Hospital Infection Society

Infection Control Nurses Association

The Third Prevalence Survey of Healthcare Associated Infections in Acute Hospitals

Republic of Ireland
Preliminary results
20th October 2006

hpsc

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

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This report has been prepared by Dr. Fidelma Fitzpatrick on behalf of Prof. Hilary Humphreys, Dr. Robert Cunney, (all of whom comprised the Irish members of the UK and Ireland Hospital Infection Society Prevalence Survey Steering group), the Health Protection Surveillance Centre and the Health Services Executive.

The Health Services Executive provided financial support for the survey, which enabled data collection teams of nurses and administrators to be employed.

This report contains the preliminary results of the Hospital Infection Society Prevalence Survey for the Republic of Ireland and also preliminary results from the UK (excluding Scotland). There is no statistical analysis performed on these figures; the UK and Republic of Ireland database is due to be analysed by the Hospital Infection Society Prevalence Survey statistician in late 2006.

Foreword

Healthcare-associated infection (HCAI) is increasingly recognised as an important cause of patient morbidity and mortality and contributes significantly to healthcare costs. HCAI is not new but has become more prominent in recent years arising from the complexity of patients now seeking care in our hospitals and developments in healthcare, which in some instances, render patients more vulnerable to infection, e.g. new treatments for cancer. In addition, HCAI represents an adverse outcome from acute hospital care and therefore can be used as a quality indicator for the overall assessment of hospital treatment.

Although Irish hospitals have participated in previous surveys of HCAI, and many hospitals carry out regular surveillance of HCAI, the third prevalence survey of healthcare-associated infections in acute hospitals, jointly sponsored by the Hospital Infection Society (HIS) and the Infection Control Nurses Association (ICNA), is the first time that most acute hospitals in Ireland have had the opportunity to collect detailed information on the prevalence of HCAI in their hospital and compare their data directly with that from other hospitals in Ireland as well as data from England, Wales, Northern Ireland, and Scotland. Furthermore, this survey represents a benchmark for determining the future impact of measures to reduce infections in our hospitals.

This survey would not have been possible without the commitment, enthusiasm and drive of infection control and prevention teams throughout Irish hospitals, who committed considerable amounts of time to this survey in addition to carrying out their normal duties. We also acknowledge the contribution and commitment of staff at the Health Protection Surveillance Centre (HPSC) and the Health Services Executive (HSE). The HSE provided funding to employ data collectors who were available to assist local infection control and prevention teams. We believe that the information arising from this survey will be of interest to all, not least patients and the public themselves, who are increasingly concerned about adverse advents in hospitals, including the acquisition of HCAI such as meticillin-resistant *Staphylococcus aureus* (MRSA).

A key objective of the prevalence survey, in addition to collecting accurate information on HCAI in Ireland, was to guide future strategies and approaches to surveillance of HCAI. Consequently, this prevalence survey must be seen as the start of a process of regular on-going surveillance as required by EU law, rather than the completion of a project, with no long-term implications. Such a national programme of surveillance, which will require funding, will not only provide important data for healthcare planning, but also reassure the public that HCAI is considered important, and that measures are being taken to reduce it.

Fidelma Fitzpatrick,
Hilary Humphreys,
Robert Cunney.
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Summary

- **45 acute adult hospitals in Ireland participated, representing the vast majority of eligible acute adult hospitals in Ireland. Because of difficulties in applying definitions to children, children's hospitals and certain other clinical areas were excluded.**
- **A total of 7518 patients were surveyed, 3512 in regional/tertiary hospitals, 3654 in general hospitals, and 352 in specialist hospitals. The average age of patients surveyed was 63.2 years.**
- **The overall rate of healthcare-associated infection (HCAI) was 4.9%. This varied from 6% in regional/tertiary hospitals, to 4.2% in general hospitals and 2% in specialist hospitals. Although the prevalence rate is lower than that found in the 2nd Prevalence Survey carried out in the 1990s, the results are not comparable as the definitions of infections used were different.**
- **1.3% (95/7518) of patients had a HCAI that was associated with a device, e.g. an intravascular catheter "(drip)". 0.5% (37/7518) of patients had an MRSA-related HCAI, and bloodstream infection associated with HCAI occurred in 0.2% (15/7518) of patients.**
- **36 (0.5%) patients had infection with *Clostridium difficile* and 7 (0.4%) patients had Norovirus infection.**
- **The most common HCAIs according to anatomical site were**
    - **Urinary tract infection (1.1% of patients), of which 56.2% were catheter-related and 7.2% were caused by MRSA.**
    - **Surgical site infection (1.1% of patients), 8.4% of which were caused by MRSA. The rate for non-implant surgery was 5.1% and for implant surgery (e.g. insertion of a prosthetic knee) was 3.7%.**
    - **Pneumonia (0.86% of patients), 18% of which were ventilator-related and 6% were caused by MRSA.**

- **Primary bloodstream infection (bacteraemia or blood poisoning) occurred in 0.5% of patients; in 13.5% of patients this was due to MRSA.**

- **This survey would not have been possible without the commitment of infection control and prevention teams in acute hospitals throughout Ireland, with the support of data collectors, who were funded by the Health Services Executive and the Health Protection Surveillance Centre.**
- **The survey took hospital infection control teams 1897 hours to conduct and this represents 207 working days (for a team that consisted of a minimum of three people)**
- **Infection control and prevention teams in the hospitals who participated indicated that they would be happy to participate in subsequent surveys but that this would not be possible without additional support**
- **This survey has provided important detailed information on the prevalence of HCAI in Irish acute hospitals. It will provide a benchmark for future interventions to determine whether or not these are effective. However, there is a need for on-going surveillance, both national and local, to guide future health policies**

1. Introduction

1.1 Background

Healthcare associated infection (HCAI) is defined as an infection that arise 48 hours or more after admission to hospital and which were not present or incubating on admission. While some HCAI are avoidable, [1] all are costly to the health service and to patients.[2] HCAI are also a source of disability and distress to the individuals affected. To reduce the burden of HCAI there is a requirement for good, representative baseline and accurate information on the burden of HCAI, collected in a rigorous and consistent manner, in order to assess the impact of preventative measures and act as a focus for future actions. Improvements in preventing and reducing rates of HCAI will lead to better care and reduced healthcare costs. A national system for HCAI surveillance is a requirement under European Commission decision 2119/98/EC and one of the key recommendations in the Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) report.[3] Ireland remains the only EU country without an effective ongoing national HCAI surveillance system.

The Hospital Infection Society (HIS) is a registered UK charity, mainly consisting of microbiologists and infection control nurses that have a particular interest in HCAI. Many Irish microbiologists and Infection Control Nurses are members of the HIS. The Infection Control Nurses Association (ICNA) is the professional organisation for infection control nurses, and includes members in both the UK and Ireland. Two HIS/ICNA Prevalence Surveys of HCAI were carried out previously in the UK, one in 1980 and the other in 1993. The overall prevalence of infection in these two surveys was approximately 10%.

In addition to hospitals in England, Wales, Northern Ireland and Scotland, seven Irish hospitals participated in the 1993 HIS/ICNA Prevalence Survey.

In 2005 the Department of Health in London approached both organisations and asked them to carry out another prevalence survey of HCAI in the UK. Because of the very close links between professionals in the area in the UK and Ireland, the Republic of Ireland was also invited by both

organisations to participate. The participation of hospitals in the Republic had the support of relevant professional organisations (Irish Society of Clinical Microbiologists (ISCM), ICNA, Surveillance Scientists Association of Ireland (SSoI)) and the Health Services Executive (HSE). In addition, both the National SARI Committee and the SARI Infection Control Sub-committee approved and encouraged participation in the survey by Irish Infection control teams (ICT's). All believed that this was an opportunity for Irish hospitals to participate in a survey which for the first time would provide comparable data with the UK. In addition, it was hoped that the HIS/ICNA Prevalence Survey would highlight key areas on which to focus future Irish national HCAI surveillance initiatives.

1.2 Aims of the HIS/ICNA Prevalence Survey

The aims of the third HIS/ICNA Prevalence survey of HCAI were:

- To provide participating hospitals with standardised data on the prevalence of HCAI within their own institution, along with timely feedback of national aggregate data, to inform local infection control programmes and future surveillance initiatives.
- To provide the Department of Health & Children (DoH&C) and the HSE, with baseline information on the prevalence of HCAI in acute hospitals in the Republic of Ireland, and to participate with the UK Department of Health (DH) in a similar exercise. This information will be available to guide priority setting in the development of strategy and policy.
- To help identify appropriate methodologies and priorities in establishing a national routine surveillance system for HCAI in Ireland, including perhaps repeated prevalence surveys. Data derived from surveillance will help monitor the effectiveness of measures taken nationally to reduce the burden of HCAI.
- To maintain compatibility with studies performed in other countries, e.g. Scotland.
- To enable comparisons to be made between the respective countries.
- To publish survey results locally and in the Journal of Hospital Infection.

2. Methods

2.1 HIS/ICNA Prevalence Survey in the UK

The HIS/ICNA Prevalence Survey was coordinated by the HIS and monitored by the HCAI Prevalence Survey Steering Group appointed by the HIS. The HIS appointed a lead for the project (Dr. Edward Smyth, Director, Northern Ireland HCAI Surveillance Centre, The Royal Hospitals, Belfast) and a project central coordinator. (Ms. Joanne Enstone) The HIS Steering group contained three Irish members, Prof. Hilary Humphreys, chair, National SARI committee, Dr. Robert Cunney, Consultant Microbiologist, Health Protection Surveillance Centre (HPSC) and Dr. Fidelma Fitzpatrick, Irish Coordinator of the HIS/ICNA Prevalence Survey, HPSC (joined October 2005).

The 2006 HIS/ICNA Prevalence Survey was designed as a point prevalence survey. While ideally all data collection in each participating hospital should be completed on a single day, the HIS/ICNA realised that completion of the HIS/ICNA Prevalence Survey on a single day was not feasible even for the smallest centres. Therefore they advised that at least one ward should be completed on a single day and the overall hospital as soon as possible within a 12 week study period (1st March 2006 to 30th May 2006). Data was collected on a one-page double-sided paper sheet, which was subsequently scanned into a computer for analysis. No identifiable patient data was collected. Data on all active HCAI with special emphasis placed on four main system infections:

- Primary bloodstream infections,
- Pneumonia,
- Urinary tract infections
- Surgical site infections were collected.

The initial protocol for the HIS/ICNA prevalence survey was amended after pilot surveys in a number of hospitals in the UK in late 2004.

A major criticism of the Second National Prevalence HIS/ICNA Prevalence Survey 1993/4 was the inability to provide timely and relevant information to participants. In order to address this issue a

HCAI Prevalence Survey secure website, linked to both the HIS and ICNA websites, was developed to promote and disseminate information to participating hospitals. Participating hospitals have access to their own data through a secure web-based reporting system. Analytical software was developed and provided access for ICT's to download local results.

2.2 Organisation of the HIS/ICNA Prevalence Survey in Ireland

The Irish protocol and survey questionnaire were identical to that used in England, Wales and Northern Ireland. The HIS/ICNA Prevalence Survey in Ireland was co-ordinated and organised through the HPSC in conjunction with the Irish members of the HIS Steering group. The HPSC team included Ms. Orla Bannon (OB), Senior Executive – Corporate Services, Dr. Fidelma Fitzpatrick (FF) Irish coordinator, Mr. Myles Houlden, IT Specialist, Ms. Mary Kate Mageean (MM), Project Administrator, Ms. Niamh Murphy, Surveillance Scientist and Ms. Roma Ruddy (RR), infection control nurse. In November 2005, ISCM, ICNA and SSoI members were circulated regarding participation in the survey. Each hospital was requested to nominate one member of the ICT to lead the survey in that institution.

The UK pilot surveys indicated that a team of three persons was the most efficient way to collect the survey data: these teams comprised a medical microbiologist, an infection control nurse (ICN) and another member of the ICT that completed the survey form as instructed by the microbiologist and the ICN. However, this team could not be reproduced in Irish hospitals, as many hospitals had no microbiologists and in many, the ICT consisted of one person (usually an ICN). Therefore the Irish members of the HIS steering group approached the HSE regarding funding of external data collectors, to assist local ICTs collect survey data. Funding was secured in December 2005 to facilitate co-ordination at the HPSC, and also in the temporary employment of data collectors and a senior ICN (RR).

The Irish Steering group agreed to attempt to replicate the UK teams. Eight HSE/HPSC teams of two persons (one nurse and one administrator) were employed by the HPSC to assist local ICTs in survey data collection. The Irish Steering group trained the external data collectors in survey methodology in February 2006. The HPSC team supported these teams both administratively (OB and MM) and with queries regarding survey methodology and definitions (RR and FF) during the survey. These teams were based in Dublin (three teams covering Dublin and Leinster hospitals), West (Western and Midwestern hospitals), Northwest, Midlands, South and Southeast.

