



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

SUMMARY OF THE NATIONAL REPORT: IRELAND – DECEMBER 2018

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Executive Summary

This report presents the findings of the second point prevalence survey (PPS) of hospital-acquired infections (HAI) and antimicrobial use (AMU) conducted in Ireland and the European Union (EU)/European Economic Area (EEA) using a common protocol.¹ The first PPS was performed in 50 Irish hospitals in May 2012 and repeated in 60 hospitals in May 2017.^{2,3} The number of patients included, along with the national HAI and AMU prevalence increased between the two surveys. For 49 hospitals that have participated in both PPS to date, increases in median patient age, the proportion of patients aged ≥ 65 years and the prevalence of vascular catheter use were observed.

The European Centre for Disease Prevention and Control (ECDC) has estimated that on any given day, there are 670 inpatients in Irish hospitals with a HAI, translating to almost 30,000 patients in Ireland affected by HAI annually.⁴

Hospital & Eligible Patient Characteristics

- In May 2017, 60 acute Irish hospitals (46 public and 14 private) participated in the voluntary European ECDC PPS of HAI and AMU. The breakdown of participating hospitals by type included: primary (n=9), secondary (n=17), tertiary (n=7), specialist public (n=13), specialist private (n=1) and private (n=13)
- The average number of acute beds in the 46 public hospitals ranged from 72 to 588, depending on the hospital type. The average proportion of single patient rooms was lowest in public primary (15%), secondary (20%), specialist (23%) and tertiary (29%) hospitals and was highest in private hospitals (52%)
- All hospitals reported having an infection prevention and control nurse (IPCN), 17 reported having no infection prevention and control doctor (IPCD) and 17 reported having no antimicrobial pharmacist (AMP)
- The resource of whole time equivalent (WTE) IPCN per 100 beds was similar for both public (0.8) and private hospitals (0.9). Private hospitals reported 0.24 IPCD per 100 beds, higher than that of public hospitals (0.17). Public hospitals reported 0.26 AMP per 100 beds, higher than that of private hospitals (0.14)
- Of 10,333 eligible patients, there was a slight female preponderance (52%), with 10% aged <10 and 54% aged ≥ 65 years
- Surgery since hospital admission was a risk factor for 18% of patients and 58% had at least one invasive device *in situ* (e.g., peripheral vascular catheter or urinary catheter)

Hospital-Acquired Infections (HAI)

- There were 678 active HAI identified in 633 patients. The overall HAI prevalence was 6.1%, an increase from 5.2% reported for the previous PPS in May 2012. The vast majority of HAI occurred in patients aged ≥ 15 years (96.5%) and 90% of HAI were attributable to the reporting hospital
- Ireland's HAI prevalence equalled that of Northern Ireland (6.1%), but was higher than that of Scotland (4.5%) and participating EU countries overall (5.5%)⁴
- Patients with HAI were more likely to have risk factors, such as surgery since hospital admission and invasive medical devices *in situ*, than the overall eligible population
- The overall HAI prevalence by hospital type was highest for tertiary (8.7%) and lowest for specialist hospitals (3.4%)
- The HAI prevalence was highest in adult intensive care units (24%) and surgical wards (9.1%). Obstetrics/gynaecology (1.8%) and psychiatry (1.6%) wards had the lowest HAI prevalence
- The top four HAI types were:
 - Pneumonia (PN) (196 cases; 28.9% of all HAI; prevalence = 1.9% of inpatients)
 - Surgical site infection (SSI) (122 cases; 18.1% of all HAI; prevalence = 1.2% of inpatients)
 - Urinary tract infection (UTI) (98 cases; 14.5% of all HAI; prevalence = 0.9% of inpatients)
 - Bloodstream infection (BSI) (64 cases; 9.9% of all HAI; prevalence = 0.6% of inpatients)

- A large increase in PN as a proportion of all HAI was observed in 2017 versus 2012 (28.9 versus 17%), with a doubling of prevalence (1.9 versus 1.0%) and for 49 hospitals that participated in both PPS, a 195% increase in the HAI categories pneumonia & lower respiratory tract infection was observed. Alteration in the PN surveillance case definition between the two PPS may have contributed to this increased prevalence
- Of the BSI, 16 (25%) were due to infection of an indwelling vascular catheter
- There were 30 patients with *Clostridium difficile* infection (CDI), accounting for 4.4% of all HAI
- The most common HAI causative pathogens were *Enterobacteriaceae* (37%) and of those, 14% were resistant to third generation cephalosporins (C3G). *Staphylococcus aureus* was the second commonest, 28% of which were flucloxacillin resistant (i.e., methicillin-resistant *S. aureus* or MRSA)

Antimicrobial Use (AMU)

