



Carbapenemase producing *Enterobacterales* (CPE) in HSE acute hospitals

Monthly report on January 2019 data for the National Public Health Emergency Team (NPHET)

Executive summary of the latest available data (data source)

- 1. Patients with newly-confirmed CPE (NCPERLS):** There were 55 patients in January, compared with 36 in December. There were 536 patients in total for 2018 versus 433 in 2017
- 2. Notification of patients with invasive CPE infection (Departments of Public Health):** Two invasive CPE infections were notified in January, with one in December. There were 16 notifications in 2018 and 14 in 2017
- 3. Creation of new CPE outbreak events (Departments of Public Health):** In January, two new acute hospital CPE outbreak events were created, with one in December. There were 27 new CPE outbreaks created in 2018 versus 15 in 2017
- 4. Active/current CPE hospital outbreak events (HSE acute hospitals reporting to BIU):** Data returned by 90% of hospitals, with 11 reporting events in January [December = 94% returns & 11 outbreak events]
- 5. CPE screens and CPE detections (HSE acute hospitals reporting to BIU):** Data returned by 96% of hospitals, with 21,132 CPE screens performed in January and 58 CPE detected overall, 51 from screening specimens [December = 98% returns; 18,972 screens; 29 CPE detected overall, 27 from screening specimens]
- 6. Inpatients with known CPE (HSE acute hospitals reporting to BIU):** Data returned by 96% of hospitals. There were 198 inpatients of 25 hospitals with known CPE colonisation or infection in January [December = 98% returns; 184 inpatients of 25 hospitals]
- 7. Known CPE inpatients not accommodated in an *en suite* single room/appropriate cohort area for part of their admission (HSE acute hospitals reporting to BIU):** Data returned by 94% of hospitals. In January, nine inpatients of seven hospitals were not accommodated in an *en suite* single room/appropriate cohort area for part of their admission [December = 98% returns; 10 inpatients of five hospitals]
- 8. Total grams (g) of meropenem* issued by hospital pharmacies: (HSE acute hospitals reporting to BIU):** Data returned by 28% of hospitals. In January, 6,995g of meropenem were issued [December; 30% returns; 5,992g]

Data provided by the HSE Business Information Unit (BIU) are provisional. Once the HSE's monthly performance and data governance process is completed and the National Performance Profile has been approved by the HSE Directorate, these data will be considered final. In the event of there being any changes to the data contained in this report, they will be adjusted in subsequent reports (this report incorporates BIU data received by HPSC after review by the National HCAI Steering Group on 27/02/2019). Acute hospitals are required to report data for a given month to BIU by the 15th of the following month.

The terms carbapenem-resistant and carbapenemase-producing *Enterobacterales* (CRE/CPE) have often been used interchangeably. For technical reasons the term *Enterobacterales* has now replaced *Enterobacteriaceae*.

*See section 7 for details

Prior to January 2019, 47 acute HSE hospitals reported CPE data to BIU, with Tallaght University Hospital data including Tallaght Paediatric Hospital and Cork University Hospital data including Cork University Maternity Hospital. Since January 2019, these are reported separately as: Children's Health Ireland at Tallaght and Cork University Maternity Hospital, increasing the total number of hospitals reporting monthly CPE data to BIU to 49.

1. Patients with CPE newly-confirmed by the National CPE Reference Laboratory Service (NCPERLS)

Microbiology laboratories are requested to submit all newly-detected isolates from both diagnostic and screening specimens and any subsequent invasive isolates to NCPERLS. If a specific bacterial species and carbapenemase (e.g. OXA-48 *E. coli*) has previously been identified and confirmed from the patient, there is usually no need for the isolate to be resent to NCPERLS, unless it is isolated from invasive infection (involving a normally sterile site).

1. Isolates that are suspected carbapenemase producers should be referred for confirmatory testing, if confirmation cannot be performed locally. A rapid immunological assay (lateral flow device) is performed by NCPERLS for preliminary confirmation of the most commonly encountered carbapenemases, pending further characterisation
2. Locally-confirmed CPE should also be referred to NCPERLS for further characterisation

Since July 2018, NCPERLS has begun whole genome sequencing (WGS) on CPE isolates received. WGS provides improved information for comparison of isolates of the same carbapenemase type from different regions. *Data presented below are provisional. The data in this monthly report is based on latest preliminary rapid test results. WGS results may provide additional information. For example, the less common IMI or GES carbapenemases are not detected by rapid assays, but will be detected by WGS. Data relate to the date that NCPERLS received the isolates, not the original specimen collection date.*

Appendix 1a displays annual CPE and carbapenemase trends from 2012 to 2018. **Appendix 1b** displays total patients with CPE newly-confirmed by NCPERLS, stratified by carbapenemase type, by HSE acute hospital for 2018 (also see **Appendix 1c**).

In January 2019, 55 patients with newly-detected CPE were identified, compared with 36 in December (**Figure 1**). The previously reported figure for December when validated resulted in one fewer case.

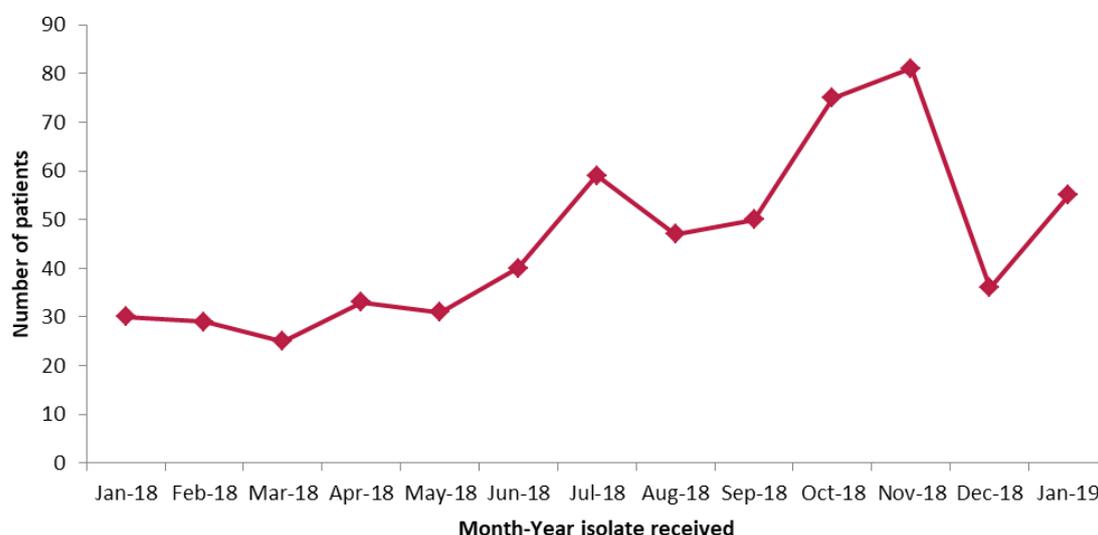


Figure 1. Monthly numbers of patients with CPE newly-confirmed by NCPERLS from Jan 2018. **Source:** NCPERLS

Of 55 patients in January 2019, 85% were newly-confirmed carriers detected on CPE screening (rectal swab/faeces) (**Figure 2**). OXA-48 remains the predominant carbapenemase in Ireland. Increased detection of KPC carbapenemase has been observed in 2018 (**Figure 3**).

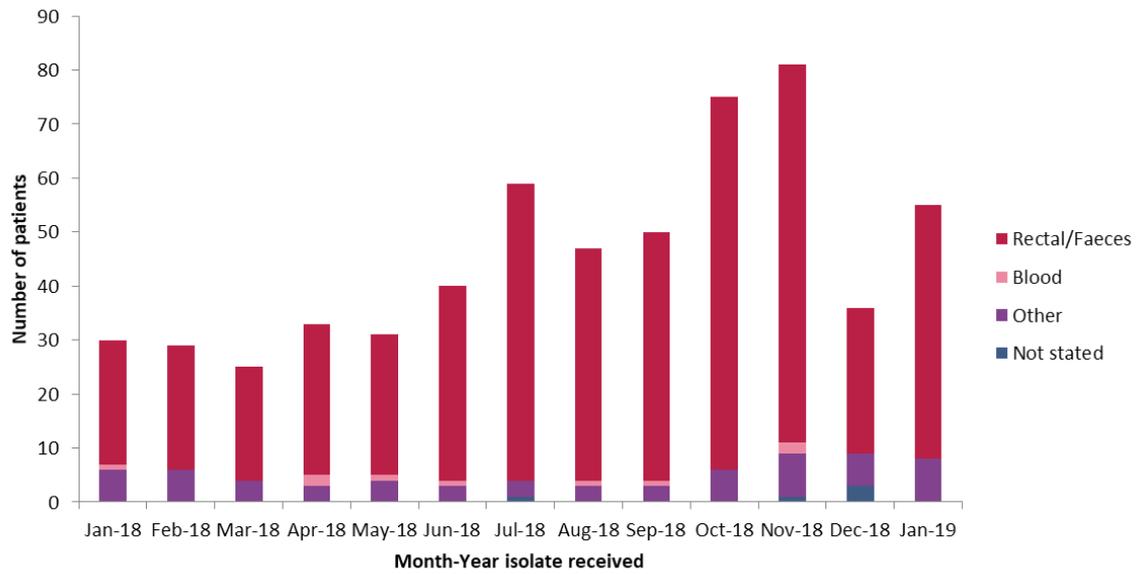


Figure 2. Monthly number of patients with CPE newly-confirmed by NCPERLS, by specimen type.
Source: NCPERLS

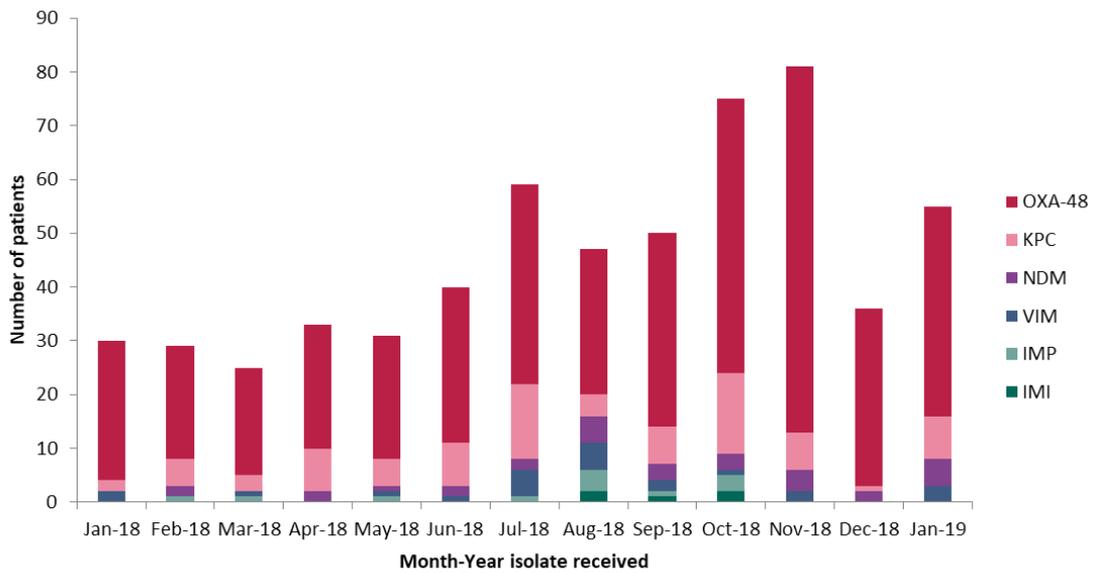


Figure 3. Monthly numbers of patients with CPE newly-confirmed by NCPERLS, by carbapenemase.
Source: NCPERLS

2. Invasive CPE infections notified to Departments of Public Health

In December 2018, the Infectious Diseases Regulations were updated, changing the terminology from CRE to CPE and expanding requirement to notify not only invasive “carbapenemase producing *Enterobacteriaceae* (CPE) infection, but also non-invasive infection and colonisation” by laboratories (public and private) to Departments of Public Health.