Each participating hospital designated a member of the hospital's ICT to lead the survey in that institution. This person ensured the collaboration of clinical staff and hospital management and led the data collection team. The hospital ICT assisted by the HSE/HPSC data collectors was responsible for the collection and recording of survey data. The HSE/HPSC administrator liaised with the ICT regarding dates of data collection in that institution, completion of survey forms as instructed by the ICT and ensured forms were collected by courier for delivery to the HPSC. Both members of the HSE/HPSC team assisted the ICT in gathering survey data (e.g. relevant medical or nursing documentation or other healthcare records and relevant discussions with ward staff). The final decision regarding presence of HCAIs rested with the local ICT.

Two training days, explaining survey protocol, Centers for Disease Control and Prevention (CDC) definitions and organisational issues were held for participants in February and March 2006. In addition information leaflets for hospital staff and patients/members of the public were produced and circulated to participants and external data collectors and put on the HPSC website (Appendix 1&2). Data was collected between 1st March 2006 and 30th May 2006 in eligible participating hospitals on all active HCAI present on the date of survey. The survey data was collated and validated by the HPSC and subsequently forwarded to the Northern Ireland HCAI Surveillance Centre, The Royal Hospitals, Belfast in August 2006. A feedback questionnaire was circulated to participants (Appendix 3) and HSE/HPSC data collectors (Appendix 4) in June 2006.

A secure web-based reporting system, hosted on the NHS intranet, was developed by the Welsh healthcare-associated infection programme team in Cardiff UK. This enabled HIS survey participants timely access to their own results, after the official launch of survey results in October 2006 at the HIS International Conference. Participants could either analyse their own results on-line or export their results for later analysis. As Republic of Ireland participants could not access the NHS intranet, the HPSC hosted a copy of the UK programme on the E-Gov Services VPN. This system is due to go live in late November 2006.

2.3 Characteristics of the HIS/ICNA Prevalence Survey

Hospital, patient and ward eligibility criteria for the HIS/ICNA Prevalence Survey are outlined in Table 2.1. All acute hospitals with adult in-patients were eligible to participate in the survey. Specialist paediatric hospitals were excluded. Patients of all consultant specialties were included except for paediatric, rehabilitation, psychiatric and day-case patients. Hospitals were graded as regional/tertiary, general or specialist.[4]

Table 2.1: Eligibility criteria for the HIS/ICNA Prevalence Survey

	Inclusion criteria	Exclusion criteria
Hospitals	Acute hospitals with adult inpatients except those which meet the exclusion criteria	• Hospitals without access to an Infection Control Team • Hospitals providing non-acute services • Hospitals with fewer than 50 inpatient beds • Specialist Paediatric Hospitals
Wards	All wards serving adult patients except those that meet the exclusion criteria	Wards serving • Paediatric and neonatal patients • Inpatients with learning difficulties
Patients	All adult patients except those who meet the exclusion criteria	• Day patients • Patients admitted for one day for treatment or for diagnostic procedures • Patients with learning difficulties

Data was collected between 1st March 2006 and 30th May 2006 in eligible participating hospitals on all active HCAI present on the date of survey. The information was completed for each ward/unit in a single day. A HCAI was defined as a localised or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxins in the survey population and that there was no evidence that it was present or incubating at the time of admission to the participating hospital (unless the infection was related to a previous admission to that hospital). It also met the CDC criteria for a specific infection site.[5, 6] For most bacterial HCAI; this means that the infection became evident 48 hours (i.e., the typical incubation period) or more after admission. All active HCAI were recorded on the survey form, with emphasis placed on four main system infections:

- Primary bloodstream infections,
- Pneumonia,
- Urinary tract infections
- Surgical site infections.

The CDC definitions are more stringent than those used in previous surveys and therefore the data from this survey is not directly comparable to the previous prevalence survey HCAI rate of 10%.

2.4 The Survey Form

Data was entered onto a double-sided A4 sheet (Appendix 5). Completed survey forms were scanned into a database using an automated optical reader (Teleform). Results were analysed using Microsoft Excel. Consultant and ward specialty codes were aligned with the specialties recognised in the European specialist medical qualifications Order 1995 and European Primary and Specialist Dental Qualifications Regulations 1998.

The data set included:

(a) Basic demography. (e.g. survey date, consultant and ward specialty, sex, age (but not date of birth) and date of admission).

(b) Risk factors for HCAI. (e.g. Presence of indwelling devices, mechanically ventilation and whether the patient has had recent surgery).

(c) Active HCAI. Emphasis was placed on four major sites of infection (primary blood stream infection, pneumonia, urinary tract infection and surgical site infection). CDC category of pneumonia, urinary tract infection and surgical site infection was recorded.[5, 6] In addition, for each HCAI, meticillin-resistant *Staphylococcus aureus* (MRSA) infection, association with insertion of a medical device and presence of secondary bacteraemia were recorded. Considerably less detail was recorded for nine other HCAI. [5] These were

1. Bone and joint infection (which included osteomyelitis, joint, bursa and disc space infection).
2. Central nervous system infection (which included Intracranial infection, Meningitis, ventriculitis and spinal abscess).
3. Cardiovascular system infection (which included arterial and venous infection, endocarditis, myocarditis, pericarditis and mediastinitis).
4. Eye, ENT (ear, nose, throat) or mouth infection (which included conjunctivitis and other eye infections, sinusitis, oral cavity, ear, mastoid and upper respiratory tract infection, pharyngitis, laryngitis and epiglottitis).
5. Gastrointestinal system infection (which included gastroenteritis and other gastrointestinal tract infection, hepatitis and intra-abdominal infection).
6. Reproductive tract infection (which included endometritis, episiotomy, vaginal cuff and other infections of the male or female reproductive tract).
7. Skin and soft tissue infection (which included breast abscess, mastitis, infected ulcers and infections in burns).
8. Lower respiratory tract infection other than pneumonia (which included bronchitis, tracheobronchitis, tracheitis and other infections of the lower respiratory tract).
9. Systemic infection.

2.5 Data Validation and analysis

Data collected on HCAI was validated by a member of the HPSC team (RR). HCAI on one ward for a cross-sectional representation of participating hospitals was validated. Validation of the database included de-duplication, checking for inappropriate values, range and outlier checks and validation across questions. Data was stored in MS Access version 9.0 in the HPSC and analysed in MS Access version 9.0, MS Excel version 9.0 and Epi Info version 3.3.2.

2.6 Confidentiality and ethical approval

The HIS/ICNA Prevalence Survey form (Appendix 5) contained no patient identifiable data, (i.e. the name, date of birth, episode or hospital number, or address). The data extracted was anonymised before transmission to the HPSC. The HSE/HPSC administrators and nurses signed confidentiality agreements. The HSE confirmed that as in the UK, ethical approval was not required in Ireland for the survey.

3. Results

3.1 Description of the survey population

45 acute adult hospitals participated in the third HIS/ICNA Prevalence Survey of HCAI in Ireland. (Appendix 7) 7518 patients were surveyed, 3475 males and 4023 females. Hospital type, age and sex breakdown of patients surveyed is outlined in Table 3.1 and the presence of risk factors for HCAI in the survey population is outlined in Table 3.2. Most patients were located on either general medical or general surgical wards. (Fig 3.1)

Table 3.1 Hospital type, age and sex of patients surveyed

	Regional/Tertiary Hospital	General Hospital	Specialist Hospital	Total
Total surveyed	**3512**	**3654**	**352**	**7518**
Total <44 years	**604**	**737**	**160**	**1501**
Females	306	529	147	982
Males	296	205	12	513
Unknown	2	3	1	6
Total 45-64 years	**942**	**958**	**90**	**1990**
Females	409	458	51	918
Males	531	500	38	1069
Unknown	2	0	1	3
Total 66-75 years	**749**	**711**	**54**	**1514**
Females	337	328	26	691
Males	408	382	28	818
Unknown	4	1	0	5
Total >75 years	**1217**	**1246**	**47**	**2510**
Females	705	703	23	1431
Males	508	542	24	1074
Unknown	4	1	0	5
Total: Unknown age	**0**	**2**	**1**	**3**
Female	0	1	0	1
Male	0	1	0	1
Unknown sex	0	0	1	1

Table 3.2 Presence of risk factors for HCAI and patient location in the survey population

	Regional/Tertiary Hospital	General Hospital	Specialist Hospital	Total (%)
Total patients surveyed	**3512**	**3654**	**352**	**7518 (100%)**
Mean age (range)	64.4 (15-100)	63.3 (15-101)	50.4 (16-95)	63.2 (15-101)
Peripheral IV line *	2176	2569	216	4961 (66%)
Central IV line *	389	176	10	575 (7.6%)
TPN *	74	71	0	145 (1.9%)
Indwelling urinary catheter *	860	800	83	1743 (23.2%)
Other bladder instrumentation *	72	73	5	150 (2%)
Mechanical ventilation *	113	89	0	202 (2.7%)
Non-implant surgery	548	486	57	1091 (14.5%)
Implant surgery	368	320	76	764 (10.2%)
Other invasive infection	1285	1063	103	2451 (33.8%)
Antibiotics	1208	1315	51	2621 (35%)
IV antibiotics	699	649	25	1371 (18%)

* *in situ* or present in the previous 7 days

Fig 3.1 Location (ward speciality) of patients surveyed

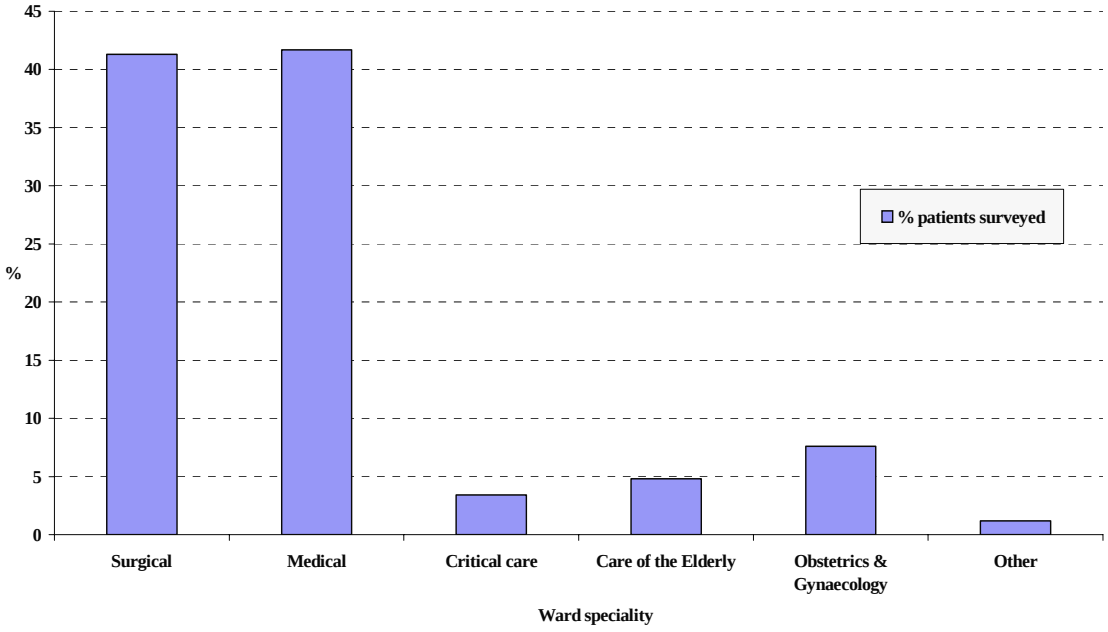


Table 3.3 outlines the attending consultant speciality of patients surveyed and Table 3.4 the location (ward speciality) of patients. In 26 patients the consultant speciality and in one patient the ward speciality was not recorded

Table 3.3 Consultant speciality of patients surveyed

Consultant speciality	Regional/Tertiary Hospital	General Hospital	Specialist Hospital	Total
Breast surgery	13	22	0	35
Cardiac surgery	14	28	0	42
Cardiology	203	245	0	448
Cardiothoracic surgery	37	29	0	66
Care of the elderly	339	241	0	580
Clinical haematology	80	14	0	94
Clinical immunology	1	3	0	4
Colorectal surgery	54	51	0	105
Dermatology	4	7	0	11
Endocrinology	174	118	0	292
ENT	75	42	12	129
Gastroenterology	165	106	0	271
General medicine	410	892	0	1302
General surgery	325	496	0	821
Genito-urinary medicine	3	3	0	6
Gynaecology	58	106	6	170
Hepatobiliary & pancreatic surgery	27	44	0	71
Hepatology	11	1	0	12
Infectious diseases	38	0	0	38
Maxillo-facial surgery	18	0	0	18
Medical oncology	169	106	88	363
Nephrology	124	44	0	168
Neurology	89	25	0	114
Neurosurgery	65	19	0	84
Obstetrics	57	237	129	423
Ophthalmology	30	15	28	73
Orthodontics	0	1	0	1
Others	5	6	8	19
Pain management	7	3	0	10
Palliative medicine	2	2	0	4
Plastic surgery	46	8	0	54
Respiratory medicine	203	176	0	379
Rheumatology	80	89	0	169
Thoracic surgery	4	1	0	5
Transplantation surgery	11	1	0	12
Trauma & orthopaedics	310	329	81	720
Upper gastrointestinal surgery	14	12	0	26
Urology	85	74	0	159
Vascular surgery	149	45	0	194
Total	**3499**	**3641**	**352**	**7492**

