

Healthcare associated infections (HAIs) continue to represent a threat to patient safety in NHSScotland and to safe care, wherever that is delivered. The threat of antimicrobial resistance (AMR) remains a key focus for current and future health protection strategies.

Gram-negative Bacteraemia

Incidence rate of *E. coli* bacteraemias (ECB) in patients of all ages was 87.3 per 100,000 population. ↔

There was a stable year on year trend in the incidence of ECB in the period 2014-2018. ↔

Incidence rate of healthcare associated ECB was 37.4 per 100,000 bed days.

Incidence rate of community associated ECB was 45.1 per 100,000 population.

Lower urinary tract infections accounted for 34.2% of *E. coli* bacteraemia primary infections.

Proportions of ECB non-susceptible to commonly used antibiotics were generally stable over the last five years. ↔

Susceptibility in *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* has remained stable since 2014. ↔

Prevention of Healthcare Associated Bloodborne Viruses

2,223 sharps-related injuries were reported in 2017 giving a rate of 1.88 sharps injuries per 100 WTE staff. ↔

There were 71 exposures to a source known to be infected with a BBV. Zero BBV seroconversions were reported.

The number of safety devices purchased increased significantly from 37% in 2013 to 79% in 2017.

Clostridioides difficile Infection

Clostridioides difficile infection (CDI) incidence rate in patients aged ≥15 years was 24.2 per 100,000 population ↔

There was a decreasing year on year trend of 7.5% in the incidence rate between 2014 to 2018. ↓

Incidence rate of healthcare associated CDI was 15.2 per 100,000 bed days. ↔

Incidence rate of community associated CDI was 7.0 per 100,000 population. ↔

Surgical Site Infection

Caesarean Section: Overall surgical site infection (SSI) incidence to day 10 was 1.5%. ↔

Hip Arthroplasty: Overall SSI incidence to day 30 was 0.7%. ↔

Staphylococcus aureus Infection

Incidence rate of *S. aureus* bacteraemias (SAB) was 29.2 per 100,000 population. ↔

There was a decreasing year on year trend of 17.1% in the MRSA incidence rate between 2014 to 2018 ↓ however the incidence rate of SAB and MSSA has not changed over this time period. ↔

Incidence rate of healthcare associated SAB was 17.6 per 100,000 bed days. ↔

Incidence rate of community associated SAB was 9.3 per 100,000 population. ↔

Norovirus Outbreaks

Norovirus spreads very easily and there is a risk of outbreaks in shared living spaces such as in hospitals.

From October 2017 to July 2018 there were a total of 88 wards closed with an additional 139 bays closed giving a total of 227 closures.

HCAI in Intensive Care Units

The incidence of HCAI in 2017 in intensive care units (ICU) was 2.7%. ↔

There was no increase in the incidence of ventilator associated pneumonia (VAP) between 2016 and 2017. ↔

Carbapenemase-producing Organisms

The emergence and spread of Gram-negative organisms which have acquired the ability to produce carbapenemase enzymes that inactivate carbapenem antibiotics, is concerning.

In Scotland in 2018, a total of 101 carbapenemase-producing organisms (CPOs) were reported.

There was an increasing year on year trend of 22.7% in the incidence rate between 2014 and 2018. ↑

Urinary Tract Infection

Urinary tract infections (UTI) and catheter associated-UTI (CAUTI) are amongst the most prevalent healthcare associated infections in Scotland today.

The annual incidence of *E. coli* urinary isolates was 2,285 per 100,000 population in 2018.

There was an increasing year on year trend of 0.7% in the incidence rate between 2014 and 2018. ↑

↑ Statistically significant increase*

↔ No change*

↓ Statistically significant decrease*

* From previous year, or year on year where stated.



Controlling Antimicrobial Resistance in Scotland (CARS)

The Controlling Antimicrobial Resistance in Scotland (CARS) team within HPS, aims to provide a strategic response to antimicrobial resistance (AMR) in Scotland. In 2018, the second Scottish One Health Antimicrobial Use and Antimicrobial Resistance (SONAAR) report was published; the CARS Team contributed to the international surveillance of AMR and antimicrobial use (AMU) through submission of Scottish data, and introduced quarterly GP practice reports on antibiotic use. In animal health, Scotland's Healthy Animals website now includes Scotland's Poultry Hub which has guidance and information about keeping poultry health, and the CARS Team have explored potential future collaborations for data analysis and stewardship tools for veterinary practices. Additionally, funded by the Scottish Government and commissioned by HPS, Glasgow Caledonian University (GCU) has produced a report which provides insights on AMR/AMU related behaviours in the 'One Health' context. In the last year, the CARS Team has continued to engage with stakeholder groups and represented regularly on a number of UK groups.



