</b>	<b>2988**</b>	<b>3124**</b>	<b>3239**</b>	<b>1678**</b>	
- Patients with ESBL- <i>E. coli</i> BSI (%)	<b>266 (9.9%)</b>	<b>276 (10.5%)</b>	<b>325 (10.9%)</b>	<b>331 (11.0%)</b>	<b>368 (11.6%)</b>	<b>171 (10.4%)</b>	% 
- Patients with MDR <sup>‡</sup> - <i>E. coli</i> BSI (%)	<b>134 (5.0%)</b>	<b>148 (5.6%)</b>	<b>162 (5.4%)</b>	<b>185 (5.9%)</b>	<b>201 (6.2%)</b>	<b>105 (6.3%)</b>	% 
†MDR = resistant to 3 antimicrobial classes (3GCs, fluoroquinolones and aminoglycosides)							
<b><i>K. pneumoniae</i> (Fig 3)</b>							
- Patients with <i>K. pneumoniae</i> BSI	<b>356**</b>	<b>387**</b>	<b>453**</b>	<b>479**</b>	<b>483</b>	<b>264</b>	
- Patients with MDR- <i>K. pneumoniae</i> BSI (%) <sup>‡</sup>	<b>26 (7.3%)</b>	<b>29 (7.5%)</b>	<b>26 (5.8%)</b>	<b>29 (6.1%)</b>	<b>40 (8.3%)</b>	<b>17 (6.4%)</b>	% 
†MDR = resistant to 3 antimicrobial classes (3GCs, fluoroquinolones and aminoglycosides)							
<b><i>S. aureus</i> (Figs 4 &amp; 5)</b>							
- Patients with <i>S. aureus</i> BSI	<b>1076</b>	<b>1056</b>	<b>1142</b>	<b>1153</b>	<b>1188</b>	<b>557</b>	
- Patients with MRSA BSI (%)	<b>208 (19.3%)</b>	<b>191 (18.1%)</b>	<b>164 (14.4%)</b>	<b>186 (16.1%)</b>	<b>147 (12.4%)</b>	<b>65 (11.7%)</b>	% 
- MRSA rate (cases/1,000 BDU)	<b>0.053</b>	<b>0.050</b>	<b>0.042</b>	<b>0.046</b>	<b>0.034</b>	<b>0.031</b>	Rate 
<b><i>Enterococcus faecium</i> (Fig 6)</b>							
- Patients with <i>E. faecium</i> BSI	<b>390</b>	<b>406**</b>	<b>423**</b>	<b>442</b>	<b>419**</b>	<b>228</b>	
- Patients with VRE BSI (%)	<b>175 (44.9%)</b>	<b>186 (45.9%)</b>	<b>187 (44.3%)</b>	<b>169 (38.2%)</b>	<b>168 (40.2%)</b>	<b>88 (38.6%)</b>	% 





	2014	2015	2016	2017	2018†	2019†	2019 v 2018
<b>Patients with bloodstream infection (BSI)</b>							
<b><i>Pseudomonas aeruginosa</i></b>							
- Patients with <i>P. aeruginosa</i> BSI	177**	195**	244	288**	273**	130**	
- Patients with MDR <sup>‡</sup> - <i>P. aeruginosa</i> BSI (%)	10 (5.7%)	8 (4.1%)	21 (8.6%)	23 (8.5%)	8 (3.1%)	10 (7.9%)	% 
† MDR = resistant to ≥3 antimicrobial classes							
<b>Patients with <i>C. difficile</i> infection (CDI)</b>							
New cases of CDI	1523	1667	1566	1604	1737	891	
CDI rate (new HCAI cases/10,000 BDU)*** (Figure 8)	2.1	2.3	1.9	2.0	2.1	2.5	Rate 
Participating hospitals	53	52	54	56	56	56	

† EARS-Net data (Note: includes data from private hospitals and other non-acute facilities) & CDI data to end Q2 2019