Table 3.3 Location (ward speciality) of patients surveyed

Ward speciality	Regional/Tertiary Hospital	General Hospital	Specialist Hospital	Total
Blood and marrow transplantation	20	0	0	20
Burns care	9	0	0	9
Cardiac surgery	13	33	0	46
Cardiology	107	60	0	167
Cardiothoracic surgery	61	19	0	80
Care of the elderly	251	112	0	363
Clinical haematology	7	2	0	9
Clinical microbiology	0	1	1	2
Colorectal surgery	52	22	0	74
Coronary care unit (ward spec only)	31	36	0	67
Critical care medicine	156	98	1	255
ENT	167	15	12	194
Gastroenterology	45	0	0	45
General medicine	802	1316	0	2118
General surgery	609	922	0	1531
Gynaecology	45	94	9	148
Hepatobiliary & pancreatic surgery	1	0	0	1
Infectious diseases	20	0	0	20
Medical high dependency	7	9	0	16
Medical oncology	148	112	67	327
Nephrology	86	25	0	111
Neurology	44	0	0	44
Neurosurgery	55	0	0	55
Obstetrics	60	234	130	424
Ophthalmology	66	0	28	94
Other wards	36	31	23	90
Plastic surgery	46	0	0	46
Respiratory medicine	96	45	0	141
Rheumatology	11	32	0	43
Surgical high dependency	9	9	0	18
Thoracic surgery	0	22	0	22
Transplantation surgery	28	0	0	28
Trauma & orthopaedics	302	368	81	751
Urology	58	36	0	94
Vascular surgery	64	0	0	64
Total	**3512**	**3653**	**352**	**7517**

The age and sex of the 2621 patients on antibiotic therapy are outlined in Table 3.5 and the consultant speciality of the attending consultant is outlined in Table 3.6. 802/2621(30%) patients on antibiotics were located on general medical, 592(23%) on general surgical and 201(7.7%) on trauma & orthopaedic wards.

Table 3.5 Age and sex of patients on antibiotics

Age Group (years)	Male	Female	Unknown	Total (% in each age group)
<45	206	276	1	483 (18.4)
45-65	387	304	1	894 (34.1)
66-75	308	243	0	648 (24.7)
>75	389	503	2	595 (22.7)
Unknown	1	0	0	1
Total	**1291**	**1326**	**4**	**2621 (100)**

Table 3.6 Consultant speciality of patients on antibiotics

Consultant speciality	Number (%) of patients on antibiotics
General Medicine	540 (20.6)
General Surgery	330 (12.6)
Trauma & Orthopaedics	198 (7.6)
Respiratory Medicine	180 (6.9)
Care of the Elderly	170 (6.5)
Cardiology	122 (4.7)
Medical Oncology	110 (4.2)
Endocrinology	106 (4)
Gastroenterology	92 (3.5)
Vascular Surgery	86 (3.3)
Nephrology	74 (2.8)
Obstetrics	64 (2.4)
Urology	63 (2.4)
ENT	63 (2.4)
Rheumatology	60 (2.3)
Gynaecology	51 (1.9)
Clinical Haematology	49 (1.9)
Colorectal Surgery	46 (1.8)
Hepatobilary & Pancreatic Surgery	30 (1.1)
Plastic Surgery	27 (1)
Cardiothoracic Surgery	25 (1)
Infectious Diseases	18 (0.7)
Opthalmology	14 (0.5)
Breast Surgery	14 (0.5)
Neurology	14 (0.5)
Neurosurgery	12 (0.5)
Cardiac Surgery	10 (0.4)
Upper Gastrointestinal Surgery	10 (0.4)
Maxillo-facial Surgery	9 (0.3)
Hepatology	8 (0.3)
Transplantation Surgery	5 (0.2)
Dermatology	4 (0.2)
Genito-Urinary Medicine	4 (0.2)
Pain Management	3 (0.1)
Palliative Medicine	2 (0.1)
Others	8 (0.3)
Total	**2621**

3.2 HCAI rates in participating Republic of Ireland hospitals

3.2.1 Overall HCAI rates

386 HCAI's in 369 patients were recorded during the survey, giving an overall prevalence of HCAI of 4.9%. (Table 3.7) 17 patients had more than one HCAI type present.

The prevalence of HCAI was highest in regional/tertiary hospitals (6%) and lowest in specialist hospitals (2%). The age and sex breakdown of patients with HCAI are outlined in Table 3.8.

Table 3.7: HCAI Prevalence rates: Overall and breakdown by HCAI type

	Regional/Tertiary Hospital	General Hospital	Specialist Hospital	Total
Total survey population	**3512**	**3654**	**352**	**7518**
HCAI	210 (6%)	152 (4.2%)	7 (2%)	**369 (4.9%)**
MRSA-related HCAI	19 (0.5%)	18 (0.5%)	0	**37 (0.5%)**
Device*-related HCAI	46 (1.3%)	46 (1.3%)	3 (0.9%)	**95 (1.3%)**
Secondary bloodstream infection	6 (0.2%)	7 (0.2%)	2 (0.6%)	**15 (0.2%)**
Primary bloodstream infection	27 (0.8%)	10 (0.3%)	0	**37 (0.5%)**
Pneumonia	39 (1.1%)	25 (0.7%)	1 (0.3%)	**65 (0.9%)**
Urinary Tract Infection	41 (1.1%)	40 (1.1%)	2 (0.6%)	**83 (1.1%)**
Surgical site infection	50 (1.4%)	32 (0.9%)	1 (0.3)	**83 (1.1%)**
Other HCAI +	62 (1.8%)	53 (1.5%)	3 (0.9%)	**118 (1.6%)**

Device*: Central-line related primary bloodstream infection, catheter-related urinary tract infection, ventilator-associated pneumonia and device-related "other" HCAI

Other HCAI +: bone, central nervous system, cardiovascular infection, eyes ENT and mouth, gastrointestinal system, reproductive tract, skin and soft tissue, systemic, lower respiratory tract (other than pneumonia)

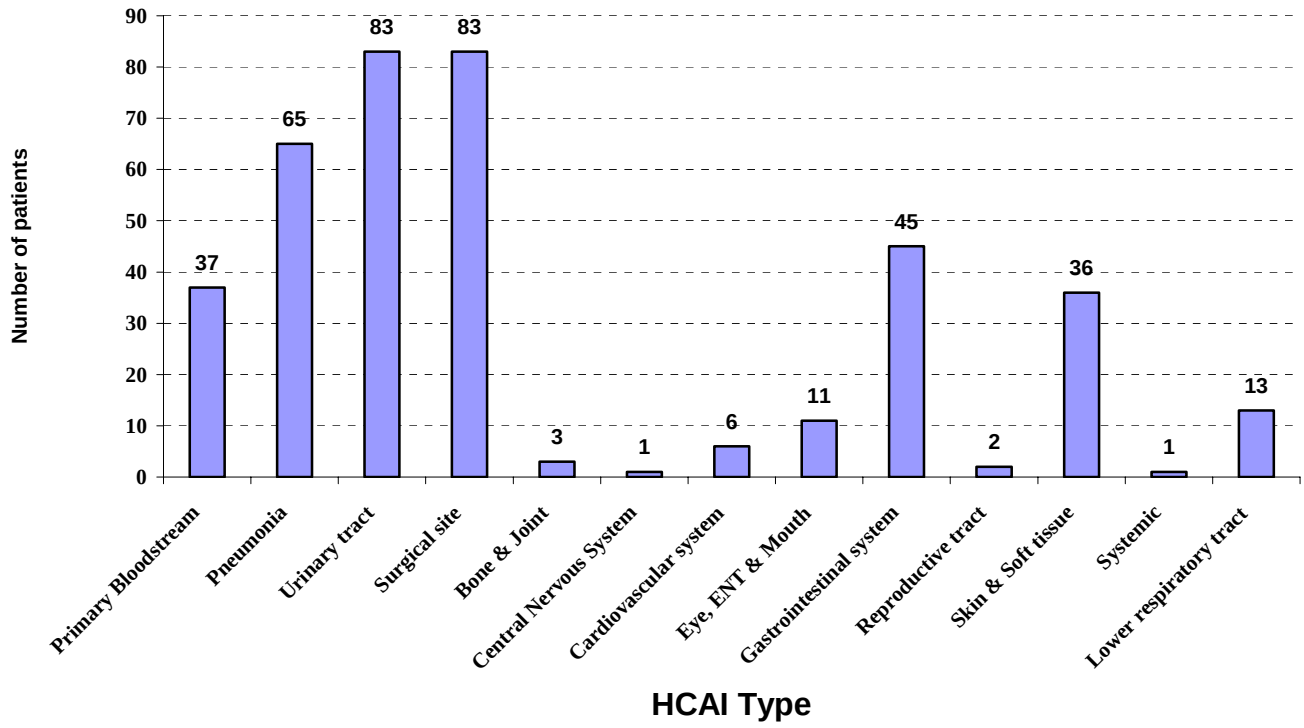
Table 3.8 Age and sex breakdown of patients with a HCAI

Age groups	Sex						Overall Total	
	Male		Female		Unknown			
	Total surveyed	Total HCAI	Total surveyed	Total HCAI	Total surveyed	Total HCAI	Total surveyed	Total with HCAI (% of each age group with HCAI)
<44 years	513	18	982	14	6	0	**1501**	**32 (2.1)**
45-64 years	1069	58	918	49	3	1	**1990**	**108 (5.4)**
65-75 years	818	51	691	39	5	0	**1514**	**90 (5.9)**
>75 years	1074	58	1431	81	5	0	**2510**	**139 (5.5)**
Unknown age	1	0	1	0	1	0	**3**	**0**
Total	**3475**	**185**	**4023**	**183**	**20**	**1**	**7518 (100)**	**369 (4.9)**

The most common HCAI (Fig 3.2) were

- Urinary tract infection (UTI) – 83/386 (21.5%) patients with a HCAI
- Surgical site infection (SSI)- 83/386 (21.5%) patients with a HCAI
- Pneumonia - 65/386 (16.8%) patients with a HCAI
- Gastrointestinal infection - 45/386 (11.6%) patients with a HCAI
- Primary bloodstream infection (PBSI) -37/386 (9.5%) patients with a HCAI
- Skin and soft tissue infection - 36/386 (9.3%) patients with a HCAI

Fig 3.2 Breakdown of HCAI type (n=386 HCAI)



191 patients with a HCAI were being cared for by medical consultants and 198 patients by surgical or obstetric/gynaecology consultants. (Table 3.9) The location of patients by ward speciality is outlined in Table 3.10. Of note, the majority of patients with HCAIs were located on either general medical (23.8%), general surgical (18.4%), critical care (10.8%) or trauma & orthopaedic (9.8%) wards.

