

# ARHAI Scotland 2021 Annual Report

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### **Alternative formats**

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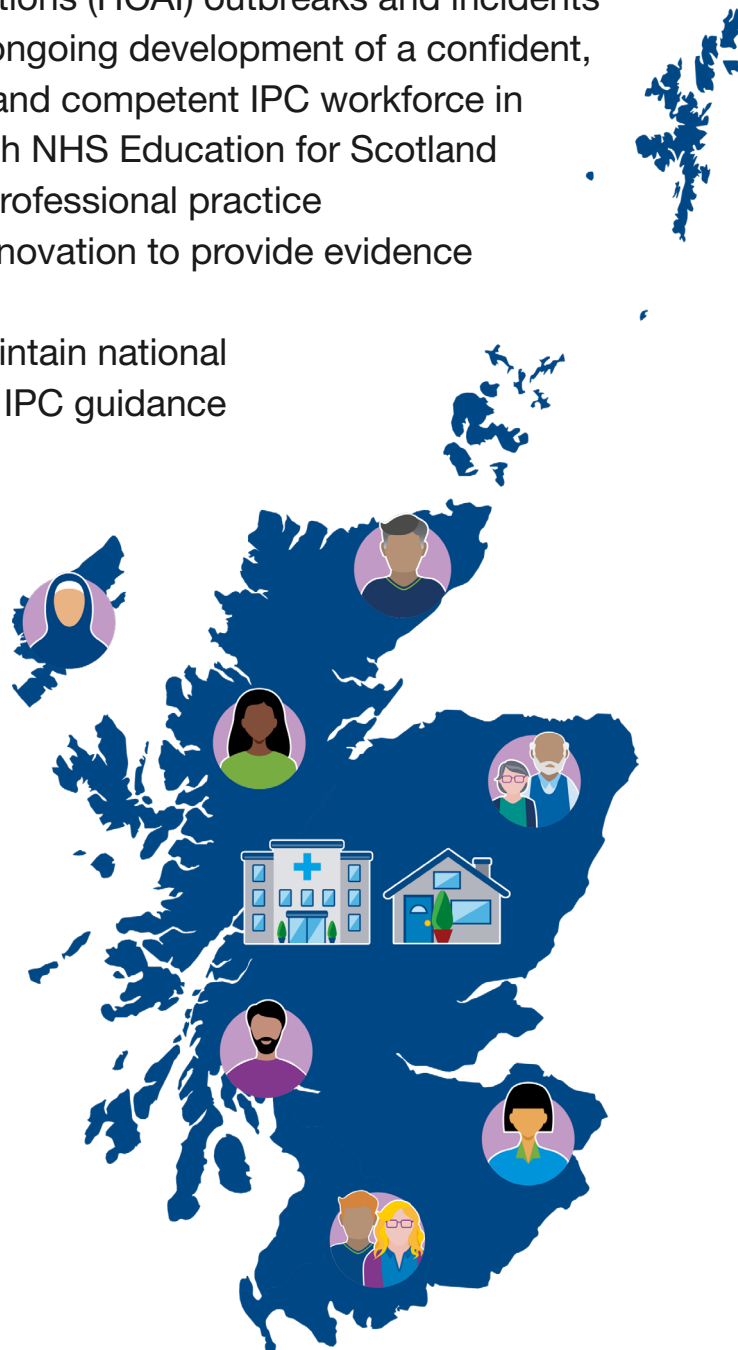
### **Reference this document as:**

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**The work of ARHAI Scotland is underpinned by delivering a wide range of functions, working with stakeholders across health and care and beyond to fulfil these functions. ARHAI Scotland's functions are:**

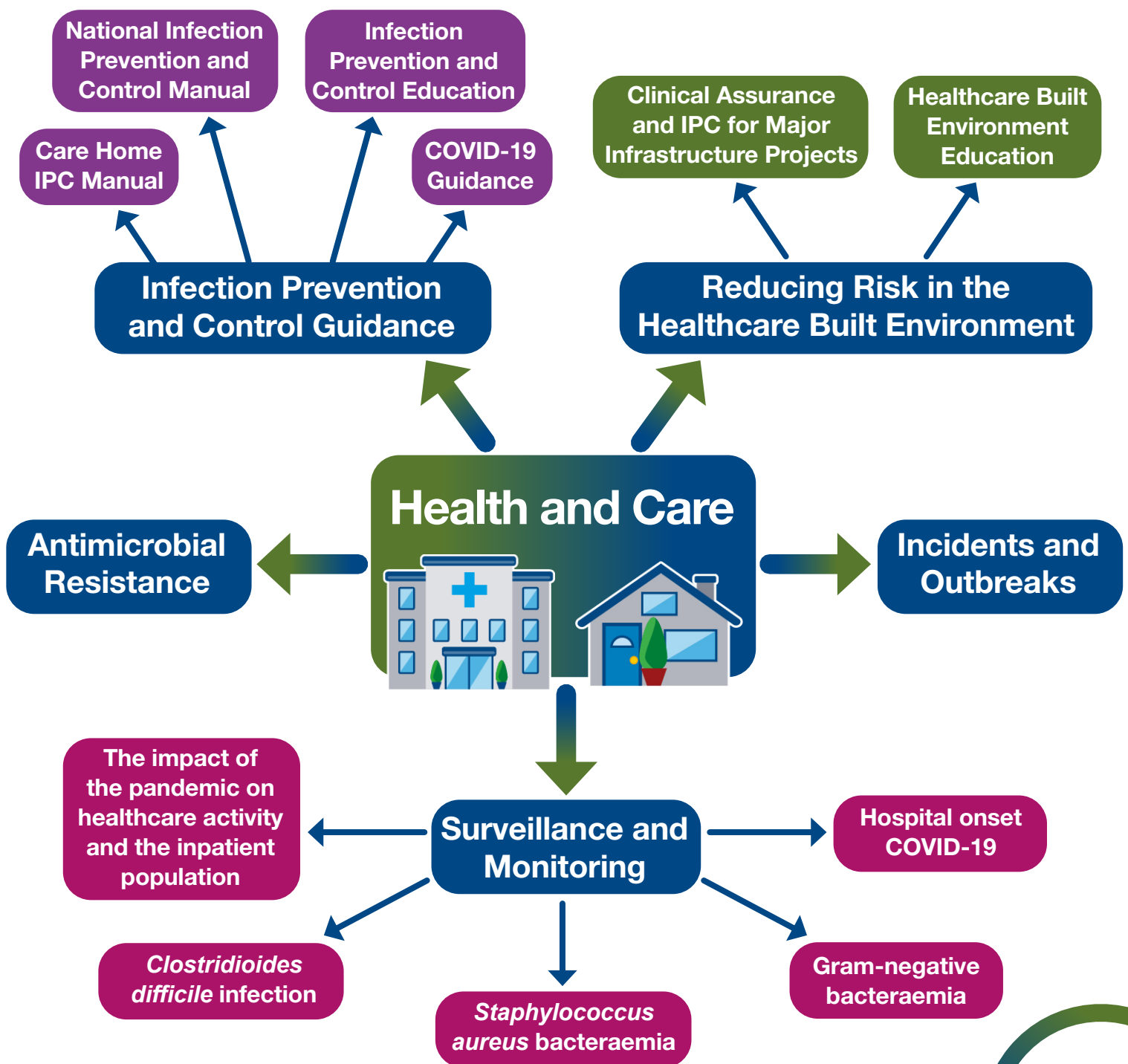
- Surveillance and monitoring of infections and antimicrobial resistance to assess their impact on health
- Clinical assurance to reduce risk in the built healthcare environment
- Co-ordination of national Infection Prevention and Control (IPC) and Antimicrobial Resistance (AMR) programmes
- Expert Infection Prevention and Control/Antimicrobial Resistance advice and horizon scanning
- Effective preparation and response to Healthcare associated infections (HCAI) outbreaks and incidents
- Supporting the ongoing development of a confident, knowledgeable and competent IPC workforce in collaboration with NHS Education for Scotland
- Enabling good professional practice
- Research and innovation to provide evidence for action
- Develop and maintain national evidence-based IPC guidance for Scotland



# ARHAI Scotland Activities in 2021

Healthcare associated infections (HCAs) continue to represent a threat to patient safety in NHSScotland and to safe care, wherever that is delivered. This annual report reflects some of the key work delivered by ARHAI Scotland to support Infection Prevention and Control (IPC), HCAI prevention and tackling Antimicrobial Resistance (AMR) during 2021. This planned work was undertaken alongside reactive provision of IPC expert advice throughout 2021.