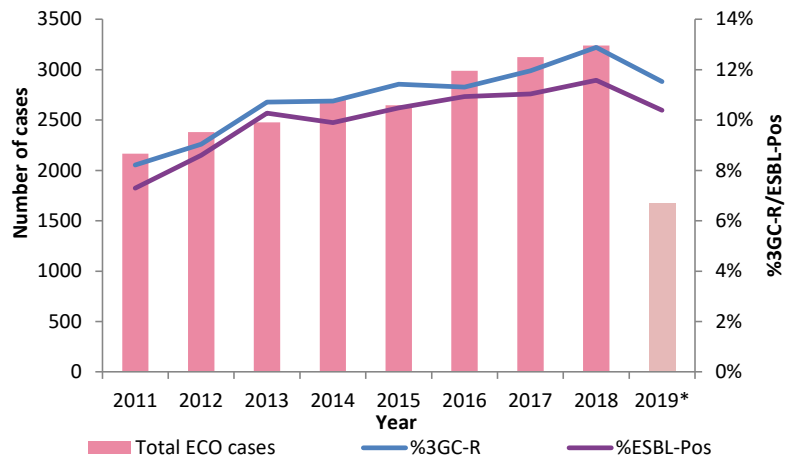
\* The eight EARS-Net pathogens are *S. aureus*, *S. pneumoniae*, *E. coli*, *E. faecium*, *E. faecalis*, *K. pneumoniae*, *P. aeruginosa*, *Acinetobacter* spp (2012 onwards): the case definition has been amended to include only the first isolate per patient per year

\*\* Note: not all isolates tested for ESBL, multi-drug resistance (MDR), meticillin or vancomycin resistance;

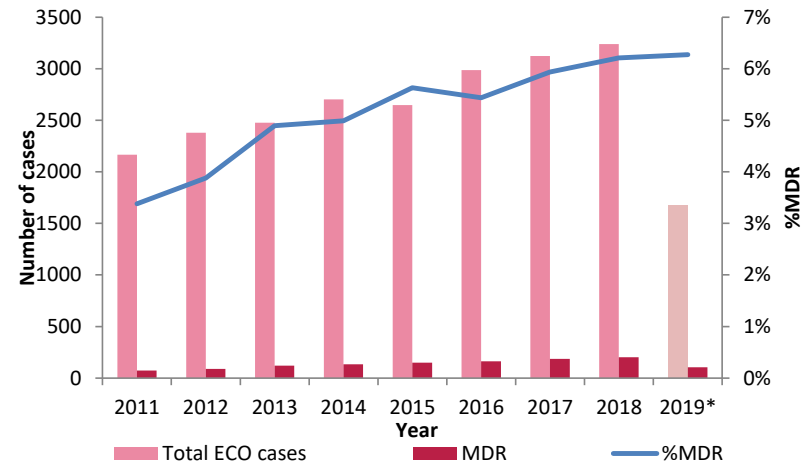
\*\*\* CDI rate based on number of new CDI originating within the participating HCF, where enhanced surveillance specifies the origin as 'healthcare-associated' and the location as 'this hospital'

	2014	2015	2016	2017	2018	2019††	2018 v 2017
<b>Hospital antimicrobial consumption (DDD/100 BDU), median</b>	81.0	80.8	84.6	86.3	89.3	NA	Rate 
<b>Community antimicrobial consumption (DDD/1,000 inhabitants/day - DID), overall</b>	23.8	25.3	24.1	23.1	22.9	NA	Rate 
<b>Biannual audit of hand hygiene compliance % in acute public hospitals</b>	87.2 (Period 8– Oct/Nov)	89.2 (Period 10– Oct/Nov)	90.8 (Period 12– Oct/Nov)	92.2 (Period 14– Oct/Nov)	91.8 (Period 16– Oct/Dec)	92.3 (Period 17– May/June)	% 
<b>Alcohol-based hand rub use (L/1,000BDU), median</b>	27.7	32.5	29.7	30.9	32.4	NA	Rate 