Table 3.9 Numbers of HCAI by consultant speciality

Consultant speciality	Number of patients with HCAI
Surgical specialities - Total	**168**
General surgery	48
Trauma & orthopaedics	41
Vascular surgery	21
Urology	8
Colorectal surgery	7
Cardiothoracic surgery	7
Hepatobiliary & pancreatic surgery	7
ENT, ophthalmology	7
Neurosurgery	7
Plastic surgery	6
Cardiac surgery	6
Transplantation surgery	1
Breast surgery	1
Upper gastrointestinal surgery	1
Medical specialities - Total	**191**
General medicine	40
Care of the elderly	26
Medical oncology	22
Respiratory medicine	21
Cardiology	17
Endocrinology	17
Gastroenterology	15
Clinical haematology	10
Nephrology	9
Rheumatology	6
Infectious diseases	3
Neurology	3
Hepatology	1
Dermatology	1
Obstetrics and Gynaecology - Total	**10**
Gynaecology	6
Obstetrics	4

Table 3.10 Location (ward speciality) of patients with HCAI

Ward speciality	Number of patients with HCAI
Medical wards - Total	**154**
General medicine	88
Care of the elderly	17
Medical oncology	16
Respiratory medicine	10
Cardiology	9
Nephrology	6
Blood and marrow transplantation	3
Gastroenterology	2
Infectious diseases	2
Rheumatology	1
Surgical wards - Total	**156**
General surgery	68
Trauma & orthopaedics	36
Cardiothoracic surgery	10
ENT	8
Vascular surgery	8
Cardiac surgery	6
Urology	5
Colorectal surgery	4
Ophthalmology	3
Neurosurgery	3
Plastic surgery	2
Thoracic surgery	2
Transplantation surgery	1
Obstetrics & Gynaecology wards - Total	**7**
Gynaecology	3
Obstetrics	4
Critical and high dependency care - Total	**49**
Critical care medicine	40
Medical high dependency	4
Surgical high dependency	3
Burns care	1
Coronary care unit	1
Others	**3**

3.2.2 Device-related HCAI

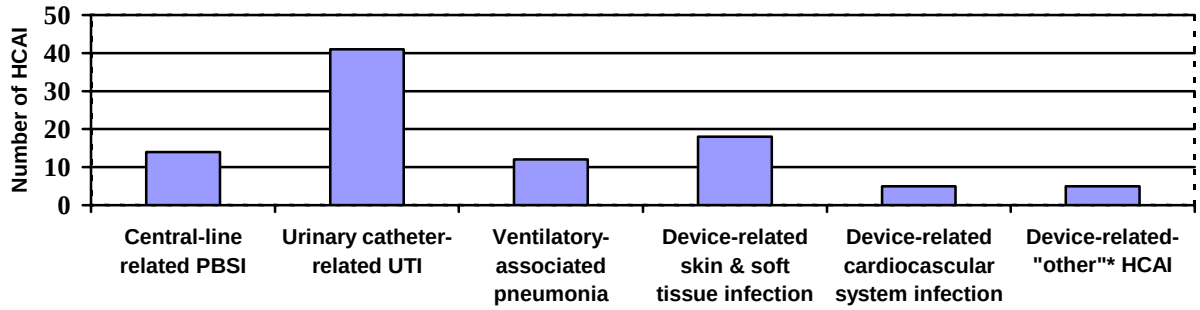
In 95/369 (26%) patients with a HCAI, the HCAI was device-related (either central-line, ventilator, urinary catheter or other medical device), with the majority of patients located in regional/tertiary and general hospitals. (Table 3.7) The age and sex of patients with device-related HCAI is outlined in Table 3.11 and a breakdown by device-related HCAI by HCAI type is outlined in Fig 3.3

Table 3.11 Age and sex of patients with device*-related HCAI, MRSA-related HCAI and HCAI associated with secondary bloodstream infection (SBSI)

HCAI Type	Age group	Male	Female	Total	% in each age group
Device*-related HCAI	**Total**	**60**	**35**	**95**	**100**
	<44 years	7	3	10	10.5
	45-64 years	18	12	30	31.6
	65-75 years	16	8	24	25.3
	>75 years	19	12	31	32.6
MRSA – related HCAI	**Total**	**22**	**15**	**37**	**100**
	<44 years	2	1	3	8.1
	45-64 years	9	5	14	37.8
	65-75 years	2	4	6	16.2
	>75 years	9	5	14	37.8
SBSI- associated HCAI	**Total**	**10**	**5**	**15**	**100**
	<44 years	1	1	2	13.3
	45-64 years	1	2	3	20
	65-75 years	5	2	7	46.7
	>75 years	3	0	3	20

* Includes central-line-related primary bloodstream infection, ventilator-related pneumonia, catheter-related UTI and "Other HAI" related to devices

Fig 3.3 Device-related HCAI: Breakdown by HCAI type (n=95)



The consultant speciality of patients with a device-related HCAI included general surgery (13 patients representing 14% of device-related HCAI), care of the elderly (12 patients, 13% of device-related HCAI) general medicine (12 patients, 13% of device-related HCAI), medical oncology (8 patients, 8% of device-related HCAI), urology (6 patients, 6% of device-related HCAI) vascular surgery (5 patients, 5% of device-related HCAI) and trauma & orthopaedics (5 patients, 5% of device-related HCAI). The location (ward speciality) of patients with device-related HCAI is outlined in Table 3.12.

Table 3.12. Location (ward speciality) of patients with device-related HCAI

Ward speciality	Number (%) of patients
General medicine	22 (23.2)
Critical care medicine	18 (18.9)
General surgery	17 (17.9)
Care of the elderly	8 (8.4)
Trauma & orthopaedics	5 (5.3)
Medical oncology	4 (4.2)
Urology	4 (4.2)
Cardiothoracic surgery	3 (3.2)
Others	3 (3.2)
Blood and marrow transplantation	2 (2.1)
Cardiology	2 (2.1)
Medical high dependency	1 (1.1)
Neurosurgery	1 (1.1)
ENT	1 (1.1)
Infectious diseases	1 (1.1)
Vascular surgery	1 (1.1)
Nephrology	1 (1.1)
Gynaecology	1 (1.1)
Total	**95 (100)**

3.2.3 MRSA-related HCAI

37/369 (10%) patients with a HCAI were recorded as having an MRSA-related HCAI, 19 of whom were in regional/tertiary hospitals and 18 in general hospitals. (Table 3.5) The age and sex breakdown of patients with MRSA-related HCAI is outlined in Table 3.9. A breakdown of MRSA-related HCAIs by HCAI type, by consultant speciality and by location (ward speciality) is outlined in Fig 3.4, Table 3.13 and Table 3.14 respectively.

Fig 3.4 MRSA-related HCAI: Breakdown by HCAI type (n=37)

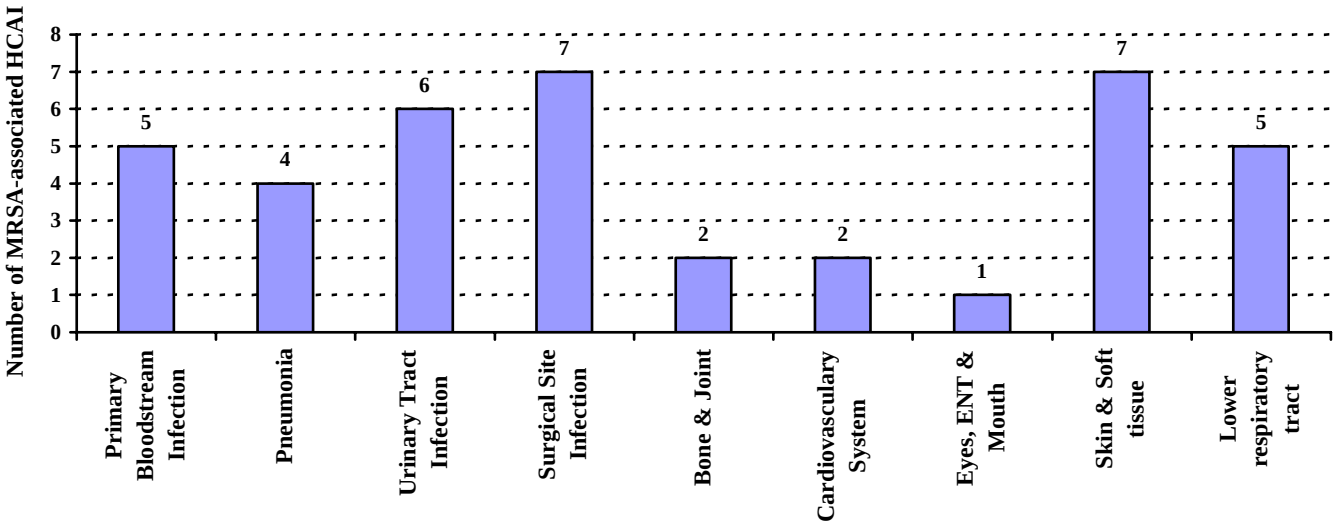


Table 3.13 MRSA-related HCAI: Breakdown by consultant speciality

Consultant speciality	Number (%) of patients
Trauma & orthopaedics	4 (10.8)
General surgery	4 (10.8)
Cardiology	4 (10.8)
Care of the elderly	4 (10.8)
General medicine	3 (8.1)
Vascular surgery	3 (8.1)
Plastic surgery	3 (8.1)
Endocrinology	2 (5.4)
Respiratory medicine	2 (5.4)
Hepatology	1 (2.7)
Infectious diseases	1 (2.7)
Neurosurgery	1 (2.7)
ENT	1 (2.7)
Nephrology	1 (2.7)
Rheumatology	1 (2.7)
Urology	1 (2.7)
Clinical haematology	1 (2.7)
Total	**37 (100)**

Table 3.14 MRSA-related HCAI: Breakdown by ward speciality

Ward speciality	Number (%) of patients
General medicine	14 (37.8)
General surgery	6 (16.2)
Critical care medicine	4 (10.8)
Trauma & orthopaedics	4 (10.8)
Care of the elderly	2 (5.4)
Cardiology	2 (5.4)
Neurosurgery	2 (5.4)
Infectious diseases	1 (2.7)
Medical high dependency	1 (2.7)
Vascular surgery	1 (2.7)
Total	**37 (100)**

3.2.4 HCAI associated with secondary bloodstream infection (SBSI)

In 15/369 (4%) patients, their HCAI was associated with a SBSI, with most patients located in either regional/tertiary or general hospitals (Table 3.7) The age and sex breakdown of patients with a SBSI is outlined in Table 3.11.

SBSI was recorded in patients with UTI (five patients), SSI (three patients), pneumonia (two patients), gastrointestinal infection (two patients), bone & joint infection (one patient), cardiovascular infection (one patient) and combined UTI and skin and soft tissue infection (one patient). The consultant speciality of these patients included medical oncology (three patients), cardiology (three patients) and trauma and orthopaedics (two patients). The remaining seven patients were cared for by a variety of medical and surgical consultants. Patients with SBSI were located on general medical (seven patients), medical oncology (two patients), trauma and orthopaedics (two patients) and other medical/surgical wards (four patients).

3.2.5 Presence of risk factors for HCAI and HCAI prevalence

Table 3.15 outlines the prevalence of HCAI in patients with a history of urinary catheter insertion, bladder instrumentation, mechanical ventilation and surgical procedures. The highest rates of HCAI were found in patients with a history of mechanical ventilation or parenteral nutrition.

Table 3.15 HCAI prevalence in patients with HCAI risk factors

Risk Factor	Total number of patients	Patients with risk factor who had a HCAI	% of those with risk factor who had a HCAI
Urinary catheter *	1743	160	9.2
Other bladder instrumentation *	150	10	6.7
Peripheral IV catheter *	4961	245	4.9
Central IV catheter *	575	86	15
Mechanical ventilation *	202	46	22.8
Parenteral nutrition *	145	34	23.4
Surgery within 30 days	1091	109	10
Surgery within last year	764	57	7.5
Other invasive procedure	2451	186	7.6

* *in situ* or present in the previous 7 days

3.2.6 *C. difficile* infection

36 (0.5%) patients had *C. difficile* infection, 25/36(69.4%) were greater than 75 years (Fig 3.5). The consultant speciality of patients with *C. difficile* infection is outlined in Table 3.16. 22/36(61%) patients with *C. difficile* infection were located on general medical wards and six (16.7%) on care of the elderly wards. (Table 3.17)

Fig 3.5 Age and sex of patients with *C. difficile* infection

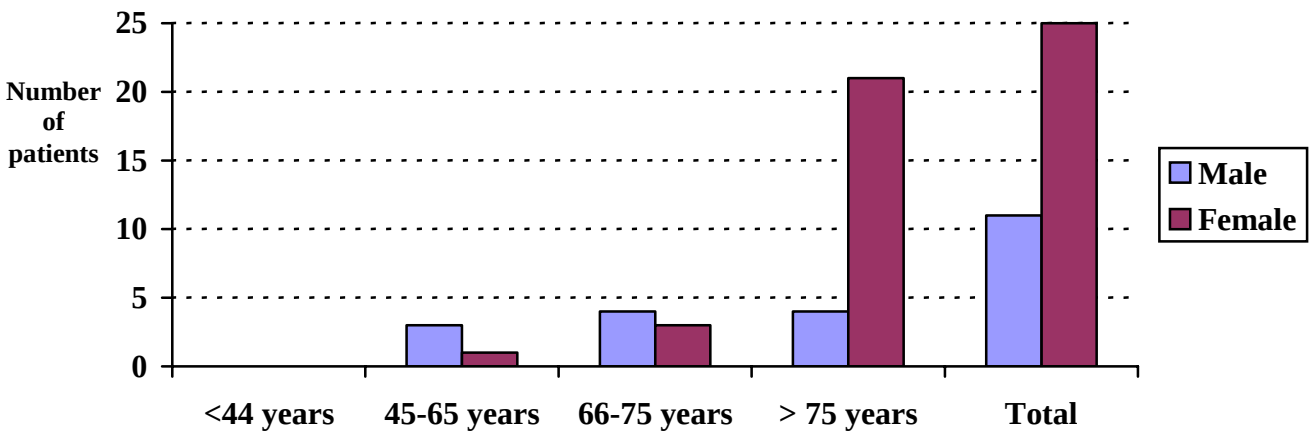


Table 3.16 Consultant speciality of patients with *C. difficile* infection

Consultant speciality	Number (%) of patients
General medicine	8 (22.2)
Endocrinology	6 (16.7)
Gastroenterology	5 (13.9)
Care of the elderly	4 (11.1)
Respiratory medicine	3 (8.3)
Rheumatology	2 (5.6)
Nephrology	2 (5.6)
Cardiology	2 (5.6)
Trauma & orthopaedics	2 (5.6)
Clinical haematology	1 (2.8)
General surgery	1 (2.8)
Total	**36 (100)**

Table 3.17 Location (ward speciality) of patients with *C. difficile* infection

Ward speciality	Number (%) of patients
General medicine	22 (61.1)
Care of the elderly	6 (16.7)
Respiratory medicine	2 (5.6)
ENT	2 (5.6)
Trauma & orthopaedics	2 (5.6)
Critical care medicine	1 (2.8)
General surgery	1 (2.8)
Total	**36 (100)**

3.2.7 Norovirus infection

27 (0.4%) patients, 14 males and 12 females (1 unrecorded sex) had norovirus infection on the day of the survey. Ten (37%) of these patients were greater than 75 years. The consultant speciality of patients with norovirus infection is outlined in Table 3.18 and location (ward speciality) in Table 3.19.

