

JSNA: Health Protection: Health Care Associated Infections (HCAI) and Antimicrobial Resistance (AMR)

Summary

- Healthcare Associated Infections (HCAI) can develop either as a direct result of a healthcare intervention (such as medical or surgical treatment) or from being in contact with a healthcare setting.
- Wirral had 187 cases of reported healthcare associated infections in 2015/16 compared to 180 cases in 2014/15.
- The 187 cases of mandatory HCAI in 2015/16 across health care settings were mostly C. difficile infections (95 cases).
- There is a link between overuse of antibiotics and greater risk of HCAI.
- Wirral has higher prescribing levels of antibiotics in comparison to similar areas in England.
- Factors which increase susceptibility to HCAI include older age, weakened immune system and high levels of contact with healthcare providers.
- Reducing the burden of HCAI on the population and the health and social care system requires a seamless approach to delivery, increased importance of infection prevention and control practices and a reduction in unnecessary antibiotic prescribing.

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What do we know

Overview

Healthcare associated infections can develop either as a direct result of a healthcare intervention (such as medical or surgical treatment) or from being in contact with a healthcare setting.

Healthcare-associated infections arise across a wide range of clinical conditions and can affect people of all ages. They can exacerbate existing or underlying conditions, delay recovery and adversely affect quality of life. Healthcare-associated infections can occur in otherwise healthy people, especially if invasive procedures or devices are used. Healthcare workers, family members and carers are also at risk of acquiring infections when caring for people. A number of factors can increase the risk of acquiring an infection, but high standards of infection prevention and control practice, including providing clean environments, can minimise the risk.

The term HCAI covers a wide range of infections. Two key infections are; [Methicillin Resistant Staphylococcus Aureus](#) (MRSA) and [Clostridium difficile](#) (also known as C. diff, *C. difficile* or *CDI*). MRSA is a type of bacteria that's resistant to a number of widely used antibiotics. This means MRSA infections can be more difficult to treat than other bacterial infections. *C. difficile* is a bacterium that can infect the bowel and cause diarrhoea. The infection most commonly affects people who have recently been treated with [antibiotics](#), but can spread easily to others.

Both infections are associated with being a health or social care environment and the surveillance and reduction of these is important as they can result in considerable morbidity and mortality. (It is important however, to note that **not** all infections originate in a health or social care setting as cases can also be brought into such settings from the community).

Other HCAI, such as [MSSA](#), and [CPE](#) are also monitored. However there are no threshold levels set by the Department of Health which such infections should not exceed.

[Antimicrobial stewardship](#) is about the systems and processes for the effective use of antimicrobial medicine. This is important to help slow the emergence of antimicrobial resistance (AMR) and ensure that antimicrobials remain an effective treatment for infection. AMR is the ability of micro-organisms to withstand antimicrobial treatments such as antibiotics. This resistance occurs as bacteria adapt and find ways to survive the effects of an antibiotic. The result of this is the drug is no longer able to fight the infection it was previously used to treat. The more an antibiotic is used, the more bacteria become resistant to it. Antibiotic resistant pathogens are associated with the increased incidence of healthcare acquired

infections. Good antimicrobial stewardship is a key part of effective infection prevention and control.

In this section we consider:

- Healthcare associated infections and
- Antimicrobial stewardship and antimicrobial resistance

Why is this important

HCAI's prolong hospital stays, create long-term disability and increase resistance to antimicrobials. They also represent a massive additional financial burden for health systems, generate high costs for patients and their family and cause unnecessary illness and deaths.

HCAIs pose a particular risk to individuals in poor health or people with weakened immune systems. This could be due to frailty in old age, medical interventions such as surgery or chemotherapy and or pre-existing medical conditions. Risk of infection rises with increased and or prolonged contact with healthcare interventions.

The consequences of AMR include increasing treatment failure for the most commonplace infections, such as urinary tract infections and decreasing the treatment options available where antibiotics are vital, such as during cancer treatment when patients are prone to infection. Antibiotic resistant pathogens are also associated with the increased incidence of healthcare associated infections

Globally, nationally and locally, anti-microbial resistance is an ongoing significant risk to public health. It is estimated if no action is taken then antibiotic resistant infections could kill an extra 10 million people across the world each year by 2050.