- There were 4,105 patients who were prescribed 5,813 antimicrobials. The overall AMU prevalence was 39.7%, an increase from 34% reported in May 2012. The vast majority of AMU occurred in patients aged ≥ 15 years (94%)
- At 39.7%, Ireland's AMU prevalence was higher than that of neighbouring UK countries (Wales 34.2% - England 37.4%) and participating EU countries overall (30.5%)⁵
- The overall AMU prevalence, by hospital type was highest for private (45.4%) and lowest for specialist hospitals (26.5%)
- The AMU prevalence was highest in adult intensive care units (ICU) (70.4%) and lowest in psychiatry wards (7.8%)
- Most antimicrobials were administered via the parenteral or intravenous (IV) route (63%)
- For 91% of antimicrobial prescriptions, the indication was documented. Treatment of infection (78.8%), surgical antimicrobial prophylaxis (SAP) (9.5%) and medical prophylaxis (9.2%) were the commonest reasons:
 - Of prescriptions to treat infection, community infections represented the majority (72%), followed by hospital (24%) and long-term care facility infections (3%)
 - The commonest infection sites for treatment antimicrobials were; respiratory tract (36%), skin, soft tissue and surgical site (15%), urinary tract (11%) and intra-abdominal (10%)
- Of SAP prescriptions, the majority (69.4%) exceeded single-dose. Indeed, 36% exceeded 24 hours duration
- Compared with PPS 2012, only a slight reduction in the proportion of SAP exceeding single dose was observed (73% to 69.4%) and the duration in Ireland was double that in Scotland, with 69.4% of SAP continued beyond one dose versus 35.1%
- Twenty agents collectively accounted for 90% of prescribed antibacterials. Broad spectrum β lactam- β lactamase inhibitor combination antimicrobials (i.e., co-amoxiclav and piperacillin-tazobactam) together accounted for 36%. Meropenem ranked tenth (3%) and for 49 hospitals that participated in both PPS, while the meropenem ranking remained unchanged, an 8% increase in prescriptions was observed
- The HAI and AMU prevalence results of the 46 acute public hospitals are categorised by their respective hospital groups, with 14 private hospitals categorised separately. Owing to differences in hospital types and case mix, direct comparison of HAI and AMU prevalence is not recommended

Future Priorities

1. Ensure all acute hospital staff have been made aware of the local PPS results in 2017, along with observed changes since 2012, for the 49 hospitals that participated in both PPS to date
2. Provide ongoing education and training for healthcare workers, regarding the importance and impact of HAI and antimicrobial resistance and the need for antimicrobial stewardship
3. Minimise the risk of the most common HAI types;
 - a. Develop and implement national evidence-based multi-modal preventative strategies for hospital acquired pneumonia
 - b. Develop and implement national evidence-based multi-modal preventative strategies for surgical site infection, with particular emphasis on improving compliance with recommendations on duration of SAP
4. Monitor and measure the incidence of the most common HAI types, prioritising SSI and pneumonia, through the implementation of prospective surveillance programmes
5. Implement the core, high impact interventions to promote prudent antimicrobial prescribing
6. Ensure that frontline healthcare worker staffing levels reflect patient case mix and dependency levels
7. Ensure that infection prevention and control, antimicrobial stewardship and surveillance staffing levels reflect patient case mix and that such staff are not diverted to tasks outside their designated roles and that activities related to prevention of antimicrobial resistance and HAI are appropriately resourced
8. Ensure that future strategic developments in Irish healthcare includes infrastructure and information technology that support the prevention of HAI and antimicrobial resistance and the timely measurement and reporting of surveillance data
9. Plan for periodic repeat PPS, locally and nationally to monitor and measure improvements in HAI prevalence and antimicrobial prescribing practices. An annual PPS of AMU is already performed by most Irish hospitals

Plain Language Summary

Background

During May 2017, 60 Irish hospitals took part in a European hospital survey. The survey was coordinated in Ireland by the Health Protection Surveillance Centre (HPSC). The HPSC is the national centre for the surveillance of infections in Ireland. The survey was carried out in 28 European countries. This was the second European survey to be performed, with the first survey completed in 2012.

During April 2017, staff members from the 60 Irish hospitals went to a training day, where they were taught how to perform the survey. The survey was then carried out in each hospital by a team of the hospital's own staff, using the same set of instructions in each hospital across the country. Once the survey was completed, the results from each hospital were collected and checked at the HPSC. The results have been put together to produce this national report for Ireland. The results for every hospital that took part were returned to each individual hospital in February 2018, to be used to help the staff to make future plans to further improve patient care.

The survey was done for the following reasons:

1. To count the number of patients with an infection that may have occurred as a result of hospital contact. A so-called 'hospital-acquired infection' or HAI for short
2. To count the number of patients in the hospitals who were prescribed antibiotics
3. To provide the Irish Government, Department of Health, Health Service Executive (HSE), the managers, doctors and nurses in all of the hospitals that took part, with information about HAI and antibiotic prescribing in Irish hospitals in 2017 and for hospitals that took part in both surveys in 2012 and 2017, an opportunity to assess progress in the five-year interval between surveys. This information is important to plan future ways to reduce the numbers of patients who get HAI and to reduce the chance that antibiotics may be prescribed unnecessarily
4. To provide members of the public with more information about HAI in Ireland and which types of infections are most commonly seen in Irish hospitals

The count of the patients with a HAI and the patients prescribed antibiotics is called 'prevalence'. These results provide us with a picture or a snapshot of the number of patients who had a HAI and the number of patients who were prescribed antimicrobials in the 60 Irish hospitals that took part in the survey in May 2017.

Hospital-Acquired Infections (HAI)

During this survey, a HAI was defined as an infection that developed more than two days after a patient was admitted to a hospital, or an infection that developed because of a medical device being inserted or a wound infection that occurred within a defined time period after an operation. HAI are important because they can cause harm to patients. Not every HAI can be prevented from happening, but every opportunity should be taken to prevent HAI, whenever possible.