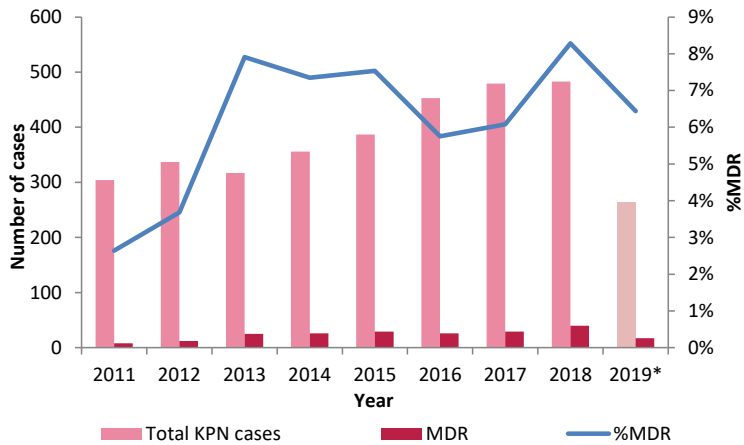
†† Data to end Q4 2018 only unless otherwise stated



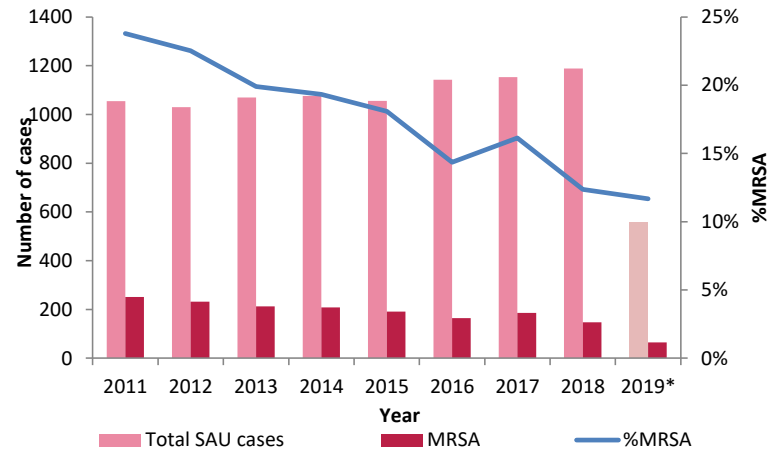
**Figure 1:** Total number of *E. coli* bloodstream isolates and proportions of 3GC-resistant and ESBL-producing isolates from acute hospitals (public & private) by year, 2011 to 2019\*  
 3GC, 3<sup>rd</sup>-Generation Cephalosporin; ESBL, Extended-Spectrum Beta-Lactamase  
 \* 2019 data to the end of Q2 only



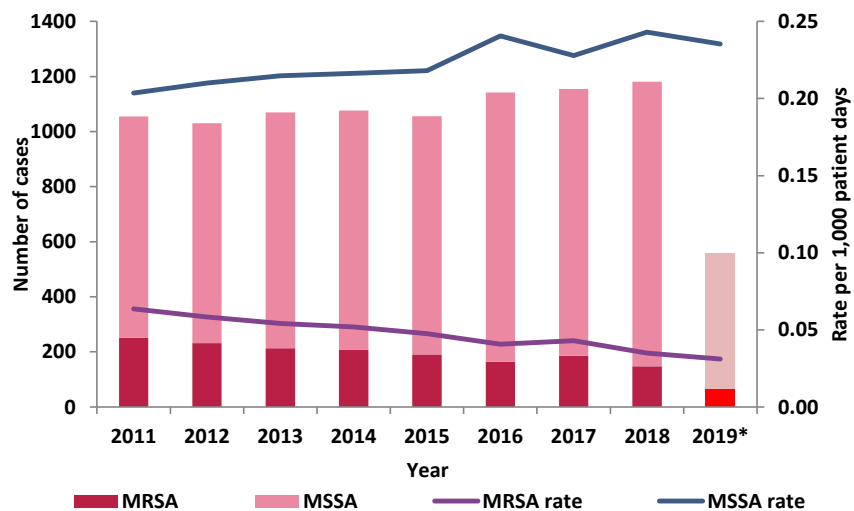
**Figure 2:** Total number of *E. coli* bloodstream isolates and proportions of MDR isolates from acute hospitals (public & private) by year, 2011 to 2019\*  
 MDR, Multi-drug resistant *E. coli*  
 \* 2019 data to the end of Q2 only