To date, invasive CPE infection cases are reported through the Computerised Infectious Disease Reporting (CIDR) system. **Appendix 2a** displays annual total cases of notified invasive CPE infections from 2012 to 2018. National data are analysed by HPSC. *The data presented below are provisional and relate to the date that cases were reported on CIDR, not the specimen collection date or illness onset date.*

Figure 4 displays monthly notifications of invasive CPE infection since January 2018 and **Figure 5** displays cumulative monthly notifications from 2012 onwards. Two cases of invasive CPE infection were notified in January.

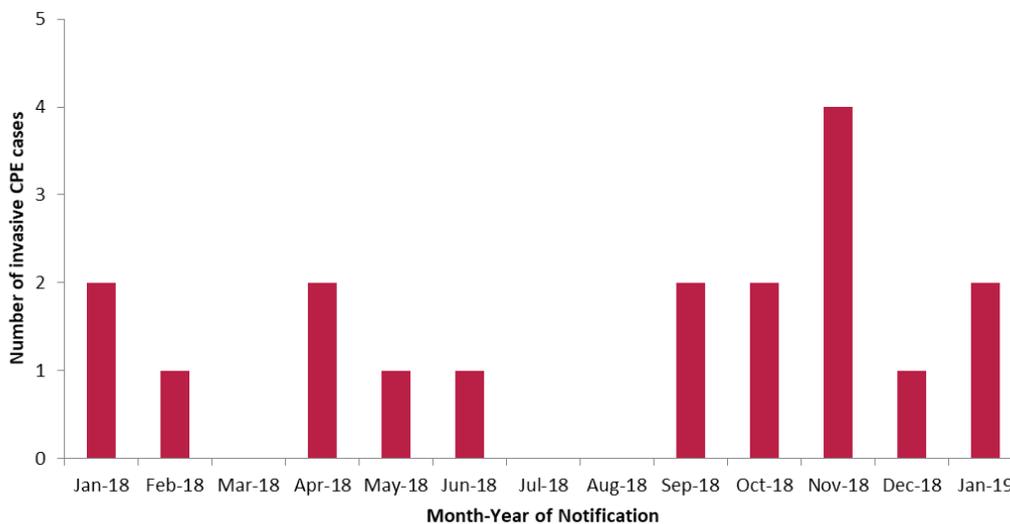


Figure 4. Monthly notifications of invasive CPE infection from Jan 2018. **Source:** CIDR

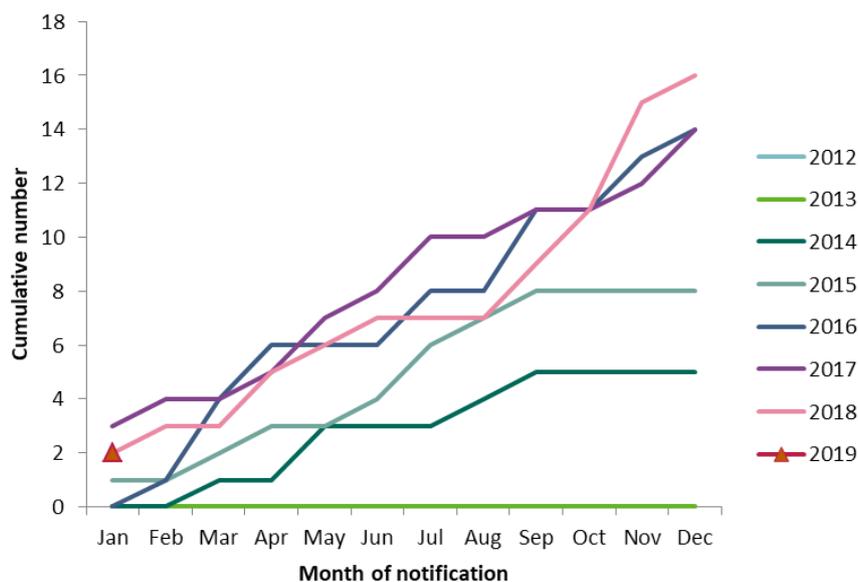


Figure 5. Cumulative monthly notifications of invasive CPE infection (2012-2018). **Source:** CIDR

3. New CPE outbreak events created by Departments of Public Health

Under Infectious Diseases Regulations, outbreaks (infections and/or colonisations) must be notified to the Department of Public Health, with creation of a unique outbreak event on CIDR. Legislation applies to all healthcare facility types regardless of ownership or acuity. *The data presented below are provisional and relate to the date an outbreak event was created on CIDR, not the date the outbreak was first detected or notified by the healthcare facility.*

Appendix 2b displays annual total of CPE outbreaks created on CIDR from 2012 to 2018. **Figure 6** displays monthly CPE outbreaks created on CIDR from January 2018. In January 2019, two new acute hospital CPE outbreak events were created on CIDR, with the latest on the 24th January.

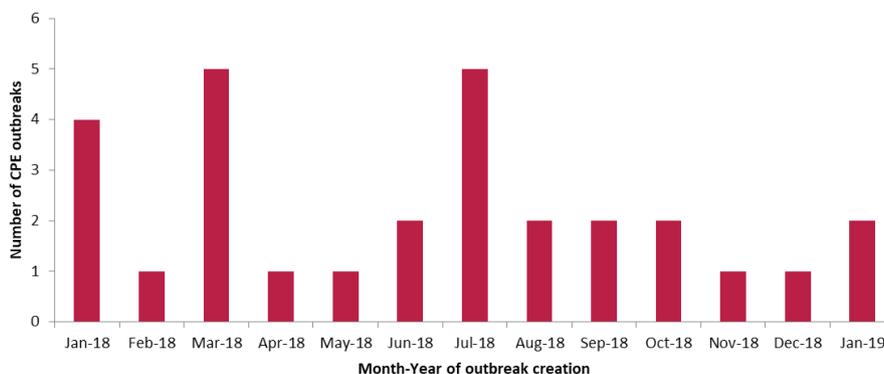


Figure 6. Monthly new CPE outbreak events created by Departments of Public Health from Jan 2018. **Source:** CIDR

4. Active/current CPE hospital outbreak events reported to BIU

All 49 acute HSE hospitals are asked to report data on the number of active or current CPE outbreaks to the HSE’s Business Information Unit (BIU), with monthly data available from January 2018. **Appendix 3** describes the CPE-related performance indicators currently reported to BIU by HSE acute hospitals and **Appendix 4** displays compliance with monthly data returns of each hospital for the preceding two months.

Figure 7 displays the total number of hospitals reporting active/current CPE outbreaks from January 2018. In January 2019, a current/active CPE outbreak was being managed by 11 (25%) of the 44 hospitals (90%) that reported this data.

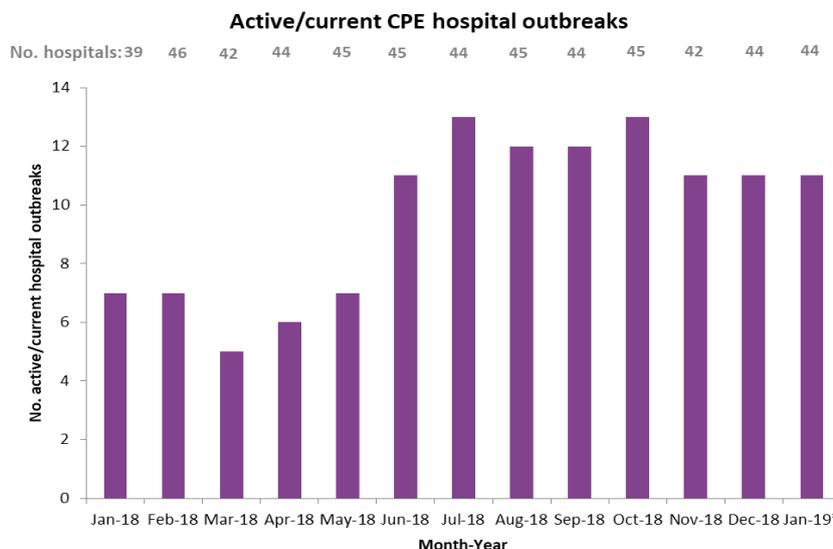


Figure 7. Monthly CPE active/current outbreaks (purple bars) from Q1 2018. Number of hospitals reporting cited above each bar. **Source:** BIU

5. Monthly CPE screens performed and CPE positives reported to BIU

All 49 acute HSE hospitals are asked to report monthly data on the total number of CPE screens performed (rectal swab or faeces) and on the number of patients with newly-detected CPE from either screening or diagnostic specimens to the HSE's BIU. The monthly data reported by NCPERLS will not match the monthly data reported to BIU for the following reasons:

1. NCPERLS accepts specimens from both acute HSE and private hospital microbiology laboratories – Acute HSE hospitals are required to report data to BIU, whereas private hospitals are not required to report
2. NCPERLS reports positive specimens based on the date the specimen was received by NCPERLS, not the date the specimen was taken. Hospitals return data to BIU based on specimen collection date

Appendix 3 describes the CPE-related performance indicators currently reported to BIU by HSE acute hospitals and **Appendix 4** displays compliance with monthly data returns of each hospital for the preceding two months. **Table 1** and **Figure 8** display national monthly data totals from January 2018, with a monthly increase in CPE screens performed observed.

Data provided by BIU are provisional. Once the HSE's monthly performance and data governance process is completed and the National Performance Profile has been approved by the HSE Directorate, these data will be considered final. In the event of there being any changes to the data contained in this report, they will be adjusted in subsequent reports (this report incorporates BIU data received by HPSC after review by the National HCAI Steering Group on 27/02/2019). Acute hospitals are required to report data for a given month to BIU by the 15th of the following month.

Table 1. Monthly CPE screening activity and confirmed CPE cases from January 2018. **Source:** BIU

	N (%) HSE acute hospitals providing data (CPE004)	Total monthly CPE screens (CPE004)	Total monthly confirmed CPE cases screening & diagnostic (CPE002+003)	Total confirmed CPE cases from screening (CPE002)	Percentage of positive CPE screens (CPE002/CPE004)
January 2018	45 (96)	11,293	34	29	0.26
February 2018	46 (98)	10,518	25	22	0.21
March 2018	47 (100)	10,648	25	20	0.19
April 2018	47 (100)	11,468	37	34	0.30
May 2018	47 (100)	13,416	24	21	0.16
June 2018	47 (100)	13,062	49	45	0.35
July 2018	47 (100)	15,471	56	49	0.32
August 2018	47 (100)	17,486	50	45	0.26
September 2018	47 (100)	16,341	49	45	0.28
October 2018	47 (100)	19,703	81	74	0.38
November 2018	45 (96)	19,824	72	68	0.34
December 2018	46 (98)	18,972	29	27	0.14
January 2019*	47 (96)	21,132	58	51	0.24

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

The monthly total number of patients who had a CPE screen performed is likely to be less than the total screens, as some patients may have been tested more than once (e.g., admission and weekly CPE screening on selected high-risk wards, patients identified as contacts of CPE carriers requiring weekly screening for four weeks while they remain an inpatient etc.). The monthly number of CPE screens performed and CPE positive results from both screening and diagnostic specimens, by hospital group and hospital is displayed in **Appendix 5**.

In January, there were 58 patients from whom CPE were newly-detected (**Table 1** and **Figure 8**). Of these, a screening specimen accounted for 51 new detections (0.24% of all screening specimens n=21,132; **Table 1** and **Figure 9**). **Figures 10** and **11** display the rate of CPE screens and number of newly-detected patients with CPE in January by hospital group, respectively. Considerable variation in

screening activity between each group was observed in January, as is evident from the differences in the screening rate by hospital group in **Figure 10**, which suggests variable local implementation of national CPE screening guidance.