Facts, figures and trends

Health Care Associated Infections (HCAIs)

Surveillance

Public Health England (PHE) monitors the numbers of certain infections that occur in healthcare settings through routine surveillance programmes and advises on how to prevent and control infection in establishments such as hospitals, care homes and schools.

Surveillance programmes provide essential information on:

- what and where the problems are and
- how well control measures are working

There is national mandatory surveillance of the following infections:

- Blood stream infection (bacteraemia) due to Methicillin Resistant Staphylococcus aureus ([MRSA](#))
- Blood stream infection (bacteraemia) due to Methicillin Sensitive Staphylococcus aureus ([MSSA](#))
- Blood stream infection (bacteraemia) due to Escherichia coli ([E-coli](#))
- Gastrointestinal infection and diarrhoea due to Clostridium Difficile infection ([CDI or C.diff](#))

Guidelines, targets and prevention

Infection prevention and control is the responsibility of all organisations and staff involved in the provision of health and social care.

Under the [Health & Social Care Act 2012](#), all providers of health and social care services must declare themselves compliant with the Essential Standards of Quality and Safety and its supporting document 'The Code of Practice on the prevention and control of infections and related guidance'.

[NICE Quality Standards](#) describe high-priority areas for quality improvement in a defined care or service area. Each standard consists of a prioritised set of specific, concise and measurable statements. They draw on existing guidance which provides an underpinning, comprehensive set of recommendations.

[NICE quality standard 61](#) 'Infection prevention and control' published in 2014 covers the prevention and control of infection for people receiving healthcare in primary, community and secondary care settings. Settings include hospitals, general practices, dental clinics, health centres, care homes, the person's own home, schools and prisons providing healthcare and care delivered by the ambulance service and mental health services.

The paper has six quality statements for effective Infection Prevention and Control, these are;

1. People are prescribed antibiotics in accordance with local antibiotic formularies as part of antimicrobial stewardship.
2. Organisations that provide healthcare have a strategy for continuous improvement in infection prevention and control, including accountable leadership, multi-agency working and the use of surveillance systems.
3. People receive healthcare from healthcare workers who decontaminate their hands immediately before and after every episode of direct contact or care.

4. People who need a urinary catheter have their risk of infection minimised by the completion of specified procedures necessary for the safe insertion and maintenance of the catheter and its removal as soon as it is no longer needed.
5. People who need a vascular access device have their risk of infection minimised by the completion of specified procedures necessary for the safe insertion and maintenance of the device and its removal as soon as it is no longer needed.
6. People with a urinary catheter, vascular access device or enteral feeding tube, and their family members or carers (as appropriate), are educated about the safe management of the device or equipment, including techniques to prevent infection.

NHS England has set official guidance for [Clostridium difficile infection \(CDI\) objectives for NHS organisations in 2016/17 and guidance on sanction implementation.](#) All acute care organisations should be encouraged to assess each CDI case to determine whether the case was linked with a lapse in the quality of care provided to patients. An infection is not classed as hospital acquired unless it is evident after 48 hours in hospital.

The document includes objectives for maximum number of cases and rates of CDI for acute trusts. Table 1 provides the proposed CDI objectives for Wirral University Teaching Hospital and Wirral CCG for 2016-17.

Table 1: Clostridium difficile (CDI) objectives for Wirral University Teaching Hospital 2016/17

Organisation	CDI case objective	CDI rate objective
Wirral University Teaching Hospital	29	11.7
Wirral CCG	75	23.4

Source: Wirral University Teaching Hospital

HCAI incidence

Public Health England produces an annual national epidemiological commentary on mandatory reported infections of MRSA, MSSA and E-coli bacteraemia and C. difficile infection (CDI). The [2014/15 report](#) found across England the rate of MRSA bacteraemia (bloodstream infection, not colonisation on the skin) cases dropped by 7.1% in 2014/15 compared to the previous financial year (a reduction to 1.5 per 100,000 population in 2014/15 from 1.6 per 100,000 population in 2013/14). However, counts and rates of C. difficile infections (antibiotic-associated infection) and both MSSA and E.coli bacteraemia significantly increased in 2014/15.