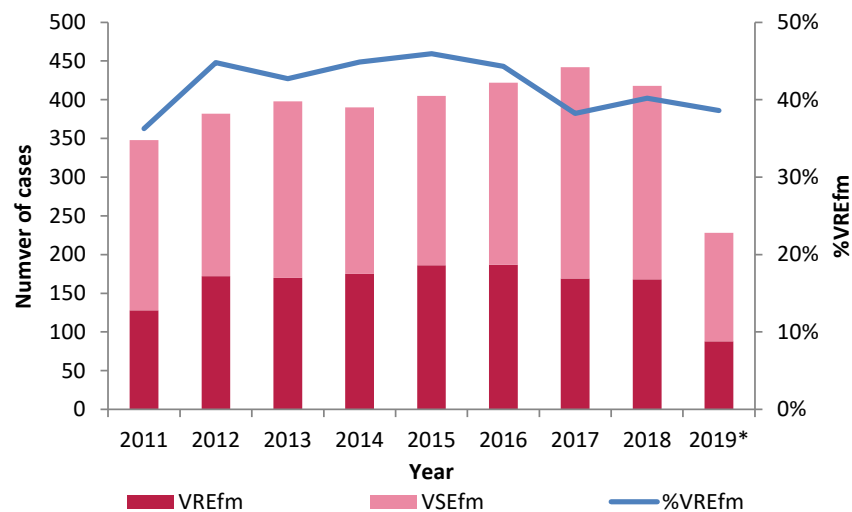
**Figure 3:** Total number of *K. pneumoniae* bloodstream isolates and proportions of MDR isolates from acute hospitals (public & private) by year, 2011 to 2019\*  
 MDR - Multi-drug resistant *K. pneumoniae*  
 \* 2019 data to the end of Q2 only



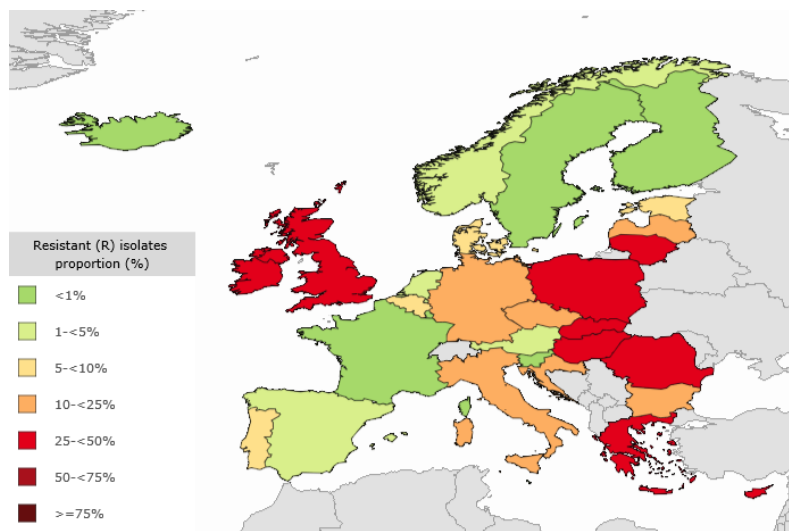
**Figure 4:** Total number of *S. aureus* (MRSA and MSSA) bloodstream isolates and proportion (%) MRSA from acute hospitals (public & private) by year, 2011 to 2019\*  
 \* 2019 data to the end of Q2 only