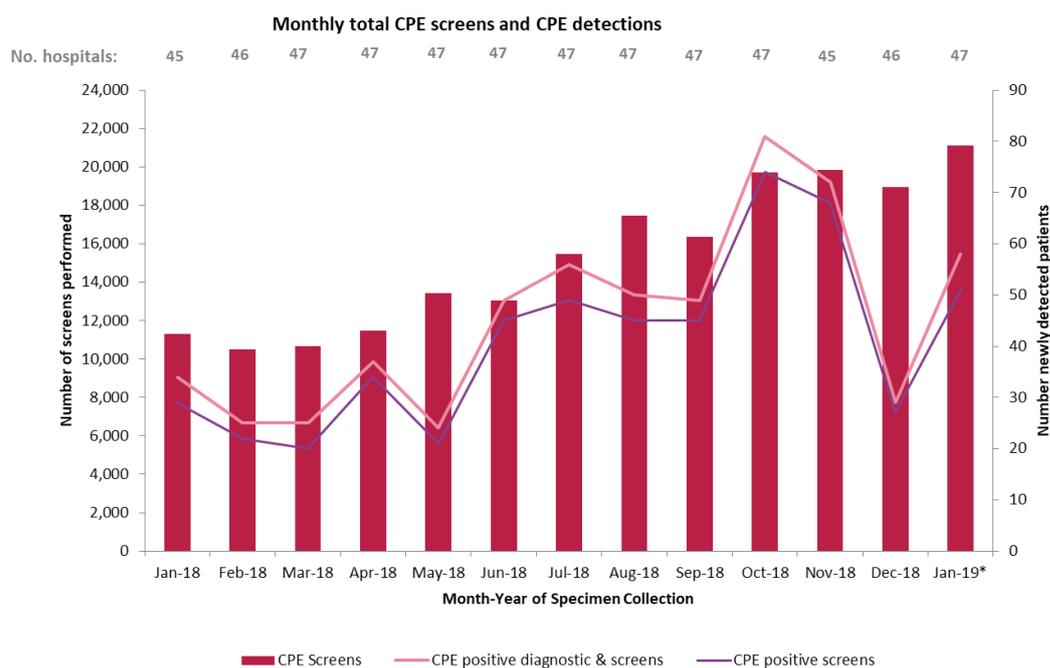


Figure 8. Monthly total CPE rectal swab/faecal screening specimens (red bars), CPE diagnostic and screening detections from all sites (pink line) and CPE detections from rectal swab/faecal screening specimens (purple line) in acute HSE hospitals from January 2018. Number of hospitals reporting cited above each bar. **Source:** BIU

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

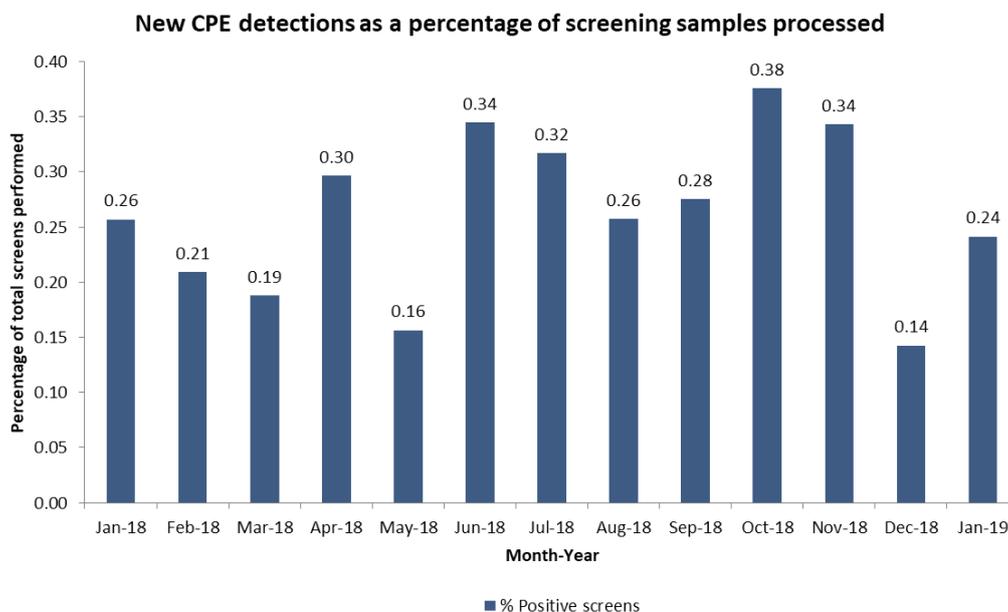


Figure 9. Newly positive CPE detections as a percentage of rectal swab/faecal screening samples processed from January 2018. **Source:** BIU

Rate of CPE screens by BDU conducted by hospital group

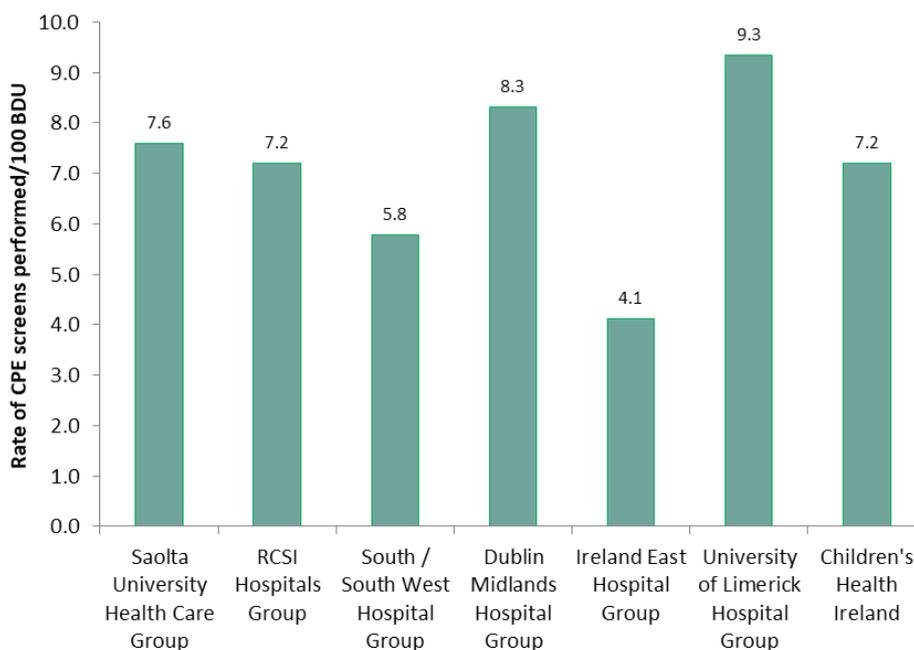


Figure 10. Rate of CPE screens per 100 bed days used (BDU), by acute HSE hospital group (January 2019). **Source:** BIU

Denominator used in rate calculations derived from average monthly bed days used by hospital group for 2014-2018 inclusive.

Newly detected patients with CPE by hospital group

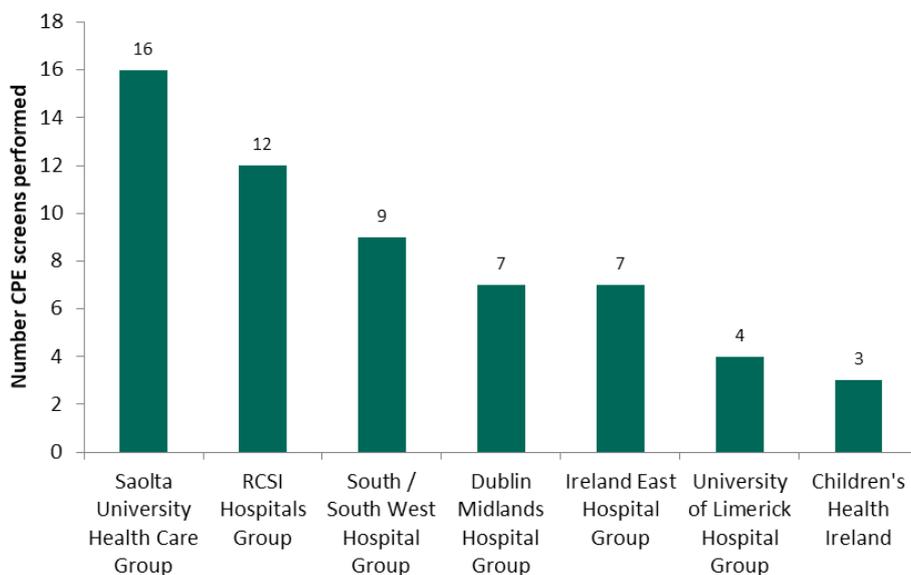


Figure 11. Distribution of newly-detected patients with CPE (from either screens or diagnostic specimens) by acute HSE hospital group (January 2019). **Source:** BIU

6. Additional CPE performance indicators reported to BIU

All 49 acute HSE hospitals are asked to report monthly data on additional CPE-related performance indicators to the BIU. **Appendix 3** describes the CPE-related performance indicators currently reported to BIU by HSE acute hospitals and **Appendix 4** displays compliance with monthly data returns of each hospital for the preceding two months. **Table 2** displays national monthly data from January 2018.

Table 2. Monthly national inpatients with known CPE and those not accommodated in an *en suite* single room or appropriate cohort for part of their admission from January 2018. **Source:** BIU

	N (%) HSE acute hospitals providing data (CPE005)	Total inpatients with known CPE	N (%) HSE acute hospitals providing data (CPE006)	Total inpatients not accommodated suitably for part of admission
January 2018	44 (94)	150	44 (94)	7
February 2018	44 (94)	149	46 (98)	9
March 2018	46 (98)	152	45 (96)	5
April 2018	46 (98)	141	46 (98)	18
May 2018	47 (100)	142	46 (98)	10
June 2018	47 (100)	170	47 (100)	9
July 2018	47 (100)	167	47 (100)	12
August 2018	47 (100)	191	46 (98)	10
September 2018	47 (100)	197	47 (100)	11
October 2018	47 (100)	228	47 (100)	19
November 2018	46 (98)	250	46 (98)	13
December 2018	46 (98)	184	46 (98)	10
January 2019*	47 (96)	198	46 (94)	9

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

6.1 Inpatients with known CPE infection or colonisation (Indicator: CPE005)

In January 2019, 47 HSE acute hospitals (96%) provided data. There were 198 inpatients with known CPE infection or colonisation accommodated in 25 (53%) reporting HSE acute hospitals (range = 1 – 41 inpatients), with 22 hospitals reporting no known inpatients with CPE (**Figure 12** and **Appendix 5**).