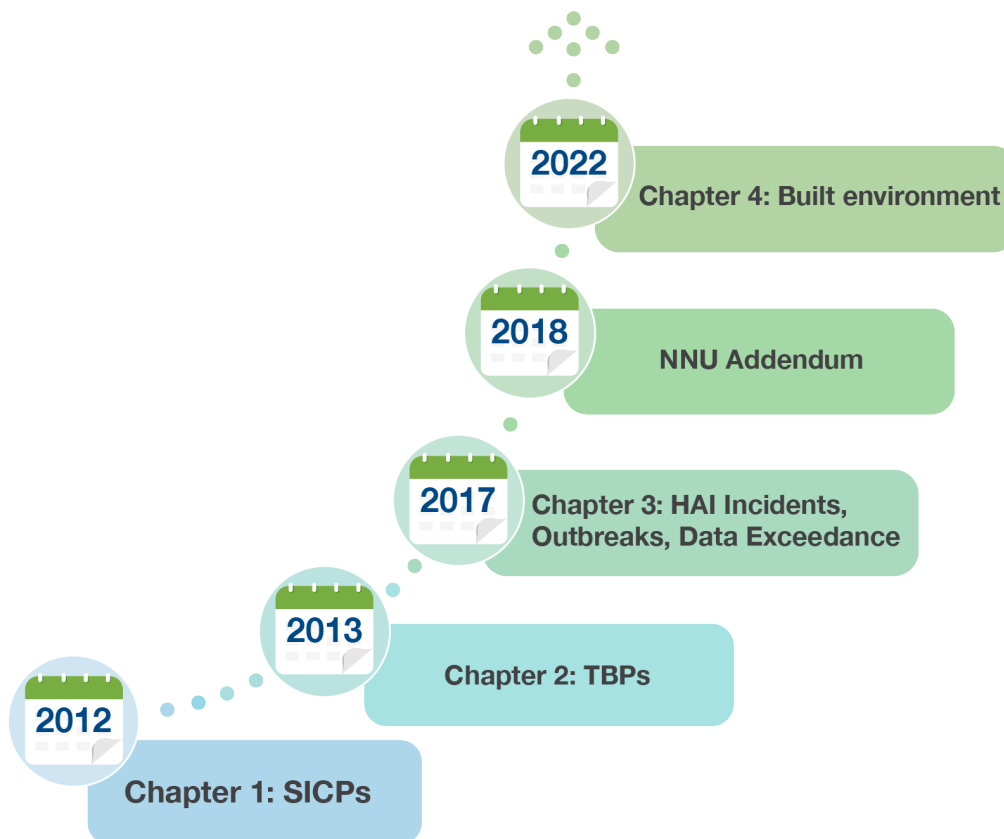
Click below to read more about ARHAI Scotland's work in 2021.



# Infection Prevention and Control Guidance

## National Infection Prevention and Control Manual

The **National Infection Prevention and Control Manual (NIPCM)** continues to evolve from its inaugural chapter, Chapter 1: Standard Infection Control Precautions (SICPs) in 2012, followed by Chapter 2: Transmission Based Precautions (TBPs) in 2013/2014; Chapter 3: Healthcare Infection, Incidents, Outbreaks and Data Exceedance in 2017 and the Addendum for Infection Prevention and Control within Neonatal Settings (NNU) in 2018.



In 2021, development of a new chapter for the NIPCM commenced (Chapter 4), which will cover infection prevention and control (IPC) in the built environment and decontamination. Chapter 4 is planned for release in 2022 and will initially exist as a repository for evidence reviews and tools relating to IPC in the built environment. This will include delivery of appropriate decontamination methods within health and care settings and risk mitigation for water-based pathogens. Content will be developed with stakeholder engagement and learning from Scottish outbreaks and incidents.

In addition to the core chapters, the NIPCM also contains multiple appendices and supporting materials which are constantly being updated as the evidence base evolves. In 2021, a new appendix was added, Appendix 17 which provides information on Aerosol Generating Procedures (AGPs) and post-AGP fallow times.

In recognition of the volume of expansion within the NIPCM throughout the COVID-19 pandemic, work will be undertaken in 2022 to refresh the NIPCM design, content and functionality and this will be done in conjunction with our stakeholders.

## Care Home IPC Manual

In May 2021, a **Care Home IPC Manual** that is context specific for older people and adult Care Homes was published in the NIPCM. The content of the Care Home Infection Prevention and Control Manual (IPCM) is aligned to the evidence based NIPCM and is intended to be used by all those involved in care provision for all older people and adult care homes registered with the Care Inspectorate in Scotland. The Care Home IPCM was co-produced in collaboration with a variety of national and local key stakeholders. Working in partnership with Health Facilities Scotland, ARHAI Scotland supported the development of a National Cleaning Specification, which forms part of the Care Home IPCM. Several webinars were developed and delivered across a variety of community health and care sectors in 2021. These webinars supported the adoption and implementation of national IPC guidance through the application of SICPs as well as enhanced measures of TBPs.

## COVID-19 Guidance

As the pandemic progressed through 2021, COVID-19 guidance was developed at pace across the UK. ARHAI Scotland with input on key decisions from the Scottish Government COVID-19 Nosocomial Review Group (CNRG) developed and published Scottish specific COVID-19 IPC guidance. Setting-specific guidance was published in the NIPCM in the form of addenda for acute, care home, and community settings. These COVID-19 addenda contained all relevant IPC guidance in the context of Scottish policy and public health mitigation measures, a 'one stop shop' for all COVID-19 IPC guidance. In November 2021, these COVID-19 addenda were superseded





# Reducing Risk in the Healthcare Built Environment

Throughout 2021, there continued to be a focus on reducing risk in the healthcare built environment - from the design, construction and adaptation phases of buildings and associated environments, to how they are occupied and maintained by the health and social care teams using them. ARHAI Scotland are supporting the assessment of associated infection prevention and control risks at all stages. During incidents and outbreaks, ARHAI Scotland have supported Infection Prevention and Control Teams and NHSScotland health boards with the provision of expert subject matter knowledge.

COVID-19 has ignited the need for a focus on ventilation in all health and social care environments and local focus on ventilation in the healthcare built environment has increased with a direct correlation to patient safety.

Expert IPC advice was provided during the development and updating of guidance for reducing risk in the healthcare built environment in a range of settings during 2021. This included reviewing technical memoranda and supporting the development of best practice statements for decontamination alongside identification of priorities for new guidance.

The focus for the year ahead is developing Chapter 4 of the National Infection Prevention and Control Manual (NIPCM) content, tools and evidence to support the safe management of risks from the complex components within the built environment.

## Clinical Assurance and IPC for Major Infrastructure Projects

NHS Scotland Assure was formally launched in June 2021 following the request from the Scottish Government for National Services Scotland (NSS) to work with national stakeholders and develop a new national body that aims to reduce risk in the healthcare built environment including risks posed by infectious hazards. An integral workstream of NHS Scotland Assure was the development of the Assurance Service which reviews the design, construction, and maintenance of major infrastructure developments within NHS Scotland at key stages. ARHAI Scotland provided IPC support as

subject matter experts in the development of key stage review processes, ensuring an overarching focus on IPC and that infection risk is considered during all stages of the building lifecycle. Supporting materials for each stage in the building lifecycle were developed to support NHSScotland health boards in demonstrating compliance at all the key stages in the build.

During 2021, ARHAI Scotland supported the completion of eight project reviews. The reviews involve a multidisciplinary Assurance Service team reviewing all the evidence and documentation submitted by the NHSScotland health board and, as a group, agreeing if the evidence demonstrates that the project is being managed and delivered in accordance with national guidance.

In 2022, continued IPC expertise will be provided to the NHSScotland Assurance Service alongside the development of supporting educational resources on the review process and delivery of workshops for IPC teams on the role of IPC in construction projects.

## Healthcare Built Environment Education

During 2021, NES and ARHAI also worked collaboratively to identify, develop and deliver learning and development opportunities for the specialist healthcare built environment workforce. The vision being to provide the skills and capabilities to prevent infection and other risks and improve safety in the healthcare built environment. Senior leadership development webinars were developed alongside a healthcare built environment (HBE) Knowledge and Skills Framework and an **HBE Learn Zone** was created within the NES digital platform TURAS.



The future focus of educational activities includes supporting a relaunch of the NIPCM and development of HBE resources to support clinical staff and compliment Chapter 4 of the NIPCM.

# Antimicrobial Resistance

Antimicrobial Resistance (AMR) arises when micro-organisms, such as bacteria, develop the ability to withstand antimicrobial treatments making infections harder to treat which could result in severe disease and potentially death.

In January 2019, the UK Government published a five-year national action plan 'Tackling antimicrobial resistance 2019–2024' as well as a vision for AMR in 20 years 'Contained and controlled: The UK's 20-year vision for antimicrobial resistance'. The UK action plan acknowledges that a 'One Health' approach is required to mitigate the threat from AMR. Antimicrobial use and spread of infection in humans, animals and the environment contribute to the development of resistant infections. The 'One Health' approach to AMR accepts that the health of humans, animals and the environment are interconnected and that a co-ordinated cross sectoral response is needed to address the threat from AMR. Actions to tackle AMR in Scotland, within the United Kingdom and internationally are underway with ARHAI Scotland playing an important role. ARHAI Scotland coordinates the implementation of the UK AMR National Action Plan in Scotland by delivery partners through the Scottish One Health National AMR Action Plan (SOHNAAP) group.