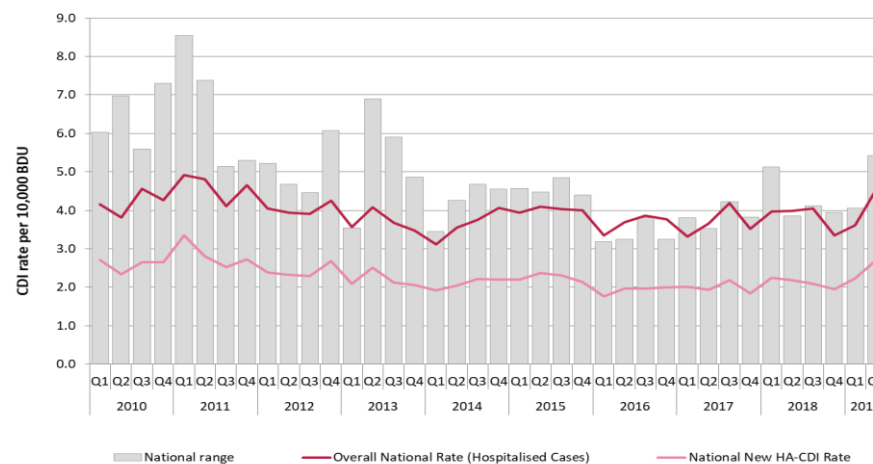
**Figure 5:** Total number of *S. aureus* (MRSA and MSSA) bloodstream isolates, and MRSA and MSSA rates (per 1,000 bed days used) from acute hospitals (public & private) by year, 2011 to 2019\*  
\* 2019 data to the end of Q2 only



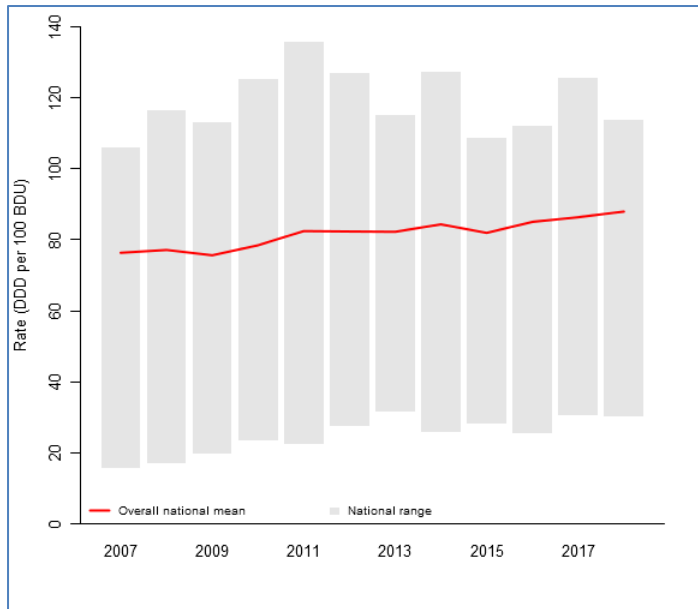
**Figure 6:** Total number of *E. faecium* (VREfm and VSEfm) bloodstream isolates, and VREfm proportions from acute hospitals (public & private) by year, 2011 to 2019\*  
VREfm, Vancomycin resistant *E. faecium*; VSEfm, Vancomycin susceptible *E. faecium*  
\* 2019 data to the end of Q2 only



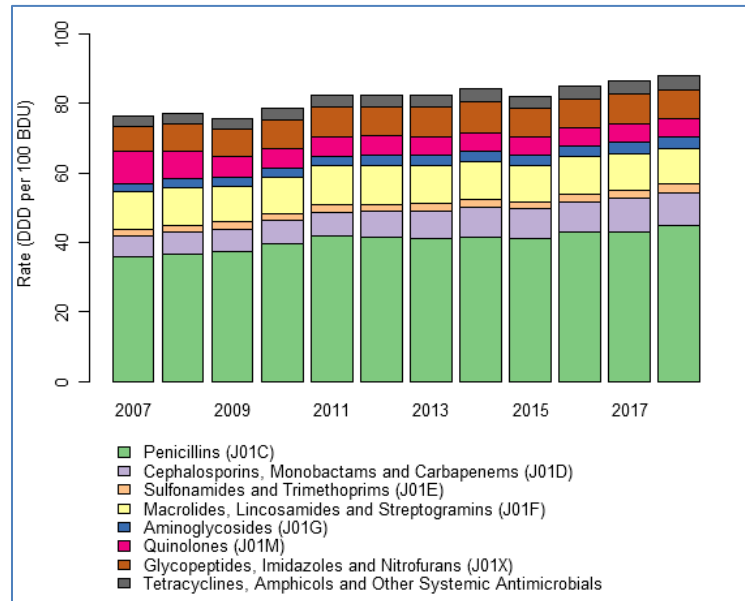
**Figure 7:** VREfm isolates Europe 2017 (Source: EARS-Net at ECDC; map accessed via [www.ecdc.europa.eu](http://www.ecdc.europa.eu) 19/11/2018)