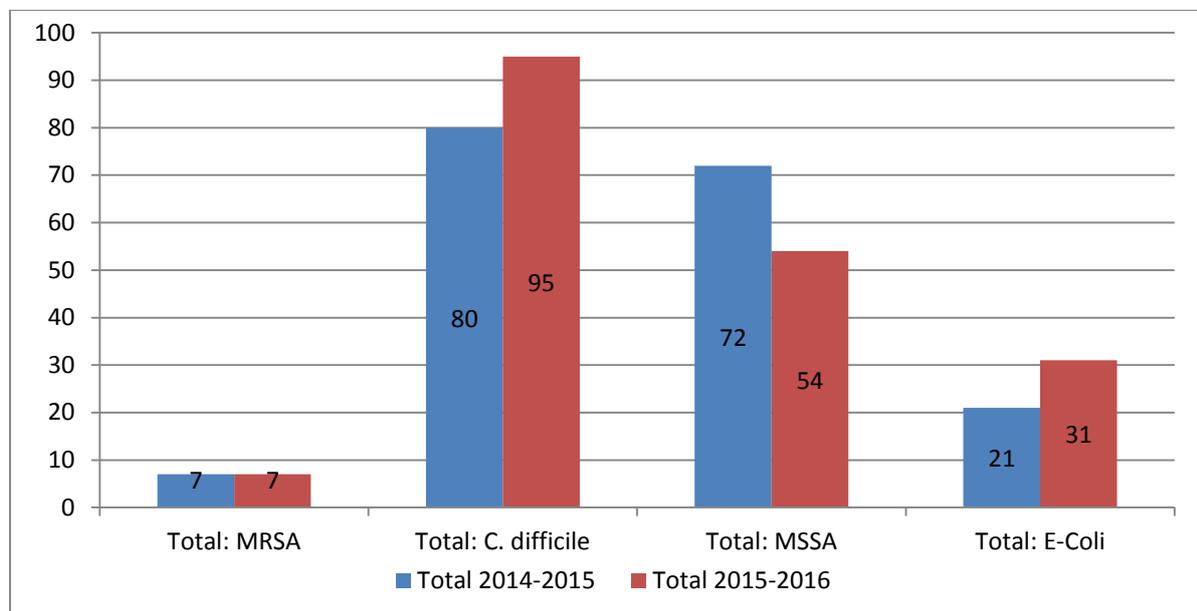
Regionally, up to and including December 2015, the North of England had the highest number of cases of C. difficile infection and the second highest MRSA

bacteraemia rates in England. The annual national report for 2015/16 should be published later in 2016.

During 2014/15 the Clinical Commissioning Groups within Cheshire & Merseyside had a total of 768 cases of C. difficile infection and 30 MRSA bacteraemia cases. Wirral had lower total HCAI counts compared to neighbouring CCGs. Numbers will vary across different areas depending on population size and factors such as the age of the local population. We do not currently have rates per population to compare performance.

Figure 1 below shows the official Public Health England (PHE) HCAI counts for Wirral across healthcare settings for 2014/15 and 2015/16.

Figure 1: Wirral incidence of HCAI for April 2014 to March 2015 and April 2015 to March 2016



Source: PHE Cheshire and Merseyside

The total number of reported cases for 2015/16 was 187. This is slightly higher than the number for the same period in 2014/ 2015 which was 180 cases. This is as a result of a significant reduction in MSSA cases but a rise in E-coli and C. difficile counts in 2015/16. The distribution of cases of acute and community acquired C. difficile is broadly proportionate. A larger proportion of MRSA cases have been assigned to the community.