There were 10,333 patients counted during the survey across 60 Irish hospitals. Of those patients, 633 had a HAI at the time of the survey. This means that the prevalence of HAI across all of the hospitals in May 2017 was 6.1%. For individual hospitals, some had an infection prevalence that was higher and for others it was lower. This means that just over one-in-twenty patients admitted to Irish hospitals in May 2017 had a HAI, which equates to around 670 patients on one day or almost 30,000 patients in one year.⁴ However, because different hospitals may admit different types of patients and have different types of medical and surgical specialists working within the hospital, it is not possible to directly compare the results of one hospital with those of another.

The commonest infection types found in the survey were:

1. Pneumonia, also known as a chest infection
2. Surgical site infection, also known as wound infection
3. Urinary tract infection, which may include infections of the bladder or kidneys
4. Bloodstream infection

In this survey, it was found that the patients who had a HAI were more likely to have some of the common 'risk factors' for developing a HAI, when they were compared with the patients who did not have a HAI. Well-known risk factors for developing HAI can include: having had an operation, having a drip or a urinary catheter, being in an intensive care unit, being older or very young in age and receiving antibiotics. Recent antibiotic use can also be a risk factor for developing *Clostridium difficile* infection. There were 30 patients being treated for *Clostridium difficile* infection during this survey.

Antibiotics are an extremely important resource for treatment of infections caused by bacteria. There is growing evidence worldwide that bacteria are becoming more and more resistant to antibiotics, so they no longer work to treat common infections. This problem is made worse by the fact that there have been very few new types of antibiotics developed to overcome this problem of resistance. It is very important that antibiotics are only used when they are absolutely necessary and that they are not used inappropriately, such as to try and treat infections caused by viruses. It is also very important that antibiotics are not used for too long and that the course of treatment is kept as short as possible. During this survey, 19 patients were reported to have infection caused by resistant *Enterobacteriaceae*, 14 by methicillin resistant *Staphylococcus aureus* (MRSA) and 14 by vancomycin resistant enterococci (VRE).

Antibiotic Use

This survey found that of 10,333 patients, 4,105 were prescribed antibiotics. This means that the prevalence of antibiotic use across all of the Irish hospitals was 39.7%. However, because different hospitals may admit different types of patients and have different types of medical and surgical specialists working within the hospital, it is not possible to directly compare the results of one hospital with those of another hospital.

About four-in-ten patients who were admitted to Irish hospitals in May 2017 were prescribed an antibiotic. This survey showed that antibiotic prescribing is very common in Irish hospitals. Many patients are admitted to hospital from home because they need to get antibiotic treatment for an infection. Patients who develop an infection while in hospital for other reasons (a so-called HAI) will often need antibiotic treatment. The results of the survey show that it is very important to make sure that antibiotic prescribing in hospitals is done properly and that antibiotics are prescribed appropriately. This in turn, will reduce the chances of antibiotic resistant bacteria emerging in our hospitals and preserve the use of antibiotics for treatment of patients in the future.

Participating Hospitals

The 60 participating hospitals, classified by hospital group or ownership are presented in Table 3.1. In Ireland, 46 acute public and 14 private hospitals participated. For the purposes of data analysis and reporting by hospital type, 14 specialist hospitals (13 public and one private) have been included together. The single specialist private hospital has not been included in the analysis of the other private hospitals, owing to the difference in case mix.

Table 3.1. Participating hospitals categorised by hospital group or ownership (continued overleaf)

Hospital Group or Affiliation	Hospital name	Hospital type
Children's Hospital group	Children's University Hospital, Temple Street	Specialist
	Our Lady's Children's Hospital, Crumlin	Specialist
	Tallaght Children's Hospital	Specialist
<i>Percentage of acute hospitals in Children's Hospital group participating in PPS</i>		<i>100%</i>
Dublin Midlands	St James's Hospital	Tertiary
	Tallaght Hospital	Tertiary
	Midland Regional Hospital, Portlaoise	Secondary
	Midland Regional Hospital, Tullamore	Secondary
	Naas General Hospital	Secondary
	Coombe Women and Infant's University Hospital	Specialist
<i>Percentage of acute hospitals in Dublin Midlands group participating in PPS</i>		<i>100%</i>
Ireland East	Mater Misericordiae University Hospital	Tertiary
	St Vincent's University Hospital	Tertiary
	Midland Regional Hospital, Mullingar	Secondary
	St Luke's General Hospital, Kilkenny	Secondary
	Wexford General Hospital	Secondary
	Our Lady's Hospital, Navan	Primary
	St Columcille's Hospital, Loughlinstown	Primary
	St Michael's Hospital, Dun Laoghaire	Primary
	Cappagh National Orthopaedic Hospital	Specialist
	National Maternity Hospital, Holles Street	Specialist
Royal Victoria Eye and Eye Hospital	Specialist	
<i>Percentage of acute hospitals in Ireland East group participating in PPS</i>		<i>100%</i>
RCSI group	Beaumont Hospital	Tertiary
	Cavan General Hospital	Secondary
	Connolly Hospital, Blanchardstown	Secondary
	Our Lady of Lourdes Hospital, Drogheda	Secondary
	Louth County Hospital	Primary
	Rotunda Hospital	Specialist
	St Luke's Hospital, Rathgar	Specialist
<i>Percentage of acute hospitals in RCSI group participating in PPS</i>		<i>100%</i>