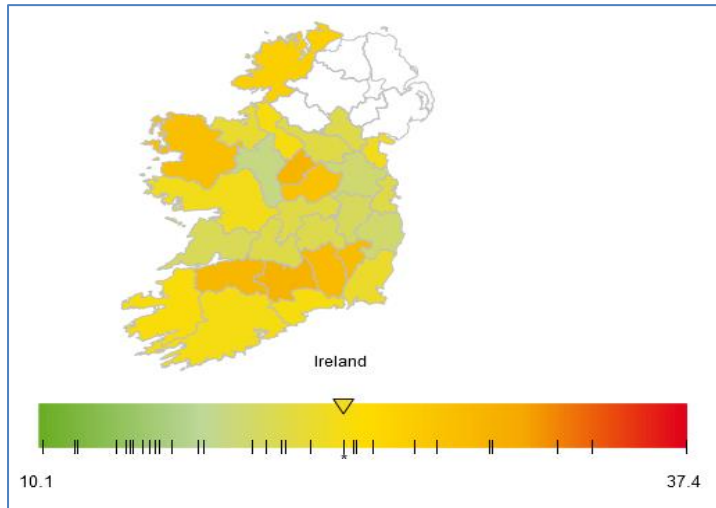
**Figure 8:** Quarterly national CDI rates per 10,000 BDU. Overall (red) and new Hospital-acquired CDI (pink). \* 2019 data to the end of Q2 only



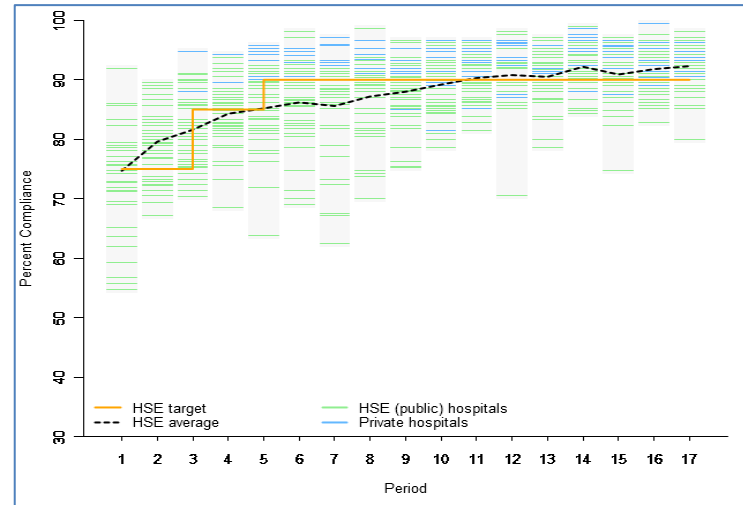
**Figure 9:** Hospital antimicrobial consumption (DDD per 100 BDU)  
\* Data to end of Q4 2018



