



**WIRRAL
INTELLIGENCE
SERVICE**

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

Wirral Intelligence Service

June 2018

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

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Background to JSNA – Joint Strategic Needs Assessment

What is a JSNA?

A Joint Strategic Needs Assessment, better known as a JSNA, is intended to be a systematic review of the health and wellbeing needs of the local population, informing local priorities, policies and strategies that in turn informs local commissioning priorities that will improve health and wellbeing outcomes and reduce inequalities throughout the Borough.

Who is involved?

Information from Council, NHS and other partners is collected and collated to inform the JSNA and this reflects the important role that all organisations and sectors have (statutory, voluntary, community and faith) in improving the health and wellbeing of Wirral's residents.

About this document

This JSNA section looks to contain the most relevant information on the topic and provides an overview of those related key aspects

How can you help?

If you have ideas or any suggestions about these issues or topics then please email us at wirralintelligenceservice@wirral.gov.uk or go to <https://www.wirralintelligenceservice.org/>

Version Number	Date	Authors
3.0	June 2018	Sophie Patterson, Lesley Hankinson, Hannah Cotgrave, John Highton, Sarah Kinsella, Matthew Saunders

Content overview

Abstract	Summary of healthcare associated infections (HCAI) and antibiotic resistance (AMR) in Wirral. HCAI develop as a direct result of a healthcare intervention or contact with a healthcare setting. AMR occurs when bacteria, viruses, fungi or parasites are no longer susceptible to previously effective treatments.
Intended or potential audience	<ul style="list-style-type: none"> • Wirral partners via Health Protection Forum • Public Health Departmental Management Team • Environmental Health Departmental Management Team
Links with other topic areas	<ul style="list-style-type: none"> • Communicable diseases that includes vaccinations • Screening • Food Safety • Environmental Health

Key findings

- 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 415 cases of reported HCAI in 2016/17.
- The majority (81%) of mandatory HCAI reported in 2016/17 across healthcare settings were E.coli bacteraemia and C. difficile infections.
- In light of the national strategy to reduce the number of gram negative bacteraemias 50% by 2020-2021, increased efforts to reduce the incidence of E.coli bacteraemias in Wirral is a key priority.
- Factors which increase susceptibility to HCAI include older age, weakened immune system and high levels of contact with healthcare providers.
- There is a link between overuse of antibiotics, emergence of drug-resistant pathogens, and greater risk of HCAI.
- Wirral has higher prescribing levels of antibiotics in comparison to similar areas in England.
- Partners across Wirral must celebrate and continually improve actions to prevent infection and reduce inappropriate antibiotic use in the region. Strong action is needed for Wirral to meet the national target of 50% reduction in antibiotic prescribing by 2020-2021.
- 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 less inappropriate antibiotic prescribing.
- Antimicrobial resistance (AMR) occurs when bacteria, viruses, fungi or parasites are no longer susceptible to previously effective treatments.
- AMR is a threat to global public health, which can impact treatment choices and health outcomes for HCAI.
- Antimicrobial stewardship initiatives aim to promote high quality patient care, while limiting the spread of AMR.
- NHS Wirral CCG has seen an increase in the number of antibiotic guardians between 2014 and 2016.

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

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What do we know?

Healthcare associated infections (HCAI) can develop either as a direct result of a healthcare intervention (such as medical or surgical procedure) or from being in contact with a healthcare setting. HCAI arise across a wide range of clinical circumstances and can affect people of all ages. They can exacerbate existing or underlying conditions, delay recovery and adversely affect quality of life. HCAI can occur in otherwise healthy people, especially if invasive procedures are performed. Healthcare workers, family members and carers are also at risk of acquiring HCAI when caring for other people. A number of factors can increase the risk of acquiring HCAI, but high standards of infection prevention and control practice can minimise the risk. Surveillance and prevention of HCAI is important as they can lead to increased morbidity and mortality, and are difficult to treat.

The term HCAI covers a wide range of infections. Two key infections are [Clostridium difficile](#) (also known as *C. diff*, *C. difficile* or *CDI*) and [Methicillin Resistant Staphylococcus Aureus](#) (MRSA). *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. MRSA is a type of bacteria that has developed resistance to a number of widely used antibiotics. This means MRSA infections can be more difficult to treat than other bacterial infections.

Antimicrobial resistance (AMR) has developed in many bacteria, viruses, fungi and parasites, including organisms responsible for HCAI, which can impact treatment choices and health outcomes. AMR is the ability of micro-organisms to withstand antimicrobial treatments, such as antibiotics. This resistance occurs as organisms adapt and find ways to survive the effects of an antimicrobial drug. The result of this is that the drug is no longer able to fight the infection it was previously used to treat. Inappropriate antimicrobial use is a major contributor to AMR, driven by misuse or overuse of treatment among both people and animals.

[Antimicrobial stewardship](#) is about the systems and processes to optimise effective use of antimicrobial medicine. This is important to help slow the emergence of AMR and ensure that antimicrobials remain an effective treatment for infection. Good antimicrobial stewardship is a key part of effective infection prevention and control.

In this section we consider:

- Healthcare associated infections (HCAI)
- Antimicrobial resistance (AMR)
- Antimicrobial stewardship

Why is this important?

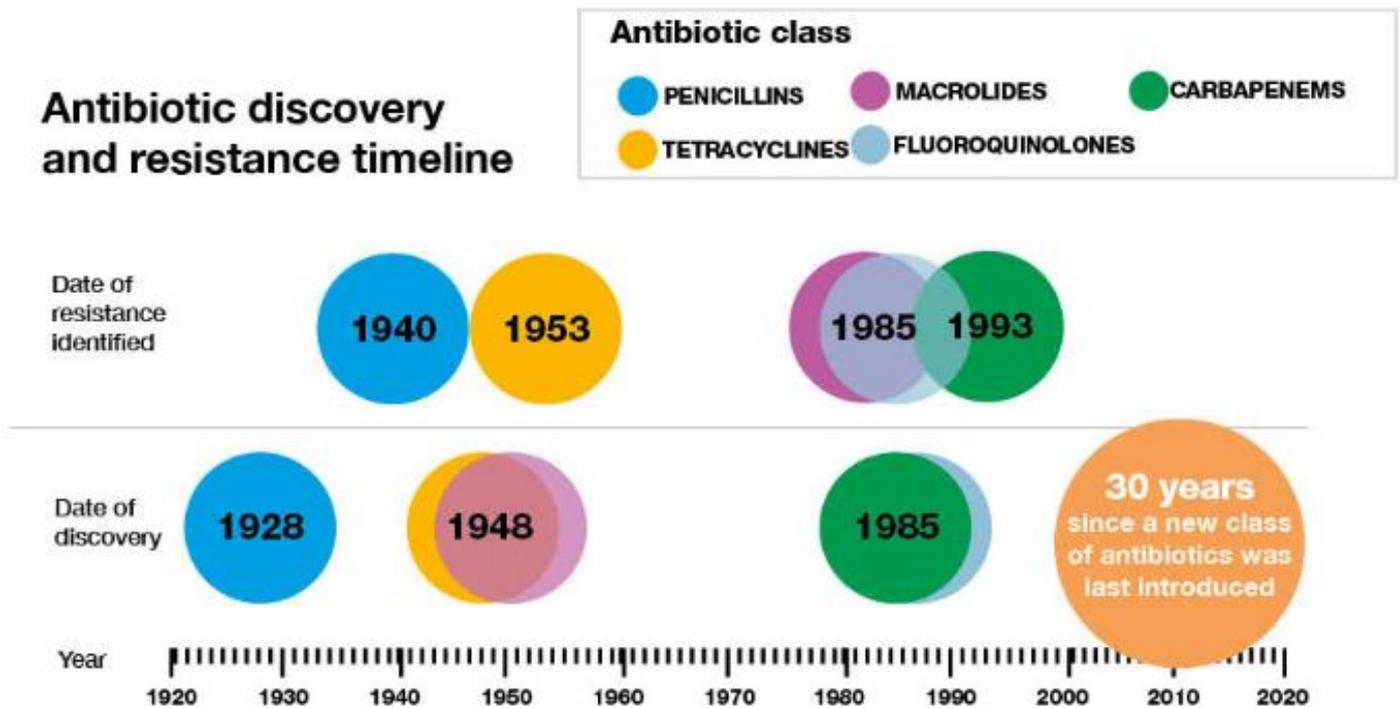
HCAI prolong hospital stays, create long-term disability and increase resistance to antimicrobials. They also represent a massive additional financial burden for health systems, generate high costs for patients and their family and cause unnecessary illness and deaths.