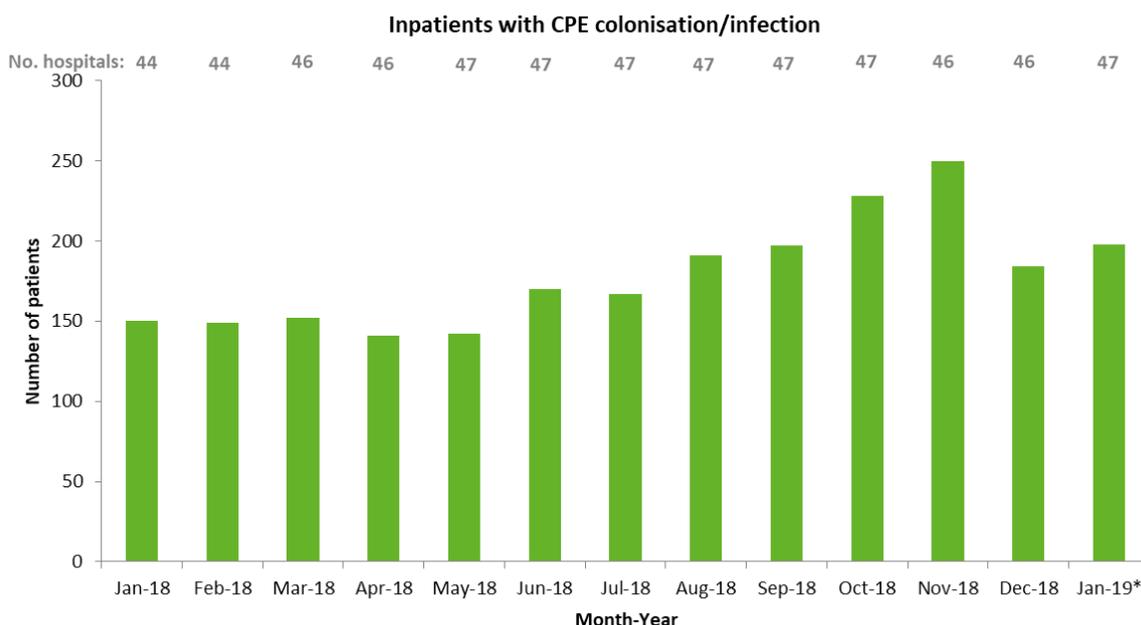


Figure 12. Monthly total of known inpatients with CPE (green bars) in acute HSE hospitals. Number of hospitals reporting cited above each bar. **Source:** BIU

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

6.2 Known CPE inpatients not accommodated in an *en suite* single room or appropriate cohort* for part of their admission (Indicator: CPE006)

In January 2019, 46 HSE acute hospitals (94%) provided data. A total of nine inpatients of seven acute HSE hospitals (15% of those providing data) were not accommodated in an *en suite* single room or appropriate cohort* for part of their admission, increasing the risk of further CPE transmission (Figure 13 and Appendix 5): Saolta University Hospital Group (n=5 patients), RCSI Hospital Group (n=2 patients) Dublin Midlands Hospital Group (n=1 patient) and South/South West Hospital Group (n=1 patient).

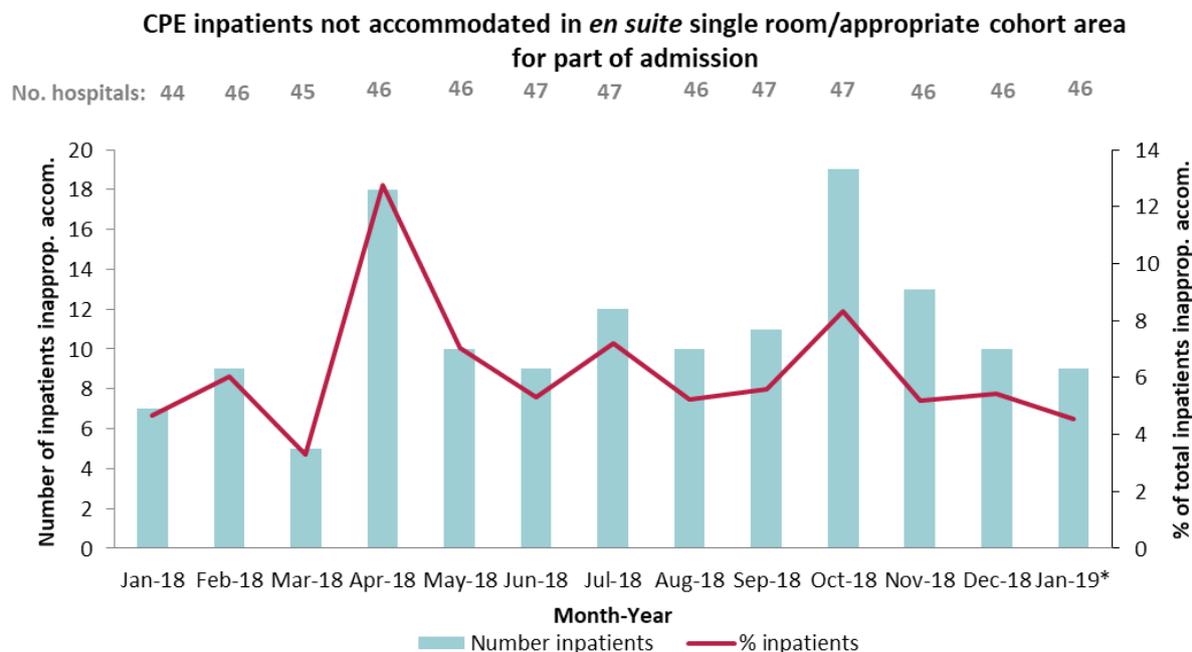


Figure 13. Monthly total known CPE inpatients (blue bars) not accommodated in an *en suite* single room or appropriate cohort area for part of their admission to acute HSE hospitals. Proportion (%) of total CPE inpatients not accommodated appropriately (red line). Number of hospitals reporting cited above each bar. **Source:** BIU

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

7. Meropenem use

7.1 Acute HSE hospital pharmacy dispensing of meropenem, as reported to BIU (indicator: CPE008)

Meropenem is a carbapenem antimicrobial of last resort, used in hospitals and reserved for treatment of infections due to antimicrobial resistant bacteria and infections in seriously ill patients, with input from an infection specialist (clinical microbiologist or infectious diseases physician). Because antimicrobial consumption is a driver of antimicrobial resistance, excessive consumption of meropenem is undesirable, as it may contribute to the spread of CPE in hospitals.

All 49 acute HSE hospitals are asked to report data on net monthly grams of meropenem dispensed by the pharmacy. **Appendix 3** describes the CPE-related performance indicators currently reported to BIU by HSE acute hospitals and **Appendix 4** displays compliance with monthly data returns of each hospital for the preceding two months.

Table 3 and **Figure 14** display national monthly data from January 2018 and **Appendix 5** displays data by hospital and hospital group. A decline in reporting hospitals was observed in 2018, bringing the total to just 13 HSE acute hospitals (28%) in January 2019. Fewer reporting hospitals accounts for the reduction in monthly meropenem dispensing, with 6,995 net grams dispensed in January by 12 pharmacies (92% of those providing data), and one hospital reported having dispensed no meropenem.

Table 3. Monthly net grams of meropenem dispensed from January 2018. **Source:** BIU

	N (%) HSE acute hospitals providing data (CPE008)	Net grams of meropenem dispensed monthly	Number of pharmacies dispensing meropenem
January 2018	32 (68)	13,627	28
February 2018	32 (68)	11,201	28
March 2018	30 (64)	11,534	23
April 2018	26 (55)	10,413	17
May 2018	19 (40)	9,594	15
June 2018	16 (34)	7,554	13
July 2018	14 (30)	8,097	12
August 2018	14 (30)	7,715	13
September 2018	14 (30)	7,671	12
October 2018	15 (32)	8,635	12
November 2018	15 (32)	7,513	13
December 2018	14 (30)	5,992	12
January 2019*	13 (28)	6,995	12

*Tallaght University Hospital included Tallaght Paediatrics data and Cork University Hospital included Cork University Maternity Hospital data prior to January 2019. These are reported separately as CHI at Tallaght and Cork University Maternity Hospital respectively from January 2019, bringing the total number of hospitals reporting from January 2019 to 49.

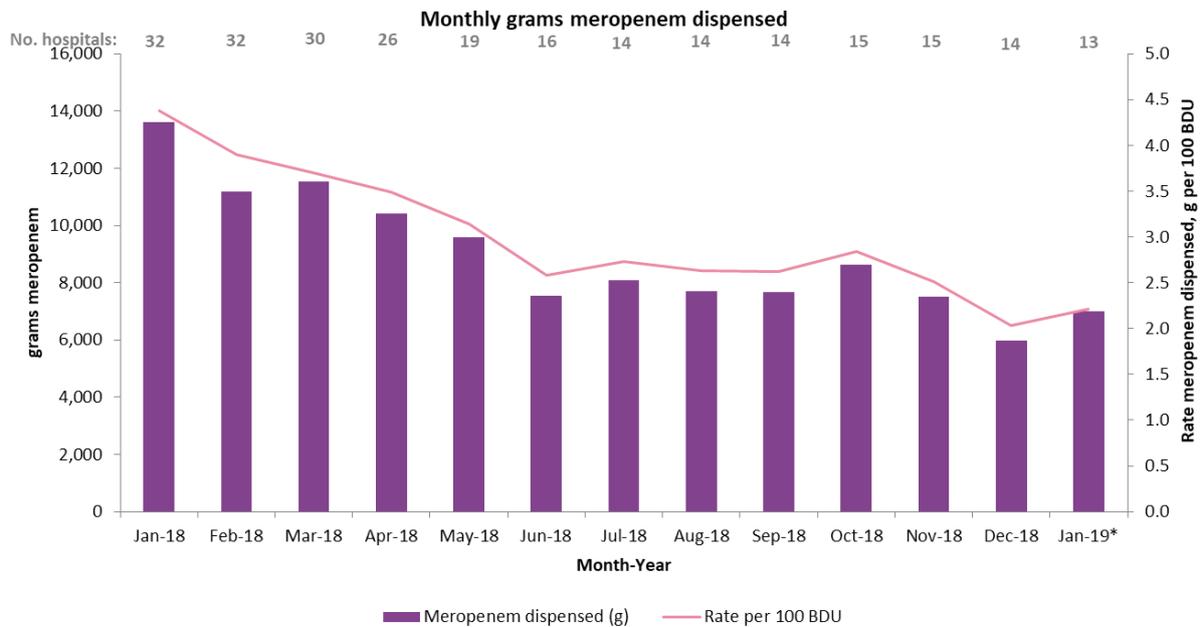


Figure 14. Monthly net** grams of meropenem dispensed by acute HSE hospital pharmacies (purple bars) and rate of meropenem dispensed per 100 bed days used (pink line). Note monthly reduction in number of hospitals reporting data, cited above each bar. **Source:** BIU

**Not all meropenem dispensed by the hospital pharmacy may be administered to patients within the month. Pharmacy dispenses Xg in a month, but Yg is returned at the end of the month: Net = X-Y. For example, 400g issued in January, with 100g returned in February: 100g is deductible from the total issued in February (net = 300g). Denominator used in rate calculations derived from average monthly bed days used for 2014-2018 inclusive (2013-2017 used for Jan-Dec 2018 figures).

7.2 National carbapenem use data, as reported to HPSC

The majority of HSE acute hospitals submit data on antimicrobial use to the HPSC. Data are published nationally and by participating hospital on the HPSC website. Overall use and use by antimicrobial class, including carbapenems (meropenem, ertapenem and imipenem), are reported. Data are expressed as a rate of defined daily doses (DDD) per 100 bed days used (BDU), using the WHO standard method. **Figure 15** displays annual national carbapenem use trends to end Q2 2018, with a consistent decline in carbapenem use observed since a peak in 2014.