**Figure 10:** Hospital antimicrobial consumption by class (DDD per 100 BDU)  
\*Data to end of Q4 2018



**Figure 11:** Community antimicrobial use in DDD per 1000 inhabitants per day (DID) \*Data to end of Q4 2018



**Figure 12:** Hand hygiene compliance audit up to Period 17 (May/June 2019)

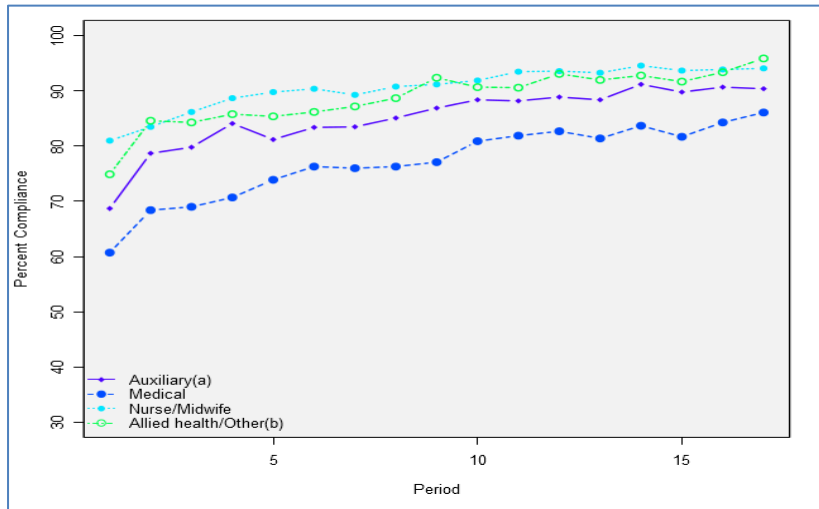


Figure 13: Hand hygiene compliance by healthcare worker category up to Period 17

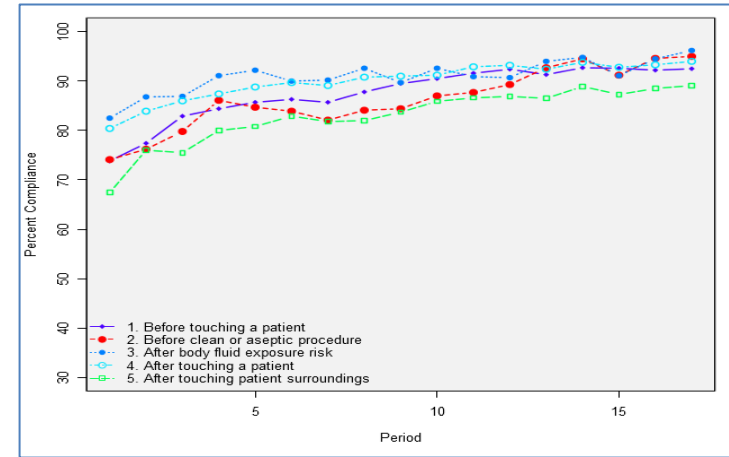


Figure 14: Hand hygiene compliance by the WHO '5 moments' up to Period 17

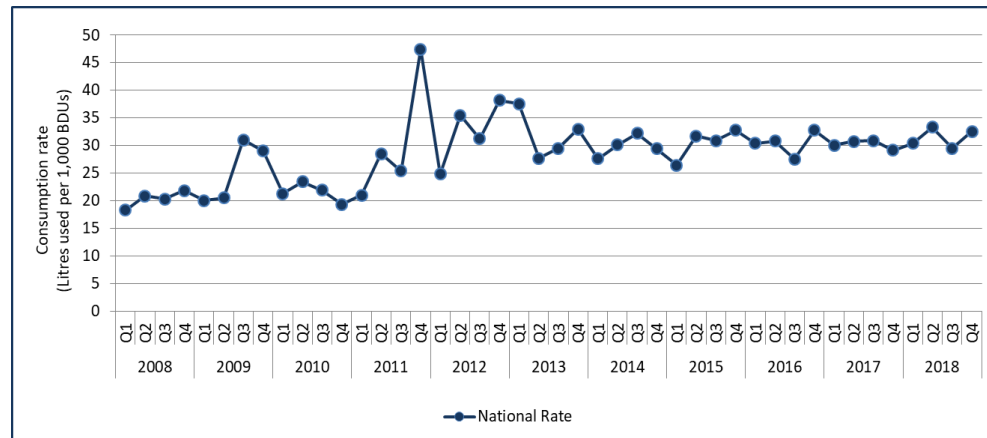


Figure 15: Quarterly alcohol-based hand-rub (ABHR) use in acute hospitals: 2008 to Q4 2018