During 2021, ARHAI Scotland monitored and reported trends in antibiotic use to assess the impact of the COVID 19 pandemic on prescribing behaviour and antibiotic consumption in humans. This assessment used near real time monitoring of weekly trends in antibiotics used for respiratory infection with reporting for action within NHSScotland health boards. This was undertaken alongside surveillance of AMR including monitoring unusual phenotypes for the emergence of new and unusual AMR. Reassuringly there were no new emerging pathogens or increasing trends observed during 2021. Effective, clinically meaningful intelligence on antibiotic use and AMR was provided to stakeholders through Discovery Dashboards to inform and influence practice to contain and control AMR. This enabled NHSScotland health boards to track local progress against Scottish Government standards on antibiotic use and to identify areas for targeted local improvement activity. AMR has remained largely stable throughout this period in Scotland. In

addition, Scotland's Healthy Animals website was further developed to support veterinarians, livestock industry and animal keepers with advice on biosecurity and antimicrobial stewardship in animal health.

In 2022, work will continue assessing the impact of NHS remobilisation from COVID-19 and generating evidence for optimisation of antibiotic prescribing. Preliminary analysis of patient level antibiotic use in acute hospitals will be undertaken to investigate how changes in patient case mix have impacted on hospital level antibiotic use.

Collaborative work with the Scottish Environment Protection Agency and Scotland's Rural College is planned around enterococci, and in particular, vancomycin, linezolid and tigecycline resistance, adopting a One Health approach. A fuller understanding on the contextual and behavioural factors driving trends in antibiotic use in animal health will be developed through engagement with stakeholders.

Comprehensive data and intelligence from 2021 will be published in the annual Scottish One Health Antimicrobial Use and Antimicrobial Resistance (SONAAR) report providing information on antibiotic use and resistance to antibiotics in humans and animals. The reports are published in November to coincide with World Antibiotic Awareness Day and European Antibiotic Awareness Week. The reports are available on the [Antimicrobial resistance - One Health | National Services Scotland \(nhs.scot\)](https://www.nhs.uk/antimicrobial-resistance) website.



## Causes of Antibiotic resistance

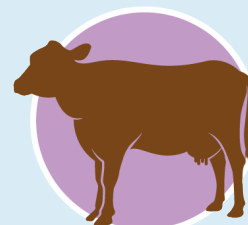
Antibiotic resistance happens when bacteria change and become resistant to the antibiotics used to treat the infections they cause.



**Over-prescribing of antibiotics**



**Patients not finishing their treatment**



**Over-use of antibiotics in livestock and fish farming**



**Poor infection control in hospitals and clinics**



**Lack of hygiene and poor sanitation**



**Lack of new antibiotics being developed**

# Surveillance and Monitoring

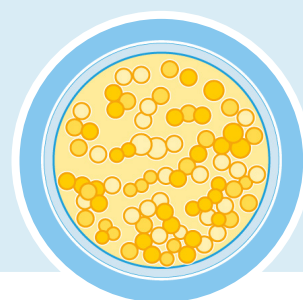
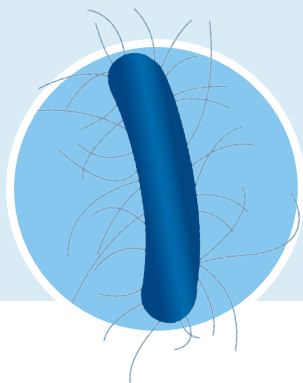
## Surveillance of Healthcare Associated Infection in Scotland

Healthcare associated infections (HCAI) represent a threat to patient safety and can contribute to morbidity and mortality in an already vulnerable population. A significant proportion of HCAI are avoidable and prevention of these infections provides an opportunity to improve patient outcomes and reduce unnecessary costs within healthcare systems.

The mandatory National Surveillance Programme in Scotland has been developed to monitor the burden of key HCAI, providing intelligence to inform the development of interventions and monitor their impact.

**During 2021, three key infection types were included in the National Surveillance Programme:**

- *Clostridioides difficile* infection (CDI)
- *Escherichia coli* bacteraemia (ECB)
- *Staphylococcus aureus* bacteraemia (SAB)



**Trends in key HCAI rates continued to be published quarterly in 2021 and provided in NSS Discovery, supporting local NHSScotland health boards with quality improvement and reduction strategies**





## Surveillance of HCAI during the pandemic

Surveillance continued during the pandemic with surgical site infection surveillance and some enhanced elements of *E. coli* and *S. aureus* bacteraemia surveillance paused to support the pandemic response.

## Surveillance priorities for 2022

- **Develop epidemiological intelligence to support reducing risk in the healthcare built environment**
- **Further investigation into the impact of the pandemic on other HCAI**
- **Development of wider Gram-negative bacteraemia surveillance to support the UK Antimicrobial resistance (AMR) National Action Plan**
- **Development of smarter solutions for surveillance of HCAI, maximising clinical effectiveness whilst reducing burden of data collection**





## The impact of the pandemic on healthcare activity and the inpatient population

Since the onset of the COVID-19 pandemic, there have been changes in healthcare delivery, activity and the inpatient population (including patients being treated for COVID-19). While more services resumed in 2021, hospital activity levels have not yet returned to pre-pandemic levels. This continued disruption to healthcare delivery and the patient population changes the risk of other types of healthcare associated infections (HCAI). Changes in HCAI epidemiology are multifactorial and must be interpreted in the context of these wider healthcare changes.



There was an **increase in hospital activity in 2021** but activity has not yet reached pre-pandemic levels



An **increase of 8.7%** in the **number of patients admitted to acute hospitals in 2021** compared to 2020  
**605,923** in 2021 compared to **557,265** in 2020

**Admissions to acute hospitals in 2021** remained **18.5%** lower than in 2019

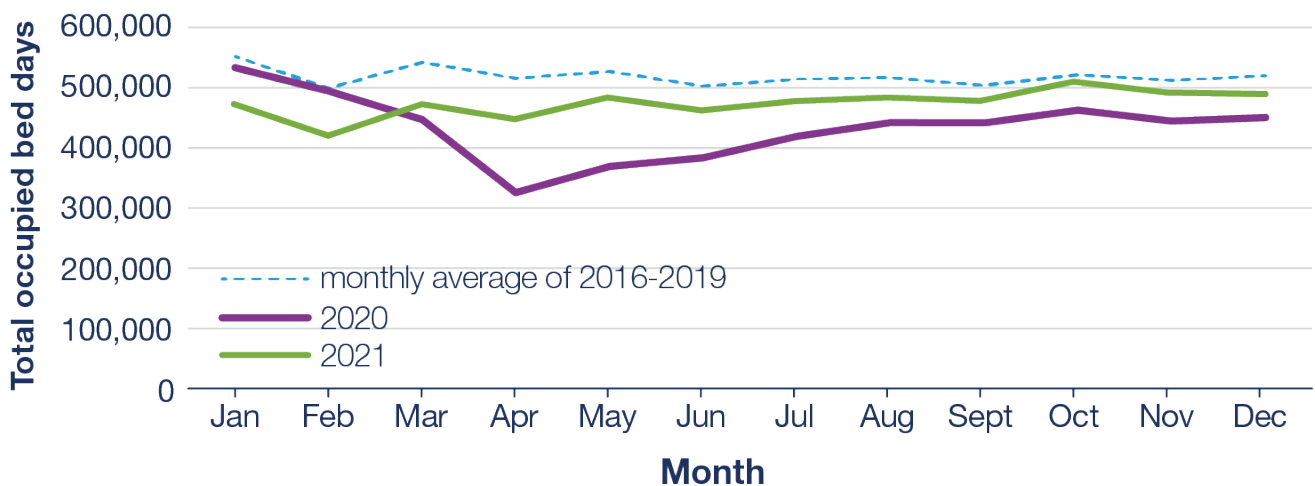


An **increase of 9.2%** in **total occupied bed days in 2021** compared to 2020  
**5,696,926** in 2021 compared to **5,218,675** in 2020

**Total occupied bed days in 2021** remained **6.4%** lower than in 2019



## Total Occupied Bed Days, by Month



An **increase** of **4.9%** in the **number of emergency admissions** within **acute hospitals** in **2021** compared to **2020**

**470,542** in **2021** compared to **448,409** in **2020**

**Emergency admissions** in **2021** remained **9.2%** **lower** than in **2019**



An **increase** of **4.2%** in **elective admissions** within **acute hospitals** in **2021** compared to **2020**

**84,420** in **2021** compared to **81,046** in **2020**

**Elective admissions** in **2021** remained **34.2%** **lower** than in **2019**





An **increase** of **20.2%** in **day cases within acute hospitals** in **2021** compared to **2020**

