

APPENDIX 1 - LITERATURE REVIEW

A comprehensive literature review was undertaken for the HAI prevalence survey. The following table summarises multi-hospital (≥ 4) surveys undertaken from 1990 onwards in Europe. Only the most recent survey reported from an individual country has been included in the table, except in the case of the three surveys undertaken in the UK. The table reports country, year, population surveyed, HAI definitions and prevalence.

Appendix Table 1-1: Literature review of prevalence

Reference & publication date	Country	Year of survey	Inpatient population sampled:	Definition of 'a prevalent HCAI' ¹	Case definition	% inpatients with HCAI	Notes
(Smyth et al., 2006) (18)	UK and Eire	2006	Adults 273 acute hospitals, 75,763 patients	c1, c2, c3 met	CDC	UK: 7.6 England: 8.2 Wales: 6.3 N. Ireland: 5.5 Rep of Ireland: 4.9	Volunteer hospitals Local data collectors trained Selected wards within some hospitals
(Eriksen et al., 2005) (22)	Norway	Four surveys in 2002 and 2003	Adults & children 76 non-psychiatric acute hospitals, 11 – 12,000 patients per survey	c1, c2 met	Modified CDC	Range: 5.1 to 5.4 in four surveys	All hospitals involved Local data collectors Only 4 main HAI included
(Zotti et al., 2004) (20)	Regional, Italy	2000	Adults & children > 1 year old 60 hospitals, 9467 patients	c1 inpatients ≥24hrs. c2 met	CDC	7.8	All hospitals included Local data collectors trained
(Klavs et al., 2003) (17)	Slovenia	2001 (October)	Adults & children 19 acute care hospitals, 6696 patients	C2 met otherwise not stated	CDC	4.6	All acute hospitals Data collection lead by hospital coordinators
(Gikas et al., 2002) (24)	Greece	1999	Adults & children 5 university, 9 regional hospitals, 3925 patients	c1, c2 met	CDC	8.6	Volunteer hospitals Local data collectors
(Pittet et al., 1999) (23)	Switzerland	1996	Adults & children 4 university acute hospitals, 1349 patients	c1, c2 met	CDC	11.6	4 hospitals involved Trained data collectors and observers Validation of data collection Excludes asymptomatic bacteruria

Reference & publication date	Country	Year of survey	Inpatient population sampled;	Definition of 'a prevalent HCAI' ¹	Case definition	% inpatients with HCAI	Notes
(Vaque et al., 1999)(21)	Spain	Annually 1990 -1997	Adults & children 123-214 acute hospitals, 34,489 - 51,674 patients	C2 met otherwise not stated	CDC excluding asymptomatic bacteruria	1990: 8.5 1997: 6.9	Volunteer hospitals, a large (74) core group participating every year Local data collectors
(Gastmeier et al., 1998) (19)	Germany	1998	Adults 72 acute hospitals, 14,966 patients	c1, c2, c3 met	CDC	3.5	Random selection of hospitals and patients Fully trained external data collectors Data collection validated
(Emmerson et al., 1996) (6)	Second UK Survey	1993-94	Adults & children 157 hospitals, 37,111 patients	c2 met, otherwise not stated	UK	9.0	Volunteer hospitals Local data collectors trained 'Possible', 'probable' and 'definite' infections
(Meers, 1981) (5)	First UK Survey – England and Wales	1980	Adults & children 43 hospitals, 18163 patients	c2 met, otherwise not stated	UK	9.2	Volunteer hospitals Local data collectors Excludes geriatric and psychiatric patients. 'Possible', 'probable' and 'definite' infections

¹ Criteria for definition of 'a prevalent HAI' in HPS (Scotland 2006) survey: c1 arises ≥48 after admission; c2 fully meets survey case definition; c3 partially meets case definition and on antimicrobial treatment

APPENDIX 2 - DATA ITEMS COLLECTED DURING THE SURVEY

Appendix Table 2-1: Data items collected for each component of the survey

Data Item	Prevalence (No HAI present)	Prevalence (HAI present)	Burden
WARD SELECTION FORM			
Ward name	✓	✓	✓
Hospital name	✓	✓	✓
Official (administrative) specialty of ward 1,2,3,4	✓	✓	✓
WARD CENSUS			
Hospital	✓	✓	✓
Specialty ¹	✓	✓	✓
Survey Type (Burden or Prevalence)	✓	✓	✓
Date of census	✓	✓	✓
Time of census	✓	✓	✓
Beds occupied by inpatients at time of survey	✓	✓	✓
Beds occupied by patients staying for <24 hrs	✓	✓	✓
Unoccupied beds at time of census	✓	✓	✓
Total available beds at time of census	✓	✓	✓
Number of trained NHS nursing staff on duty	✓	✓	✓
Number of untrained NHS nursing staff on duty	✓	✓	✓
Number of trained agency nursing staff on duty	✓	✓	✓
Number of untrained agency nursing staff on duty	✓	✓	✓
Number of student nursing staff	✓	✓	✓
Comments on data collection	✓	✓	✓
Form completed by	✓	✓	✓
PATIENT DETAILS			
Patient hospital number	✓	✓	✓
Patient date of birth	✓	✓	✓
Gender	✓	✓	✓