Antimicrobial Stewardship

Guidelines and targets

The Department of Health have produced a five year [UK Five Year Antimicrobial Resistance Strategy](#) for 2013 to 2018. This has seven key areas for action;

1. Improving infection prevention and control practices.
2. Optimising prescribing practice.
3. Improving professional education, training and public development.
4. Developing new drugs, treatment and diagnostics.
5. Better access to and use of surveillance data.
6. Better identification and prioritisation of AMR research needs.
7. Strengthened international collaboration.

Towards the end of 2015, NHS England (NHSE) issued a [Patient Safety Alert](#) entitled “*Addressing antimicrobial resistance through implementation of an antimicrobial stewardship programme*”. The main aim of this alert was to highlight the challenge of AMR and to support the NHS in improving antimicrobial stewardship in both primary and secondary care via the use of specifically developed [Target Toolkits](#).

There are [NICE guidelines \(NG15\)](#) on Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use. This guideline covers the effective use of antimicrobials in children, young people and adults. It aims to change prescribing practice to help slow the emergence of antimicrobial resistance and ensure that antimicrobials remain an effective treatment for infection.

Antibiotic prescribing

[The NHS Atlas of Variation in Healthcare](#) has reported the national surveillance on antibiotic prescribing up to 2013. Nationally the majority of antibiotic prescribing occurs in the community. In 2013 GPs prescribed 79% of antibiotics, dentists and other community prescribers prescribed 6% and the remaining 15% was prescribed in hospitals.

From 2010 to 2013 total national antibiotic consumption increased by 6%. General practice use increased by 4%, prescribing to hospital inpatients increased by 12% and other community prescriptions increased by 32%. The reasons for the increase in consumption may represent a combination of changes in the number of patients presenting with infections requiring antibiotics and over-prescribing of antibiotics by clinicians.

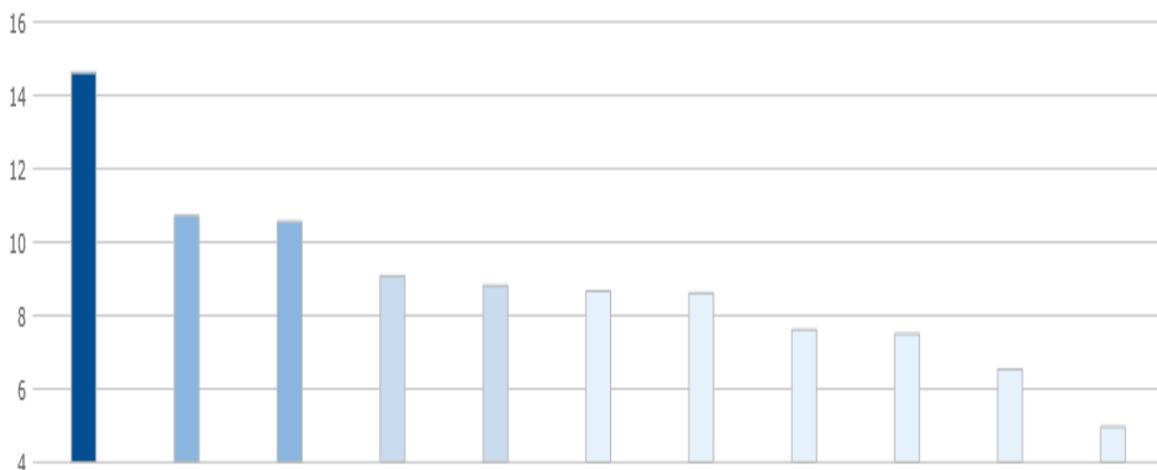
Nationally the most commonly prescribed [antibiotics](#) in 2013 were penicillins, tetracyclines, and macrolides.

Defined daily dose (DDD) is a fixed unit of measurement developed by the World Health Organisation to enable comparisons among population groups and countries. In 2013, the total measured consumption of antibiotics in England was 21.7 DDDs per 1000 population per day.

Examining prescribing by NHS area teams in England the average number of DDDs of antibiotics prescribed in primary and secondary care per day ranged from 19.2 to 25.6 per 1000 population. The highest figures were in the north of England.