Surgical Site Infection

The overall incidence of surgical site infection (SSI) following hip arthroplasty surgery and C-section procedures did not change between 2017 and 2018. HPS continue to work to reduce these clinically significant infections further. HPS has evaluated data collected on large bowel and major vascular procedures since implementation of these new procedures and will report within Discovery. HPS will review and evaluate the SSI surveillance programme to improve its performance and effectiveness and ensure it continues to meet its objectives efficiently.



Healthcare Associated Infections in Intensive Care Units

The incidence of HCAI in ICU during 2017 was 2.7%. The incidence of ventilator associated pneumonia has increased between 2015 and 2017 but there has been no increase between 2016 and 2017. HPS and the Scottish Intensive Care Society Audit Group (SICSAG) continue to work in partnership to reduce HCAI in the critical care setting. An evaluation of the surveillance system is planned to take place during 2019. The objective of the evaluation is to establish whether the objectives of the system are being met and engage with stakeholders to assess attributes of the surveillance system.



Clostridioides difficile infection

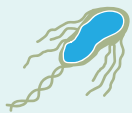
Clostridioides difficile Infection (CDI) is an important healthcare associated infection which causes diarrhoea and contributes to a significant burden of morbidity and mortality. Prevention of CDI is therefore essential and an important patient safety issue. The trend in annual incidence rates for CDI in patients aged ≥ 15 years has continuously declined between 2014 and 2018 from 32.0 to 24.2 per 100,000 population. Much of the decline in CDI incidence rates can be attributed to a decrease in healthcare associated CDI, though a significant burden exists which is community-associated. Further work is being undertaken to identify additional interventions to reduce CDI rates in both hospitals and community settings. There was a decreasing trend in the proportion of people dying of any cause within 30-days of CDI diagnosis between 2013 and 2017. HPS will continue to investigate factors associated with improved survival among CDI patients.



Staphylococcus aureus Infection

Staphylococcus aureus bacteraemia (SAB), is a serious systemic form of infection which leads to increased morbidity and mortality. During 2018, 1,585 cases of SAB reported in Scotland with 4.8% reported as meticillin resistant *S. aureus* bacteraemias (MRSA) and 95.6% were meticillin sensitive *S. aureus* bacteraemias (MSSA). Overall there was a decreasing year on year trend in MRSA between 2014-2018 however the incidence rate of SAB and MSSA has not changed over this time period.

In 2018, the incidence rate of healthcare associated SAB was 17.6 per 100,000 bed days, while the incidence rate of community associated SAB was 9.3 per 100,000 population. The main entry point for healthcare associated cases was relating to a device whereas skin and soft tissue infection were the main entry point for community associated cases. In 2018, 83% of patients audited underwent a clinical risk assessment in line with national MRSA screening policy. This remains below the 90% key performance indicator.



Gram-negative Bacteraemia

Gram-negative bacteria continue to be an emerging threat to health worldwide. During 2018, there were 4,738 cases of *Escherichia coli* Bacteraemia (ECB) in Scotland with a rate of 87.3 per 100,000 population. These infections are predominately from a community origin with a rate of 45.1 cases per 100,000 population in 2018. Given the changes to the way care is delivered and will be delivered in the future, it is appropriate that a broader public health approach which focuses on reducing the risk of infection before admission to hospital is developed. Developments to surveillance systems are underway to ensure areas for improvement are highlighted to guide the best use of national resources (e.g. Scottish Urinary Tract Infection Network) and facilitate implementation of quality improvement and preventative measures both locally and nationally. The proportions of ECB non-susceptible to commonly used antibiotics were generally stable over the last five years; however, resistance to some antibiotics was consistently high over this period. Susceptibility in *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* has remained stable since 2014.



Urinary Tract Infection

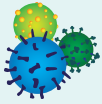
Urinary tract infections (UTI) are amongst the most commonly encountered infections in healthcare. The majority of UTIs in Scotland are caused by *E. coli*. In 2018, there were 123,955 *E. coli* urinary isolates reported to HPS. In addition, findings from the ECB enhanced surveillance dataset indicate that a third of these bloodstream infections had a lower urinary tract infection as their primary infection.

Using a population health approach, Scottish UTI Network (SUTIN) has continued to promote shared learning and targeted UTI reduction strategies across health and social care. The National Hydration Campaign and the National Catheter Passport are examples of this collaborative approach to reducing UTI and catheter associated UTI (CAUTI). This in turn supports reduction of ECB and prudent antimicrobial prescribing.



Carbapenemase-producing Organisms

The number of carbapenemase-producing organisms (CPOs) overall remains low, however in Scotland a total of 101 CPO were reported in 2018. Incidence of CPO isolates increased from 0.8 per 100,000 population in 2014 to 1.9 per 100,000 population in 2018. This increase may be temporally associated with improved awareness of CPO, continued carbapenemase-producing Enterobacterales (CPE) screening in Scotland, and the launch of the Scottish AMR Satellite Reference service. In April 2018, the MRSA screening uptake monitoring tool was extended to include CPE. These data are monitored by HPS and feedback is provided to boards on a quarterly basis.