Data Item	Prevalence (No HAI present)	Prevalence (HAI present)	Burden
Patients Bed Number	✓	✓	✓
Hospital Specialty responsible for patient care	✓	✓	✓
Date patient was admitted to this hospital	✓	✓	✓
Admission type	✓	✓	✓
Boarder	✓	✓	✓
Patient was transferred from another hospital	✓	✓	✓
Patient was transferred from another hospital ward	✓	✓	✓
Patient was transferred from another hospital ICU	✓	✓	✓
Transferred to ward from own ICU	✓	✓	✓
Patient was transferred from Care home	✓	✓	✓
Comments on data collection	✓	✓	✓
Date of Survey	✓	✓	✓
INFECTION			
HAI	✓	✓	✓
HAI type ²		✓	✓
MICROBIOLOGY (subject to positive or awaited microbiology report)			
Microbiology specimen(s) status		✓	✓
Organisms identified/isolated/cultured 1, 2, 3, 4		✓	✓
Other organism		✓	✓
SURGERY			
Surgery within the last year		✓	✓
Readmitted with an SSI		✓	✓
Surgery without implant in year preceding survey		✓	✓
Date(s) of surgery (no implant) 1, 2, 3		✓	✓
OPCS Code(s) (no implant) ^{3,7} 1, 2, 3		✓	✓
Other OPCS Code(s) (no implant)		✓	✓
Surgery with implant in last year		✓	✓
Date(s) of surgery (implant) 1, 2, 3		✓	✓

Data Item	Prevalence (No HAI present)	Prevalence (HAI present)	Burden
OPCS Code(s) (implant) ⁴ 1, 2, 3		✓	✓
Other OPCS Code(s) (implant)		✓	✓
ANTIMICROBIALS			
Patient is Currently receiving Antimicrobial Therapy	✓	✓	✓
Antimicrobial(s) ⁵ 1, 2, 3, 4	✓	✓	✓
Method of administration 1, 2, 3, 4	✓	✓	✓
Date Started 1, 2, 3, 4	✓	✓	✓
Prescription Type 1, 2, 3, 4	✓	✓	✓
INVASIVE DEVICES			
Invasive Device in situ		✓	✓
Urinary catheter in situ		✓	✓
Peripheral vascular catheter in situ		✓	✓
Number of peripheral vascular catheters in situ		✓	✓
Central vascular catheter in situ		✓	✓
Number of central vascular catheters in situ		✓	✓
Invasive mechanical ventilation in situ		✓	✓
Other invasive device in situ		✓	✓
DISCHARGE DETAILS			
Discharge date		✓	✓
Discharge status		✓	✓

1 Appendix Table 3-1 Mapping of specialty name to high level specialty groups

2 Appendix Table 3-4 Mapping of specific infection sites to high level HAI types

3 Appendix Table 3-2 Mapping of surgical procedures to high level surgery

4 Appendix Table 3-2 Mapping of surgical procedures to high level surgery

5 Appendix Table 3-3 Mapping of antimicrobials to high level antimicrobial groups

APPENDIX 3 - CONTROLLED LISTS

3.1 Specialties

Appendix Table 3-1: Mapping of specialty name to high level specialty groups

Specialty Group	Specialty Name
Care of the Elderly	Care of the Elderly - Care of the Elderly
	Care of the Elderly - GP Other than Obstetrics
	Care of the Elderly - Medicine
Dentistry	Dentistry - Oral Surgery
	Dentistry - Oral Medicine
	Dentistry - Orthodontics
	Dentistry - Restorative Dentistry
Gynaecology	Gynaecology - Gynaecology
Haematology	Haematology - Haematology
Medicine	Medicine - General Medicine
	Medicine - Cardiology
	Medicine - Clinical Genetics
	Medicine - Infectious Diseases
	Medicine - Dermatology
	Medicine - Endocrinology
	Medicine - Gastroenterology
	Medicine - Genito-Urinary Medicine
	Medicine - Medical Oncology
	Medicine - Renal Medicine
	Medicine - Neurology
	Medicine - Palliative Medicine
	Medicine - Rehabilitation Medicine
	Medicine - Respiratory Medicine
Medicine - Rheumatology	