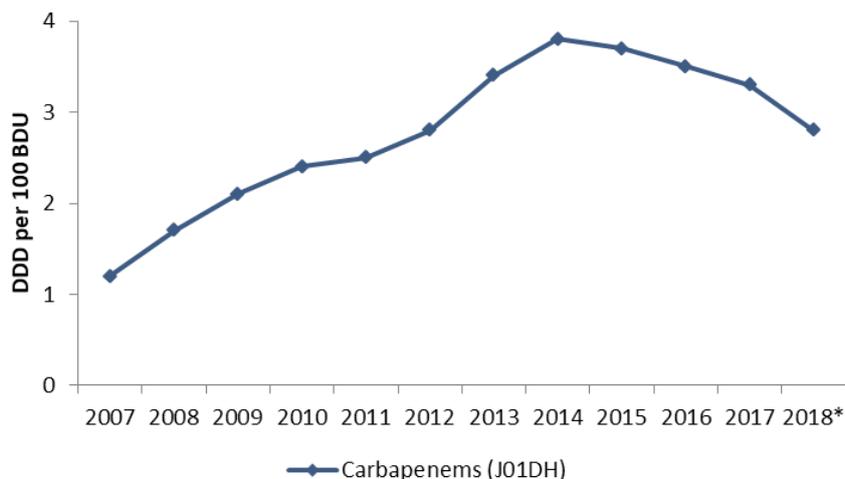


Figure 15. Annual national carbapenem use in acute HSE hospitals (results are provisional for *2018 data to end Q2). **Source:** HPSC

<http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/europeansurveillanceofantimicrobialconsumptionesac/PublicMicroB/SACHC/Report1.html>

8. Enhanced surveillance of CPE, as reported to HPSC

In January 2017, a mandatory CPE enhanced surveillance scheme was launched, with quarterly data reported by microbiology laboratories to HPSC, including those serving public and private hospitals. CPE enhanced surveillance collects information based on the first CPE isolate per patient per year of any *Enterobacteriales* species confirmed as a carbapenemase producer from acute HSE and private hospitals, patient age, gender, location at the time of positive CPE specimen, specimen type, and carbapenemase type. For inpatients, additional information is sought on patient isolation status within 24 hours of a suspected CPE result, whether or not the patient had required antimicrobial therapy for suspected CPE infection by the time of reporting and patient outcome. In 2017, 449 CPE were reported from 447 patients by 32 microbiology laboratories. In the first six months of 2018, 209 cases were reported by 23 laboratories. The latest CPE enhanced surveillance report is available on the HPSC website:

http://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/strategyforthecontrolofantimicrobialresistanceinirelandsari/carbapenemresistantenterobacteriaceae/surveillanceofcpeinireland/cpequarterlysurveillancereports/CRE%20Enhanced%20Surveillance%20Report%202018Q1-2_Website_20190204.pdf

Appendix 1

Appendix 1a. Annual NCPERLS data (2012 – 2018)

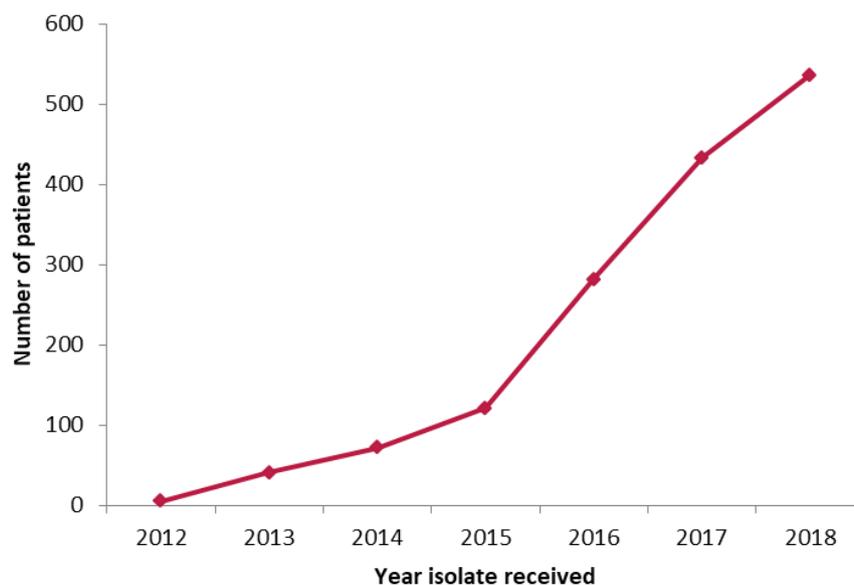


Figure 16. Annual numbers of patients with CPE newly-confirmed: 2012-2018. **Source:** NCPERLS

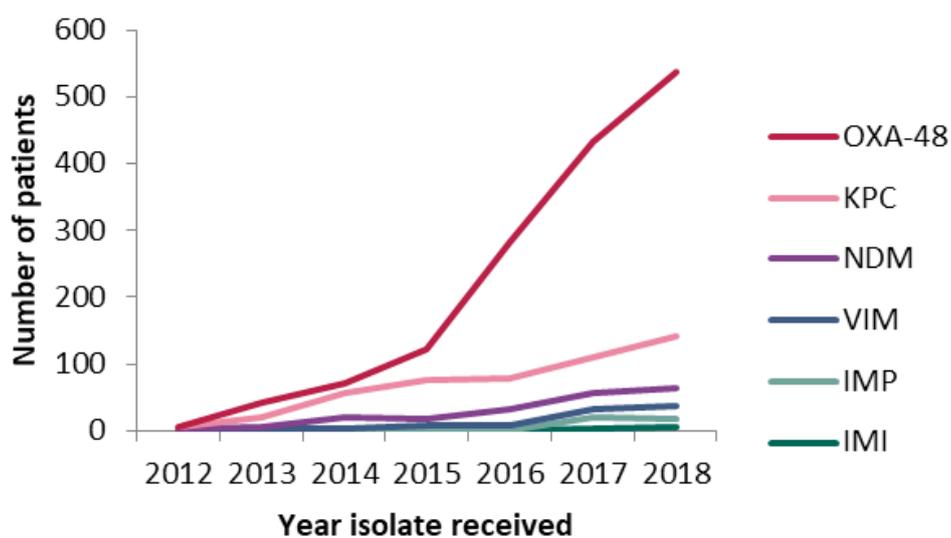


Figure 17. Annual numbers of patients with newly-confirmed CPE by carbapenemase type, 2012-2018. **Source:** NCPERLS

Appendix 1b. Total patients with newly-confirmed CPE, by carbapenemase and HSE acute hospital in 2018. Source: NCPERLS

CPE variant:	OXA-48	KPC	NDM-1	VIM	IMP	IMI	Total
Children's Hospital Group							
Our Lady's Children's Hospital, Crumlin	3			2			5
Temple Street Children's University Hospital							0
Dublin Midlands Hospital Group							
Coombe Women and Infants University Hospital							0
MRH Portlaoise							0
MRH Tullamore	3		1				4
Naas General Hospital	3						3
St. James's Hospital	29		3				32
St. Luke's Radiation Oncology Network							0
Tallaght University Hospital	70	2	6				78
Ireland East Hospital Group							
Cappagh National Orthopaedic Hospital							0
Mater Misericordiae University Hospital	21	8	2				31
MRH Mullingar	2						2
National Maternity Hospital							0
Our Lady's Hospital Navan	1	1					2
Royal Victoria Eye and Ear Hospital							0
St. Columcille's Hospital							0
St. Luke's General Hospital Kilkenny	10						10
St. Michael's Hospital							0
St. Vincent's University Hospital	12		1			1	14
Wexford General Hospital	1						1
Royal College of Surgeons Ireland Hospital							
Beaumont Hospital	37	1	1	1		1	41
Cavan General Hospital	16	2					18
Connolly Hospital	2						2
Louth County Hospital							0
Our Lady of Lourdes Hospital	1						1
Rotunda Hospital	1						1
Saolta Hospital Group							
Galway University Hospitals	42	2	1	10		1	56
Letterkenny University Hospital	2		2	2			6
Mayo University Hospital	2			5			7
Portiuncula University Hospital	2						2
Roscommon University Hospital							0
Sligo University Hospital	30	1					31
South/South West Hospital Group							
Bantry General Hospital							0
Cork University Hospital	12	7	1				20
Lourdes Orthopaedic Hospital Kilcreene							0
Mallow General Hospital			2				2
Mercy University Hospital	17	1					18
South Infirmary Victoria University Hospital	1						1
South Tipperary General Hospital	7						7
UH Kerry	1						1
UH Waterford	39						39
University Limerick Hospital Group							
Croom Orthopaedic Hospital			1				1
Ennis Hospital		2					2
Nenagh Hospital		4					4
St. John's Hospital Limerick		6					6
UH Limerick	6	38				1	45
Other							
Private hospitals	12	1	5		12	1	31
Long-termcare facilities	2						2
Other e.g. G.P., private laboratories	7	3					10
Total:	394	79	26	20	12	5	536

- Data are based on bacterial cultures submitted to NCPERLS. Patients are counted once only in the hospital/hospital group from which their first CPE isolate was submitted. It should not be assumed that the location of the patient at the time of first detection represents the hospital/hospital group in which colonisation/infection was acquired.
- Total does not include a small number of NDM-producing *Acinetobacter* species and VIM-producing *Pseudomonas aeruginosa* isolates detected in 2018, because neither are members of the order *Enterobacterales*. Other healthcare facilities include specimens from: Private hospitals, long-term care facilities and GP surgeries.
- *Data are preliminary and may be revised upon end-of-year analysis and validation.*

Appendix 1c. Total patients with newly-confirmed CPE, by carbapenemase and HSE Hospital Group in 2018. Source: NCPERLS

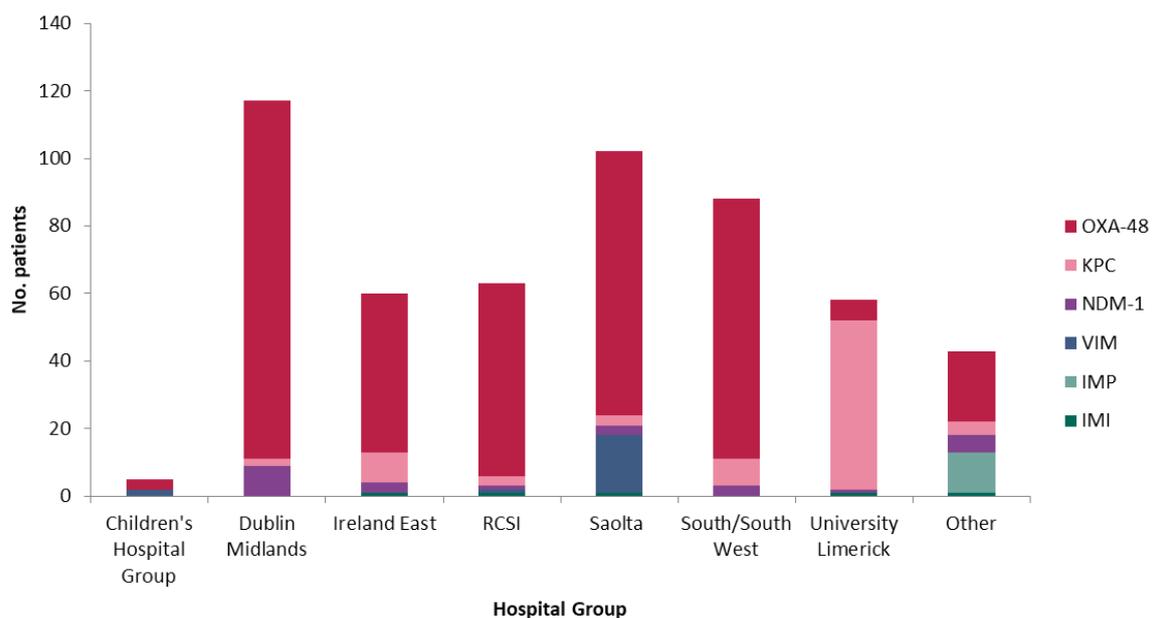


Figure 18. Patients with newly-confirmed CPE in 2018, by carbapenemase type and hospital group.
Source: NCPERLS

Data are based on bacterial cultures submitted to NCPERLS. Patients are counted once only in the hospital/hospital group from which their first CPE isolate was submitted. It should not be assumed that the location of the patient at the time of first detection represents the hospital/hospital group in which colonisation/infection was acquired.

Other*: Private hospitals, long-term care facilities and GP surgeries.

Data are preliminary and may be revised upon end-of-year analysis and validation.