Table 3.1 (continued). Participating hospitals categorised by hospital group or ownership

Hospital Group or Affiliation	Hospital name	Hospital type
Saolta group	Galway University Hospital	Tertiary
	Letterkenny University Hospital	Secondary
	Mayo University Hospital, Castlebar	Secondary
	Portiuncula University Hospital, Ballinasloe	Secondary
	Sligo University Hospital	Secondary
	Roscommon County Hospital	Primary
<i>Percentage of acute hospitals in Saolta group participating in PPS</i>		<i>100%</i>
South/South-West group	Mercy University Hospital	Secondary
	South Infirmary/Victoria University Hospital	Secondary
	South Tipperary General Hospital, Clonmel	Secondary
	University Hospital Tralee, Tralee	Secondary
	Bantry General Hospital	Primary
	Kilcreene Regional Orthopaedic Hospital, Kilkenny	Specialist
<i>Percentage of acute hospitals in South/South-West group participating in PPS</i>		<i>67%</i>
UL group	University Hospital Limerick	Tertiary
	St John's Hospital Limerick	Primary
	University Hospital Ennis	Primary
	University Hospital Nenagh	Primary
	Croom Orthopaedic Hospital	Specialist
	University Maternity Hospital, Limerick	Specialist
<i>Percentage of acute hospitals in UL group participating in PPS</i>		<i>100%</i>
Private	Aut Even Hospital, Kilkenny	Private
	Beacon Hospital, Sandyford	Private
	Blackrock Clinic	Private
	Bon Secours Hospital, Limerick at Barringtons	Private
	Bon Secours Hospital, Cork	Private
	Bon Secours Hospital, Galway	Private
	Bon Secours Hospital, Glasnevin	Private
	Bon Secours Hospital, Tralee	Private
	Galway Clinic	Private
	Hermitage Medical Clinic	Private
	Mater Private Hospital, Cork	Private
	Mater Private Hospital, Dublin	Private
	St Vincent's Private Hospital	Private
	Sports Surgery Clinic, Santry	Specialist
<i>Percentage of private hospitals participating in PPS</i>		<i>100%</i>
Percentage of all acute hospitals participating in PPS		95%
Other	National Rehabilitation Hospital, Dun Laoghaire	Specialist
TOTAL NUMBER OF PARTICIPATING HOSPITALS		60

* For the purpose of data analysis, Santry Sports Surgery Clinic is included in the specialist hospital category, along with the public specialist hospitals

HAI & AMU Prevalence by Hospital Ownership & Type

Sixty acute hospitals (46 public, 14 private) participated in PPS 2017. The overall HAI prevalence for public hospitals was slightly higher than that for private hospitals (6.2% versus 5.8%). The overall AMU prevalence for public hospitals was lower than that of private hospitals (38.8% versus 45.6%), as shown in Table 4.35.

Table 4.35. Participating hospitals by ownership, overall HAI and AMU prevalence

Hospitals	N participating hospitals	N eligible patients	HAI prevalence (%)	95% CI		AMU prevalence (%)	95% CI	
				Lower	Upper		Lower	Upper
Public	46	8,989	6.2	5.7	6.7	38.8	37.8	39.9
Private	14	1,344	5.8	4.6	7.2	45.6	42.9	48.3
Total	60	10,333	6.1	5.7	6.6	39.7	38.8	40.7

Table 4.36, Figures 4.34 and 4.35 display HAI and AMU prevalence by hospital type. For the purposes of analysis by hospital type, 13 specialist public and one specialist private hospital have been grouped together. The specialist private hospital has not been included in the analysis of the private hospitals (hence, there are 14 private hospitals in Table 4.35 compared with 13 in Table 4.36). The HAI prevalence was highest in tertiary (8.7%) and lowest in specialist (3.4%) hospitals. The AMU prevalence was quite similar across public hospitals (38.8–42.9%), highest in private hospitals (45.4%) and lowest in specialist hospitals (26.5%). However, private hospitals had a much higher percentage of patients on surgical wards (37%) in comparison to public hospitals (20%), a factor which may have contributed to the higher AMU prevalence observed in private hospitals.

Table 4.36. Participating hospitals by type, overall HAI and AMU prevalence

Hospitals	N participating hospitals	N eligible patients	HAI prevalence (%)	95% CI		AMU prevalence (%)	95% CI	
				Lower	Upper		Lower	Upper
Primary	9	577	7.6	5.6	10.1	38.8	34.8	42.9
Secondary	17	3,514	4.2	3.5	4.9	39.0	37.4	40.7
Tertiary	7	3,700	8.7	7.8	9.6	42.9	41.3	44.5
Specialist*	14	1,229	3.4	2.5	4.6	26.5	24.1	29.1
Private†	13	1,313	5.9	4.7	7.4	45.4	42.7	48.1

*includes one private specialist hospital; †excludes one private specialist hospital