Specialty Group	Specialty Name
Obstetrics	Obstetrics - GP Obstetrics
	Obstetrics - Obstetrics
	Obstetrics - Midwifery
Oncology	Oncology - Clinical Radiology
	Oncology - Clinical Oncology
Orthopaedics	Orthopaedics - Trauma & Orthopaedic Surgery
Other	Other
Pathology	Pathology - Chemical Pathology
Podiatry	Podiatry - Surgical Podiatry
Psychiatry	Psychiatry - General Psychiatry
	Psychiatry - Adolescent Psychiatry
	Psychiatry - Forensic Psychiatry
	Psychiatry - Psychiatry of Old Age
Surgery	Surgery - General Surgery
	Surgery - Vascular Surgery
	Surgery - Accident & Emergency
	Surgery - Anaesthetics
	Surgery - Cardiothoracic Surgery
	Surgery - Cardiac Surgery
	Surgery - Thoracic Surgery
	Surgery - Ear, Nose & Throat
	Surgery - Neurosurgery
	Surgery - Ophthalmology
Surgery - Plastic Surgery	
Urology	Urology - Urology

3.2 Surgery

Appendix Table 3-2: Mapping of surgical procedures to high level surgery type

Surgery Type	Surgical Procedures
Arteries and Veins	Arteries and Veins - Varicose vein surgery Arteries and Veins - Vascular surgery
Bones and Joints	Bones and Joints - Open reduction of fracture Bones and Joints - Hip prosthesis Bones and Joints - Knee prosthesis Bones and Joints - Other musculo-skeletal surgery
Cardiovascular	Cardiovascular - CABG chest and leg/radial (donor incision) Cardiovascular - CABG – chest only (donor incision e.g. mammary artery) Cardiovascular - Cardiac Surgery Cardiovascular - Heart valve replacement or repair of congenital defect Cardiovascular - Other cardiovascular surgery
Digestive tract	Digestive tract - Stomach surgery Digestive tract - Small intestine surgery Digestive tract - Large intestine surgery Digestive tract - Cholecystectomy Digestive tract - Appendectomy Digestive tract - Other surgery of the digestive tract
Endocrine and Breast	Endocrine and Breast - Mastectomy Endocrine and Breast - Thyroidectomy Endocrine and Breast - Other surgery of the endocrine system
Eye	Eye - Cataract surgery Eye - Other eye surgery
Female Genital	Female Genital - Vaginal hysterectomy Female Genital - Abdominal hysterectomy Female Genital - Other obstetric problem
Head	Head - Surgery of the head and neck

Surgery Type	Surgical Procedures
Head	Head - Surgery of the ear, nose or throat
Misc	Misc - Limb amputation Misc - Other prosthetic surgery Misc - Any other surgical procedure/intervention
Other	Other
Other abdominal surgery	Other abdominal surgery - Liver or pancreas surgery Other abdominal surgery - Laparotomy Other abdominal surgery - Repair of haemorrhoids Other abdominal surgery - Herniorrhaphy Other abdominal surgery - Splenectomy Other abdominal surgery - Other surgery haem/lymph system Other abdominal surgery - Organ transplant
Pregnancy	Pregnancy - Caesarean section
Respiratory	Respiratory - Other respiratory system surgery
Skin	Skin - Skin graft
Skull and Spine	Skull and Spine - Craniotomy Skull and Spine - Ventricular shunt Skull and Spine - Other surgery of the CNS Skull and Spine - Spinal fusion Skull and Spine - Laminectomy
Soft Tissue	Soft Tissue - Other surgery of the integumentary system
Thoracic	Thoracic - Thoracic surgery
Urinary	Urinary - Nephrectomy Urinary - Prostatectomy Urinary - Other surgery genitourinary system (except hysterectomy and CS)

3.3 Antimicrobials

Appendix Table 3-3 Mapping of antimicrobials to high level antimicrobial groups

Antimicrobial Group	Antimicrobial Name
Aminoglycosides	Amikacin
	Framycentin sulphate
	Gentamicin
	Neomycin
	Netilmicin
	Capreomycin
	Streptomycin
	Tobramycin
Antifungal	Amorolfine
	Benzoic Acid
	Clotrimazole
	Econazole Nitrate
	Sulconazole Nitrate
	Tioconazole
	Undecenoates
	Amphotericin
	Caspofungin
	Fluconazole
	Flucytosine
	Griseofulvin
	Itraconazole
	Ketoconazole
	Miconazole
	Nystatin
	Terbinafine
Voriconazole	