HCAI 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, or pre-existing medical conditions. The risk of HCAI increases with increased or prolonged contact with healthcare services. Furthermore, antibiotic resistant pathogens are associated with the increased incidence of HCAI.

Globally, nationally and locally, AMR is a significant threat to public health. It is estimated that if no action is taken to curb the spread of AMR, then antimicrobial resistant infections could kill an extra 10 million people across the world each year by 2050.

Recent reports suggest that AMR could represent the primary cause of global mortality by 2050. The challenge of AMR is enhanced by the fact that no new antibiotics have been discovered for over 30 years (Figure 1).

Figure 1: Antibiotic discovery and resistance timeline.



Source: [Health matters: antimicrobial resistance. 2015](#)

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 antimicrobials are vital, such as during cancer treatment when patients are susceptible to infection.

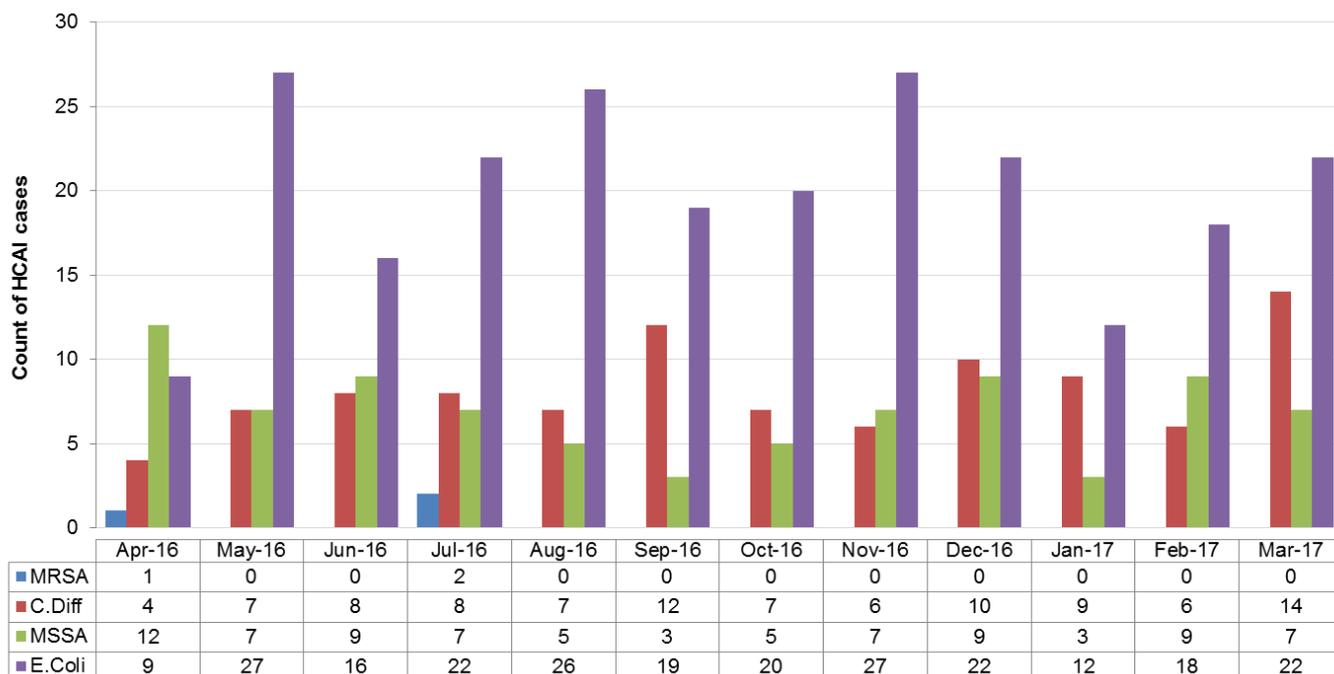
Facts, figures and trends (Wirral and beyond)

Trends in 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. **Figure 2** shows official Public Health England HCAI counts for Wirral for 2016/17.

The total number of reported cases in Wirral for 2016/17 was higher than the number for the same period in 2015/ 2016 (415 vs. 187 cases). The majority (81%) of HCAI cases reported in Wirral in 2016/17 were *E.coli* bacteraemia and *C.difficile* infections.

Figure 2: Cases of HCAI in Wirral between April 2016 and March 2017.



Source: [PHE Cheshire and Merseyside](#)

E. coli

National incidence rates of *E.coli* bacteraemia also significantly increased from 69.7 cases per 100,000 population in 2015/16 to 73.9 cases per 100,000 population in 2016/17. In Wirral, there was a notable increase in the number of *E. coli* cases in 2016/17, with 240 cases reported compared to only 41 cases in 2015/16 (representing a 485% increase in cases). This increase has coincided with a national drive to reduce Gram-negative blood stream infections, potentially leading to improvement in the identification of *E.coli* cases. Incidence rates of *E.coli* infections in Wirral were lower than those seen in England in quarters 1 and 4 of 2016/17, but higher than England in quarters 2 and 3 (**Figure 3**). Incidence rates of new *E.coli* infections were below those seen overall in the North West, except for quarter 3. (Also see **figure 4**)

C.difficile

The national incidence rate of *C. difficile* infection declined from 107.6 per 100,000 population in 2007/08 to 23.4 in 2016/17. The number of *C. difficile* infections remained high in the Wirral in 2016/17, with 98 cases reported compared to 95 cases in 2015/16. Incidence rates of *C.difficile* infections were higher than seen in England for the entirety of 2016/17. Incidence rates were also above the rates for the North West overall for quarters 2 and 4 (**Figure 3**). (Also see **figure 4**)