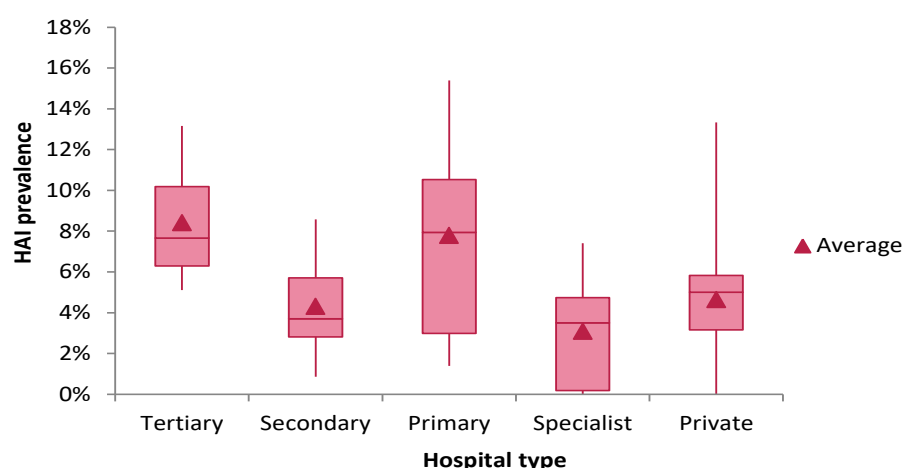


Figure 4.34. HAI prevalence box plots by hospital type

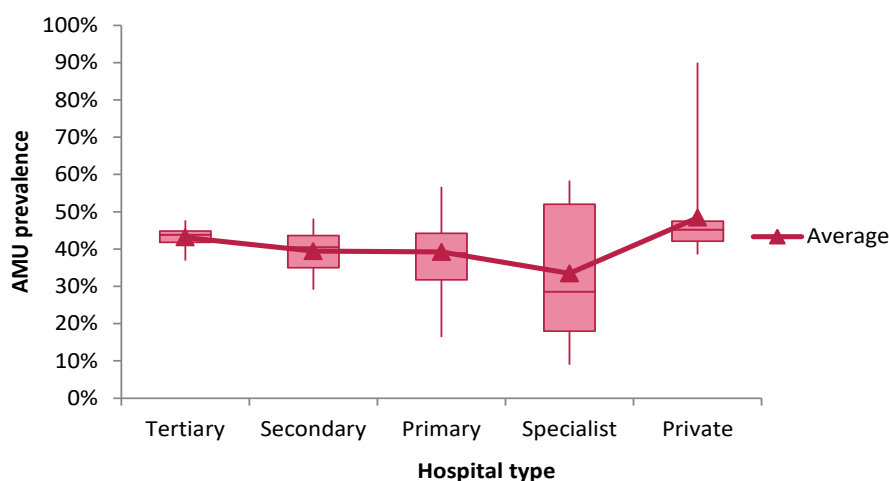


Figure 4.35. AMU prevalence box plots by hospital type

Table 4.37 displays the HAI and AMU prevalence by participating hospital in PPS 2017, with further breakdown of HAI prevalence (overall HAI and HAI deemed acquired in the participating hospital). For the purposes of reporting, the 46 public hospitals are presented by hospital group and the private hospitals are grouped separately. Direct comparison of HAI and AMU prevalence in acute hospitals within the same group is not recommended, owing to differences in hospital type and case mix. Likewise, direct comparison of HAI and AMU prevalence between private hospitals is not recommended. Inter-hospital comparisons between similar hospital types should be undertaken with caution, as individual hospitals have differing patient case mix and acuity. For example, elective admissions only versus both elective and emergency admissions, predominance of day surgery versus major surgery, admissions to an on-site emergency department (ED) or critical care unit versus no on-site ED and critical care unit, etc. Such factors will have significant impact on the prevalence of HAI and AMU within and between hospitals and limit the validity of inter-hospital comparisons.

Table 4.38 compares the HAI and AMU prevalence for the 49 hospitals that participated in both PPS 2012 and 2017.

Table 4.37a. HAI & AMU prevalence by participating hospital, with public hospitals presented in their Hospital Group (continued overleaf).