Appendix 2

Appendix 2a. Annual notifications of invasive CPE infections, 2012-2018. Source: CIDR

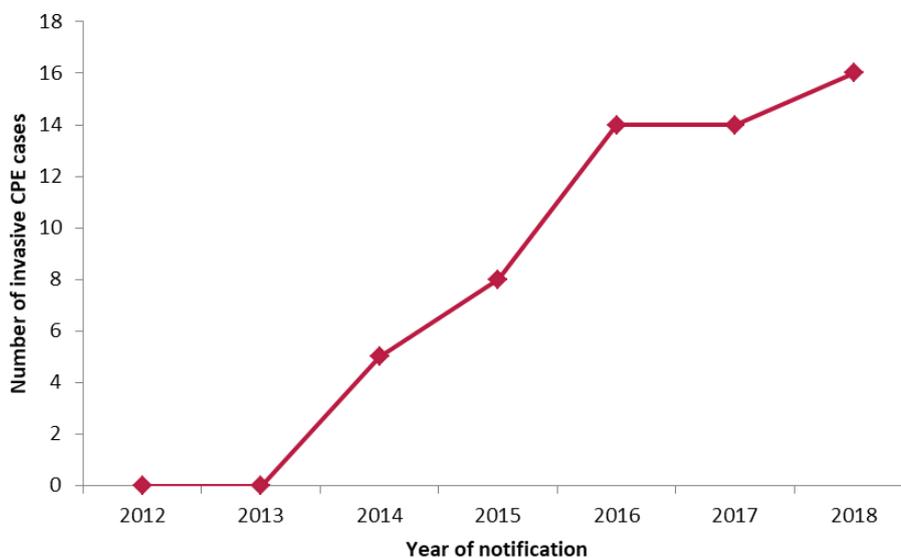


Figure 19. Annual notifications of invasive CPE infection: 2012-2018. Source: CIDR

Appendix 2b. Annual CPE outbreak events created by Departments of Public Health, 2012-2018. Source: CIDR

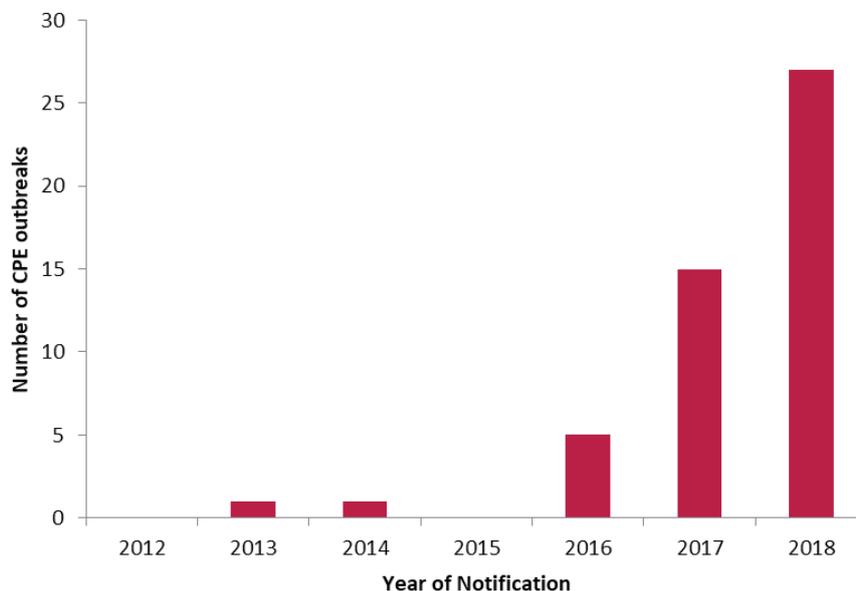


Figure 20. Annual CPE outbreak events created by Departments of Public Health: 2012-2018. Source: CIDR

Appendix 3. CPE-related performance indicators reported monthly by acute HSE hospitals to the BIU.



Carbapenemase Producing Enterobacteriaceae (CPE) and Meropenem use

Reference	Indicator
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces*
CPE003	Number of patients confirmed with newly detected CPE from any other site*
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in any accommodation other than an en-suite single room or appropriate cohort area, for any part of their admission. (Include time spent in the emergency department. Overnight means present at midnight).
CPE007	Did you or the IPC team consider that there was evidence of person to person transmission of CPE in your hospital in the past month
CPE008	Net number of grams of meropenem issued from pharmacy in this month**
CPE009	Hospital Manager approved all information included in CPE002- CPE 008 inclusive confirm Yes/ No***
CPE010	Do you have an active/current CPE outbreak in your hospital during this month?****

Note:

It is acknowledged that this information does not of itself form a basis for meaningful comparisons between hospitals and this is not its intended purpose. The data is intended to provide real time system wide information on the detection and distribution of patients colonised or infected with CPE and the challenges in containing further spread.

*To avoid duplication confirmed CPE should be counted once only and for the purpose of this return it should be associated with the month during which a molecular result performed either in house or at reference laboratory becomes available to the Infection Prevention Control team at the hospital making the return.

**It is acknowledged that the dispensing of meropenem by the hospital pharmacy does not mean that the agent was used in patients in that month. The quantity returned should be the net quantity issued. For example if in a given month a pharmacy issues 400g but receives 100g returned from the wards the number for this return is 300g. For example, 400 grams was issued in January, but 100 grams was returned in February, this is deducted from the total issued in February.

***It is important that the name of the Hospital Manager approving the return is included in each return

****For definition and help with determining if your hospital has an outbreak, please refer to the policy document HCAI/AMR P003 "Guide to Assessing if there is Evidence of Carbapenemase Producing Enterobacteriaceae (CPE) Transmission in an Acute Hospital"

Appendix 4. Monthly CPE returns received by the BIU:

December 2018 and January 2019

Provider	Dec-18		Jan-19	
	Questions completed	% completed	Questions completed	% completed
Beaumont Hospital	4	80%	4	80%
Cappagh National Orthopaedic Hospital	5	100%	5	100%
Cavan General Hospital	4	80%	4	80%
CHI at Tallaght			3	60%
CHI at Temple St	4	80%	4	80%
Connolly Hospital - Blanchardstown	4	80%	4	80%
Coombe Women and Infants University Hospital	4	80%	4	80%
Cork University Hospital	4	80%	4	80%
Cork University Maternity Hospital			Data outstanding	
Croom Hospital	4	80%	4	80%
Ennis Hospital	4	80%	4	80%
Galway University Hospitals	5	100%	5	100%
Letterkenny University Hospital	4	80%	4	80%
Lourdes Orthopaedic Hospital Kilcreene	4	80%	4	80%
Louth County Hospital	4	80%	4	80%
Mater Misericordiae University Hospital	Data outstanding		Data outstanding	
Mayo University Hospital	4	80%	4	80%
Mercy University Hospital Cork	5	100%	5	100%
Midland Regional Hospital - Portlaoise	5	100%	4	80%
Midland Regional Hospital - Tullamore	4	80%	4	80%
Midland Regional Hospital Mullingar	4	80%	4	80%
Naas General Hospital	5	100%	5	100%
National Maternity Hospital	4	80%	4	80%
Nenagh Hospital	4	80%	4	80%
Our Lady of Lourdes Hospital Drogheda	4	80%	4	80%
CHI at Crumlin	4	80%	4	80%
Our Ladys Hospital - Navan	4	80%	4	80%
Portiuncula University Hospital	4	80%	4	80%
Roscommon University Hospital	4	80%	4	80%
Rotunda Hospital	5	100%	5	100%
Royal Victoria Eye and Ear Hospital	5	100%	5	100%
Sligo University Hospital	4	80%	4	80%
South Infirmary/Victoria University Hospital Cork	5	100%	5	100%
South Tipperary General Hospital	4	80%	4	80%
St John's Hospital	4	80%	4	80%
St. Columcille's Hospital	5	100%	5	100%
St. James's Hospital	5	100%	5	100%
St. Luke's Hospital Kilkenny	4	80%	4	80%
St. Luke's Radiation Oncology Network	5	100%	5	100%
St. Michael's Hospital	4	80%	4	80%
St. Vincent's University Hospital	5	100%	5	100%
Tallaght University Hospital	5	100%	5	100%
University Hospital Waterford	4	80%	4	80%
University Hospital, Limerick	4	80%	4	80%
UMH Limerick	4	80%	4	80%
Wexford General Hospital	4	80%	4	80%
Kerry General Hospital	4	80%	4	80%
Mallow General Hospital	4	80%	4	80%
Bantry General Hospital	5	100%	5	100%
Total submitted	46		47	
Did not submit	1		2	
% of providers who submitted data	98%		96%	

Appendix 5. Monthly BIU CPE performance indicator data by Hospital Group

5a. National:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Hospital Group	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Childrens Health Ireland	CPE002+003	2	0	1	0	0	0	0	1	0	2	0	0	3
	CPE004	423	352	367	458	439	372	441	458	488	519	563	488	574
	CPE005	6	4	5	3	4	3	1	3	3	4	4	0	2
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	350	520	321	399	630	0	0	0	0	0	0	0	0
Dublin Midlands Hospital Group	CPE002+003	13	7	9	11	8	12	8	13	15	18	13	9	7
	CPE004	3,822	3,247	3,189	3,049	3,786	3,571	3,839	4,210	3,895	4,823	4,302	4,656	4,892
	CPE005	67	63	58	49	60	65	65	65	62	72	64	59	57
	CPE006	0	1	0	0	2	2	0	0	1	0	0	0	1
	CPE008	3,157	2,145	2,789	2,708	3,943	3,101	3,136	2,539	2,983	3,204	2,299	2,824	3,725
Ireland East Hospital Group	CPE002+003	3	5	5	3	3	8	10	4	5	7	6	3	7
	CPE004	1,976	1,825	1,842	2,161	2,292	2,399	2,687	2,659	2,450	2,832	2,762	2,299	2,847
	CPE005	14	21	13	15	17	22	21	22	30	30	25	14	13
	CPE006	2	5	2	5	3	5	2	3	3	7	3	2	0
	CPE008	5,822	5,344	4,856	4,132	3,424	3,230	3,717	3,377	2,735	3,489	3,093	1,111	1,401
RCSI Hospitals Group	CPE002+003	1	1	0	4	1	3	6	11	12	10	18	4	12
	CPE004	987	881	931	1,004	1,163	1,115	1,444	2,178	2,260	3,121	2,977	2,955	3,498
	CPE005	8	5	7	9	4	8	5	17	19	18	37	23	30
	CPE006	2	1	2	3	0	1	3	0	1	1	0	0	2
	CPE008	242	288	30	55	75	65	49	35	83	75	62	115	23
Saoita University Health Care Group	CPE002+003	8	5	1	4	7	10	12	10	7	14	20	5	16
	CPE004	2,172	2,425	2,146	2,413	3,035	2,653	3,281	3,363	3,095	3,651	3,889	3,459	4,039
	CPE005	26	24	28	25	27	30	31	41	35	43	60	42	46
	CPE006	2	1	1	5	4	0	3	2	2	1	2	3	5
	CPE008	1,189	688	745	593	665	677	657	1,242	1,307	936	854	1,321	1,249
South / South West Hospital Group	CPE002+003	3	2	6	7	3	8	8	5	4	25	10	4	9
	CPE004	639	635	1,037	1,114	1,443	1,689	2,115	2,689	2,374	2,974	3,550	3,243	3,223
	CPE005	10	15	17	18	12	18	13	23	16	36	33	28	26
	CPE006	1	1	0	3	1	1	1	1	1	0	3	1	1
	CPE008	1,400	1,140	1,065	921	857	481	538	522	563	931	1,205	621	597
University of Limerick Hospital Group	CPE002+003	4	5	3	8	2	8	12	6	6	5	5	4	4
	CPE004	1,274	1,153	1,136	1,269	1,258	1,263	1,664	1,929	1,779	1,783	1,781	1,872	2,059
	CPE005	19	17	24	22	18	24	31	20	32	25	27	18	24
	CPE006	0	0	0	2	0	0	3	4	3	10	5	4	0
	CPE008	1,467	1,076	1,728	1,605	0	0	0	0	0	0	0	0	0
National Total (All Groups)	CPE002+003	34	25	25	37	24	49	56	50	49	81	72	29	58
	CPE004	11,293	10,518	10,648	11,468	13,416	13,062	15,471	17,486	16,341	19,703	19,824	18,972	21,132
	CPE005	150	149	152	141	142	170	167	191	197	228	250	184	198
	CPE006	7	9	5	18	10	9	12	10	11	19	13	10	9
	CPE008	13,627	11,201	11,534	10,413	9,594	7,554	8,097	7,715	7,671	8,635	7,513	5,992	6,995