MRSA

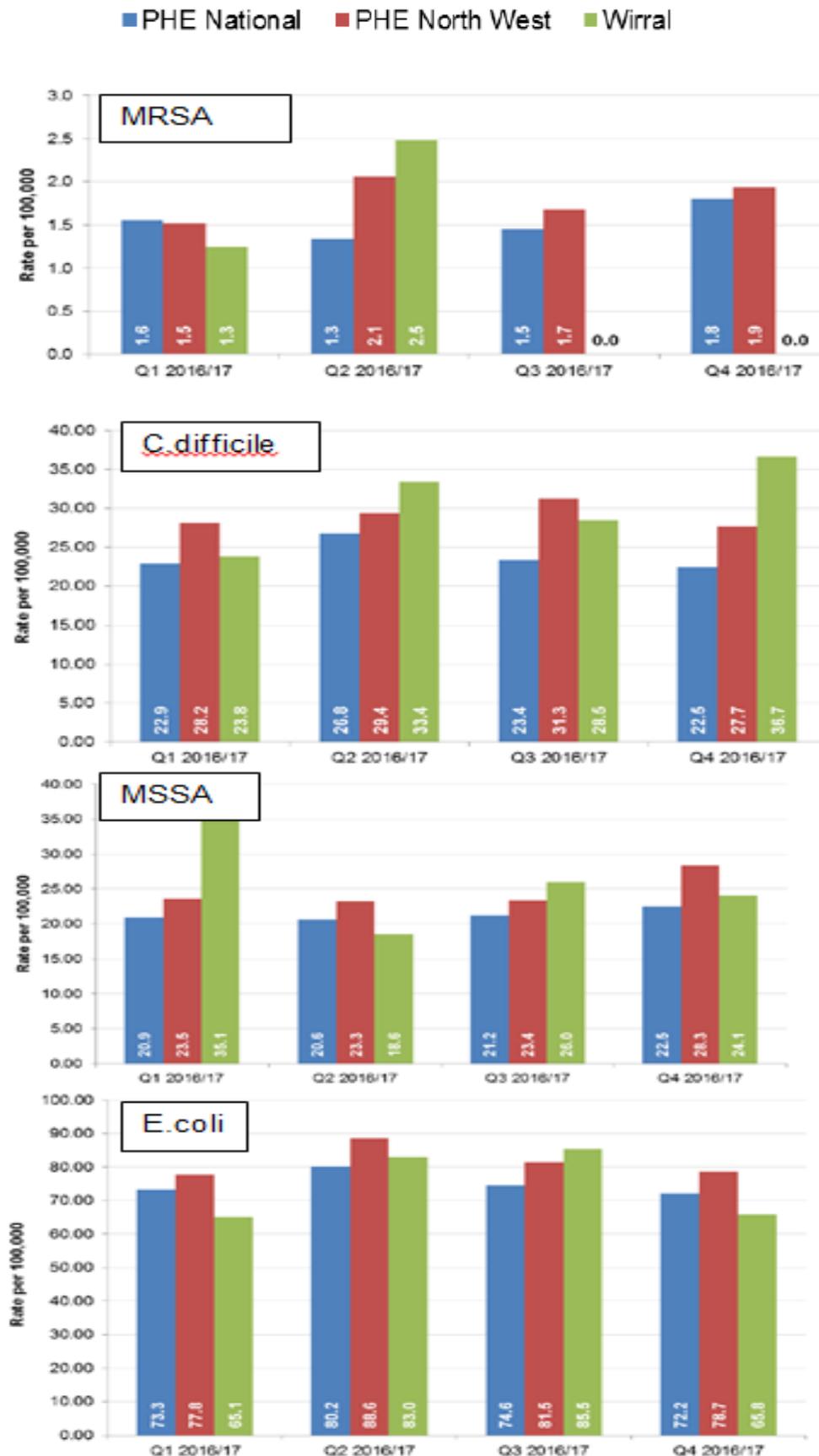
The 2016/17 data show that the national incidence rate of MRSA bacteraemia (bloodstream infection, not colonisation on the skin) has remained constant at 1.5 cases per 100,000 population over the past 3 years. The number of MRSA bacteraemia cases in Wirral fell slightly, from 7 cases in 2015/16 to 3 cases in 2016/17. The incidence rate of MRSA infections in Wirral was lower than in England and the North West in all quarters except quarter 2 during 2016/17 (**Figure 3**) (Also see **figure 4**).

MSSA

National rates of new cases of MSSA significantly increased from 19.3 cases per 100,000 population in 2015/16 to 20.9 cases per 100,000 population in 2016/17. The number of MSSA bacteraemia cases in Wirral was higher in 2016/17 compared to those reported in 2015/16 (74 vs. 56 cases). (**Figure 3**) (Also see **figure 4**)

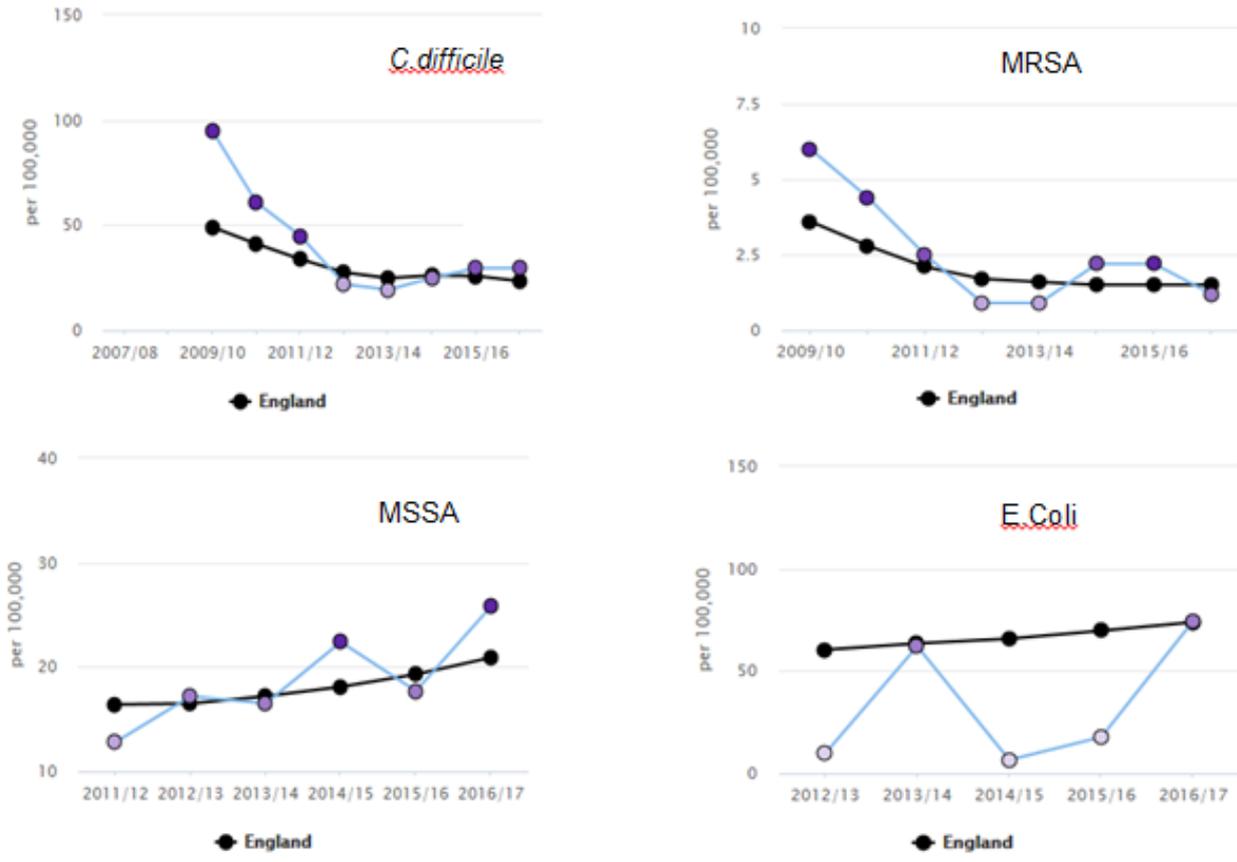
Incidence rates of MSSA infection in Wirral were higher than seen in England for all quarters except quarter 2 in 2016/17. MSSA incidence rates in Wirral were higher than the North West in quarters 1 and 3 (**Figure 3**).

Figure 3: Incidence rates of HCAI cases, Wirral, PHE North West and PHE National, 2016/17



Source: [Wirral Intelligence Service. HCAI Surveillance 2016/17](#)

Figure 4: Rates of laboratory-confirmed cases of *E.coli*, MRSA, and MSSA bacteraemia, and *C. difficile* infection reported by Wirral University Teaching Hospital NHS Foundation Trust and England by financial year (crude rate/ 100,000 bed days)



Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

For more information on local trends in HCAI incidence, see [Health Care Acquired Infection Surveillance 2016/17](#)