Table 3.18 Consultant speciality of patients with norovirus infection

Consultant Speciality	Number (%) of patients
General medicine	4 (14.8)
Cardiology	3 (11.1)
Endocrinology	3 (11.1)
Trauma & orthopaedics	3 (11.1)
General surgery	3 (11.1)
Respiratory medicine	2 (7.4)
Vascular surgery	2 (7.4)
Care of the elderly	1 (3.7)
Rheumatology	1 (3.7)
Neurology	1 (3.7)
Nephrology	1 (3.7)
Clinical haematology	1 (3.7)
Gastroenterology	1 (3.7)
Hepatobiliary & pancreatic surgery	1 (3.7)
Total	**27 (100)**

Table 3.19 Location (ward speciality) of patients with norovirus infection

Ward Speciality	Number (%) of patients
General medicine	9 (33.3)
Respiratory medicine	6 (22.2)
Trauma & orthopaedics	3 (11.1)
Colorectal surgery	3 (11.1)
General surgery	3 (11.1)
Vascular surgery	2 (7.4)
Cardiology	1 (3.7)
Total	**27 (100)**

3.3 Individual HCAI sites

3.3.1 Primary Bloodstream Infection (PBSI)

37/7518 (0.5%) surveyed patients had a PBSI. PBSI represented 10% of all HCAI (37/386 HCAI's). The age and sex breakdown of patients with PBSI is outlined in Table 3.20

Regarding PBSI in patients with IV lines *in situ* or present the previous seven days, 20/4961 (0.4%) patients with a peripheral IV line and 20/575 (3.5%) patients with a central IV line had a PBSI. 8/145 (5.5%) patients either receiving or who had received total parenteral nutrition (TPN) in the previous seven days, had a PBSI.

14/37 patients (37.8%) with PBSI had a central line-related PBSI. Of these, four patients were located in critical care medicine, three each on general surgical or haematology / oncology wards with the remaining four on medical wards. The consultant speciality of patients with a central line-related PBSI included clinical haematology (three), general surgery (three), care of the elderly, neurology, nephrology, infectious disease, general medicine, neurosurgery, vascular surgery and colorectal surgery (one in each speciality).

Five patients (13.5%) with PBSI had an MRSA-related PBSI (Table 3.21) – three of which were central line- related (representing 8% of central line-related PBSI).

Table 3.20 Age and sex breakdown of patients with individual HCAI types

HCAI Type	Patients	Sex			Age (years)			
		Unknown	Male	Female	<44	45-64	65-75	> 75
Primary bloodstream infection (PBSI) - Total	**37**	**-**	**27**	**10**	**7**	**16**	**3**	**11**
-Central-line-related PBSI	**14**	-	10	4	4	6	1	3
Urinary tract infection (UTI) - Total	**83**	**-**	**34**	**49**	**7**	**12**	**20**	**44**
- Symptomatic UTI	**54**	-	18	36	5	10	13	26
-Asymptomatic UTI	**26**	-	15	11	1	2	6	17
-Other infection of urinary tract	**2**	-	1	1	0	0	1	1
- Catheter-related UTI	**41**	25	16	28	2	5	14	20
Surgical site infection (SSI) - Total	**83**	**1**	**39**	**43**	**9**	**34**	**23**	**17**
- Superficial incisional SSI	**37**	1	16	20	4	16	10	7
- Deep incisional SSI	**36**	-	19	17	4	13	12	7
- Organ / Space SSI	**9**	-	3	6	1	5	1	2
Pneumonia - Total	**65**	**-**	**38**	**27**	**2**	**22**	**19**	**22**
- Clinically defined pneumonia	**53**	-	29	24	0	20	13	20
- Pneumonia with laboratory findings	**8**	-	6	2	2	1	4	1
- Pneumonia in immunocompromised	**3**	-	4	0	0	1	2	0
- Ventilator – associated pneumonia	**12**	-	9	3	2	7	3	0

Table 3.21 HCAI types – association with medical devices, MRSA and secondary bloodstream infection (SBSI)

HCAI site	Number of HCAI	Proportion of patients surveyed (n=7518)	Proportion of patients with HCAI (n=369)	Device-related infection	MRSA-associated infection	SBSI
Primary bloodstream infection	37	0.5	10	14	5	-
Pneumonia	65	0.9	17.6	12	3	2
Urinary tract infection	83	1.1	22.5	41	6	5
Surgical site infection	83	1.1	22.5	-	7	2
Bone & joint	3	0.04	0.81	1	2	1
Central nervous system	1	0.01	0.27	1	0	0
Cardiovascular	6	0.08	1.63	5	2	1
Eyes, ENT or mouth	11	0.15	2.98	0	1	0
Gastrointestinal	45	0.6	12.2	0	0	2
Reproductive tract	2	0.03	0.54	2	0	0
Skin & soft tissue	36	0.48	9.76	18	7	2
Systemic	1	0.01	0.27	0	0	0
Lower respiratory tract	13	0.17	3.52	1	5	0

3.3.2 Pneumonia

65/7518 (0.86%) patients had pneumonia, representing 17.6% patients with a HCAI.
The age and sex of patients with pneumonia and ventilator-associated pneumonia (VAP) are outline in Table 3.20. 4/65 (6%) pneumonias were MRSA-related and two (3%) were associated with secondary bloodstream infection. (Table 3.21) The majority of patients (53) had a clinically defined pneumonia, eight had pneumonia with specific laboratory findings and three immunocompromised patients had pneumonia. The type of pneumonia was not recorded in one patient.

Of the 202 patients surveyed that either were currently or had been mechanically ventilated: 46 (22%) had a HCAI, 19 (9.4%) had pneumonia and 12 (18%) had a ventilator-associated pneumonia (VAP).

Of the 12 patients with VAP, ten (83%) were located in critical care units, one in a medical high dependency unit and one in a cardiothoracic unit. One VAP was associated with MRSA infection but none with secondary bloodstream infection. The consultant speciality of these patients included gastroenterology, general medicine, general surgery (two patients each), medical oncology, clinical haematology, cardiothoracic surgery, neurosurgery, vascular surgery and upper gastrointestinal surgery (one patient each).

3.3.3 Urinary Tract Infection (UTI)

83/7518 (1.1%) patients had a UTI, representing 22.5% patients with a HCAI. The age and sex breakdown of patients with UTI are outlined in Table 3.20. Six (7.2%) UTIs were MRSA-related and five (6%) were associated with SBSI (Table 3.21). 54 (65%) patients with a UTI had a symptomatic UTI, 26 (31.3%) had asymptomatic UTI, and two (2.4%) another infection of the urinary tract. In one patient, the type of UTI was not recorded.

45/1743 patients (2.6%) who either were or had been catheterised and 4/150 (2.7%) patients who either were or had received other bladder instrumentation had a UTI.

Regarding catheter-related UTI, responses were recorded in 73 patients with a UTI. 41/73 (56.2%) patients with a UTI had a catheter-related UTI. Of these,

- Four were associated with MRSA infection and three with secondary bloodstream infection.
- The majority of patients were over 65 years (Table 3.20).
- Consultant speciality of patients with catheter-related UTI included care of the elderly (nine, 22%), general medicine (six, 14.6%), urology (five, 12.2%)), medical oncology, general surgery (three patients each), respiratory medicine, cardiothoracic surgery, trauma & orthopaedics, vascular surgery, colorectal surgery (two patients each), gynaecology, dermatology, endocrinology, gastroenterology and "other" (one patient each).
- The majority of patients were located on either general medical (15, 36.6%), general surgical (10, 24.4%) and care of the elderly (five, 12.2%) wards. The remaining patients were located on urology (three), cardiothoracic surgery, trauma & orthopaedics (two patients each), medical oncology, cardiology and "other" (one patient each) wards.

3.3.4 Surgical Site Infection (SSI)

83/7518 (1.1%) patients had an SSI, representing 22.5% of patients with a HCAI. 56/1091 (5.1%) patients with a history of non-implant surgery and 28/764 (3.7%) patients with a history of implant surgery had a SSI. (Table 3.22) Breakdown of procedure categories for non-implant SSI and implant surgery are outlined in Table 3.23 and 3.24.

The age and sex breakdown of patients with a SSI are outlined in Table 3.20. Seven (8.4%) SSIs were MRSA-related and three (2.4%) were associated with secondary bloodstream infection. (Table 3.21) 37 (45%) patients had a superficial incisional SSI, 36 (43%) a deep incisional and nine an organ space SSI. The type of SSI was not recorded in one patient.

Table 3.22 Association between surgical procedures and SSI

	Non-implant surgery	Implant surgery	Other invasive procedure	Total
Total number of patients	1091	764	2451	N/A *
Any HCAI	109	57	186	N/A *
SSI	**56**	**28**	**39**	**83**
Superficial incisional	33	7	11	37
Deep incisional	18	19	19	36
Organ space	5	1	8	9
SSI type not recorded	0	1	1	1

N/A * Not applicable; there can be multiple responses for one individual

Table 3.23 Breakdown of procedure categories for non-implant surgical site infection

Surgical procedure	Number (%) of patients with SSI
Colon surgery	10 (17.9)
Coronary artery bypass graft with both chest and donor site incisions	5 (8.9)
Other operations on the musculoskeletal system	5 (8.9)
Other operations on the integumentary system	4 (7.1)
Limb amputation	4 (7.1)
Small bowel surgery	3 (5.4)
Bile duct, liver or pancreatic surgery	2 (3.6)
Abdominal surgery	2 (3.6)
Neck surgery	2 (3.6)
Breast surgery	2 (3.6)
Herniorrhaphy	2 (3.6)
Other operations on the nervous system	1 (1.8)
Other operations on the eye, ear, nose, mouth, and pharynx	1 (1.8)
Ovarian surgery	1 (1.8)
Coronary artery bypass graft with chest incision only	1 (1.8)
Other operations on the cardiovascular system	1 (1.8)
Gallbladder surgery	1 (1.8)
Appendix surgery	1 (1.8)
Caesarean section	1 (1.8)
Other operations on the genitourinary system	1 (1.8)
Gastric surgery	1 (1.8)
Other operations on the digestive system	1 (1.8)
Rectal surgery	1 (1.8)
Kidney surgery	1 (1.8)
Abdominal hysterectomy	1 (1.8)
Surgical procedure not specified	1 (1.8)
Total	**56 (100)**

Table 3.24 Breakdown of procedure categories for implant surgical site infection

Surgical procedure	Number (%) of patients with SSI
Hip prosthesis	9 (32.1)
Open reduction of fracture	6 (21.4)
Other operations on the cardiovascular system	3 (10.7)
Refusion of spine	2 (7.1)
Herniorrhaphy	2 (7.1)
Spinal fusion	1 (3.6)
Other operations on the musculoskeletal system	1 (3.6)
Knee prosthesis	1 (3.6)
Craniotomy	1 (3.6)
Colon surgery	1 (3.6)
Cardiac surgery	1 (3.6)
Total	**28 (100)**

3.3.5 Other HCAI

Details of the age and sex of patients with 118 "other" HCAI are outlined in Table 3.15 and the location of these patients outlined in Table 3.25 and Table 3.26. The association of these infections with MRSA infection, presence of medical devices and secondary bloodstream infection is outlined in Table 3.21.

The most common infections in this category were,

- Gastrointestinal infections (45 infections),
- Skin and soft tissue infections (36 infections)
- Lower respiratory infections (13 infections).