HSE Hospital Group	Hospital name	Hospital type	Number of eligible patients	HAI prevalence				Antimicrobial use prevalence	
				All HAI		Current hospital*		N	%
				N	%	N	%	N	%
Children's Hospital group	Children's University Hospital, Temple Street	Specialist	78	5	6.4	3	3.8	42	53.8
	Our Lady's Childrens Hospital, Crumlin	Specialist	172	8	4.7	7	4.1	82	47.7
	Tallaght Children's Hospital	Specialist	28	0	0.0	0	0.0	8	28.6
Dublin Midlands	St James's Hospital	Tertiary	607	70	11.5	66	10.9	258	42.5
	Tallaght Hospital	Tertiary	418	32	7.7	27	6.5	172	41.1
	Midland Regional Hospital, Tullamore	Secondary	189	7	3.7	5	2.6	91	48.1
	Naas General Hospital	Secondary	184	12	6.5	11	6.0	83	45.1
	Midland Regional Hospital, Portlaoise	Primary	116	1	0.9	1	0.9	43	37.1
	Coombe Women and Infant's University Hospital	Specialist	178	8	4.5	7	3.9	32	18.0
Ireland East	Mater Misericordiae University Hospital	Tertiary	570	75	13.2	64	11.2	255	44.7
	St Vincent's University Hospital	Tertiary	455	27	5.9	25	5.5	204	44.8
	Midland Regional Hospital, Mullingar	Secondary	174	3	1.7	2	1.1	57	32.8
	St Luke's General Hospital, Kilkenny	Secondary	205	3	1.5	3	1.5	83	40.5
	Wexford General Hospital	Secondary	180	15	8.3	14	7.8	63	35.0
	Our Lady's Hospital, Navan	Primary	76	8	10.5	8	10.5	32	42.1
	St Columcille's Hospital, Loughlinstown	Primary	96	8	8.3	8	8.3	28	29.2
	St Michael's Hospital, Dun Laoghaire	Primary	72	1	1.4	1	1.4	28	38.9
	National Maternity Hospital, Holles Street	Specialist	198	5	2.5	5	2.5	41	20.7
	Cappagh National Orthopaedic Hospital	Specialist	78	5	6.4	3	3.8	14	17.9
	Royal Victoria Eye and Eye Hospital	Specialist	15	0	0.0	0	0.0	8	53.3
RCSI group	Beaumont Hospital	Tertiary	634	56	8.8	54	8.5	278	43.8
	Cavan & Monaghan Hospital	Secondary	233	13	5.6	13	5.6	100	42.9
	Connolly Hospital, Blanchardstown	Secondary	255	9	3.5	7	2.7	100	39.2
	Our Lady of Lourdes Hospital, Drogheda	Secondary	337	16	4.7	14	4.2	98	29.1
	Louth County Hospital	Primary	55	8	14.5	5	9.1	9	16.4
	Rotunda Hospital	Specialist	145	2	1.4	1	0.7	26	17.9
	St Luke's Hospital, Rathgar	Specialist	42	2	4.8	1	2.4	12	28.6

Table 4.37a continued. HAI & AMU prevalence by participating HSE hospital presented in their Hospital Group

HSE Hospital Group	Hospital name	Hospital type	Number of eligible patients	HAI prevalence				Antimicrobial use prevalence	
				All HAI N	All HAI %	Current hospital* N	Current hospital* %	N	%
Saolta group	Galway University Hospital	Tertiary	586	40	6.8	36	6.1	216	36.9
	Letterkenny University Hospital	Secondary	279	14	5.0	11	3.9	119	42.7
	Mayo University Hospital, Castlebar	Secondary	249	9	3.6	8	3.2	101	40.6
	Portiuncula University Hospital, Ballinasloe	Secondary	133	8	6.0	8	6.0	58	43.6
	Sligo University Hospital	Secondary	284	8	2.8	7	2.5	97	34.2
	Roscommon County Hospital	Primary	52	8	15.4	8	15.4	23	44.2
South/ South-West group	Cork University Hospital	Tertiary	†	†	†	†	†	†	†
	University Hospital Waterford	Tertiary	†	†	†	†	†	†	†
	Mercy University Hospital	Secondary	210	12	5.7	12	5.7	95	45.2
	South Infirmary/Victoria University Hospital	Secondary	70	6	8.6	3	4.3	25	35.7
	South Tipperary General Hospital, Clonmel	secondary	169	3	1.8	3	1.8	79	46.7
	University Hospital Tralee, Tralee	Secondary	247	8	3.2	7	2.8	79	32.0
	Bantry General Hospital	Primary	63	5	7.9	5	7.9	20	31.7
	Mallow General Hospital	Primary	†	†	†	†	†	†	†
UL group	Kilcreene Regional Orthopaedic Hospital, Kilkenny	Specialist	12	0	0.0	0	0.0	7	58.3
	University Hospital Limerick	Tertiary	430	22	5.1	22	5.1	205	47.7
	St John's Hospital Limerick	Primary	67	2	3.0	2	3.0	38	56.7
	University Hospital Ennis	Primary	54	1	1.9	1	1.9	30	55.6
	University Hospital Nenagh	Primary	42	3	7.1	3	7.1	16	38.1
	Croom Orthopaedic Hospital	Specialist	27	2	7.4	2	7.4	13	48.1
Other	University Maternity Hospital, Limerick	Specialist	136	1	0.7	1	0.7	16	11.8
	National Rehabilitation Hospital, Dun Laoghaire	Specialist	89	4	4.5	3	3.4	8	9.0
TOTAL FOR ALL HSE HOSPITALS			8,989	555	6.2	497	5.5	3,492	38.8
TOTAL FOR ALL PARTICPATING HOSPITALS			10,333	633	6.1	564	5.5	4,105	39.7

Table 4.37b. HAI & AMU prevalence by private hospital

Hospital Group	Hospital name	Hospital type	Number of eligible patients	HAI prevalence				Antimicrobial use prevalence	
				All HAI		Current hospital*		N	%
				N	%	N	%	N	%
Private	Aut Even Hospital, Kilkenny	Private	31	0	0.0	0	0.0	14	45.2
	Beacon Hospital, Sandyford	Private	130	7	5.4	7	5.4	59	45.4
	Blackrock Clinic	Private	120	7	5.8	7	5.8	64	53.3
	Bon Secours Hospital, Limerick at Barringtons	Private	10	0	0.0	0	0.0	9	90.0
	Bon Secours Hospital, Cork	Private	183	6	3.3	5	2.7	75	41.0
	Bon Secours Hospital, Galway	Private	59	1	1.7	1	1.7	28	47.5
	Bon Secours Hospital, Glasnevin	Private	80	4	5.0	4	5.0	38	47.5
	Bon Secours Hospital, Tralee	Private	79	4	5.1	4	5.1	34	43.0
	Galway Clinic	Private	109	8	7.3	7	6.4	42	38.5
	Hermitage Medical Clinic	Private	95	3	3.2	3	3.2	39	41.1
	Mater Private Hospital, Cork	Private	57	2	3.5	2	3.5	24	42.1
	Mater Private Hospital, Dublin	Private	180	24	13.3	16	8.9	81	45.0
	Sports Surgery Clinic, Santry	Private	31	0	0.0	0	0.0	17	54.8
	St Vincents Private Hospital	Private	180	12	6.7	11	6.1	89	49.4
TOTAL FOR ALL PRIVATE HOSPITALS			1,344	78	5.8	67	5.0	613	45.6
TOTAL FOR ALL PARTICPATING HOSPITALS			10,333	633	6.1	564	5.5	4,105	39.7