Trends in antimicrobial prescribing and AMR

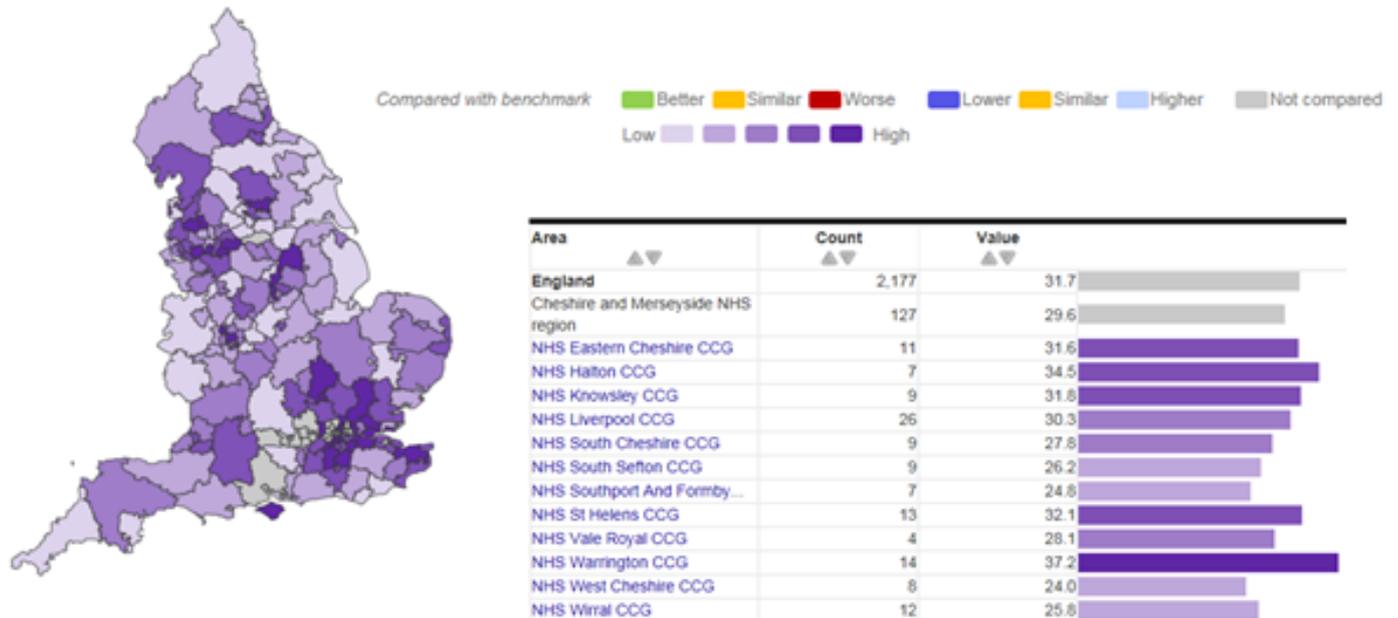
The English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR) has reported the [national surveillance on antibiotic prescribing and AMR](#) up to 2016, focussing specifically on gram negative bacteraemia in the most recent report. The 2017 report noted that *E. coli* was the most commonly reported cause of bloodstream infections nationally, with 41% of *E. coli* demonstrating resistance to the antibiotic co-amoxiclav and at least 20% of bacteria resistant to more than one antibiotic.

Total cases of *Klebsiella spp* and *Pseudomonas aeruginosa* were seen to increase between 2012 and 2016 nationally. Notably, the proportion of *E.coli*, *Klebsiella spp* and *Pseudomonas aeruginosa* demonstrating resistance to key antimicrobials remained stable between 2012 and 2016. However, given that reporting of *Klebsiella spp* and *Pseudomonas aeruginosa* was voluntary between this time period, case ascertainment and resistance may be underestimated.

There is notable geographic variation in AMR rates. **Figure 5** shows the variation across CCGs nationally in the rolling quarterly average proportion of *E. coli* blood specimens non-susceptible to at least one of the key antimicrobials (gentamicin, ciprofloxacin, piperacillin/tazobactam, 3rd-generation cephalosporins, carbapenems).

Notably, the proportion noted for Wirral CCG is below the national and regional average.

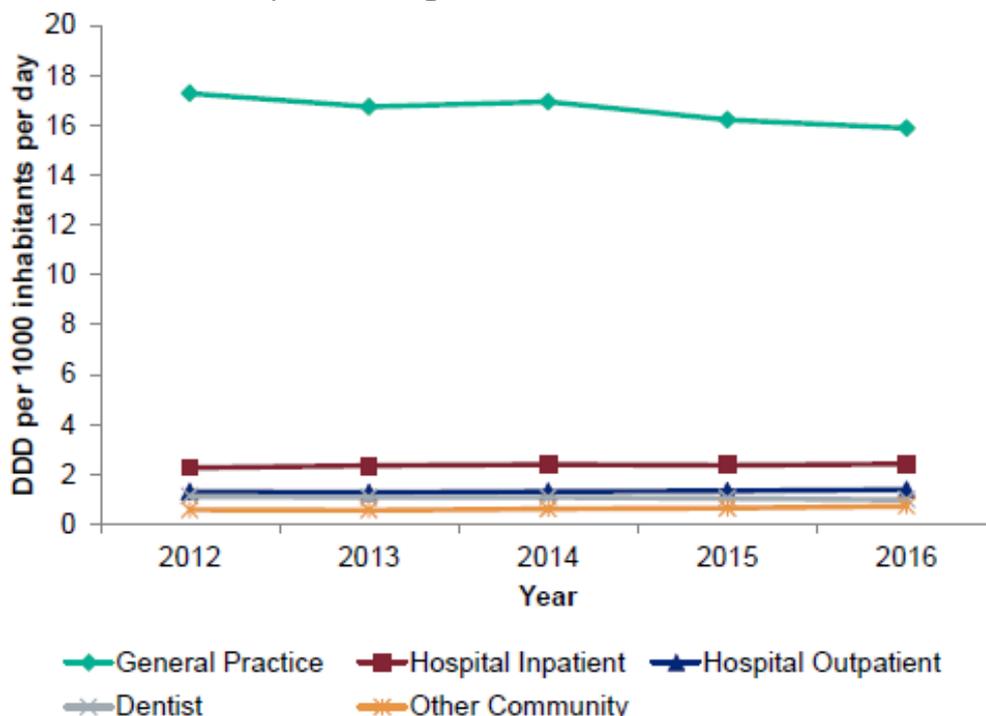
Figure 5: Rolling quarterly average proportion of *E. coli* blood specimens non-susceptible to at least 1 from key antimicrobials (gentamicin, ciprofloxacin, piperacillin/tazobactam, 3rd-generation cephalosporins, carbapenems; from English laboratories); by CCG and by Quarter (2015 Q4 onwards)



Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

Antibiotic prescribing in primary and secondary care totalled 21.4 defined daily dose (DDD) per 1000 inhabitants per day in 2016. DDD is a fixed unit of measurement developed by the World Health Organisation to enable comparisons among population groups and countries. Total antibiotic consumption has declined by 5% over the past 5 years. Nationally, the majority of antibiotic prescribing occurs in the community. In 2016, GPs prescribed 74% of antibiotics, dentists prescribed 5% and other community prescribers prescribed 3%, with 11% and 6% prescribed to hospital inpatients and outpatients, respectively. (Figure 6)