**348,677** in **2021** compared to **290,058** in **2020**

**Day cases** in **2021** remained **21.7% lower** than in **2019**



There was **no difference** in the proportion of **acute inpatients aged 65 and over** in **2021 (42.5%)** compared to **2020 (42.6%)**, but there was a **larger proportion of patients aged 65 and over** compared to **2019**



The proportion of **acute inpatients aged 65 and over** in **2021** was **2.7% higher** than in **2019**

# Clostridioides difficile infection

## Epidemiological Data

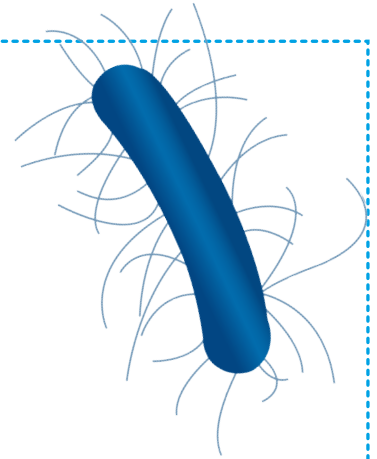
In **2021**, there were **1,135** cases of *Clostridioides difficile* Infection (CDI) reported in patients aged 15 years and older in Scotland

Compared to **1,088** cases in **2020**

The **annual incidence rate** was **20.8** per 100,000 population

The **rate** has **remained stable** between **2020** and **2021** 

There has been a **5.8%** **year-on-year decrease** over the **last 5 years** 




In **2021**, the **cases and rates** of CDI in patients aged 15 years and older were

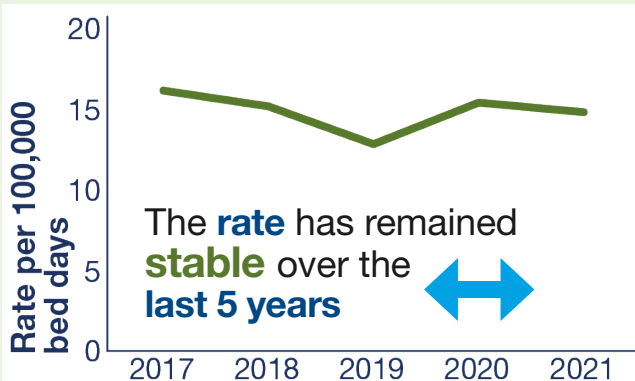


### Healthcare associated CDI

**859** cases

Annual incidence rate of **15.1** per 100,000 bed days


The **rate** has remained **stable** between **2020** and **2021** 

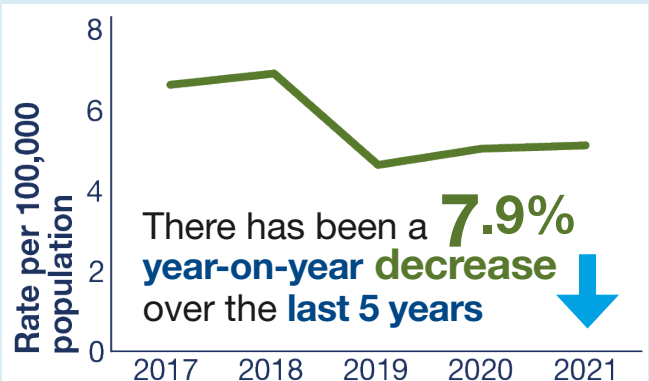


### Community associated CDI

**276** cases

Annual incidence rate of **5.0** per 100,000 population

The **rate** has remained **stable** between **2020** and **2021** 



## 2021 funnel plot analysis

**NHS Ayrshire & Arran, NHS Highland and NHS Lanarkshire** had **higher than average rates** of healthcare associated CDI compared with the **Scottish average rate**

**NHS Dumfries & Galloway and NHS Lothian** had **higher than average rates** of community associated CDI compared with the **Scottish average rate**

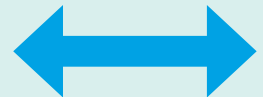
**Note:** the **NHSScotland health board rates** are **not adjusted** for **differences in the patient population**

Three **improvement plans** were developed by **NHSScotland health boards** during **2021** in response to **higher than average rates** of **healthcare associated CDI**

## All cause case fatality

In 2021, the 30 day all cause case fatality rates for CDI in patients aged 15 years and older was **11.6%**.

The **rate** has **remained stable** between **2017** and **2021**.



The **rates** are **not adjusted** for **differences** in the **patient population over time**.

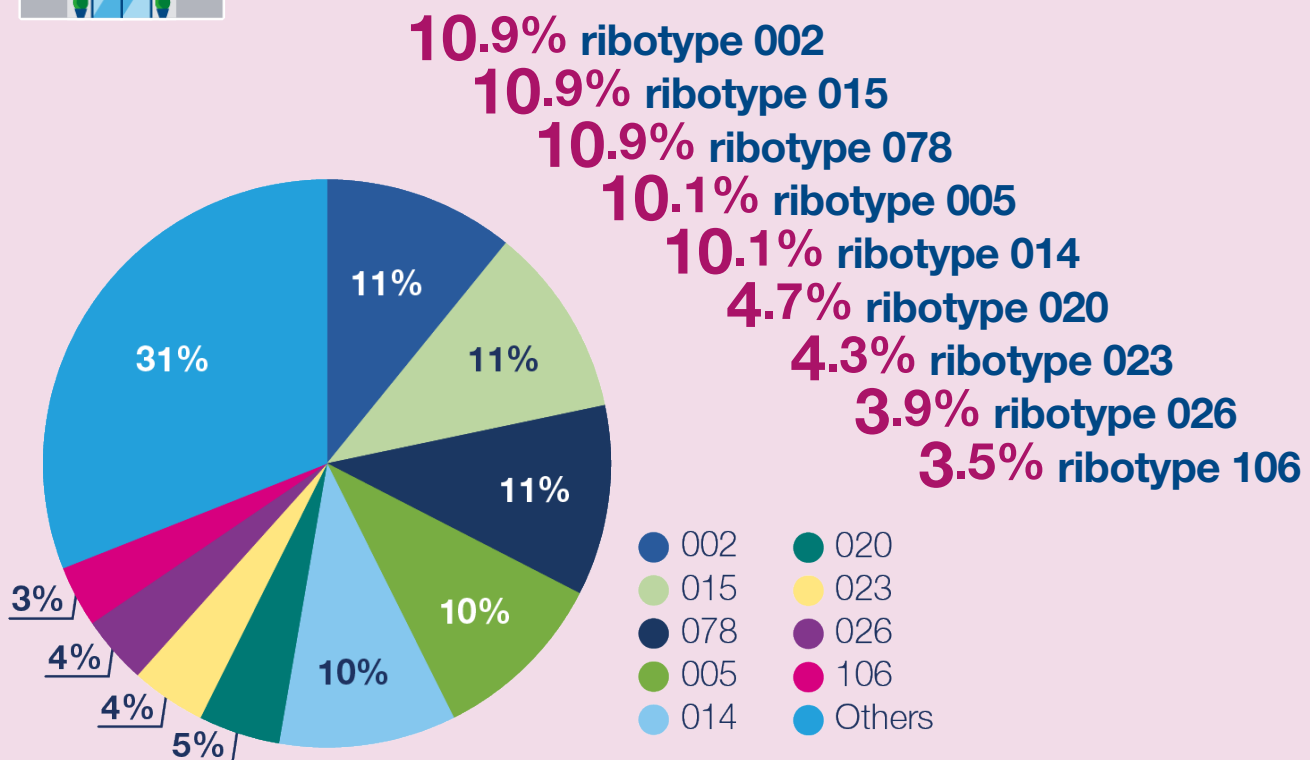


## Molecular Epidemiological Data

As part of the epidemiological surveillance of CDI, the Scottish *Salmonella*, *Shigella* and *Clostridioides difficile* Reference Laboratory carry out polymerase chain reaction (PCR) ribotyping of subsets of *Clostridioides difficile* (*C. difficile*) isolates (under a representative snapshot, and severe cases and/or outbreaks typing schemes).



In **2021**, the **most common ribotypes isolated** in **Scotland** (based on a representative sample, n=258) were



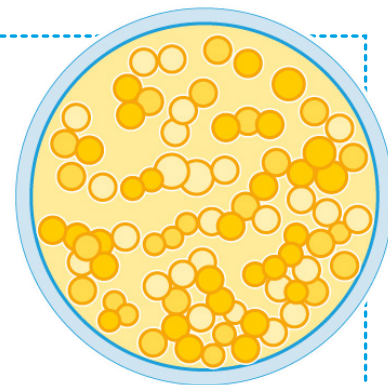
PCR ribotyping surveillance is currently being replaced by Whole Genome Sequencing (WGS). This will aid interpretation of epidemiological links and allow early warning triggers to be developed to quickly identify linked cases or outbreaks.