Of note, 18/35 (51.4%) skin and soft tissue infections were device-related (in one patient with a skin and soft tissue infection, an association with medical devices was not recorded): 6/18 (33%) were associated with MRSA infection and one (5%) with secondary bloodstream infection

Table 3.25 Age and sex of patients with "Other" HCAI

HCAI Type	Number	Sex		Age			
		Males	Females	<44 years	45-64 years	65-75 years	> 75 years
Bone & joint	**3**	2	1	1	1	0	1
Central nervous system	**1**	1	0	0	1	0	0
Cardiovascular	**6**	5	1	0	3	1	2
Eyes, ENT or mouth	**11**	3	8	2	3	1	5
Gastrointestinal	**45**	17	28	0	10	10	25
Reproductive tract	**2**	0	2	1	1	0	0
Skin & soft tissue	**36**	19	17	4	10	12	10
Systemic	**1**	1	0	0	0	1	0
Lower respiratory tract	**13**	8	5	1	2	4	6

Table 3.26 Location of patients with “Other” HCAI

HCAI site	Total	Regional / Tertiary Hospital	General Hospital	Specialist Hospital
		3	0	0
Central Nervous System	**1**	1	0	0
Cardiovascular	**6**	5	1	0
Eyes, ENT or Mouth	**11**	8	3	0
Gastrointestinal	**45**	26	19	0
Reproductive Tract	**2**	1	1	0
Skin & Soft tissue	**36**	17	17	2
Systemic	**1**	1	0	0
Lower respiratory Tract	**13**	2	11	0

3.4 UK provisional results (excluding Scotland and Jersey) (provisional – as of October 2006)

The following is a summary of Dr. Edward Smyth's presentation at the Hospital Infection Society International Conference in Amsterdam on 18th October 2006.

These figures represent the **provisional** results of the UK and Ireland prevalence survey and exclude results from Scotland (where the survey is ongoing and due to be complete in late 2006) and Jersey.

Table 3.27 outlines the survey population, Fig 3.6 outlines the presence of HCAI risk factors in the survey population, Table 3.28 outlines the overall prevalence rates and Table 3.29 MRSA-associated HCAI for England, Wales, Northern Ireland and the Republic of Ireland. As a breakdown by participating hospital type (e.g. tertiary/regional, general or specialist) has not been performed on the UK database, it is difficult to compare the Republic of Ireland results with those of the UK until this analysis had been performed. Although the prevalence of healthcare-associated infection in Irish hospitals is less than that which was found in the Second National Prevalence Surveys carried out in the 1990's, the definitions were different and therefore the data is not comparable. The prevalence of *C. difficile* infection for the Republic of Ireland and the UK and Ireland is outlined in Fig 3.7, the prevalence of specific HCAI by HCAI site is outlined in Table 3.30 and the association of HCAI with MRSA infection, medical device insertion and secondary bloodstream infection is outlined in Table 3.31.

Table 3.27 The survey population

Country	Hospitals	Patients	% of patients
UK and Republic of Ireland (excluding Scotland)	**273**	**75,763**	**100%**
England	190	58,795	77.6%
Wales	23	5,825	7.7%
Northern Ireland	15	3,625	4.8%
Republic of Ireland	45	7,518	9.9%
Jersey	1	162	-

Fig 3.6 Presence of risk factors for HCAI in the survey population

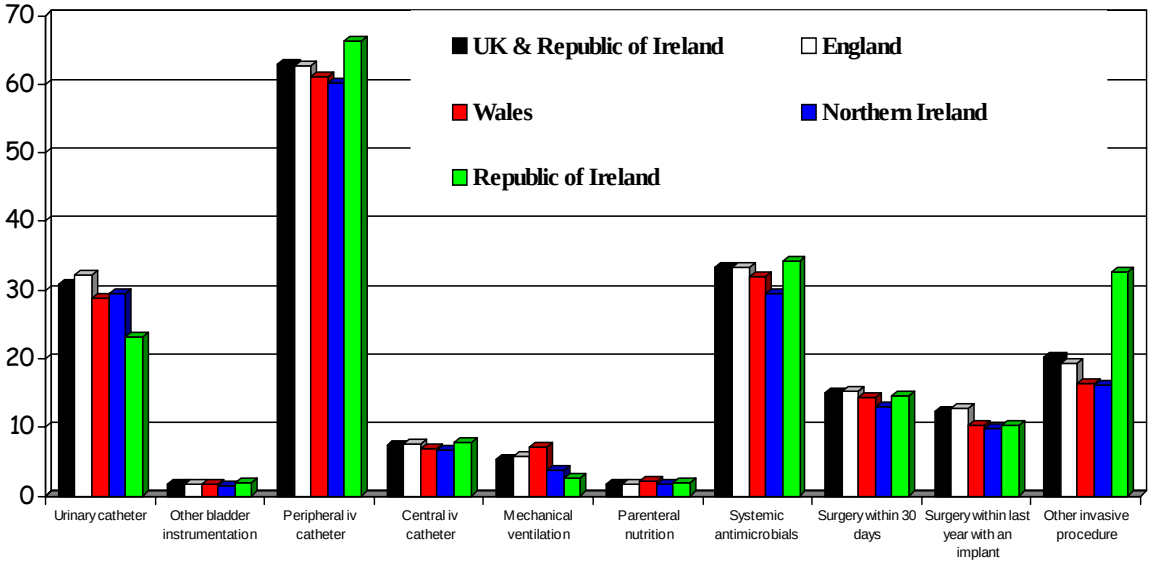


Table 3.28 Prevalence rates for England, Wales, Northern Ireland and the Republic of Ireland

	Prevalence Rate	95% CI
UK and Republic of Ireland (excluding Scotland)	**7.6%**	**7.4 – 7.8**
England	8.2%	8.0 – 8.4
Wales	6.3%	5.7 – 7.0
Northern Ireland	5.5%	4.8 – 6.3
Republic of Ireland	4.9	4.4 – 5.4

Table 3.29 MRSA-associated HCAIs in England, Wales, Northern Ireland and the Republic of Ireland

	UK & Republic of Ireland	England	Wales	Northern Ireland	Republic of Ireland
Number of patients with MRSA- associated HCAI	873	755	50	31	37
Prevalence of MRSA Infection	1.2%	1.3%	0.9%	0.9%	0.5%
MRSA-associated HCAI	15.2%	15.7%	13.6%	15.6%	10%

Fig 3.7 Prevalence of *C. difficile* infection by age and gender

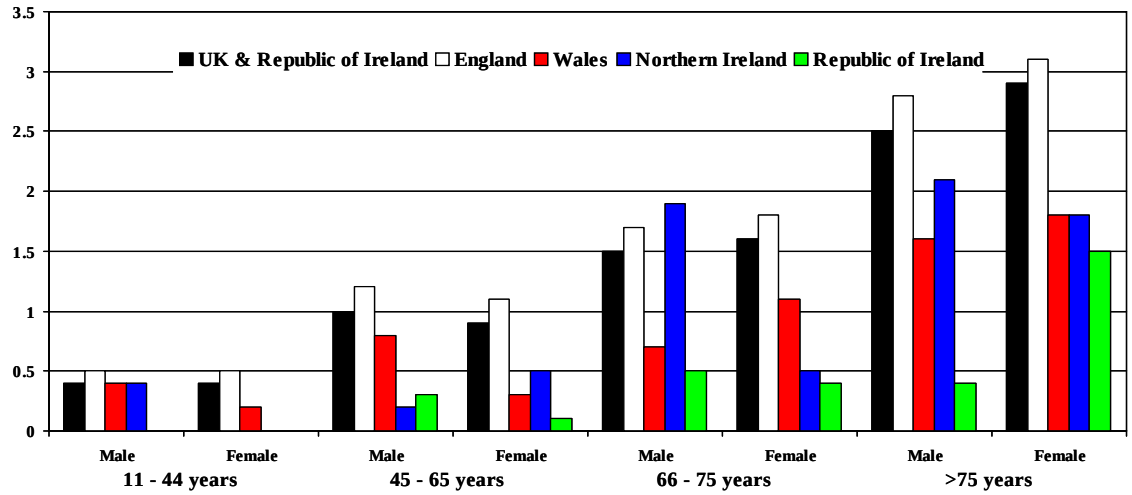


Table 3.30 HCAI sites for the UK & Republic of Ireland (excluding Scotland) and the Republic of Ireland

HCAI Site		UK & Republic of Ireland	Republic of Ireland
Primary bloodstream infection	Number	448	37
	Prevalence	0.6 %	0.5 %
Pneumonia	Number	900	65
	Prevalence	1.2 %	0.9 %
Lower respiratory tract infection	Number	403	13
	Prevalence	0.6 %	0.2 %
Urinary tract infection	Number	1273	83
	Prevalence	1.7 %	1.1 %
Surgical site infection	Number	927	83
	Prevalence	1.2 %	1.1 %
Gastrointestinal tract infection	Number	1317	45
	Prevalence	1.7%	0.6 %
Bone & joint infection	Number	75	3
	Prevalence	0.1%	< 0.1 %
Central nervous system infection	Number	16	1
	Prevalence	< 0.1 %	< 0.1 %
Cardiovascular system infection	Number	67	6
	Prevalence	0.1 %	0.1 %
Eyes, ENT or mouth infection	Number	180	11
	Prevalence	0.2 %	0.1 %
Reproductive tract infection	Number	42	2
	Prevalence	0.1 %	< 0.1 %
Skin & soft tissue infection	Number	666	36
	Prevalence	0.9 %	0.5 %
Systemic infection	Number	71	1
	Prevalence	0.1 %	< 0.1 %

Table 3.31 Association of HCAI by HCAI site with MRSA infection, medical device insertion and secondary bloodstream infection

HCAI site	Country	Total	MRSA-associated	Device*-associated	Secondary bloodstream infection
Primary bloodstream infection	UK & RoI+	448	22.3%	42.6%	-
	RoI+	37	13.9%	37.8%	-
Urinary tract infection	UK & RoI+	1273	5.1%	58%	3.9%
	RoI+	83	7.2%	56.2%	6.2%
Pneumonia	UK & RoI+	900	7.6%	19.2%	3.9%
	RoI+	65	6.3%	18.5%	3.1%
Surgical site infection	UK & RoI+	927	25.6%	-	6.3%
	RoI+	83	8.4%	-	2.4%
Skin & soft tissue infection	UK & RoI+	666	48.2%	40.7%	4.9%
	RoI+	36	19.4%	51.4%	5.7%

Device*: Central-line related primary bloodstream infection, catheter-related urinary tract infection, ventilator-associated pneumonia and device-related skin & soft tissue infection

RoI+ Republic of Ireland

3.5 Feedback from participants

Table 3.32 outlines the average composition of the ICT in each participating hospital. Excluding preparation time for the survey and cancellation of data collection due to hospital infection control matters (e.g. norovirus outbreaks), it took data collection teams 1897.25 hours to collect survey data. This represents 237 working (9am – 5pm) days for a data collection team of at least three people.

Table 3.32 Infection Control team composition in 45 participating hospitals (Total beds = 11,682 in 45 hospitals)

	Total	Average WTE* /hospital (WTE* range)	Total WTE* / 100 beds
Consultant Microbiologist	27.35	0.6 (0.1 – 2)	0.23
Infection Control Nurse	57.8	1.28 (0.5 – 3)	0.49
Surveillance Scientist	15	0.36 (0-1)	0.13

* WTE: Whole time equivalent

41/45 (91%) participating hospitals returned the feedback questionnaire. Six had participated in the previous HIS/ICNA Prevalence Survey; all found the current survey easier to perform.

37/41 (90%) participants would not have participated in the survey without the support of HSE-funded external data collectors. If the data collectors were not available, the type of additional support that participants would have required included staff (infection control nurses and microbiologists, 38/41 (93%) administrative staff, 37/41 (90%)), and additional IT support 22/41, (54%). All participants would in principle be willing to participate in future National HCAI surveillance initiatives, however 39 (87%) could only do so with additional ICT support.

During the survey, the composition of the data collection team in participating hospitals varied with the composition of the hospital ICT, and included a range of healthcare professionals including microbiologists (22/41, 54%), ICN's (41, 100%), surveillance scientists (8, 19%), ward staff

(nursing, 26, 63%, medical, 3, 7% and administrative 9, 22%) and infection control link nurses (2.5%). This was in addition to the HSE/HPSC team of two people (nurse and administrator). In ten institutions (24%), data collection was disrupted because of norovirus infection in the hospital.

Participants were asked to assess the survey form, protocol/manual and CDC definitions, scoring each from 1 (unclear, difficult) to 5 (clear, easy). Overall, participants were satisfied with the layout of the survey form (average score 4.2, range 3-5), the survey protocol/manual (average score 4.3, range 3-5), and CDC definitions (primary bloodstream infections (average score 4.3, range 2-5), pneumonia (average score 3.3, range 1-5), urinary tract infections (average score 4.2, range 1-5), surgical site infections (average score 4.1, range 1-5) and other HCAI (average score 3.8, range 1-5). 39 (95%) would consider using CDC definitions and 38 (93%) the survey form, for future surveys within their institution.