Prevention of Healthcare Associated Bloodborne Viruses

Bloodborne virus (BBVs) transmission can occur in the healthcare setting after exposure to staff or patients to infected blood or body fluids. Healthcare workers (HCWs) are at greatest risk of acquiring BBV infection following sharps related injuries. HPS has a programme of work to prevent these risk events and infections from occurring. The programme has established that, in 2017, the rate of sharps injuries per 100 whole time equivalent (WTE) in healthcare workers employed in Scotland is 1.9. Of the occupational exposures reported between January 2017 and June 2018 that were sustained from a bloodborne virus infected source, less than 40% were known to involve a safer sharps device. Uptake of safer sharps devices has increased significantly from 37% in 2013 to 79% in 2017 with increasing uptake (though smaller volumes) of non sharp alternative devices.

HPS also works with local health protection teams to support the public health response following identification of BBV infected HCWs with five risk assessments undertaken. All of them were referred to the UK Advisory Panel for Healthcare Workers Infected with Bloodborne Viruses (UKAP), who did not recommend a patient notification exercise (PNE).



Neonatal units

In 2018 the HPS Neonatal Unit (NNU) Infection Prevention Health Protection Programme continued to work towards preventing HCAI in NNUs across Scotland; facilitating national oversight and co-ordination. This programme is led by the Neonatal Unit Infection Reduction steering group, chaired by a Consultant Neonatologist, with representation from key stakeholders across NHSScotland. The key outputs for this year have included the production of tools and information resources for the prevention and management of incidents and outbreaks in NNU settings.



Development of Guidance

HPS collaborate with local Infection Prevention and Control and Health Protection Teams in the development and review of guidance documents for the prevention and control of infection across all care settings. This year, an Addendum for Infection Prevention and Control within Neonatal Settings (NNU) was published to provide additional guidance to Chapters 1, 2 and 3. HPS also published a draft version of an Addendum for Infection Prevention and Control for Patients with Cystic Fibrosis (CF) following a review of the scientific literature.

HPS continued to maintain and update the NIPCM website; new organisms such as Monkeypox and Nipah virus were added to the A-Z of pathogens guide. Improvements continued to be made to the HAI compendium; in 2018 all pathogen specific guidance and supporting materials were moved to the A-Z of Pathogens to ensure all pathogen specific information could be accessed in one place.

HPS supports the 5th of May WHO 'SAVES LIVES: Clean your hands campaign'. The 2018 call to action was 'It's in your hands – Prevent Sepsis in Healthcare'. HPS supported this through the creation of a sepsis webpage and adding sepsis to the HAI Compendium; promoting sepsis awareness information to healthcare staff and the public.



Hospital Outbreaks and Incidents

HPS support local Infection Prevention and Control and Health Protection Teams to prevent, prepare for and manage outbreaks and incidents, as well as share lessons learned throughout Scotland. In the last year, 170 outbreaks and incidents were reported to HPS compared to 167 in the previous year. Respiratory and gastrointestinal infections were most commonly reported in 2018.



Norovirus Outbreaks

From October 2017 to July 2018 there were a total of 88 wards closed and an additional 139 bays closed giving a total of 227 closures. Bay closures can assist NHS boards in reducing service impact without compromising patient safety during norovirus season.

A new norovirus reporting system was launched for NHS boards at the beginning of 2018 in addition to a supporting public facing dashboard that provides a robust reflection of norovirus impact across acute hospital settings in NHSScotland.

The 'Stay at Home' Campaign was re-launched by HPS in partnership with Health Scotland and Scottish Government Health and Social Care Directorate (SGHSCD).



Infection Control in the Built Environment and Decontamination

Outbreaks and incidents related to the healthcare environment, the built environment, reusable medical devices and surgical instruments continue to represent a threat to patient safety.

HPS has commenced the built environment programme where guidance and available evidence is being searched to inform the infection prevention interpretation of current technical guidance documents regarding the physical environment in healthcare.

Infection prevention in the care environment and for reusable patient care equipment work has continued within the ICBED programme this year including the submission of an assessment of the financial impact of mandating a protected time to clean a bed space (40mins general bed space and 60mins for a specialist bed space). Also as part of the work the development of a national monitoring framework for the monitoring of healthcare cleanliness and clinical practice was delivered and has been published. This is available for all health boards to use and provides a minimal standard for NHSScotland. A follow up study to estimate the time spent by nursing staff cleaning reusable communal patient care equipment was completed and the findings submitted to the Scottish Government. Guidance for the decontamination and testing of cardiac heater cooler units was also published this year following the international *Mycobacterium chimaera* outbreak related to cardiac heater cooler units.

Future work will include continued development of built environment guidance regarding water and ventilation in healthcare settings. Work will continue to searching for novel and new technologies for the decontamination of the healthcare setting using scientific literature reviews. Guidance for the decontamination of dental handpieces has been planned to clarify and standardise practice for NHSScotland.