The 2013 data showed Wirral to have higher levels of antibiotic prescribing in primary care than other areas. Wirral CCG was ranked 28, where 1 is the worst, out of the 209 CCGs for antibiotic prescribing in 2013. For deprivation Wirral ranks 80, where 1 is the worst, out of 209 CCGs, this would suggest that Wirral's level antibiotic prescribing is high compared to its level of deprivation. (Areas with greater deprivation would be expected to have higher levels of antibiotic prescription due to deprived populations having a greater experience of illness and infections). Figure 2 shows Wirral compared to similar areas had a higher overall percentage of all antibiotic prescribing items in primary care for key antibiotics.

Figure 2: Percentage of all antibiotic prescribing items in primary care that were for key antibiotics by Wirral and Wirral peer CCGs in 2013



In ranked order Wirral, Sunderland, Wigan, St Helens, Rotherham, South Sefton, Barnsley, Wakefield, South Tyneside, Durham Dales, Easington & Sedgefield, Stockport

Source: Wirral CCG presentation Clinical Senate 2016

Analysis at Wirral practice level shows prescribing of antibacterial drugs varies between different practices.

Data limitations

The national mandatory surveillance data for HCAs provides the most comprehensive and reliable information available. However, it gives an underestimation of the infection rates because it only monitors four infections

(MRSA, MSSA, E.coli and C.diff) out of the wide range of infectious organisms known to contribute to HCAI.

Currently we do not have data available to compare Wirral to other areas of HCAI counts to examine performance relative to other areas. We do not have patient characteristic such as age, gender of HCAI which would help indicate cases by vulnerable groups.

For antibiotic prescribing we currently do not have data from Wirral Community Trust which would show prescribing relating to sexual health, community district nurses and walk in centres.

Key inequalities & groups at risk

The risk of acquiring an HCAI increases with older age. This is related to greater prevalence of long term conditions and greater contact with health and social care interventions. Risk of HCAI also increases with deprivation related to deprived populations having a greater experience of long term conditions and complex care needs.

Other risk factors include:

- **Illnesses, such as cancer, diabetes and heart disease** that can make patients more vulnerable to infection and their immune system less able to fight it.
- **Medical treatments**, for example, chemotherapy which suppresses the immune system.
- **Medical interventions and devices**, for example surgery, artificial ventilators and intravenous lines provide opportunities for micro-organisms to enter the body directly.
- **Taking antibiotics as these can harm the body's normal gut flora "friendly" micro-organisms that live in the digestive tract and perform a number of useful functions.** This can enable other micro-organisms, such as *C.difficile*, to take hold and cause problems. This is especially a problem in older people.

Source: [Public Health England](#) (2014)

What are we doing in Wirral?

Wirral Health Protection Group

The Wirral Health Protection Group meets bi-monthly and has a strategic focus on system leadership, assurance and risk management for health protection across Wirral. Members include the Director of Public Health and other local authority leaders for health protection alongside representatives from NHS England, Public Health England (PHE) and Wirral Clinical Commissioning Group (CCG). The forum is in the process of identifying priorities for 2016 which this JSNA chapter will inform.

National HCAI Thresholds

A zero tolerance approach to MRSA and a significant reduction of reported C. difficile are linked to better patient outcomes and Wirral CCG is expected to continually increase standards of infection control to limit the incidence of HCAIs. The strategic aim is to increase organisational focus and collaborative working so as to effectively implement The Health and Social Care Act (2008).

Collaborative Working

Collaborative working across the local health economy will improve existing ways of working to create a more robust system approach. An integrated pathway for notification, investigation, management and follow up of MRSA BSI and C.difficile cases has been developed. When cases occur they are reviewed by a multi-agency panel and lessons learned are disseminated for action across partners.

Wirral Community Infection Prevention and Control Service

This service provides infection prevention and control advice and support in the community, which includes primary care and social care providers such as GPs, dental practices and nursing homes. This services audits practices and service improvement plans as well as providing education and training. The service works across the health and social care system to respond to cases, clusters and outbreaks of communicable disease in the community to manage, control and reduce the risk of infection.