*HAI which were acquired in the current hospital (based on the origin of the first HAI reported per patient); †Did not participate

Table 4.38. Comparison of HAI & AMU prevalence for 49 hospitals participating in both 2017 & 2012 PPS (continued overleaf)

HSE Hospital Group	Hospital name	Hospital type	2017			2012		
			Number of eligible patients	HAI prevalence %	AMU prevalence %	Number of eligible patients	HAI prevalence %	AMU prevalence %
Children's Hospital group	Children's University Hospital, Temple Street	Specialist	78	6.4	53.8	72	5.6	37.5
	Our Lady's Childrens Hospital, Crumlin	Specialist	172	4.7	47.7	151	5.3	46.4
	Tallaght Children's Hospital	Specialist	28	0.0	28.6	*	*	*
Dublin Midlands	St James's Hospital	Tertiary	607	11.5	42.5	727	6.3	30.0
	Tallaght Hospital	Tertiary	418	7.7	41.1	496	6.0	38.7
	Midland Regional Hospital, Tullamore	Secondary	189	3.7	48.1	152	3.9	48.0
	Naas General Hospital	Secondary	184	6.5	45.1	169	5.9	49.1
	Midland Regional Hospital, Portlaoise	Primary	116	0.9	37.1	108	0.0	36.1
	Coombe Women and Infant's University Hospital	Specialist	178	4.5	18.0	197	4.1	21.8
	Ireland East	St Vincent's University Hospital	Tertiary	455	5.9	44.8	354	7.3
Midland Regional Hospital, Mullingar		Secondary	174	1.7	32.8	186	3.2	39.2
St Luke's General Hospital, Kilkenny		Secondary	205	1.5	40.5	148	2.0	33.1
Wexford General Hospital		Secondary	180	8.3	35.0	156	3.8	34.6
Our Lady's Hospital, Navan		Primary	76	10.5	42.1	105	1.9	30.5
St Columcille's Hospital, Loughlinstown		Primary	96	8.3	29.2	104	5.8	36.5
St Michael's Hospital, Dun Laoghaire		Primary	72	1.4	38.9	67	4.5	38.8
Cappagh National Orthopaedic Hospital		Specialist	78	6.4	17.9	26	7.7	34.6
National Maternity Hospital, Holles Street		Specialist	198	2.5	20.7	171	2.3	18.1
Royal Victoria Eye and Eye Hospital	Specialist	15	0.0	53.3	20	5.0	35.0	
RCSI group	Beaumont Hospital	Tertiary	634	8.8	43.8	558	10.9	37.3
	Cavan & Monaghan Hospital	Secondary	233	5.6	42.9	206	3.4	36.9
	Connolly Hospital, Blanchardstown	Secondary	255	3.5	39.2	189	3.2	36.5
	Our Lady of Lourdes Hospital, Drogheda	Secondary	337	4.7	29.1	340	4.1	37.1
	Louth County Hospital	Primary	55	14.5	16.4	33	3.0	6.1
	Rotunda Hospital	Specialist	145	1.4	17.9	196	4.6	18.9
	St Luke's Hospital, Rathgar	Specialist	42	4.8	28.6	66	12.1	21.2

Table 4.38. Comparison of HAI & AMU prevalence for 49 hospitals participating in both 2017 & 2012 PPS