In addition, participation in the survey was also of assistance in identifying problems with medical (25, 61%), nursing (23, 58%) and device-related (26, 63%) documentation. In addition 22, 53% identified areas of concern with antibiotic prescribing and 18, 44% with device-related practice. In 11 hospitals (27%), the case mix of patients on specialist wards was also identified as a problem.

4. Conclusion

Although the prevalence of healthcare-associated infection in Irish hospitals is less than that which was found in the Second National Prevalence Surveys carried out in the 1990's, the definitions were different and therefore the data is not comparable. In particular, more rigid and precise definitions, i.e. those employed by the CDC in the USA, were used in this survey, and hence the prevalence rate of HCAI appears lower. Nonetheless, this data is directly comparable with our sister healthcare systems throughout these islands because of the common methodology used and because the survey was carried out on similar patients at the same time. At present, a direct comparison between overall Republic of Ireland and UK results cannot be made, as analysis of the type of UK hospitals that participated has yet to be performed. This analysis should be complete in late 2006.

Although the overall HCAI rate was just under 5%, it is not surprising that the rate is higher in regional/tertiary hospitals, where there are more complex patients at risk of HCAI. A major feature of HCAI in the last 20 years has been its association with devices such as intravascular catheters, urinary catheters, a variety of other devices, which although essential and very important in the management of the patient, represent an avenue by which microbial pathogens can gain entry to the body. Therefore a focus on prevention should be directed in this area to ensure appropriate practice during the insertion of such devices and optimal care subsequently. This is likely, in particular, to reduce the prevalence of secondary bloodstream infections arising from these devices.

This is the first prevalence survey that collected data on *Clostridium difficile* and norovirus infections. These infections are a significant cause of healthcare-acquired diarrhoeal illness and Norovirus in particular can lead to major outbreaks as we have seen in recent years in Irish hospitals. As ten participating hospitals could not perform data collection for the survey on particular days due to norovirus infection in particular hospital areas, the norovirus figures in this survey are most likely an underestimation of the burden of norovirus infection in Irish hospitals. The emergence of more virulent strains of *C. difficile* infection, which appear to arise in part due to the overuse of quinolone

antibiotics, and which result in significant morbidity and mortality in elderly patients is of concern. It is likely that surveillance of both these infections needs to be intensified in the future.

Hitherto, urinary tract infections have been the most common HCAI recorded. However, in this survey, the numbers of patients with urinary tract infections and surgical site infections were identical. This may represent improvements in the care of urinary catheters and a greater diversity of surgical procedures carried out on patients in the last 10 years resulting in an increased risk of infection. It is clear that MRSA accounts for a significant proportion of HCAI, e.g. 8.4% of surgical site infections were caused by MRSA. However, the burden of MRSA in the Irish acute healthcare sector is not fully represented by this survey due to the methodologies used which required strict criteria for diagnosing infection. Many more patients have MRSA in our acute hospitals, some with infection requiring treatment, although they do not meet the criteria used in this survey to be included. Further surveillance needs to determine the extent and impact of MRSA in terms of patients requiring antibiotics and the consequence for the health service.

This third prevalence survey of healthcare-associated infections in acute hospitals, which was carried out in the UK and Ireland, represents a multi-disciplinary approach to determine and benchmark HCAI at this time, using internationally acceptable definitions. It would not have been possible for many infection control teams to participate, without the significant input and commitment of a variety of individuals and organisations, such as the Health Protection Surveillance Centre, which provided important support for the conduct of the survey and the data handling, and the Health Services Executive who funded data collectors. It is clear from those who participated in this survey that they wish to continue to collect meaningful data that will guide interventions to reduce the HCAI in the future and provide reassurance to the public about their welfare when admitted to hospital. However, it is not possible to continue to conduct surveillance studies like this without greater investment in the infrastructure at both local and national level. This is obvious from the scale of the project, the detail collected and analysed, and the feedback from those who participated.

5. References

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6. HIS Prevalence Survey Republic of Ireland protocol. Available at: http://www.ndsc.ie/hpsc/A-Z/MicrobiologyAntimicrobialResistance/InfectionControlandHealthcare-AssociatedInfection/PrevalenceSurveyofHealthcare-AssociatedInfections2006/BackgroundDocuments/File,1953,en.pdf

Appendix 1 Information leaflet for patients and members of the public

Will my care be affected in any way?

No. Your normal clinical care will not be affected in any way. All the information needed is available in your case notes.

Can I be identified by the data collected?

No. All the data is collected anonymously. The only information needed is age, sex, type of ward that patients are on (i.e. medical or surgical) and test results. Only a limited number of people – such as the hospital's infection control team and the Health Protection Surveillance Centre- will have access to the information.

Where can I get more information?

You can get more information on the Prevalence Survey from:

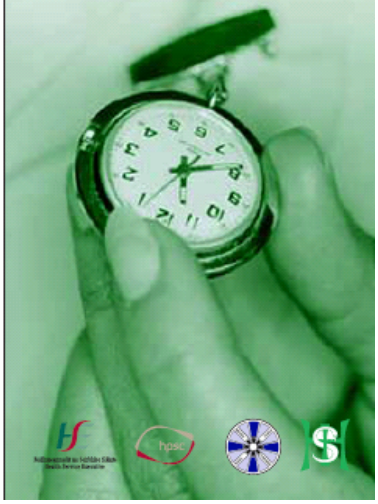
your hospital's Infection Control Team
Or
The Health Protection Surveillance Centre at info@hpsc.ie

The Prevelance Survey of Healthcare Associated Infections 2006

Hospital Infection Society and the Infection Control Nurses Association

The Prevelance Survey of Healthcare Associated Infections 2006

Information Leaflet for Patients and Members of the Public In Ireland



For further information see www.hpsc.ie

What is the HIS Prevalence Survey?

The Hospital Infection Society (HIS) is carrying out a survey to find out more about infections that patients pick-up in hospitals. It is part of a wider study in Irish and UK hospitals called the HealthCare Associated Infection (HCAI) Prevalence Survey. It gives Irish hospitals a chance to learn about hospital infections as part of an international study.

What is the Hospital Infection Society?

It is a UK based professional body that has many Irish Members. Membership includes experts in infection such as microbiologists, infection control nurses, scientists and others interested in hospital related infections. Irish members have contributed to the design and organisation of the survey.

Who is carrying out the survey in Ireland?

The Health Protection Surveillance Centre is the national agency responsible for monitoring infectious disease in Ireland, and is co-ordinating the survey here along with each hospital's infection control team.

What is a healthcare associated infection (HCAI)?

A healthcare associated infection is any infection picked-up by a patient 48 hours or more after admission to hospital. These included urinary tract infections, respiratory infections and wound infections.

How does the survey work?

Patient case notes, nursing notes and drug charts will be checked by members of the hospital infection control team and Health Protection Surveillance Centre staff. Data will be collected from these notes to check whether a patient has a hospital associated infection and how they might have picked up the infection.

Will patients benefit from the survey?

The results of the survey will lead to the setting up of a national scheme to collect accurate information about the number of patients with hospital associated infections and the reasons why these infections were picked up. This information will allow hospitals to focus on protecting at-risk patients from hospital associated infections and allow hospitals to develop national and regional strategies to prevent infections. This should lead to a fall in the number of Irish patients with these infections.

Will I need to have extra medical tests?

No. The information will be taken from previous tests. No other tests such as x-rays or blood tests are needed.

Appendix 2 Information leaflet for hospital staff

What kind of information will be collected?

All the data is collected anonymously. The only information needed is age, sex, presence of medical devices and test results. If an active HCAI is present further information will be collected on the type of infection.

Where can I get more information on the Prevalence Survey?

You can get more information on the prevalence survey from:

your hospital's Infection Control Team

Or

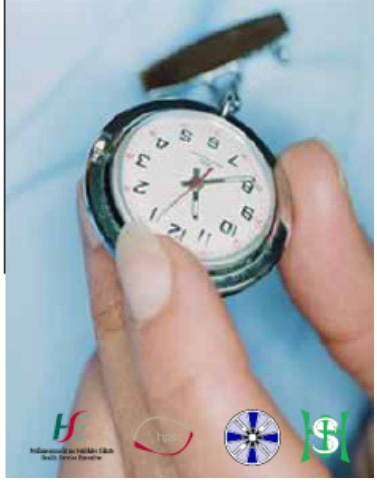
The Health Protection Surveillance Centre at info@hpsc.ie

The Prevelance Survey of Healthcare Associated Infections 2006

Hospital Infection Society and the Infection Control Nurses Association

The Prevelance Survey of Healthcare Associated Infections 2006

Information Leaflet for Healthcare Staff



For further information see www.hpsc.ie

What is the HIS Prevalence Survey?

The Hospital Infection Society (HIS) is carrying out a point prevalence survey in Ireland and the UK, to find out more about infections that patients acquire in hospitals. This survey is called the HealthCare Associated (HCAI) Prevalence Survey. It gives Irish hospitals a chance to learn about hospital infections as part of an international study.

Who is carrying out the survey in Ireland?

The hospital infection control team will be carrying out the survey in conjunction with the Health Protection Surveillance Centre (HPSC). The HPSC is the national agency responsible for monitoring infectious disease in Ireland.

What is a healthcare associated infection?

A healthcare associated infection is any infection picked-up by a patient 48 hours or more after admission to hospital. These included urinary tract infections, respiratory infections and wound infections.

What is a point prevalence survey?

The point prevalence of a disease is the number of individuals with a disease at a fixed point in time. The fixed point in time for the survey is one day for each ward evaluated.

What are the main aims of the survey?

- To estimate the prevalence of healthcare associated infections in Ireland and the UK
- To provide the Department of Health and Children and the Health Service Executive with baseline information on the prevalence of healthcare associated infections in acute hospitals in Ireland
- To use the results to direct national and regional strategies for the prevention of healthcare associated infections

Who has access to this information?

Participating hospitals will have access to their own data through a secure web based system. This will allow local infection control teams to produce their own results so that they can compare their rates with the overall HCAI Prevalence Survey results.

Who can take part?

Wards: All wards serving adult patients (> 16 years) except those that serve pediatric in-patients, day patients or patients with learning difficulties.

Patients: All adult in-patients aged 16 and over. Day patients and patients admitted for one day for treatment or diagnostic procedures are excluded from the surveys.

What will happen on the ward?

Infection control nurses and data collectors in each hospital will collect data between March and May 2006. All data collection in one ward will be completed within one day and take place on weekdays.

Appendix 3: Participants feedback questionnaire

Hospital Evaluation of Participation in the 3rd Prevalence Survey of Healthcare Associated Infections

This questionnaire is designed to provide an evaluation of participation in the HIS/CNA HCAI prevalence survey in Ireland. The Hospital Infection Society will be reviewing the conduct of the survey in the UK and Ireland later in the year. This Irish review will form part of an evaluation of the whole survey (once results are available) to assess how well the survey has worked and achieved its aims.
Please take time to complete **one** questionnaire for **each hospital** that participated in the prevalence survey.

1. **Hospital**

2. **Current members of hospital Infection Control Team (indicate numbers)**
   - *Consultant Microbiologist:*
   - *Infection Control Nurses:*
   - *Surveillance Scientist:*
   - *Other (please indicate):*

3. **The questionnaire**

How clear was the layout of the questionnaire? *unclear----------very clear*
1 2 3 4 5

Comments:

4. **Protocol/manual**

How well did the protocol/manual define the terms used in the questionnaire?
poorly----------well
1 2 3 4 5

Comments:

5. **Definitions**

Please rate the definitions on ease of application:	*difficult----------easy*				
Primary bloodstream infections	*1*	*2*	*3*	*4*	*5*
Pneumonia	*1*	*2*	*3*	*4*	*5*
Urinary tract infections	*1*	*2*	*3*	*4*	*5*
Surgical site infections	*1*	*2*	*3*	*4*	*5*
Other HCAI	*1*	*2*	*3*	*4*	*5*

Comments:

6. **Outbreaks**

Were there outbreaks of **norovirus** during the survey period? *Yes No*
Were there outbreaks of *C. difficile* during the survey period? *Yes No*
Were there other outbreaks that inhibited the survey : *Yes No*
If yes, please give details,

7. **Conducting the survey**

- Would you have participated in the survey without HSE/HPSC support? *Yes / No*
- If there was no HSE/HPSC support, what type of additional support would you have required to participate in this survey
  Staff (Microbiologist / ICN / Surveillance Scientist/Administrative) /
  IT (Teleform/Formic/other(please describe))/ Other (please describe)

- Did you attempt to survey all eligible beds in your hospital?
  Yes / No, surveyed approximately 80% of eligible beds / <80% of eligible beds

- During the survey in your hospital, did the following actively participate in data collection?
  - *Microbiologist(s)* *Yes No*
  - *Infection control nurses* *Yes No*
  - *Infection control link nurses/professionals* *Yes No*
  - *Ward nursing staff* *Yes No*
  - *Medical staff (other than microbiologists)* *Yes No*
  - *Surveillance Scientist* *Yes No*
  - *Ward Clerical staff* *Yes No*
  - *Other staff* *Yes No*

- Have you documented the number of hours it took your ICT to participate in the survey?
  Yes No

  If yes, how many hours?