**Scottish Antimicrobial Prescribing Group (SAPG)** coordinates a **national framework** for **antimicrobial stewardship** to **improve antibiotic use** supporting **reduced risk from CDI**  
**Updated advice** on **antimicrobial management** of **CDI** was issued by the **Scottish Antimicrobial Prescribing Group**

# Staphylococcus aureus bacteraemia

## Epidemiological Data

In **2021**, there were **1,590** cases of **Staphylococcus aureus bacteraemia (SAB)** reported in **Scotland**



Compared to **1,501** cases in **2020**

The **annual incidence rate** was **29.1** per 100,000 population

The rate has **remained stable** between **2020** and **2021**



The rate has **remained stable** over the **last 5 years**



**96.4%** (n = 1,533)  
of **all SAB cases** were

**Meticillin-sensitive Staphylococcus aureus (MSSA)**



The **rate** has **remained stable** between **2020** and **2021**



The **rate** has **remained stable** over the **last 5 years**



**3.6%** (n = 57)  
of **all SAB cases** were

**Meticillin-resistant Staphylococcus aureus (MRSA)**



The **rate** has **remained stable** between **2020** and **2021**



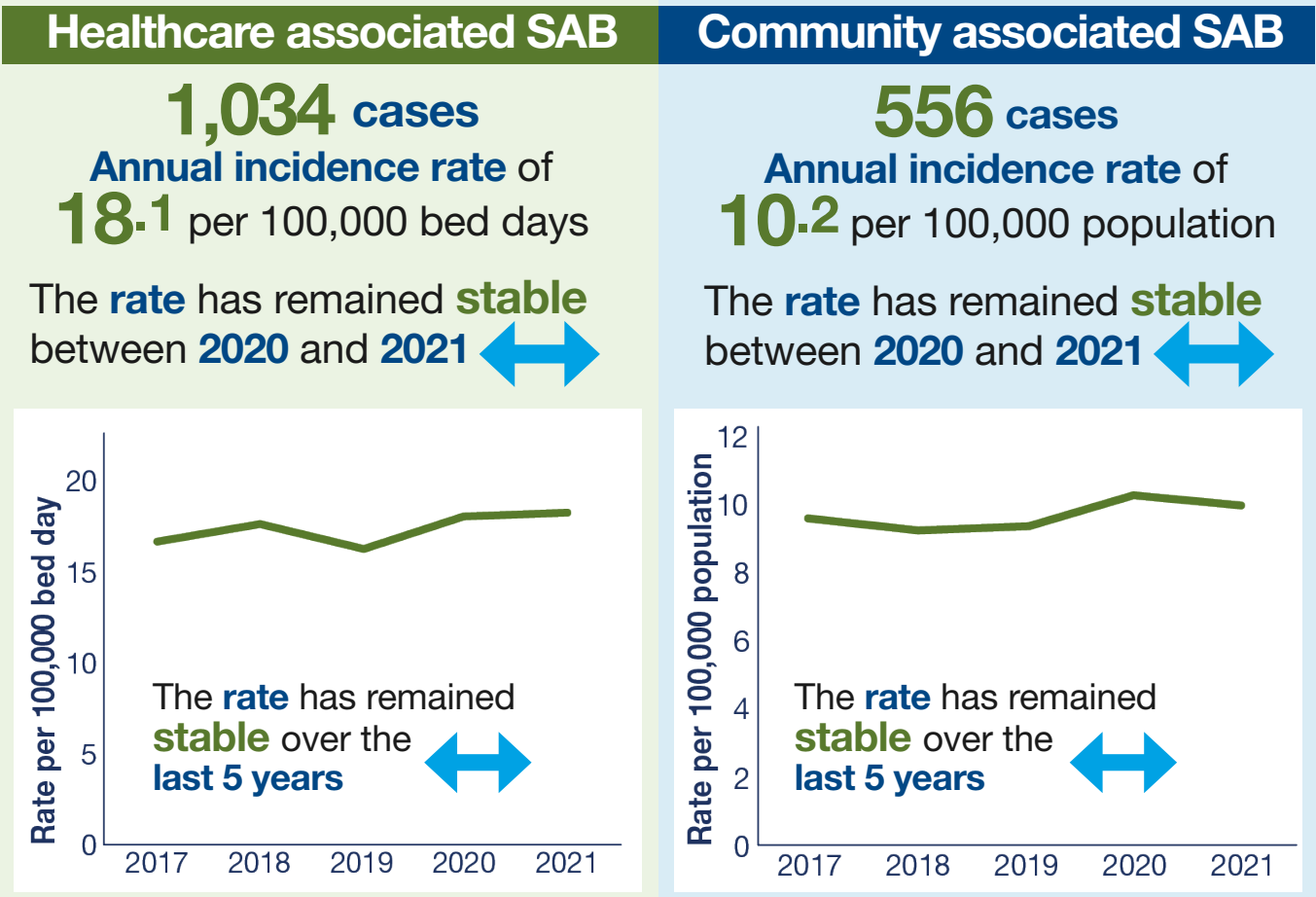
There has been an **11.5%** **year-on-year decrease** over the **last 5 years**







In 2021, the cases and rates of SAB were



## 2021 funnel plot analysis

NHS Tayside had a **higher rate** of healthcare associated SAB compared with the **Scottish average rate**

NHS Dumfries & Galloway had a **higher rate** of community associated SAB compared with the **Scottish average rate**

**Note:** the NHSScotland health board rates are **not adjusted** for differences in the patient population

**During 2021**, no NHSScotland health boards were required to develop improvement plans due to **higher than average quarterly rates** of healthcare associated SAB.



## All cause case fatality

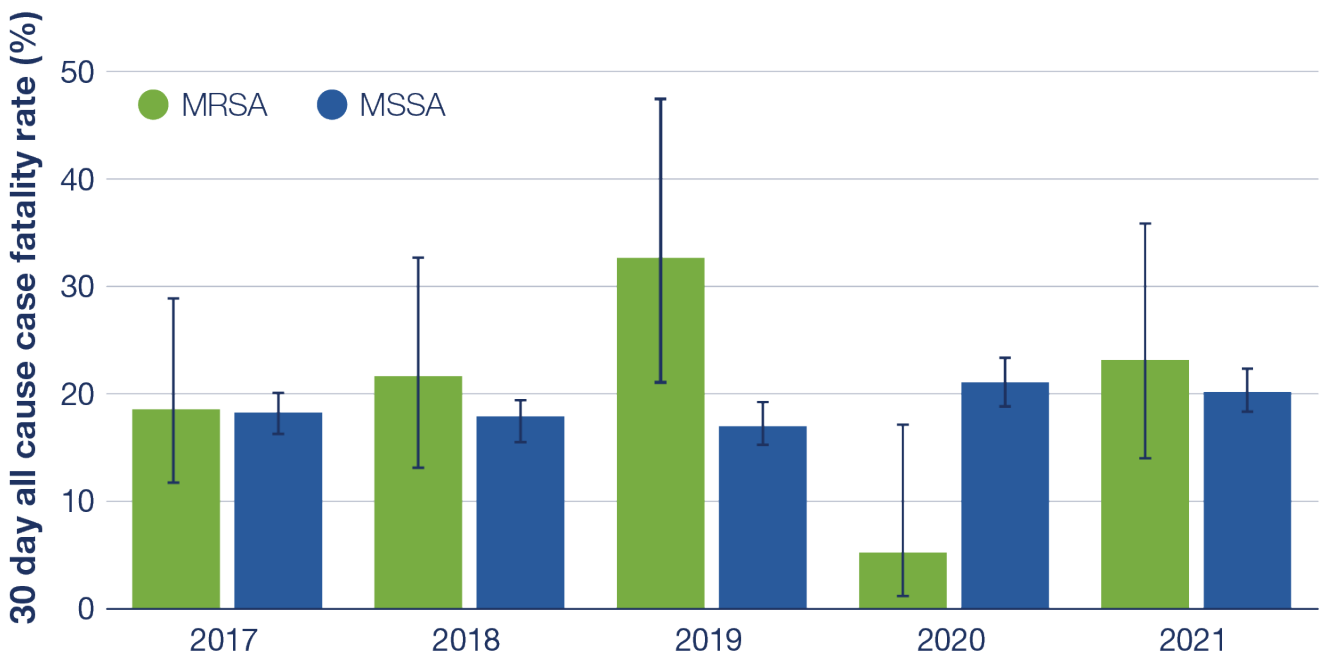
In **2021**, the **30 day all cause case fatality rates** for **SAB** were



↔ The **MRSA case fatality rate** has **remained stable** between **2017** and **2021**

There has been a **3.9% year-on-year increase** in the **MSSA case fatality rate** between **2017** and **2021** ↑