HSE Hospital Group/ Affiliation	Hospital name	Hospital type	Number of eligible patients	HAI prevalence		Antimicrobial use		Number of eligible patients	HAI prevalence		Antimicrobial use	
				N	%	N	%		N	%	N	%
Saolta group	Galway University Hospital	Tertiary	586	40	6.8	216	36.9	600	41	6.8	249	41.5
	Letterkenny University Hospital	Secondary	279	14	5.0	119	42.7	293	7	2.4	105	35.8
	Mayo University Hospital, Castlebar	Secondary	249	9	3.6	101	40.6	†	†	†	†	†
	Portiuncula University Hospital, Ballinasloe	Secondary	133	8	6.0	58	43.6	136	3	2.2	52	38.2
	Sligo University Hospital	Secondary	284	8	2.8	97	34.2	191	9	4.7	64	33.5
	Roscommon County Hospital	Primary	52	8	15.4	23	44.2	48	11	22.9	20	41.7
South/ South-West group	Cork University Hospital	Tertiary	†	†	†	†	†	†	†	†	†	†
	University Hospital Waterford	Tertiary	†	†	†	†	347	23	6.6	101	29.1	
	Mercy University Hospital	Secondary	210	12	5.7	95	45.2	158	8	5.1	58	36.7
	South Infirmary/Victoria University Hospital	Secondary	70	6	8.6	25	35.7	91	5	5.5	34	37.4
	South Tipperary General Hospital, Clonmel	Secondary	169	3	1.8	79	46.7	139	14	10.1	65	46.8
	University Hospital Tralee, Tralee	Secondary	247	8	3.2	79	32.0	221	9	4.1	58	26.2
	Bantry General Hospital	Primary	63	5	7.9	20	31.7	†	†	†	†	†
	Mallow General Hospital	Primary	†	†	†	†	†	†	†	†	†	†
UL group	Kilcreene Regional Orthopaedic Hospital, Kilkenny	Specialist	12	0	0.0	7	58.3	14	0	0.0	10	71.4
	University Hospital Limerick	Tertiary	430	22	5.1	205	47.7	345	27	7.8	157	45.5
	St John's Hospital Limerick	Primary	67	2	3.0	38	56.7	37	1	2.7	21	56.8
	University Hospital Ennis	Primary	54	1	1.9	30	55.6	51	3	5.9	24	47.1
	University Hospital Nenagh	Primary	42	3	7.1	16	38.1	49	2	4.1	17	34.7
	Croom Orthopaedic Hospital	Specialist	27	2	7.4	13	48.1	32	1	3.1	2	6.3
Private	University Maternity Hospital, Limerick	Specialist	136	1	0.7	16	11.8	149	2	1.3	15	10.1
	Aut Even Hospital, Kilkenny	Private	31	0	0.0	14	45.2	†	†	†	†	†
	Beacon Hospital, Sandyford	Private	130	7	5.4	59	45.4	129	2	1.6	75	58.1
	Blackrock Clinic	Private	120	7	5.8	64	53.3	†	†	†	†	†
	Bon Secours Hospital, Limerick at Barringtons	Private	10	0	0.0	9	90.0	†	†	†	†	†
	Bon Secours Hospital, Cork	Private	183	6	3.3	75	41.0	199	6	3.0	48	24.1
	Bon Secours Hospital, Galway	Private	59	1	1.7	28	47.5	48	1	2.1	20	41.7
	Bon Secours Hospital, Glasnevin	Private	80	4	5.0	38	47.5	101	2	2.0	37	36.6
Bon Secours Hospital, Tralee	Private	79	4	5.1	34	43.0	89	1	1.1	35	39.3	

* Tallaght Children's Hospital data reported within Tallaght Hospital data in PPS 2012

PPS Ireland 2017 versus 2012: Key Findings

Table 6.1 displays key demographics and risk factors of the population included in PPS 2012 and 2017 in Ireland.

Table 6.1. Demographics and risk factors of PPS population in 2017 and 2012

	2017	2012
Total number of surveyed patients	10,333	9,030
Number (%) of patients aged <16 years	1,011 (10)	1,092 (12)
Median age (years) [IQR]	67 [43-79]	63 [36-77]
Number (%) of patients aged ≥65	5,561 (54)	4,330 (48)
Number (%) of patients who have had surgery since admission to hospital	1,857 (18)	1,591 (18)
Number (%) of patients with peripheral line (PVC) <i>in situ</i> at the time of survey	5,032 (49)	3,679 (41)
Number (%) of patients with a central line (CVC) <i>in situ</i> at the time of survey	794 (8)	544 (6)
Number (%) of patients with a urinary catheter <i>in situ</i> at the time of survey	1,376 (13)	1,119 (12)
Number (%) of patients intubated at the time of survey	176 (2)	127 (1)

There were 49 acute hospitals that participated in both PPS 2012 and 2017 (accounting for 94% and 81% of all reported HAI per PPS, respectively). There was no major difference observed in the rank order of HAI for those hospitals, other than a 192% increase in the top-ranking category of ‘pneumonia and lower respiratory tract infections’. A welcome reduction in the proportion of UTI deemed catheter-associated from 44.9% to 37.8% and in the proportion of BSI deemed device-related from 60% to 25.9% was observed.

The prescribed antimicrobials were similar between both PPS, with a drop in rank of ciprofloxacin from 3rd to 5th position, equating to a 21% reduction. While meropenem retained its ranking of 10th in both PPS, an 8% increase in meropenem prescriptions between the two PPS was observed.

Appendix: List of Acronyms

AMP	Antimicrobial Pharmacist
AMU	Antimicrobial Use
BSI	Bloodstream Infection
CDI	<i>Clostridium difficile</i> infection
C3G	3 rd Generation Cephalosporin
ECDC	European Centre for Disease Prevention and Control
ED	Emergency Department
EEA	European Economic Area
EU	European Union
HAI	Hospital Acquired Infections
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
ICU	Intensive Care Unit
IPCD	Infection Prevention & Control Doctor
IPCN	Infection Prevention & Control Nurse
IV	Intravenous (Parenteral)
MRSA	Meticillin/Flucloxacillin Resistant <i>Staphylococcus aureus</i>
PN	Pneumonia
PPS	Point Prevalence Survey
SAP	Surgical Antimicrobial Prophylaxis
SSI	Surgical Site Infection
UTI	Urinary Tract Infection
VRE	Vancomycin Resistant Enterococci
WTE	Whole Time Equivalent