8. Documentation and clinical practice

Has the survey been of assistance in identifying any of the following areas of concern in your hospital?

- *Case mix of patients on specialist wards* *Yes No*
  (eg: general medical patients on specialist surgical wards)
- *Medical documentation* *Yes No*
- *Antibiotic prescribing* *Yes No*
- *Nursing documentation* *Yes No*
- *Device related documentation* *Yes No*
- *Device related practice* *Yes No*
- *Other (please describe)* *Yes No*

Comment::

9. Previous survey

Did you participate in the previous national prevalence survey in 1993/94? *Yes No*
If yes, did you find participation in this recent survey … *Easier / The same / More difficult*
Comment::

10. Future surveys:

- Would you consider using CDC definitions for future surveys within your hospital? *Yes No*
- Would you consider using the questionnaire for future surveys within your hospital? *Yes No*
- Would you modify the questionnaire? *Yes No*

If yes, what modifications would you make?

- Which infections or in which clinical areas should future surveys concentrate on?
- Would you be willing, in the future to participate in National HCAI surveillance
  Without additional support / only if additional support is provided /other(please specify)

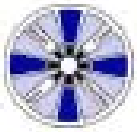
Comment::

Please return to: fidelma.fitzpatrick@mailx.hse.ie

Thank you for taking the time to complete this evaluation and for participating in the survey.

Appendix 4 HSE/HPSC data collectors feedback questionnaire





Surveyors evaluation of the Third Prevalence Survey of Healthcare Associated Infections (March- May 2006)

This questionnaire is designed to provide an evaluation of participation in the HIS/CNA HCAI prevalence survey. It will form part of an evaluation of the whole survey (once results are available) to assess how well the survey has worked and achieved its aims. Please take time to complete one questionnaire.

1.What region were you completing the survey in?

a) Dublin area south
b) Dublin area city
c) Dublin area north
d) Western Region
e) Southern Region
f) South Eastern Region
g) Midlands
h) North Western Region

2.The training

Did you feel adequate training was given on definitions/principles of the study to undertake the survey?

Inadequate---------- Adequate
1 2 3 4 5

Please comment

3.The questionnaire

How clear was the layout of the questionnaire?

Unclear----------very clear
1 2 3 4 5

Please Comment

4.Protocol/manual

How well did the protocol/manual define the terms used in the questionnaire?

Poor----------well
1 2 3 4 5

Please comment

5.Definitions
Please rate the definitions on ease of application:

	Difficult----------				----------Easy
Primary bloodstream infections	1	2	3	4	5
Pneumonia	1	2	3	4	5
Urinary tract infections	1	2	3	4	5
Surgical site infections	1	2	3	4	5
Others	1	2	3	4	5

Please comment

6.HPSC Support

Did you feel there was sufficient support given to you by the HPSC

	Insufficient----------				----------Sufficient
	1	2	3	4	5

Please comment

7.Hospital Support

Did you feel there was sufficient support given to you by the participating hospitals

	Insufficient----------				----------Sufficient
	1	2	3	4	5

Please comment

8.After completing the survey do you think there might be a quicker/easier method to collect data. If so please comment.

9.Are there any changes that you would make to the

a) Survey form?

b) Survey overall?

10.Should you think of anything else that may help future surveyors participating in a similar survey please comment

Thank you for your time and effort of filling out this form.

Appendix 5: HIS/ICNA Prevalence Survey questionnaire

Serial number 7057030

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

hpsc

Prevalence survey of healthcare associated infections

Please write inside number and date frames or enter [X] in the appropriate box

DO NOT USE A PHOTOCOPY - Each form is uniquely serialised

Survey details

Hospital

Date of survey / /

Consultant speciality *Appendix 1*

Ward speciality *Appendix 1*

Local ward identifier *Code supplied by infection control team*

Patient details

Sex Male Female Age

Date of admission / /

	Yes	No		Yes	No
Indwelling urinary catheter in-situ			→ Urinary catheter within last 7 days		
Other bladder instrumentation in-situ			→ Other bladder instrumentation within last 7 days		
Peripheral intravascular catheter in-situ			→ Peripheral intravascular catheter within last 7 days		
Central intravascular catheter in-situ			→ Central intravascular catheter within last 7 days		
Mechanical ventilation			→ Mechanical ventilation within last 7 days		
Parenteral nutrition			→ Parenteral nutrition within last 7 days		
Currently receiving systemic antibiotics			→ IV antibiotics		
Surgery within last 30 days with no implant			→ Procedure category		
Surgery within last year involving an implant			→ Procedure category		
Other invasive procedure					

Procedure category - Appendix 2

Other information

	Yes	No		Yes	No
Current confirmed/suspected norovirus			Current *C. difficile* diarrhoea		

Active healthcare-associated infections

Any healthcare-associated infections? Yes No

If 'No' this form is now completed.

If 'Yes', complete infection-related questions overleaf

Serial number

7057030

Active healthcare-associated infections

Definitions Appendix 3

Primary bloodstream infection (BSI) — No ☐ Yes ☐

- MRSA causative organism? — Yes ☐ No ☐
- Central line related? — Yes ☐ No ☐

Pneumonia — No ☐ Yes ☐

Type of pneumonia:

- Clincially defined pneumonia ☐
- Pneumonia with specific laboratory findings ☐
- Pneumonia in immunocompromised patients ☐

- MRSA causative organism? — Yes ☐ No ☐
- Secondary bloodstream infection? — Yes ☐ No ☐
- Ventilator related pneumonia? — Yes ☐ No ☐

Urinary tract infection — No ☐ Yes ☐

Type of UTI

- Symptomatic urinary tract infection ☐
- Asymptomatic bacteriuria ☐
- Other infections of the urinary tract ☐

- MRSA causative organism? — Yes ☐ No ☐
- Secondary bloodstream infection? — Yes ☐ No ☐
- Catheter related — Yes ☐ No ☐

Surgical site infection — No ☐ Yes ☐

Type of SSI

- Superficial incisional ☐
- Deep incisional ☐
- Organ / Space ☐

- MRSA causative organism? — Yes ☐ No ☐
- Secondary bloodstream infection? — Yes ☐ No ☐
- Procedure category ☐☐ *Appendix 2*

Other healthcare associated infections

	No	Yes	MRSA causative organism? Yes	MRSA causative organism? No	Device / Procedure related? Yes	Device / Procedure related? No	Secondary bloodstream infection? Yes	Secondary bloodstream infection? No
Bones & joint	☐	☐	☐	☐	☐	☐	☐	☐
Central nervous system	☐	☐	☐	☐	☐	☐	☐	☐
Cardiovasular system	☐	☐	☐	☐	☐	☐	☐	☐
Eyes, ENT or mouth	☐	☐	☐	☐	☐	☐	☐	☐
Gastrointestinal system	☐	☐	☐	☐	☐	☐	☐	☐
Reproductive tract	☐	☐	☐	☐	☐	☐	☐	☐
Skin & soft tissue	☐	☐	☐	☐	☐	☐	☐	☐
Systemic infection	☐	☐	☐	☐	☐	☐	☐	☐
Lower respiratory tract (not pneumonia)	☐	☐	☐	☐	☐	☐	☐	☐

Produced by Hospital Infection Society - HCAI Prevalence Survey Steering Group

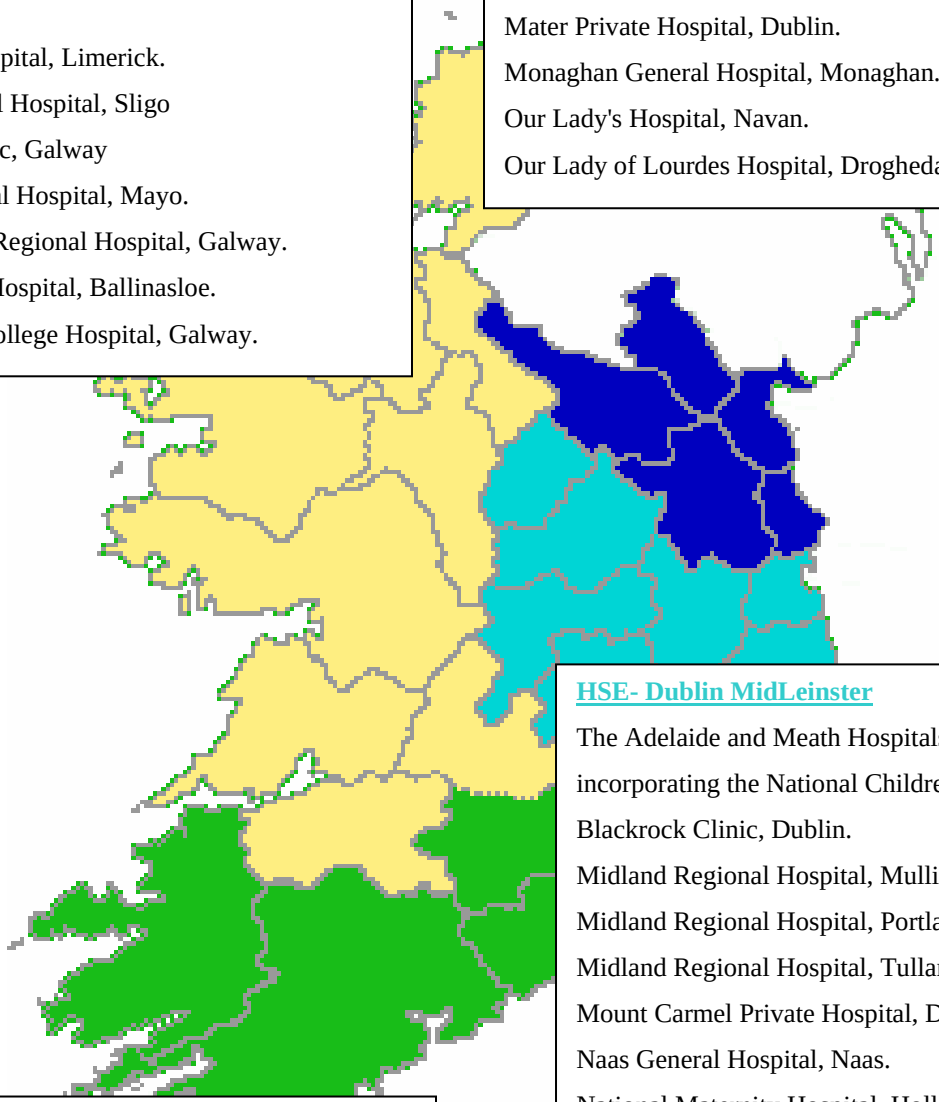
Appendix 5: Participating Adult Acute Hospitals

HSE-West

Midwestern Regional Hospital, Ennis.
Letterkenny General Hospital, Letterkenny.
Midwestern Regional Hospital, Nenagh.
Regional Maternity Hospital, Limerick.
Midwestern Regional Hospital Dooradoyle, Limerick.
Midwestern Regional Orthopaedic Hospital, Croom.
St John's Hospital, Limerick.
Sligo General Hospital, Sligo
Galway Clinic, Galway
Mayo General Hospital, Mayo.
Merlin Park Regional Hospital, Galway.
Portiuncula Hospital, Ballinasloe.
University College Hospital, Galway.

HSE- DublinNorthEast

Beaumont Hospital, Dublin.
Bon Secours Hospital, Dublin
Cappagh National Orthopaedic Hospital, Dublin
Connolly Hospital, Dublin
Cavan General Hospital, Cavan
Louth County Hospital, Dundalk.
Mater Misericordiae University Hospital, Dublin.
Mater Private Hospital, Dublin.
Monaghan General Hospital, Monaghan.
Our Lady's Hospital, Navan.
Our Lady of Lourdes Hospital, Drogheda.



HSE- Dublin MidLeinster

The Adelaide and Meath Hospitals, Dublin, incorporating the National Children's Hospital.
Blackrock Clinic, Dublin.
Midland Regional Hospital, Mullingar.
Midland Regional Hospital, Portlaoise.
Midland Regional Hospital, Tullamore.
Mount Carmel Private Hospital, Dublin.
Naas General Hospital, Naas.
National Maternity Hospital, Holles Street, Dublin.
Royal Victoria Eye & Ear Hospital, Dublin.
St. James's Hospital, Dublin.
St. Michaels Hospital, Dun Laoghaire
St. Lukes Hospital, Dublin.
St. Vincent's University Hospital
St. Vincents Private Hospital.

HSE- South

Waterford Regional Hospital, Waterford.
Wexford General Hospital, Wexford.
St. Lukes General Hospital, Kilkenny
Bon Secours Hospital, Cork
Mercy University Hospital, Cork.
Bon Secours Hospital, Tralee.
South Infirmary Victoria University Hospital, Cork