Wirral Infection Prevention & Control Network

This group meets bi-monthly and provides strategic leadership, monitoring and surveillance for the prevention and control of local healthcare-associated infections. It includes a membership panel of multidisciplinary healthcare professionals from providers in the area and is organised by Wirral Council Public Health in collaboration with Wirral Clinical Commissioning Group.

C. difficile case review group

From January 2016 a whole system, monthly C. difficile case review panel meeting has been set up to scrutinise cases. This includes examining any associated prescribing, identifying shared learning and implementing whole system preventative actions. This group includes representatives from health care provider Infection Prevention and Control teams, Wirral Clinical Commissioning Group, Wirral Council and the Commissioning Support Unit Medicines Management. It works to the 2016/17 [NHS England objectives guidance](#) for C. difficile infections.

Antimicrobial stewardship

To utilise both the prudent use of antibiotics and a sustainable infection prevention and control programme, there are several areas of work Wirral is currently developing:

Wirral Antimicrobial Resistance Strategy group

These are bi-monthly meetings involving Wirral local authority public health team, Wirral CCG, NHS Commissioning Support Unit medicines management team and Wirral Community Trust. The meeting drives Wirral's action relating to Public Health England's Patient Safety Alert addressing antimicrobial resistance through implementation of an antimicrobial stewardship programme. Key issues and risks within the local area are identified, linking in with providers to ensure seamless working. It aims to support safe and appropriate prescribing of antimicrobial agents to optimise patient outcomes. This group is responsible for developing an AMR strategy for Wirral based on the [Cheshire and Merseyside AMR Strategy](#).

Prescribing Cluster Group meetings

To address the high level of use of broad-spectrum antibiotics in Wirral and related infection rates of C difficile and MRSA, practices have been asked to share any difficulties they face with regards to antibiotic prescribing and examples of good practice / possible solutions. Focused work is being undertaken in relation to antimicrobial prescribing to reduce variation across practices.

Practice leads on Antimicrobial stewardship

Wirral practices must nominate a lead on [Antimicrobial Stewardship](#). It is recommended that this is the Prescribing Lead GP but it can be any person within the practice who is able to take on the role of raising awareness of the subject.

Implementation of the [Target Toolkit](#)

This is a national tool kit. TARGET stands for: Treat Antibiotics Responsibly, Guidance, Education, Tools. The Toolkit is designed to be used by the whole primary care team within the GP practice or out of hours setting. The toolkit aims to help influence personal attitudes of prescribers and patients, address social norms and perceived barriers to optimal antibiotic prescribing. It includes a range of resources that can each be used to support responsible antibiotic use.

Data on GP usage is not available at this time.

Antibiotic Guardian

[Antibiotic Guardian](#) is a national campaign led by Public Health England (PHE) which urges members of the public and healthcare professionals to take action in helping to slow antibiotic resistance and ensure antibiotics work now and in the future. To become an Antibiotic Guardian, people choose one pledge about how they can personally prevent infections and make better use of antibiotics and help protect these vital medicines.

AMR Prescribing CQUIN

The Commissioning for quality and Innovation (CQUIN) payment framework enables commissioners to reward excellence, by linking a proportion of English healthcare providers' income to the achievement of local quality improvement goals. The CQUIN scheme is intended to drive transformational change. There is a CQUIN on Antimicrobial resistance (AMR) which aims to reduce antibiotic consumption and encourage a prescribing review within 72 hours of commencing an antibiotic.

What are the challenges

There is difficulty in ensuring all parts of the health and social care system can work together to reduce the risk of HCAI and implement robust antimicrobial stewardship. For example, this can result in challenges in sharing timely data and being able to track patients between settings.

There is also a challenge in changing culture around the use of antibiotics amongst both the public and prescribers.

Links

- NHS choices for information on diseases:
<http://www.nhs.uk/Conditions/Pages/hub.aspx>
- NHS England Patient safety alerts:
<https://www.england.nhs.uk/patientsafety/psa/>
- UK 5 Year Antimicrobial Resistance (AMR) Strategy 2013–2018 Annual progress report and implementation plan:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/385733/UK_AMR_annual_report.pdf

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WHO Health care-associated infections FACTSHEET

http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf

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