**Note:** the **rates** are **not adjusted** for **differences** in the **patient population over time**



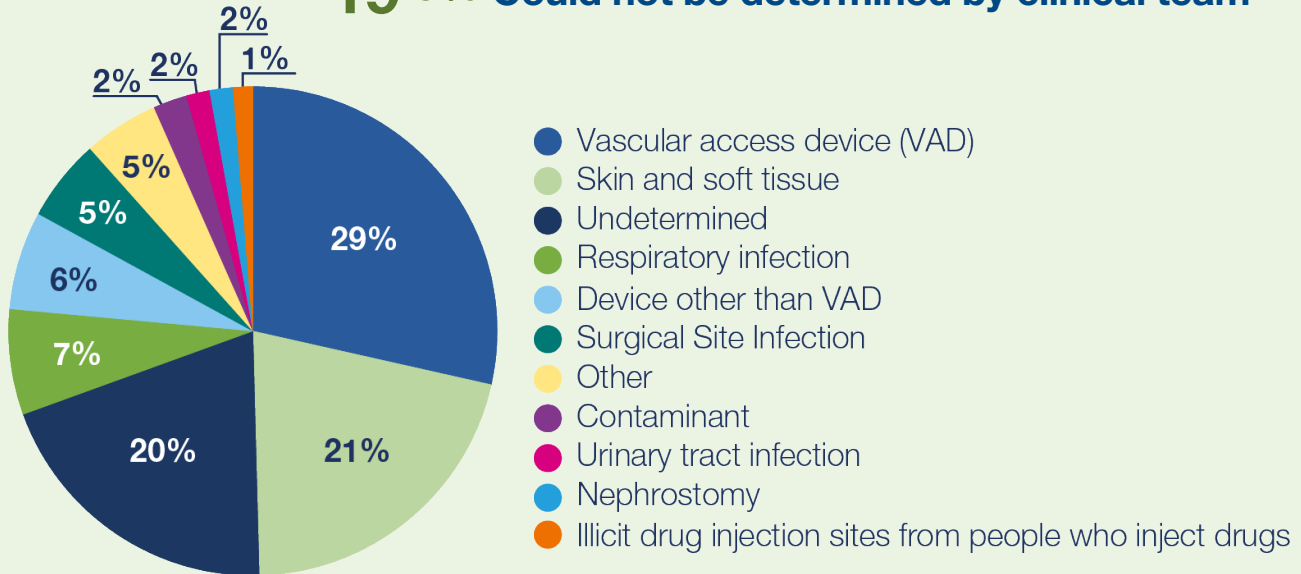


In 2021, the **3 most common** entry points for healthcare associated SAB were

**28.5% Vascular access device (VAD)**

**21.1% Skin and soft tissue**

**19.9% Could not be determined by clinical team**



\*Voluntary data due to the COVID-19 pandemic, completed for 81.7% of healthcare associated SAB cases

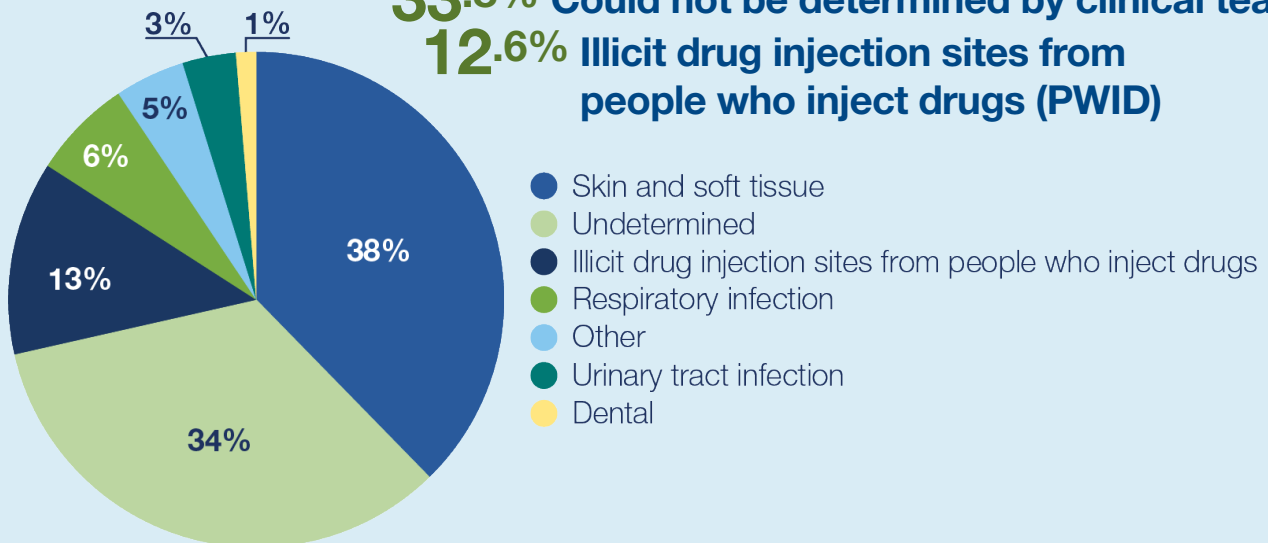


In 2021, the **3 most common** entry points for community associated SAB were

**37.7% Skin and soft tissue**

**33.8% Could not be determined by clinical team**

**12.6% Illicit drug injection sites from people who inject drugs (PWID)**



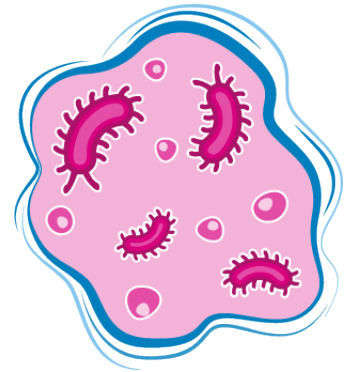
\*Voluntary data due to the COVID-19 pandemic, completed for 82.6% of community associated SAB cases

In 2021, **83%** of audited patients underwent a **clinical risk assessment** in line with **National MRSA screening policy**. This remains **below** the **90% key performance indicator**.

# Gram-negative bacteraemia

## Epidemiological Data

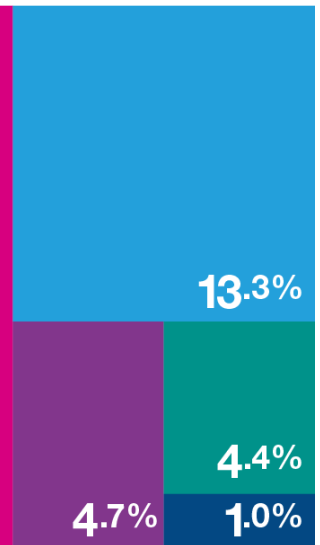
In **2021**, there were **5,600** Gram-negative bacteraemia in **Scotland** caused by **5** key Gram-negative pathogens



***E. coli*** is the most common cause of Gram-negative bacteraemia



**76.6%**



- *Escherichia coli*
- *Klebsiella pneumoniae*
- *Pseudomonas aeruginosa*
- *Klebsiella oxytoca*
- *Acinetobacter* species

In **2021**, there were **4,292** cases of ***Escherichia coli* bacteraemia (ECB)** reported in **Scotland**

**Compared** to **4,206** cases in **2020**

The **annual incidence rate** was **78.5** per 100,000 population

The **rate** has **remained stable** between **2020** to **2021** ↔

There has been a **3.4%** **year-on-year decrease** over the **last 5 years** ↓





In 2021, the cases and rates of ECB were

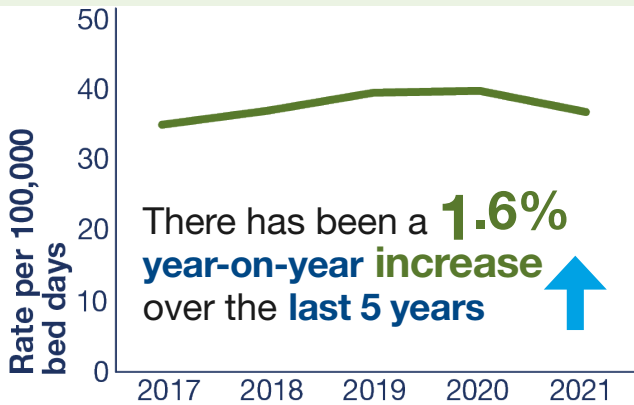


### Healthcare associated ECB

**2,113 cases**

Annual incidence rate of **37.1** per 100,000 bed days

There has been a **6.4% decrease** in the rate between **2020** and **2021** ↓

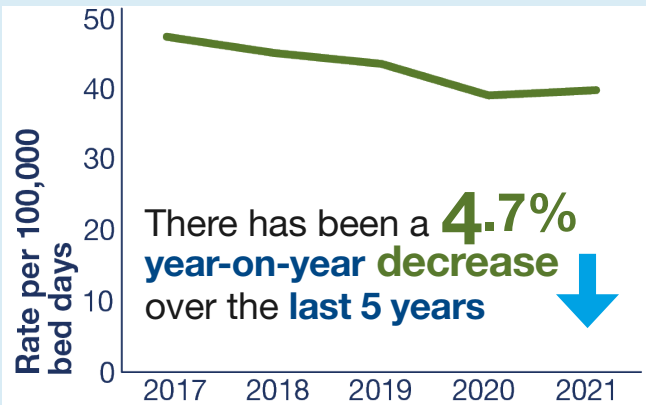


### Community associated ECB

**2,179 cases**

Annual incidence rate of **39.9** per 100,000 population

The rate has remained **stable** between **2020** and **2021** ↔



## 2021 funnel plot analysis

**NHS Ayrshire & Arran, NHS Forth Valley and NHS Tayside** all had **higher rates** of healthcare associated ECB compared with the **Scottish average rate**

**NHS Ayrshire & Arran and NHS Dumfries & Galloway** both had **higher rates** of community associated ECB compared with the **Scottish average rate**

**Note:** the **NHSScotland health board rates** are **not adjusted** for differences in the patient population

Three **improvement plans** were developed by **NHSScotland health boards** during **2021** in response to **higher than average rates** of healthcare associated ECB

## All cause case fatality

In **2021**, the **30 day all cause case fatality rates** for **ECB** was **14.3%**.