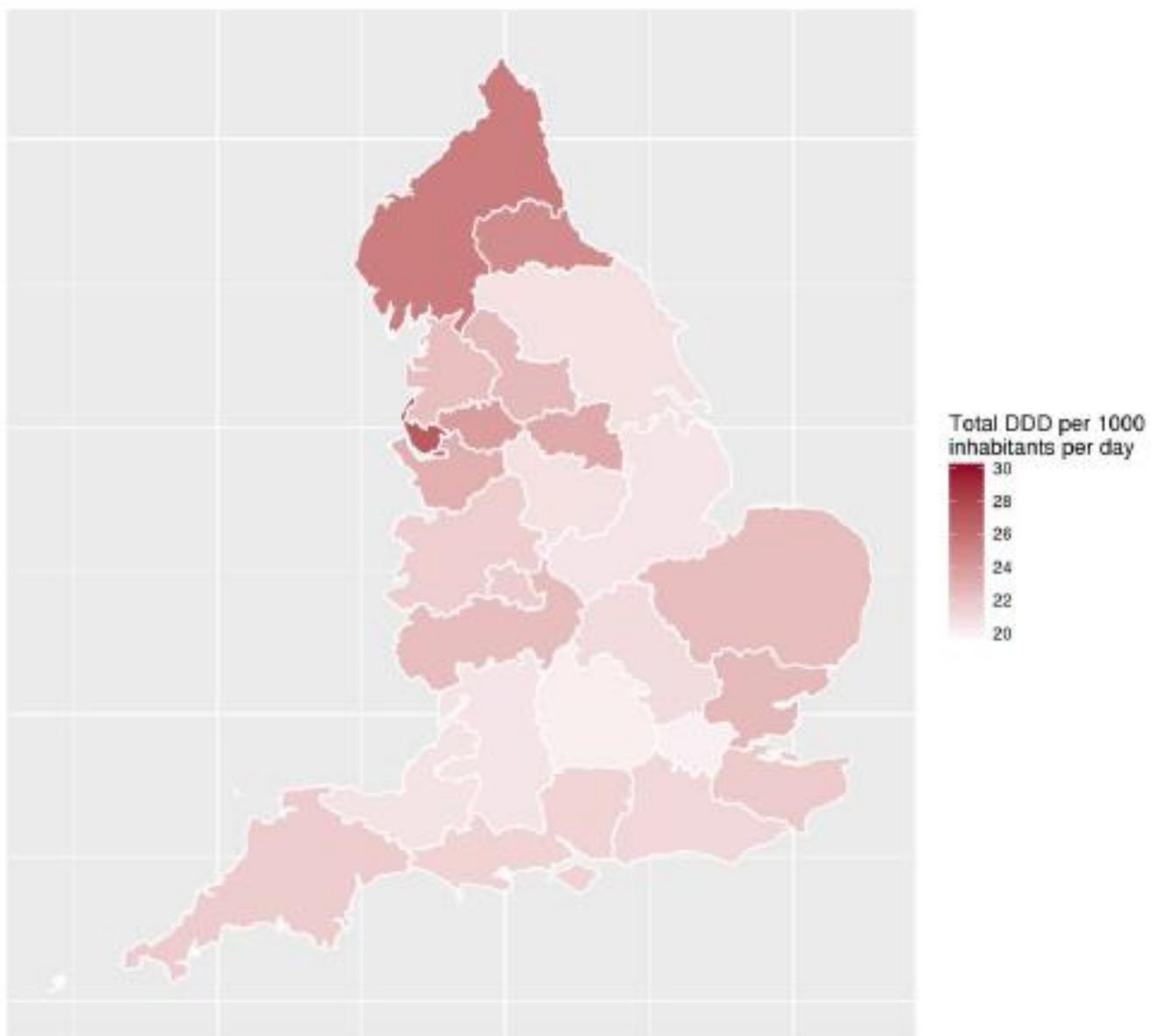
Figure 6: Total antibiotic consumption in England, 2010-2016



Source: [ESPAUR Report 2017](#)

The [NHS Atlas of Variation in Healthcare \(access via Infectious diseases link\)](#) compares antibiotic use across regions of the UK. In 2013, the average number of DDDs of antibiotics prescribed in primary and secondary care ranged from 19.2 to 25.6 per 1000 population. The highest figures were in the north of England. **(Figure 7)** These findings were consistent with the [ESPAUR Report 2017](#).

Figure 7: Total antibiotic consumption, expressed as DDD per 1000 inhabitants per day by NHS Area Team, England, 2016



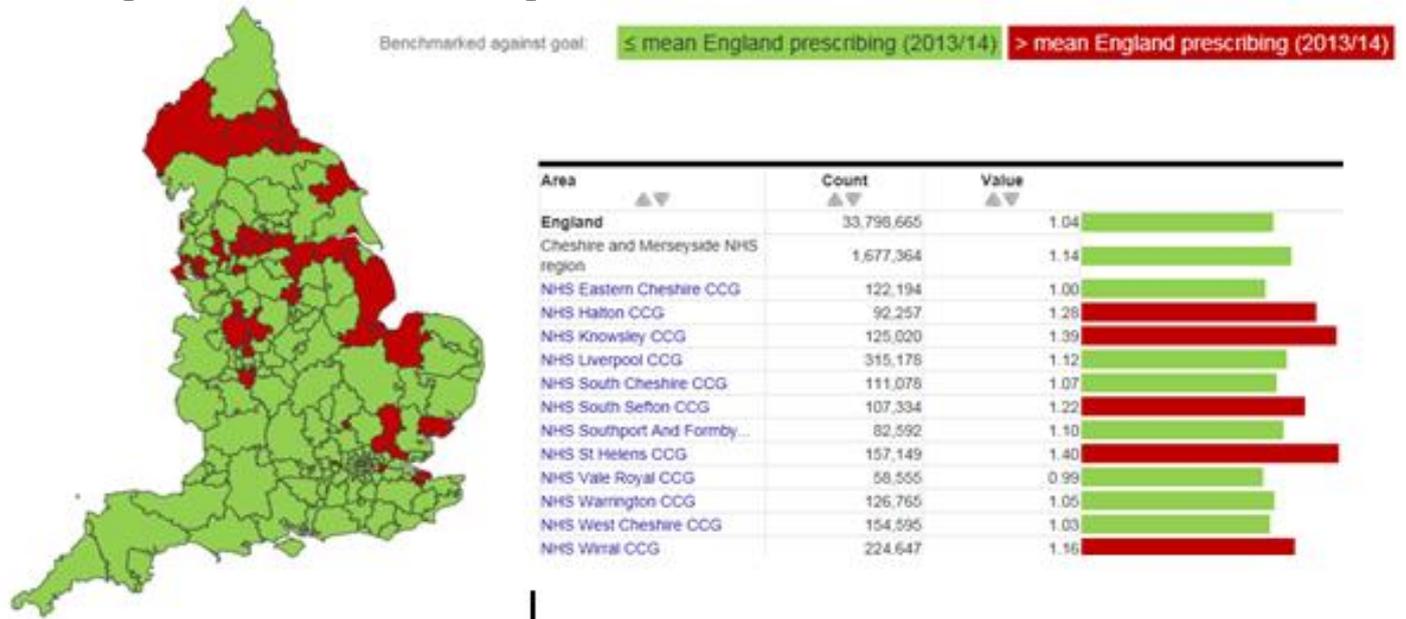
Source: [ESPAUR Report 2017](#)

Antibiotic prescribing is measured using the Specific Therapeutic group Age-sex Related Prescribing Units [STAR-PU]. This indicator is adjusted for population age and sex to enable accurate comparisons between different regions.

A higher indicator score is associated with increased prescribing. Over the last 4 years, the STAR-PU has reduced in primary care settings, representing a reduction in antibiotic prescribing.

In 2017, Wirral CCG was above the mean national prescribing STAR-PU score, but had a score similar to that of the North West region **(Figure 8)**.