5b. Children's Health Ireland:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
CHI at Crumlin	CPE002+003	2	0	1	0	0	0	0	1	0	2	0	0	0
	CPE004	310	263	270	320	340	298	347	371	394	370	417	347	410
	CPE005	5	3	4	2	3	2	1	3	3	4	4	0	1
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	289	380	246	325	630								
CHI at Tallaght	CPE002+003													1
	CPE004													6
	CPE005													1
	CPE006													
	CPE008													
CHI at Temple St	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	2
	CPE004	113	89	97	138	99	74	94	87	94	149	146	141	158
	CPE005	1	1	1	1	1	1	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	61	140	75	74									
Children's Health Ireland	CPE002+003	2	0	1	0	0	0	0	1	0	2	0	0	3
	CPE004	423	352	367	458	439	372	441	458	488	519	563	488	574
	CPE005	6	4	5	3	4	3	1	3	3	4	4	0	2
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	350	520	321	399	630	0	0	0	0	0	0	0	0

5c. Dublin Midlands Hospital Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Coombe Women and Infants University Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	27	36	38	28	31	33	55	37	68	38	51	39	49
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	59	35	59	15	16	16	43						
MRH Portlaoise	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	40	38	35	64	60	61	60	75	158	301	327	295	315
	CPE005	0	0	0	0	0	0	0	1	1	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	1	0	0	0	1
	CPE008	23	26	34					70	4	122		45	
MRH Tullamore	CPE002+003	0	0	1	1	0	1	0	0	0	0	1	1	1
	CPE004	234	222	229	262	297	289	294	341	507	671		615	655
	CPE005	0	0	1	1	0	1	1	0	0	0	1	1	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008													
Naas General Hospital	CPE002+003	0	0	0	0	1	1	0	1	0	0	0	0	1
	CPE004	801	639	483	299	397	459	521	396	377	489	511	495	630
	CPE005	5	5	4	4	4	4	4	9	3	4	4	5	1
	CPE006	0	0	0	0		0	0	0	0	0	0	0	0
	CPE008	140	7	117	0	21	121	123	106		260	130	137	67
St. James's Hospital	CPE002+003	3	0	1	2	2	2	0	7	8	6	6	2	2
	CPE004	507	582	722	656	813	815	900	1,283	760	1,051	1,168	1,083	1,125
	CPE005	17	15	10	9	14	11	13	11	15	23	18	11	14
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	2,217	1,685	1,922	1,985	2,955	2,262	2,366	2,353	2,493	2,303	1,700	2,160	3,297
St. Luke's Radiation Oncology Network	CPE002+003	0	0	0	0	1	0	0	1	0	0	1	0	0
	CPE004	234	175	127	181	219	194	207	216	182	194	248	175	170
	CPE005	0	1	1	1	0	0	1	2	2	1	2	1	1
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	0	10	20	1	0	19	15	10	14	49	4	10	107
Tallaght University Hospital	CPE002+003	10	7	7	8	4	8	8	4	7	12	5	6	3
	CPE004	1,979	1,555	1,555	1,559	1,969	1,720	1,802	1,862	1,843	2,079	1,997	1,954	1,948
	CPE005	45	42	42	34	42	49	46	42	41	44	39	41	41
	CPE006	0	1	0	0	2	2	0		0	0	0	0	0
	CPE008	718	382	637	707	951	683	589		472	470	465	472	254
Dublin Midlands Hospital Group	CPE002+003	13	7	9	11	8	12	8	13	15	18	13	9	7
	CPE004	3,822	3,247	3,189	3,049	3,786	3,571	3,839	4,210	3,895	4,823	4,302	4,656	4,892
	CPE005	67	63	58	49	60	65	65	65	62	72	64	59	57
	CPE006	0	1	0	0	2	2	0	0	1	0	0	0	1
	CPE008	3,157	2,145	2,789	2,708	3,943	3,101	3,136	2,539	2,983	3,204	2,299	2,824	3,725

5d. Ireland East Hospital Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Cappagh National Orthopaedic Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	0	0	0	17	46	47	52	139	139	165	187	112	144
	CPE005	0	0	0	0	0	0	1	1	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	23	50	15	11	6	20	0	10	8	0	61	0	10
Mater Misericordiae University Hospital	CPE002+003	2	3	2	2	2	3	6	4	2	3	4		
	CPE004	395	335	382	439	513	464	611	603	578	689	666		
	CPE005	8	10	8	4	5	9	9	9	13	13	13		
	CPE006	1	2	1	1	0	2	2	2	2	3	0		
	CPE008	2,756	2,429	2,239	2,330	2,150	2,024	2,090	1,780	1,546	1,464	1,145		
MRH Mullingar	CPE002+003	0	0	0	0	0	1	0	0	0	0	1	0	0
	CPE004	87	100	139	183	200	216	184	196	182	216	271	250	321
	CPE005	0	0	0	1	1	0	1	0	1	0	0	1	0
	CPE006	0	0	0	1	0	0	0	0	0	0	0	0	0
	CPE008	355	169	255	0									
National Maternity Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	68	92	120	129	173	135	163	160	182	182	169	140	179
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	20	0	0										
Our Lady's Hospital Navan	CPE002+003	0	0	1	0	0	1	0	0	0	0		0	0
	CPE004	46	41	84	67	71	89	107	58	47	59		41	49
	CPE005	1	2	1	2	0	2	1	2	2	2		0	0
	CPE006	0	0	1	1	0	1	0	0	0	0		0	0
	CPE008													
Royal Victoria Eye and Ear Hospital	CPE002+003	0	0	0	0	1	0	0	0	0	0	0	0	1
	CPE004	34	20	22	25	49	38	48	26	39	57	37	34	49
	CPE005	0	0	0	0	1	0	0	0	0	0	0	0	0
	CPE006	0	2	0	0	1	0	0	1	0	0	0	0	0
	CPE008	68	0	0	0	0	0	0	0	0	0	0	0	0

5d. Ireland East Hospital Group (continued):

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
St. Columcille's Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	119	103	94	102	123	109	108	119	111	130	145	162	185
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	10	0	10	0	10	11	10	23	0	0	0	13	23
St. Luke's General Hospital Kilkenny	CPE002+003	0	1	1	1	0	2	1	0	1	3	0	1	0
	CPE004	76	116	86	105	92	211	164	240	107	166	161	132	202
	CPE005	0	2	1	2	4	4	2	0	2	5	3	2	2
	CPE006	0	1	0	2	2	2	0	0	1	4	3	2	0
	CPE008	37	37	337										
St. Michael's Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	2
	CPE004	60	66	65	80	65	84	122	95	105	117	137	204	261
	CPE005	0	1	0	2	1	1	0	1	0	0	1	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	70	3	15										
St. Vincent's University Hospital	CPE002+003	1	1	1	0	0	1	3	0	0	1	1	2	4
	CPE004	984	856	749	897	837	864	1,005	876	843	902	869	1,074	1,319
	CPE005	4	2	2	3	2	4	5	8	8	6	6	7	8
	CPE006	1	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	2,373	2,495	1,985	1,791	1,258	1,175	1,617	1,564	1,181	2,025	1,887	1,098	1,368
Wexford General Hospital	CPE002+003	0	0	0	0	0	0	0	0	2	0	0	0	0
	CPE004	107	96	101	117	123	142	123	147	117	149	120	150	138
	CPE005	1	2	1	1	3	2	2	1	4	4	2	4	3
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	110	161											
Ireland East Hospital Group	CPE002+003	3	5	5	3	3	8	10	4	5	7	6	3	7
	CPE004	1,976	1,825	1,842	2,161	2,292	2,399	2,687	2,659	2,450	2,832	2,762	2,299	2,847
	CPE005	14	21	13	15	17	22	21	22	30	30	25	14	13
	CPE006	2	5	2	5	3	5	2	3	3	7	3	2	0
	CPE008	5,822	5,344	4,856	4,132	3,424	3,230	3,717	3,377	2,735	3,489	3,093	1,111	1,401

5e. RCSI Hospitals Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Beaumont Hospital	CPE002+003	1	0	0	3	0	2	2	10	9	8	6	3	11
	CPE004	696	633	591	610	743	658	685	920	896	1,474	889	935	1,264
	CPE005	7	4	6	7	3	6	2	15	18	14	21	15	23
	CPE006	2	1	2	3	0	0	1	0	1	1	0	0	1
	CPE008													
Cavan General Hospital	CPE002+003	0	0	0	0	0	0	4	0	3	1	12	0	0
	CPE004	24	33	42	52	100	61	297	796	872	982	1,469	1,132	1,340
	CPE005	0	0	0	0	0	0	2	0	0	2	14	5	2
	CPE006	0	0	0	0	0	0	2	0	0	0	0	0	0
	CPE008	210	210											
Connolly Hospital	CPE002+003	0	0	0	1	0	1	0	1	0	1	0	1	1
	CPE004	94	73	92	135	138	133	156	165	171	236	183	454	502
	CPE005	1	1	1	2	1	2	1	2	1	2	2	3	5
	CPE006	0	0	0	0	0	1	0	0	0	0	0	0	1
	CPE008													
Louth County Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	0	3	1	5	1	1	0	0	5	50	38	30	40
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008													
Our Lady of Lourdes Hospital	CPE002+003	0	1	0	0	0	0	0	0	0	0	0	0	0
	CPE004	71	59	71	69	77	151	169	176	204	223	251	239	204
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008													
Rotunda Hospital	CPE002+003	0	0	0	0	1	0	0	0	0	0	0	0	0
	CPE004	102	80	134	133	104	111	137	121	112	156	147	165	148
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	32	78	30	55	75	65	49	35	83	75	62	115	23
RCSI Hospitals Group	CPE002+003	1	1	0	4	1	3	6	11	12	10	18	4	12
	CPE004	987	881	931	1,004	1,163	1,115	1,444	2,178	2,260	3,121	2,977	2,955	3,498
	CPE005	8	5	7	9	4	8	5	17	19	18	37	23	30
	CPE006	2	1	2	3	0	1	3	0	1	1	0	0	2
	CPE008	242	288	30	55	75	65	49	35	83	75	62	115	23