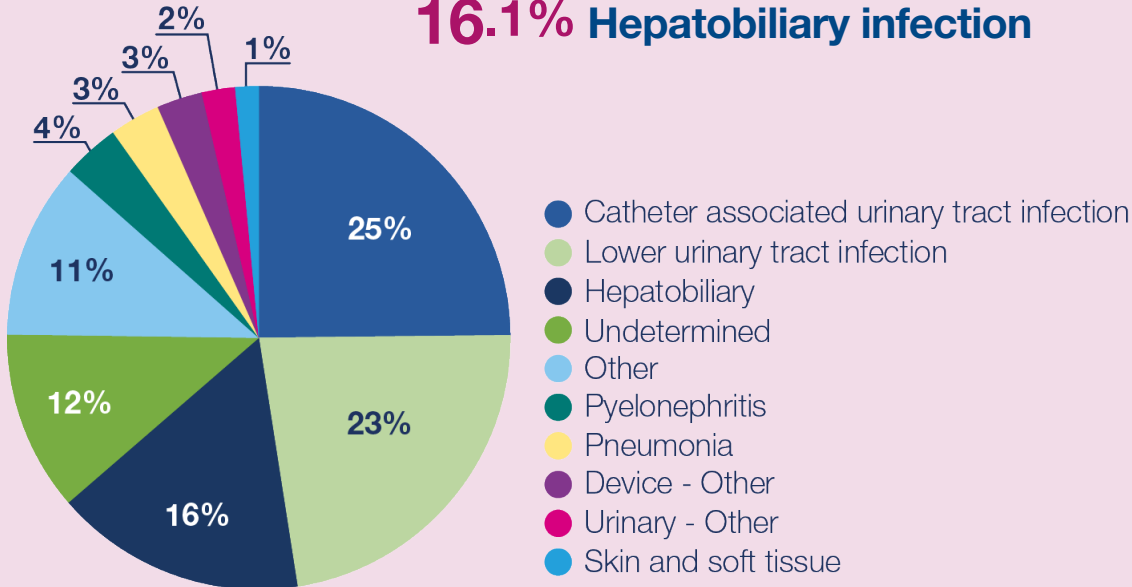
The **rate** has **remained stable** between **2017** and **2021**. ↔

The **rates** are **not adjusted** for **differences** in the **patient population** over time



In 2021, the **3 most common** primary infections for healthcare associated ECB were

**24.8%** Catheter associated urinary tract infection  
**22.7%** Lower urinary tract infection  
**16.1%** Hepatobiliary infection

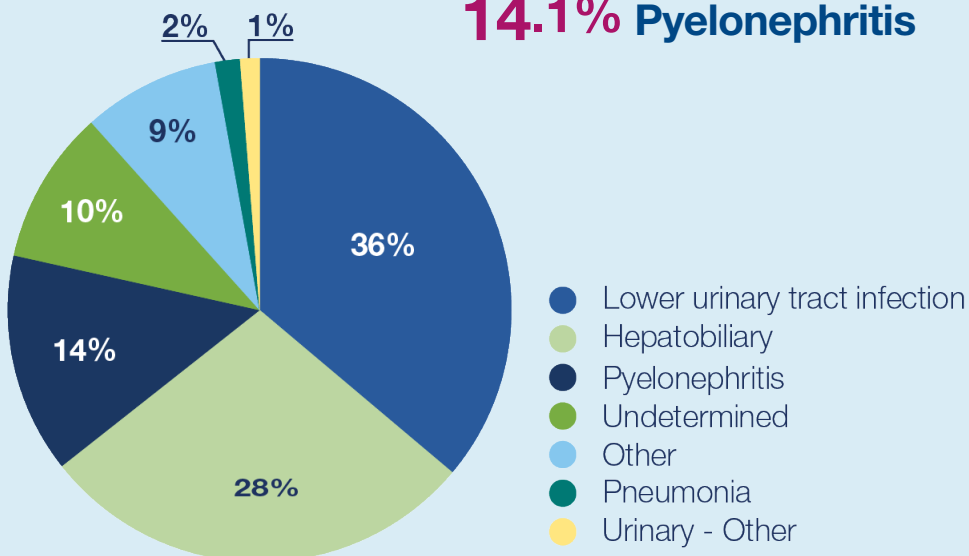


\*Voluntary data due to the COVID-19 pandemic, completed for 88.4% of healthcare associated ECB cases.



In 2021, the **3 most common** primary infections for community associated ECB were

**36.1%** Lower urinary tract infection  
**28.2%** Hepatobiliary infection  
**14.1%** Pylonephritis



\*Voluntary data due to the COVID-19 pandemic, completed for 88.8% of community associated ECB cases.

Admission screening for Carbapenemase-Producing Enterobacterales (CPE), an important group of Gram-negative organisms, is a key intervention in healthcare.

In **2021**, **82%** of **audited patients** underwent a **clinical risk assessment** in line with **national CPE screening policy**.

**ARHAI Scotland** coordinates the **sharing of urinary tract infection (UTI) reduction resources**. These include

- **National Hydration Campaign** which aims to convey the public health benefits of good hydration in terms of UTI prevention
- **National Catheter Passport** which gives information on how to care for urinary catheters at home as well as a clinical section for a nurse, doctor or carer





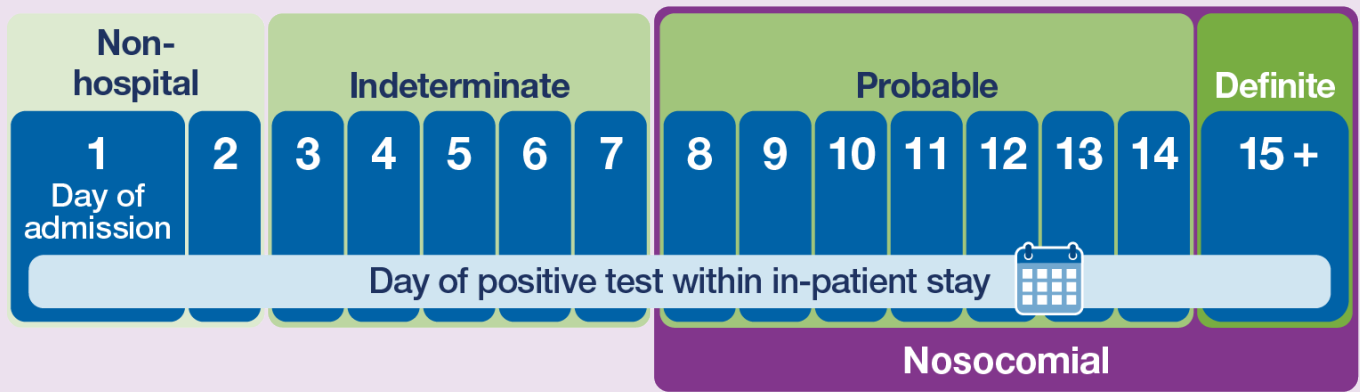
## Hospital onset COVID-19

ARHAI Scotland continued to monitor hospital transmission of COVID-19 using the hospital onset COVID-19 surveillance system during 2021. This system monitors nosocomial COVID-19 infections (patients testing positive for COVID-19 on day eight of admission onwards). The intelligence has been used to provide critical evidence to inform infection prevention and control measures, guidance and government policy. Further detail on the development of COVID-19 epidemiology and intelligence is provided in the **COVID-19 Timeline Appendix**.