Antimicrobial Group	Antimicrobial Name
Antiviral	Cidofovir
	Didanosine
	Efavirenz
	Emtricitabine
	Enfuvirtide
	Famciclovir
	Fosamprenavir
	Foscarnet Sodium
	Ganciclovir
	Indinavir
	Inosine Pranobex
	Interferon beta
	Interferon beta-1a
	Lamivudine
	Lopinavir With Ritonavir
	Nelfinavir
	Nevirapine
	Oseltamivir
	Palivizumab
	Ribavirin
	Ritonavir
	Saquinavir
	Stavudine
	Tenofovir disoproxil
	Valaciclovir
	Valganciclovir
	Zalcitabine
	Zanamivir
	Zidovudine

Antimicrobial Group	Antimicrobial Name
Antiviral	Abacavir
	Aciclovir
	Adefovir Dipivoxil
	Amantadine Hydrochloride
	Amprenavir
	Atazanavir
	Penciclovir
Carbapenems and Monobactams	Ertapenem
	Imipenem With Cilastatin
	Meropenem
	Aztreonam
Cephalosporins	Cefalexin
	Cefixime
	Cefotaxime
	Cefoxitin
	Cefpirome
	Cefpodoxime
	Cefprozil
	Cefradine
	Ceftazidime
	Ceftriaxone
	Cefuroxime
	Cefradine
	Cefaclor
	Cefadroxil
	Glycopeptide
Vancomycin	
Macrolides, Lincosamides, Streptogramin	Clarithromycin
	Clindamycin

Antimicrobial Group	Antimicrobial Name
Macrolides, Lincosamides, Streptogramin	Erythromycin
	Azithromycin
	Quinupristin with Dalfopristin
	Telithromycin
Other	Other Drugs
	Salicylates
	Salicylic Acid
	Chloramphenicol
	Clioquinol
	Clofazimine
	Colistin
	Cycloserine
	Dapsone
	Ethambutol Hydrochloride
	Fusidic Acid
	Isoniazid
	Linezolid
	Methenamine hippurate
	Metronidazole
	Mupirocin
	Nitrofurantoin
	Polymyxin B Sulphate
	Propamidine Isetionate
	Pyrazinamide
Rifabutin	
Rifampicin	
Tindazole	
Not Known	
Penicillins	Amoxicillin

Antimicrobial Group	Antimicrobial Name
Penicillins	Co-Amoxiclav
	Co-Fluampicil
	Ampicillin
	Flucloxacillin
	Benzylpenicillin
	Penicillin
	Phenoxymethylpenicillin
	Piperacillin
	Pivmecillinam Hydrochloride
	Tazocin
Ticarcillin	
Quinolones	Ciprofloxacin
	Levofloxacin
	Moxifloxacin
	Nalidixic
	Norfloxacin
	Ofloxacin
Sulphonamides and Trimethoprim	Silver sulphadiazine
	Sultrin Cream
	Co-Trimoxazole
	Sulphadiazine
	Trimethoprim
Tetracyclines	Demeclocycline
	Doxycycline
	Lymecycline
	Minocycline
	Oxytetracycline
	Tetracycline

3.4 HAI types

Appendix Table 3-4: Mapping of specific infection sites to high level HAI types

HAI Type	Specific Site of Infection
Urinary Tract Infection	Asymptomatic Urinary Tract Infection
	Other Infections of the Urinary Tract
	Symptomatic Urinary Tract Infection
Systemic Infection	Disseminated Infection
Skin & Soft Tissue Infection	Skin Infection
	Soft Tissue Infection
	Infected Burn
	Decubitus Ulcer
	Breast Abscess or Mastitis
Surgical Site Infection	Superficial Incisional Surgical Site Infection
	Deep Incisional Surgical Site Infection
	Organ\Space Surgical Site Infection
Reproductive System Infection	Endometritis
	Episiotomy Site Infection
	Vaginal Cuff infections
	Other Infections of the Male and Female Reproductive Tract
Pneumonia	Pneumonia
Lower Respiratory Tract Infection other than Pneumonia	Tracheobronchial
	Other Lower
Gastrointestinal Infection	Gastroenteritis
	Gastro Intestinal Tract Infection
	Intra Abdominal Infection
	Viral Hepatitis

HAI Type	Specific Site of Infection
Eye, Ear, Nose, Throat & Mouth Infection	Otitis Media
	Otitis Interna
	Mastoiditis
	Upper Respiratory Tract
	Conjunctivitis
	Eye Infection other than conjunctivitis
	Oral cavity
	Sinustis
	Otitis Externa
Cardiovascular System Infection	Arterial, Venous Infection
	Mediastinitis
	Endocarditis
	Myocarditis or Pericarditis
Central Nervous System Infection	Meningitis or Ventriculitis
	Spinal Abscess without Meningitis
	Intracranial Infection
Bloodstream Infection	Laboratory Confirmed Bloodstream
	Clinical Sepsis
Bone & Joint Infection	Osteomyelitis
	Joint or Bursa
	Disc Space Infection