5f. Saolta Hospital Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Galway University Hospitals	CPE002+003	6	4	1	4	3	5	10	5	5	5	8	3	7
	CPE004	1,205	1,316	1,179	1,400	1,927	1,560	1,898	1,841	1,660	1,973	1,827	1,690	1,769
	CPE005	14	13	13	11	13	14	16	20	19	25	24	18	23
	CPE006	1	0	0	0	2	0	1	1	1	1	1	0	2
	CPE008	1,110	601	745	593	665	677	657	1,242	1,307	936	854	1,321	1,249
Letterkenny University Hospital	CPE002+003	0	1	0	0	0	0	2	0	0	1	1	3	
	CPE004	99	125	107	77	111	90	206	199	282	404	542	564	578
	CPE005	3	4	6	5	5	5	2	6	3	2	5	5	4
	CPE006	0	1	0	1	2	0	0	1	0	0	0	2	1
	CPE008				0									
Mayo University Hospital	CPE002+003	1	0	0	0	0	0	2	1	0	0	2	0	3
	CPE004	382	404	345	410	373	397	482	579	537	470	475	386	664
	CPE005	4	1	3	3	1	1	3	5	4	1	7	3	6
	CPE006	1	0	1	0	0	0	0	0	0	0	0	1	0
	CPE008	79	87											
Portiuncula University Hospital	CPE002+003	0	0	0	0	0	0	1	0	1	0	0	0	
	CPE004	182	176	199	215	242	254	261	219	269	252	294	294	
	CPE005	0	0	1	1	0	1	1	2	1	1	1	0	2
	CPE006	0	0		0	0	0	0	0	0	0	1	0	2
	CPE008			0										
Roscommon University Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	
	CPE004	72	57	54	49	65	57	54	73	72	61	72	61	61
	CPE005	0	1	0	0	1	1	0	0	0	1	1	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008													
Sligo University Hospital	CPE002+003	1	0	0	0	4	5	0	1	2	8	9	1	3
	CPE004	232	347	262	262	317	295	390	410	325	474	721	464	673
	CPE005	5	5	5	5	7	8	9	8	8	13	22	16	11
	CPE006	0	0	0	4	0	0	2	0	1	0	0	0	0
	CPE008													
Saolta University Health Care Group	CPE002,003	8	5	1	4	7	10	12	10	7	14	20	5	16
	CPE004	2,172	2,425	2,146	2,413	3,035	2,653	3,281	3,363	3,095	3,651	3,889	3,459	4,039
	CPE005	26	24	28	25	27	30	31	41	35	43	60	42	46
	CPE006	2	1	1	5	4	0	3	2	2	1	2	3	5
	CPE008	1,189	688	745	593	665	677	657	1,242	1,307	936	854	1,321	1,249

Please Note: Mayo data regarding CPE006 above for January 2018 is not confirmed

5g. South / South West Hospital Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Bantry General Hospital	CPE002+003	0	0	0	1	0	0	0	0	0	0	0	0	0
	CPE004			33	41	52	40	42	42	51	115	111	91	96
	CPE005	0	0	0	1	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	1	0	0	0	0	0	0	0	0	0
	CPE008	64	40	30	10	84	117		70	153	177	110	50	178
Cork University Hospital	CPE002+003	0	1	0	1	0	2	2	1	1	9	2	0	1
	CPE004	287	261	307	279	316	313	494	771	537	684	552	444	378
	CPE005		1	0	1	1	2	3	4	1	10	7	8	3
	CPE006		0	0	0	0	1	0	0	0	0	0	0	0
	CPE008						0							
Cork University Maternity Hospital	CPE002+003													
	CPE004													
	CPE005													
	CPE006													
	CPE008													
Lourdes Orthopaedic Hospital Kilcreene	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	0	0	0	8	12	8	7	15	18	13	11	9	15
	CPE005	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	0	0	0	0	0	0							
Mallow General Hospital	CPE002+003	0	0	0	0	0	0	0	2	0	0	0	0	0
	CPE004	22	25	36	33	48	53	66	93	94	89	96	100	106
	CPE005	0	0	0	0	0	0	0	2	0	0	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008													
Mercy University Hospital	CPE002+003	3	1	2	2	0	3	0	0	1	2	1	0	1
	CPE004	73	85	287	277	533	585	577	583	587	680	595	633	621
	CPE005	3	3	2	3	1	2	1	2	3	2	3	5	5
	CPE006	0	0	0	0	0	0	0	0	0	0	1	1	0
	CPE008	445	332	567	304	314	364	520	420	350	590	510	522	370

5g. South / South West Hospital Group (continued):

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
South Infirmary Victoria University Hospital	CPE002+003	0	0	0	0	0	0	0	1	0	1	0	1	1
	CPE004	7	9	13	6	17	62	83	153	166	200	199	221	268
	CPE005	0	0	0	0	0	0	0	1	1	0	0	1	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	0	80	0	0	10		18	32	60	164	80	49	49
South Tipperary General Hospital	CPE002+003	0	0	1	1	0	0	3	0	1	0	1	0	1
	CPE004	100	96	89	89	104	102	405	564	498	510	523	528	429
	CPE005	1	2	0	2	1	0	1	2	1	1	2	1	1
	CPE006	1	1	0	2	1	0	1	1	1	0	2	0	1
	CPE008	112	190											
UH Kerry	CPE002+003		0	0	0	0	0	0	0	0	0	0	0	0
	CPE004		73	66	62	53	45	69	60	103	111	218	289	292
	CPE005		1	1	1	0	0	0	0	0	0	0	0	0
	CPE006		0	0	0	0	0	0	0	0	0	0	0	0
	CPE008		164											
UH Waterford	CPE002+003	0	0	3	2	3	3	3	1	1	13	6	3	5
	CPE004	150	86	206	319	308	481	372	408	320	572	1,245	928	1,018
	CPE005	6	8	14	10	9	14	8	12	10	23	21	13	17
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	779	334	468	607	449						505		
South / South West Hospital Group	CPE002,003	3	2	6	7	3	8	8	5	4	25	10	4	9
	CPE004	639	635	1,037	1,114	1,443	1,689	2,115	2,689	2,374	2,974	3,550	3,243	3,223
	CPE005	10	15	17	18	12	18	13	23	16	36	33	28	26
	CPE006	1	1	0	3	1	1	1	1	1	0	3	1	1
	CPE008	1,400	1,140	1,065	921	857	481	538	522	563	931	1,205	621	597

5h. University of Limerick Hospital Group:

Performance Indicators:	
CPE002	Number of patients confirmed with newly detected CPE from rectal swabs/ faeces
CPE003	Number of patients confirmed with newly detected CPE from any other site
CPE004	Total number of rectal swabs/ faeces samples tested for CPE
CPE005	Number of patients with known CPE infection or colonisation who were inpatients at any time during the month
CPE006	Number of in-patients with known CPE who were accommodated overnight in accommodation other than an en-suite single room or appropriate cohort area for any part of their admission. <i>Please note that CPE inpatients accommodated in appropriate cohort areas were not captured in the definition for CPE006 in use from October to December 2017</i>
CPE008	Net number of grams of meropenem issued from pharmacy in this month
No data submitted by provider	

Provider	Performance indicator	Q1 2018			Q2 2018			Q3 2018			Q4 2018			Q1 2019
		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Croom Orthopaedic Hospital	CPE002+003	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE004	26	18	23	27	26	21	19	25	29	31	37	31	36
	CPE005	0	0	0	0	1	1	0	0	1	1	0	0	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	0		0	0									
Ennis Hospital	CPE002+003	0	0	0	2	0	0	0	0	0	0	0	0	0
	CPE004	103	104	90	90	102	89	89	113	117	109	131	117	126
	CPE005	0		2	2	3	3	2	1	2	2	5	2	2
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	64	133	82	22									
Nenagh Hospital	CPE002+003	0	0	0	0	0	2	2	0	0	0	0	0	0
	CPE004	43	59	49	46	63	98	86	75	64	59	84	80	91
	CPE005	0		1	0	1	2	4	2	2	0	2	1	2
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008			0										
St. John's Hospital Limerick	CPE002+003	1	0	0	0	0	1	3	1	0	0	0	0	0
	CPE004	135	128	148	113	121	125	164	175	183	190	184	170	154
	CPE005	0	1	1	1	0	0	1	0	1	3	0	1	0
	CPE006	0	0	0	0	0	0	0	0	0	0	0	0	0
	CPE008	39	53	74	105									
UH Limerick	CPE002+003	3	5	3	6	2	5	7	5	6	5	5	4	3
	CPE004	967	844	826	993	943	929	1,286	1,521	1,364	1,379	1,299	1,378	1,537
	CPE005	19	16	20	19	13	18	24	17	26	19	20	14	19
	CPE006	0	0	0	2	0	0	3	4	3	10	5	4	0
	CPE008	1,364	890	1,572	1,478									
UMH Limerick	CPE002+003					0	0	0	0	0	0	0	0	1
	CPE004					3	1	20	20	22	15	46	96	115
	CPE005					0	0	0	0	0	0	0	0	1
	CPE006					0	0	0	0	0	0	0	0	0
	CPE008													
University of Limerick Hospital Group	CPE002,003	4	5	3	8	2	8	12	6	6	5	5	4	4
	CPE004	1,274	1,153	1,136	1,269	1,258	1,263	1,664	1,929	1,779	1,783	1,781	1,872	2,059
	CPE005	19	17	24	22	18	24	31	20	32	25	27	18	24
	CPE006	0	0	0	2	0	0	3	4	3	10	5	4	0
	CPE008	1,467	1,076	1,728	1,605	0	0	0	0	0	0	0	0	0

Appendix 6. Data sources for CPE indicators in Ireland – Provisional data is typically deemed final by the end of the following quarter.

Indicator	Data source	Frequency collated	Unit being measured based on
Invasive CPE infections	CIDR (HPSC)	Weekly	New notifications of invasive CRE/CPE infection by clinicians and laboratories (public and private) to Departments of Public Health. BASED ON DATE REPORTED ON CIDR
CPE outbreaks	CIDR (HPSC)	Weekly	New notifications of CPE outbreaks in healthcare settings to Departments of Public Health and created as a new event on CIDR BASED ON DATE OUTBREAK CREATED ON CIDR
Patients with CPE, newly-confirmed by NCPERLS	NCPERLS	Monthly	Number of patients newly-confirmed by NCPERLS with CPE from any specimen type. Patient counted once per year, except where a second carbapenemase type is identified when the patient is counted again. BASED ON DATE SPECIMEN RECEIVED AT NCPERLS
CPE positive screens (Indicator: CPE002)	BIU	Monthly	Number of patients with newly detected CPE from screens (rectal swabs/faeces) reported by acute HSE hospitals BASED ON DATE NEW CPE CONFIRMED
Newly detected patients with CPE (Indicator: CPE003)	BIU	Monthly	Number of patients with newly detected CPE from clinical specimens reported by acute HSE hospitals BASED ON DATE NEW CPE CONFIRMED
CPE screens (Indicator: CPE004)	BIU	Monthly	Number of CPE screens performed by acute HSE hospital BASED ON REPORTING MONTH
Inpatients with CPE (Indicator: CPE005)	BIU	Monthly	Number of inpatients with known CPE infection admitted to acute HSE hospitals at any time during the month BASED ON REPORTING MONTH
Unsuitable accommodation (Indicator: CPE006)	BIU	Monthly	Number of in-patients with known CPE who were accommodated overnight in unsuitable accommodation for any part of their admission in acute HSE hospitals. (Any facility other than an <i>en suite</i> single room or designated cohort area is unsuitable. Include time spent in the emergency department. Overnight means present at midnight). BASED ON REPORTING MONTH
Evidence of CPE transmission (Indicator: CPE007)	BIU	Monthly	Number of acute HSE hospitals reporting evidence of person-to-person transmission BASED ON REPORTING MONTH
Meropenem dispensed (Indicator: CPE008)	BIU	Monthly	Net number of grams of meropenem dispensed by acute HSE hospital pharmacies BASED ON REPORTING MONTH
Carbapenem use	HPSC	Quarterly	Carbapenem use data from public acute hospitals measured in defined daily doses (DDD) per 100 bed days used (BDU) BASED ON REPORTING QUARTER
CPE Enhanced surveillance	HPSC	Quarterly	Laboratories (public and private) report detailed information on the first positive CPE isolate per patient per year (invasive and non-invasive infections, colonisations and positive screens) BASED ON SPECIMEN DATE

Appendix 7 Glossary of Terms

AMR	Antimicrobial resistance
BIU	Business Information Unit
CIDR	Computerised Infectious Disease Reporting system
CPE	Carbapenemase-producing <i>Enterobacteriaceae/Enterobacterales</i>
CRE	Carbapenem-resistant <i>Enterobacteriaceae/Enterobacterales</i>
HCAI	Healthcare-associated infection
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
NCPERLS	National Carbapenemase-Producing <i>Enterobacterales</i> Reference Laboratory Service
NPHE	National Public Health Emergency Team