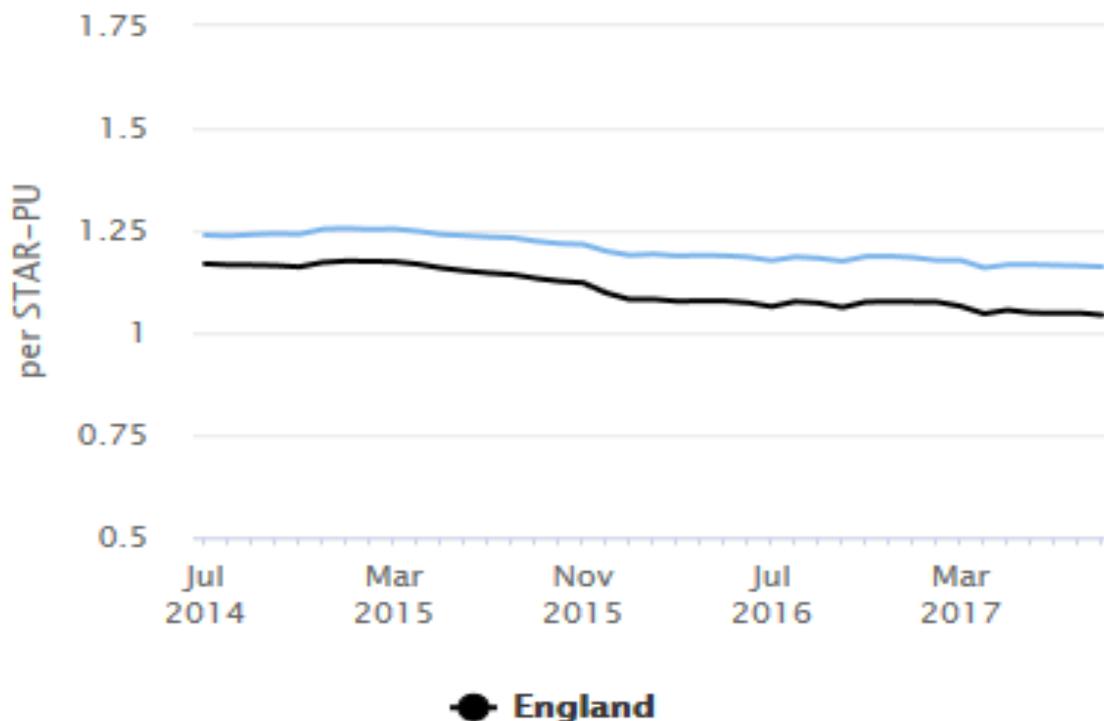
Figure 8: Twelve month rolling total number of prescribed antibiotic items per STAR-PU by CCG within England and the North West region, 2017



Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

The number of prescribed antibiotics per STAR-PU for NHS Wirral CCG has seen a marginal decline over successive calendar years (**Figure 9**).

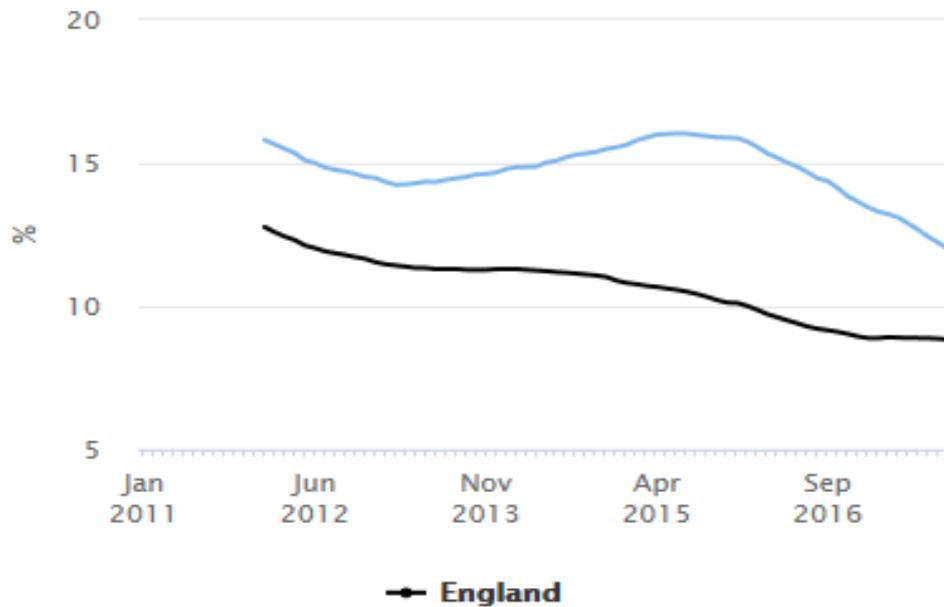
Figure 9: Twelve month rolling total number of prescribed antibiotic items per STAR-PU for NHS Wirral CCG, 2017



Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

In 2017, the percentage of broad-spectrum antimicrobials prescribed in primary care settings (accounted for by cephalosporin, fluoroquinolone and co-amoxiclav) remained below the national average (**Figure 10**).

Figure 10: Twelve month rolling percentage of prescribed broad spectrum antibiotic items from cephalosporin, quinolone and co-amoxiclav for NHS Wirral CCG, 2017.



Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

Antimicrobial Stewardship

[Antibiotic Guardian](#) is a national campaign led by Public Health England 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. As of November 2016, there were over 33,000 antibiotic guardians nationwide.

Wirral is a national leader in the recruitment of antibiotic guardians. NHS Wirral CCG has seen a dramatic increase in the number of antibiotic guardians between 2014 and 2017, from 10.3 per 100,000 people in 2014, to 51.7 per 100,000 in 2017.

As of 2017, NHS Wirral CCG had one of the highest proportions of antibiotic guardians when compared to national and regional figures (**Figure 11**).

Figure 11: Antibiotic guardians per 100,000 population by CCG (crude rate per 100,000). 2017.

Area	Count	Value	95% Lower CI	95% Upper CI
England	11,441	20.7	-	-
Cheshire and Merseyside NHS region	982	40.2	-	-
NHS Eastern Cheshire CCG	50	25.4	-	-
NHS Halton CCG	27	21.3	-	-
NHS Knowsley CCG	41	27.8	-	-
NHS Liverpool CCG	272	56.8	-	-
NHS South Cheshire CCG	56	31.3	-	-
NHS South Sefton CCG	51	32.1	-	-
NHS Southport And Formby...	17	14.8	-	-
NHS St Helens CCG	96	54.1	-	-
NHS Vale Royal CCG	25	24.3	-	-
NHS Warrington CCG	80	38.5	-	-
NHS West Cheshire CCG	101	43.7	-	-
NHS Wirral CCG	166	51.7	-	-

Source: Antibiotic Guardian counts and postcodes are extracted from www.antibioticguardian.com and include all healthcare professional, public and education sector pledges. Population estimates are based on ONS mid-year estimates.

Source: [Public Health England AMR Local Indicators \(Area type 2017/18\)](#)

Local, Community and Stakeholder views

The Wirral Health Protection Group meets every two months 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 CCG. The forum is in the process of identifying priorities for 2018, which this JSNA chapter will inform. Wirral Health Protection Group produces an [annual report](#) identifying areas of achievement and future health protection priorities. Priorities for 2016/17 include:

- 1. Reducing food borne illness**
2. Integrating seasonal and pandemic influenza plans
- 3. Tackling the growth in Antimicrobial Resistance**
- 4. Reducing incidence of Clostridium difficile**
- 5. Protecting the health of care home residents**
6. Reducing variation in cancer and diabetic retinopathy screening
7. Reducing variation in vaccine uptake at 5 years and prenatal pertussis vaccine
8. Integrating and effective emergency resilience

Priorities directly relevant to this JSNA are highlighted in bold.

What are we expecting to achieve? (Targets)

Healthcare Associated Infections (HCAI)

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' (2014) covers the prevention and control of infection for patients in primary, secondary, and community care settings. Settings include hospitals, general practices, dental clinics, health centres, care homes, private households, schools and prisons providing healthcare, and care delivered by ambulance and mental health services.

The NICE guidance 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 published official guidance for *C. difficile* infection (CDI) objectives for NHS organisations in 2017/18. This guidance encourages organisations to evaluate whether CDI cases were associated with a lapse in patient care. Furthermore, guidance details the procedures involved in justifying the application of a contractual sanction of £10,000 per case for a breach of CDI objectives where they were associated with lapses in the quality of care provided. NHS guidance for CDI specifies objectives for the maximum number of cases and rates of CDI for acute trusts and CCGs (**Table 1**).

Table 1: *C. difficile* (CDI) objectives for Wirral University Teaching Hospital and Wirral CCG 2017/18

Organisation	CDI Objectives	
	Maximum cases	Maximum rate*
Wirral University Teaching Hospital	29	11.7
Wirral CCG	75	23.4

*per 100,000 bed days for trust, per 100,000 population for CCG

Source: [NHS Improvement 2018/19](#)

[Updated 2018/19 guidelines](#) from NHS England were released in March 2018, which will inform practice for the financial year 2019/20. In the most recent guidelines, CDI objectives will be reduced by one case. Notably, NHS England and Public Health England will also undertake a review of CDI reporting ahead of planning for 2019/20.