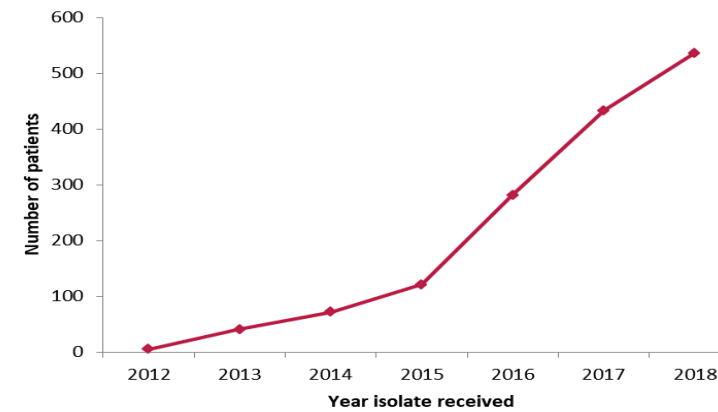


Figure 16: Carbapenemase-producing Enterobacteriales (CPE) in Ireland: 2012 – 2018 (Data: NCPERLS)



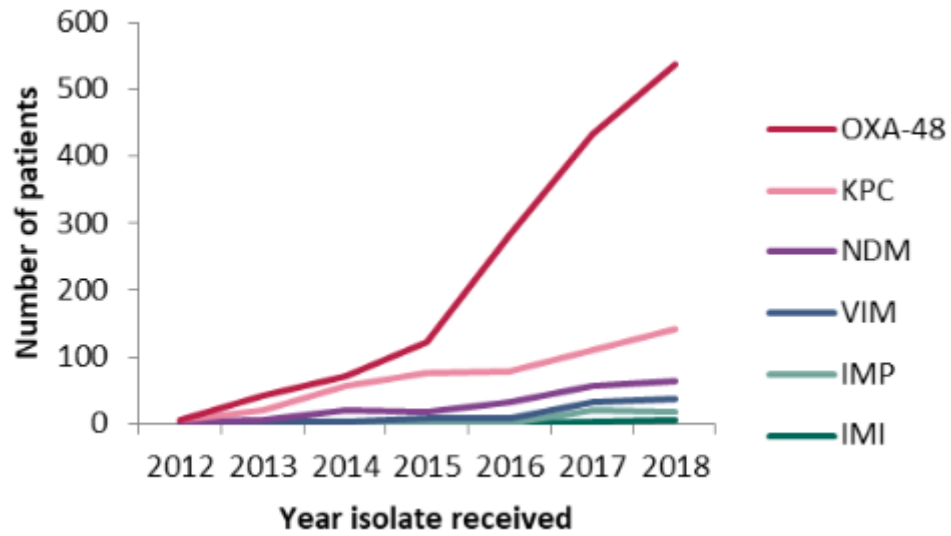


Figure 17: Annual numbers of new CPE by carbapenemase type: 2012 - 2018

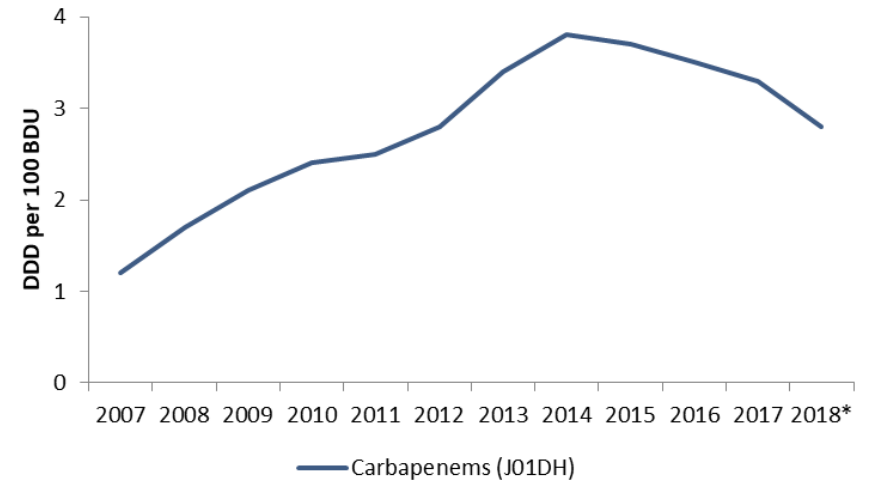


Figure 18: National carbapenem use: 2007 to 2018