In 2016, the Secretary of State for Health set ambitious new targets for HCAI, AMR and antimicrobial usage in England based on the results of an independent review into AMR led by Lord O'Neill. National targets from [NHS Improvement and Public Health](#) England specify that by the financial year 2020-2021:

- **Healthcare-associated Gram-negative bloodstream infections will reduce by 50%.**
- **Inappropriate antibiotic prescribing will reduce by 50%**

As *E.coli* represents one of the most prevalent gram-negative HCAs nationally, initial efforts are targeted towards reducing the incidence of *E.coli* bacteraemias.

Guidance from [NHS Improvement](#) states that in year 1 (from April 2017), CCGs should aim to reduce incidence of *E coli* bacteraemia by 10%. The guidance advises that surveillance should be undertaken at a local level, and post infection reviews undertaken on a sample of patients with proven *E. coli* bacteraemia to identify areas for action.

Public Health England (PHE) monitors the numbers of certain infections that occur in healthcare settings through routine surveillance programs 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
- How well infection control measures are working

There is national mandatory surveillance of six HCAs (**Table 2**). *Pseudomonas aeruginosa* and *Klebsiella spp* were added to the mandatory surveillance in April 2017 to permit monitoring of the Government target to reduce the number of gram negative bloodstream infections by 50% by 2021.

Public Health England will begin to collect surveillance data for *Klebsiella spp.* and *Pseudomonas aeruginosa* infections during the period 1 April 2017 to 31 March 2018.

Table 2: Healthcare associated infections subject to mandatory surveillance

Healthcare Associated Infection	Date mandatory surveillance commenced
Escherichia coli (E.coli) bacteraemia	June 2011
Gastrointestinal infection and diarrhoea due to <i>C.difficile</i> infection (CDI or C.diff)	2004 (patients aged 65+) April 2007 (all patients aged 2+)
Methicillin Resistant Staphylococcus aureus (MRSA) bacteraemia	April 2004
Methicillin Sensitive Staphylococcus aureus (MSSA) bacteraemia	January 2011
Klebsiella spp. Bacteraemia	April 2017
Pseudomonas aeruginosa bacteraemia	April 2017

Source: [Public Health England. Mandatory Healthcare Associated Infection Surveillance: Data Quality Statement. 2018](#)

[Antimicrobial resistance and stewardship](#)

The Department of Health produced the [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 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 national toolkits:

- ‘Treat Antibiotics Responsibly, Guidance, Education and Tools’ (TARGET) for primary care.
- ‘Start Smart, Then Focus’ – a toolkit for antimicrobial stewardship for secondary care.

There are [NICE guidelines \(NG15\)](#) on Antimicrobial stewardship covering the effective use of antimicrobials in children, young people and adults. It aims to change prescribing practice to help slow the emergence of AMR, retaining antimicrobials effectiveness.

The UK 5-Year AMR Strategy identifies improved availability and utilisation of surveillance data as a major priority to meet national targets.

What are we achieving? (Performance)

In summary:

1. The total number of reported HCAI cases in Wirral for 2016/17 has increased since 2015/2016. Most HCAI were *E. Coli* and *C. difficile*.
2. Incidence rates of *C.difficile* infections in Wirral were higher than seen in England for the entirety of 2016/17.
3. Incidence rates of *E.coli* infections in Wirral were lower than those seen in England in quarters 1 and 4 of 2016/17, but higher than England in quarters 2 and 3.
4. The average proportion of *E. coli* blood specimens non-susceptible to at least one of the key antimicrobials (gentamicin, ciprofloxacin, piperacillin/tazobactam, 3rd-generation cephalosporins, and carbapenems) for Wirral was below the national average in pooled data since 2015.
5. The number of prescribed antibiotics per STAR-PU for NHS Wirral CCG reduced over successive calendar years since 2014.
6. Wirral CCG has higher levels antibiotic prescribing than the national average, as demonstrated by a higher STAR-PU score, but demonstrates similar prescribing levels to the North West.

What is this telling us?

Groups most at risk

The risk of acquiring an HCAI increases with older age. This is related to greater prevalence of chronic conditions and greater contact with health and social care interventions. Similarly, the very young are also at increased risk of HCAs due to an immature immune system.

Other risk factors for HCAI 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.
- Immune-suppressing medical treatments (e.g. chemotherapy).
- Medical interventions and devices, such as surgery, artificial ventilators and intravenous lines, provide opportunities for micro-organisms to enter the body directly.
- Taking antibiotics 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 infect the gut. This is especially a problem in older people.

Key issues and challenges

Changing the culture around the use of antibiotics amongst both the public and prescribers remains a considerable challenge. Public misconceptions around the use of antibiotics represent a key barrier to optimal antibiotic prescribing in the UK, demonstrated by [research](#) published by Public Health England in 2014.

Education of the public around responsible antibiotic use remains a key priority, particularly among members of the community most vulnerable to infections, either due to healthcare status, life circumstances or place of work.

Use of antimicrobial agents is not limited to human healthcare or dental provision. Antimicrobials are also used by in food production and for other animals. Meaningful and lasting action on AMR requires a coordinated global response across multiple sectors to ensure responsible antibiotic prescribing among both humans and animals.

Collaborative working with the agricultural and food industries and health and dental systems is necessary to reach a transdisciplinary, sustainable solution to this complex issue.

Key inequalities

Risk of HCAI also increases with deprivation related to deprived populations having more people with chronic conditions and complex care needs. Overlapping layers of inequality emerge when considering groups most at risk of acquiring HCAI.

Individuals living in deprivation generally have worse health outcomes and are more likely to have chronic health conditions. This increases susceptibility to infections. The literature also shows that individuals in the lowest deprivation quintiles are more likely to experience prolonged hospital inpatient stays, increasing the chance of exposure to and acquisition of HCAI ([Yilmaz & Raynaud, 2013](#))

Previous work has shown that individuals living in social deprivation are more likely to experience HCAI following surgical interventions ([Packer et al, 2015](#); [Bagger et al, 2004](#)). Furthermore, those living in the most deprived conditions have less access to power, resources, and health-enabling environments to improve their life circumstances and preoperative health status (e.g. through improved diet, changing smoking status or increasing physical activity).

What are we doing and why?

Current activity and services

Healthcare Associated Infections

Wirral CCG is expected to continually increase standards of infection control to limit the incidence of HCAs. This is achieved through improved organisational focus and collaborative working to effectively implement The Health and Social Care Act (2008).

Collaborative Working

Collaborative working creates a more robust systems-approach to healthcare. An integrated pathway for notification, investigation, management and follow up of MRSA bloodstream infection 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.

A provider forum unites providers working in the prevention and control of local healthcare-associated infections every two months to encourage integrated working.

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. The service audits infection control practices and service improvement plans, and provides education, training, and support to providers to improve hygiene and infection prevention and control.

The service works across the health and social care system to respond to cases, clusters and outbreaks of communicable disease in the community in order to manage, control and reduce the risk of infection. The community infection prevention and control service will have a key role to play in conducting post-infection reviews on a sample of *E. coli* bacteraemia cases to identify areas for local action to reduce *E. coli* bacteraemias, as specified in guidance from NHS Improvement.

C.difficile case-review group

In January 2016 a whole system, quarterly *C. difficile* case review panel meeting was set up to scrutinise *C. difficile* cases. This includes examining any associated prescribing, identifying shared learning and implementing whole system preventative actions. The group includes representatives from health care provider Infection Prevention and Control teams, Wirral CCG, Wirral Council and the Commissioning Support Unit Medicines Management.

The *C.difficile* case-review group works to the 2017/18 NHS Improvement objectives guidance for *C. difficile* infections, and will adopt updated [2018/19 guidance](#). Over the coming year, this group aims to scrutinise trust-level data from the past 5 years to investigate causes of acute spikes in the incidence of *C. difficile* infections and identify improvements in clinical practice. The work of this group supports the Wirral Health Protection priority of reducing incidence of Clostridium difficile.

Antimicrobial resistance and stewardship

To encourage the prudent use of antibiotics and meet the Wirral health protection priority of tackling the growth in Antimicrobial Resistance, there are several areas of work currently underway (see below).

Wirral AMR Strategy Group

These three-monthly meetings involve representatives from Wirral Public Health Team, Wirral CCG, NHS Commissioning Support Unit [Medicines Management Team](#), Wirral Community Trust, and other partners. The meeting drives Wirral's action relating to Public Health England's Patient Safety Alert addressing AMR 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. This group supports safe and appropriate prescribing of antimicrobial agents to optimise patient outcomes and has developed an AMR strategy for Wirral. The strategy is based on the Cheshire and Merseyside AMR Strategy, which is updated on a regular basis.

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, GP practices have been asked to share any difficulties they face with regards to antibiotic prescribing and examples of good practice and potential solutions. Focused work is being undertaken in relation to antimicrobial prescribing to reduce variation across practices.

Practice leads on Antimicrobial stewardship

Wirral GP 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.

Wirral Antimicrobial Guidelines

[Guidelines](#) are updated annually by the [Wirral Medicines Management Team](#) and provide a reference for prescribers in Wirral to access current information on recommended antimicrobial treatments for conditions, specific to the local setting. These guidelines aim to promote evidence-based prescribing decisions and to reduce the local emergence of AMR. The 2018 [guidelines](#) advise to avoid the unnecessary use of broad spectrum antimicrobials, the issuing of prescriptions over the telephone and listing antibiotics as repeat prescriptions. Guidance also suggests that prescribers should consider the use of delayed prescriptions, make effective use of patient information leaflets, and referring to previous microbiology results when making prescribing decisions.

Implementation of the [TARGET Toolkit](#)

The TARGET (Treat Antibiotics Responsibly, Guidance, Education, Tools) 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 influence the behaviours of prescribers and patients, addressing 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 of the toolkit is not available at this time.

Antibiotic Guardian

Wirral is continuing its strong performance in enrolling members of the public in the antibiotic guardian campaign, to promote community engagement and awareness around the issue of AMR.

European Antibiotic Awareness Day (EAAD)

EAAD is a public health initiative promoting antibiotic stewardship in Europe. It is held annually on 18th November and is coordinated nationally by Public Health England. This health promotion initiative has been embraced in Wirral and plans are underway for 2018 EAAD within trust and community health organisations.

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 AMR which aims to reduce antibiotic consumption and encourage a prescribing review within 72 hours of commencing an antibiotic.

Vaccinations

Encouraging uptake of vaccinations (particularly the flu vaccine) among key at-risk groups within the local community reduces preventable infections, which may be inappropriately managed with antibiotics, and averts secondary bacterial infections that may occur in the context of influenza, thus reducing antimicrobial prescribing (see our JSNA on [communicable diseases](#) for information on flu vaccine uptake within our region).

What are the challenges?

Key gaps in knowledge and services

Ensuring that all parts of the health and social care system can work together to reduce the risk of HCAI and implement robust antimicrobial stewardship is challenging. Specifically, there are challenges in sharing of timely data between organisations and tracking of patients between settings.

The national mandatory surveillance data for HCAI provides the most comprehensive and reliable information available. There is some underestimation of infection rates because it only monitors four infectious agents (MRSA, MSSA, *E.coli*, and *C.difficile*) out of the wide range of infectious organisms known to contribute to HCAI. However, moving mandatory data collection will commence for *Klebsiella spp* and *Pseudomonas aeruginosa*.

Standardised data was not available for all AMR indicators, so it was not possible to compare all of Wirral's local performance with that of other regions. Characteristics of individuals acquiring HCAI in Wirral, such as age and gender, are not captured within the available data, which would help indicate cases by vulnerable groups in our local area.

For antibiotic prescribing, data from Wirral Community Trust was not available for this report, so data on prescribing by community district nurses, walk in centres and sexual health has not been presented. Poor availability of sexual health data is unfortunate given the recent national outbreak of high-level azithromycin-resistant gonorrhoea, involving 48 cases in locations including the Wirral ([ESPAUR, 2016](#)). This resistant isolate is a serious concern given that antibiotic sensitivity of gonorrhoea is limited to azithromycin and ceftriaxone. Given this context, monitoring local prescribing for gonorrhoea infections would be of value.

What is coming on the horizon?

With the new national targets for HCAI, AMR and antimicrobial usage in England, there is an increasing focus on targeting gram negative bacteraemia. Strategies moving forward will seek to more comprehensively record cases of gram negative bacteraemia, and to conduct case reviews to identify lessons for practice.

Some work is also being undertaken to explore the value of point of care CRP testing and delayed prescriptions in primary care settings in reducing or more effectively targeting antibiotic use.

What does the research suggest as further actions?

1. *E.coli* bacteraemias and *C.difficile* infections remain the biggest HCAI challenges in Wirral, and efforts will be focussed around understanding existing cases and reducing subsequent infections. In light of the national strategy to reduce the number of gram negative bacteraemias by 50% by 2020-2021, increased efforts to reduce the incidence of *E.coli* bacteraemias in Wirral is a key priority. In the short term, local efforts to continue *E. coli* surveillance, conduct post-infection reviews and to identify areas for local action are critical to this aim.
2. More antibiotics are prescribed in greater numbers in Wirral than the national average. Continual strengthening and improvement of infection-prevention and better antibiotic use

(building on the local success of the Antimicrobial Guardian initiative) is vital to Wirral meeting the national target to reduce antibiotic prescribing by 50% by 2020-2021.

- Continued work is needed to improve education and behaviours around antimicrobial resistance and prescribing among healthcare professionals and the public.
- Continued action is needed to encourage adherence to local antimicrobial [prescribing guidelines](#), promoting evidence-based prescribing and to reducing AMR. Monitoring and active work with primary care providers to reduce inappropriate antibiotic use is also important, especially as most antimicrobials are prescribed in this setting.

Key content

Links

- NHS England.** Patient safety alerts. Available at: <https://www.england.nhs.uk/patientsafety/psa/> [cited 20/03/18]
- NHS Choices.** NHS choices for information on diseases. Available at: [cited 20/03/18] <http://www.nhs.uk/Conditions/Pages/hub.aspx> [cited 20/03/18]
- NHS Choices.** The Antibiotic Awareness Campaign. Available at: <http://www.nhs.uk/NHSEngland/ARC/Pages/AboutARC.aspx> [cited 20/03/18]
- Public Health England (2015).** Health matters: antimicrobial resistance. Available at: <https://www.gov.uk/government/publications/health-matters-antimicrobial-resistance/health-matters-antimicrobial-resistance> [cited 20/03/18]
- Public Health England.** AMR local indicators. Fingertips. Available at: <https://fingertips.phe.org.uk/profile/amr-local-indicators> [cited 20/03/18]
- Public Health England.** Entrenched misconceptions about antibiotics revealed in new survey. Available at: <https://www.gov.uk/government/news/entrenched-misconceptions-about-antibiotics-revealed-in-new-survey> [cited 20/03/18]
- Wirral CCG (2018).** Wirral Antimicrobial Guidelines and Management of Common Infections in Primary Care. Available at: http://mm.wirral.nhs.uk/document_uploads/guidelines/FINAL-Primary-Care-Antimicrobial-Guide-v3.2.pdf
- Wirral Intelligence Service (2017).** Health Care Acquired Infection Surveillance 2016/17. Available at: <https://www.wirralintelligenceservice.org/jsna/health-protection/> [cited 20/03/18]
- WHO.** Health care-associated infections fact sheet. Available at: http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf [cited 20/03/18]

Relevant and related National and local strategies

Public Health England/NHS Improvement (2017). Preventing healthcare associated Gram-negative bloodstream infections: an improvement resource. London: Public Health England. Available at: <https://improvement.nhs.uk/resources/preventing-gram-negative-bloodstream-infections/> [cited 20/03/18]

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