### Hospital onset status timeline

**Hospital onset** is divided into **4** categories:

**non-hospital, indeterminate, probable** and **definite**



### Epidemiological Data



In **2021** there were **3,746 cases** of **nosocomial COVID-19 infection**, compared to **3,395** in the **2020** pandemic period of **March** to **December**

**Testing availability** and **testing policy** has **evolved** through the pandemic in **hospitals** and the **community**, therefore comparison between **COVID-19 pandemic years** should be treated with caution

**32.3%** of **patients testing positive** during an **inpatient stay** were **nosocomial cases** (excluding patients tested in the community and admitted to hospital)



Hospital onset status	2020* Number of cases	2020* %	2021 Number of cases	2021 %
Definite hospital onset (day 15+ of admission)	2,395	22.8%	2,595	21.8%
Probable hospital onset (days 8-14)	1,000	9.5%	1,151	9.7%
Indeterminate hospital onset (days 3-7)	791	7.5%	1,080	9.1%
Non-hospital onset (days 1 and 2)	6,338	60.2%	7,051	59.4%
<b>Total hospital onset COVID-19 cases</b>	<b>10,524</b>	<b>100.0%</b>	<b>11,877</b>	<b>100.0%</b>

\* 2020 pandemic period of March to December







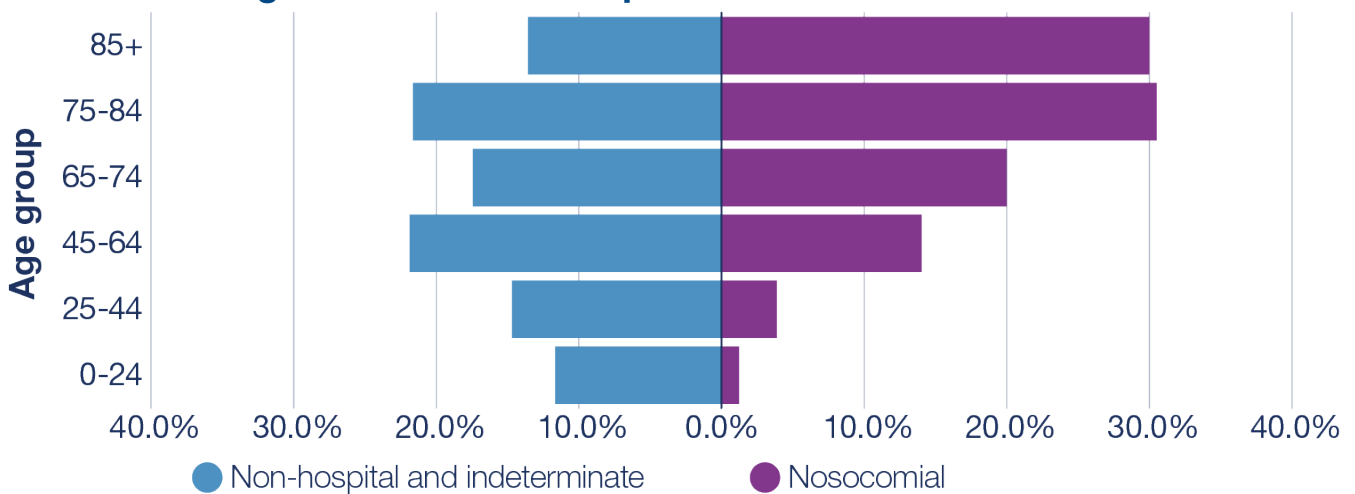
Patients with nosocomial COVID-19 were **older** than other COVID-19 cases (those diagnosed during the first week of their inpatient stay or in the community)

The **median age of nosocomial COVID-19** was **79**, which was **significantly higher** than a **median age of 66** for other patients first diagnosed in hospital ( $p < 0.001$ )

**60.8%** of all nosocomial COVID-19 cases in 2021 (definite and probable hospital onset) were **aged 75 and over**, which reflects the **older age distribution** of the hospital population

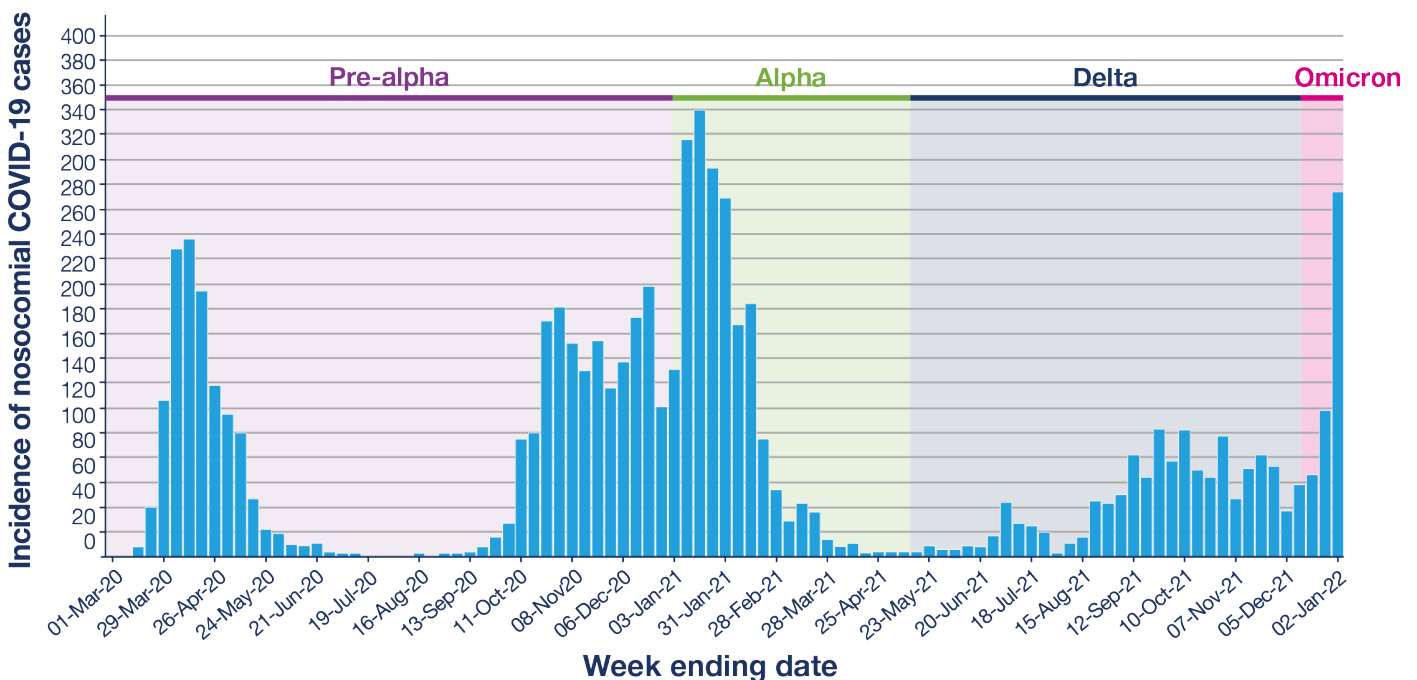


Age distribution of hospital onset COVID-19 - 2021

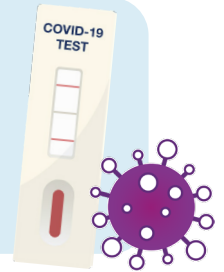


### Incidence of nosocomial cases of COVID-19 over time

Incidence of nosocomial cases of COVID-19 have followed trends **observed** in the **population** overall, which during **2021** corresponded to the **emergence of new variants**.



During the pandemic, **asymptomatic testing** has been used for **early identification** and **subsequent management of asymptomatic and pre-symptomatic COVID-19 cases**, **reducing** the **risk** of **onward transmission**



### All nosocomial cases



at time of test.\*

\* Voluntary data from August 2021 onwards (963 cases, 62.7% complete)

### All cause case fatality

**951 (25.4%)** patients with **nosocomial COVID-19** in **2021** died within **28 days** of their **first positive sample**. This was **lower** than **2020**.

A **lower all cause case fatality rate** in **2021** may be reflective of:

**vaccination; better treatment options for COVID-19; variants with reduced severity; increased ascertainment of mild cases** due to **asymptomatic testing**

Hospital onset status	2020: Total COVID-19 Cases	2020: All cause Case Fatality within 28 Days	2020: All cause Case Fatality %	2021: Total COVID-19 Cases	2021: All cause Case Fatality within 28 Days	2021: All cause Case Fatality %
Nosocomial Infections (Day 8 of admission onwards)	3,395	1,043	30.7%	3,746	951	25.4%
Non-Hospital and Indeterminate hospital onset (Days 1-7 of admission)	7,114	1,808	25.4%	8,080	1,265	15.7%
<b>Total</b>	<b>10,509</b>	<b>2,851</b>	<b>27.1%</b>	<b>11,826</b>	<b>2,216</b>	<b>18.7%</b>

Differences in case fatality rates between cases of nosocomial COVID-19 and other cases of COVID-19 diagnosed during an inpatient stay can be attributed to differences in the age distributions and underlying health conditions of the two groups. **After adjusting for these factors there was no increased risk in case fatality for nosocomial COVID-19, compared to other cases first diagnosed in hospital.**

# Incidents and Outbreaks

ARHAI Scotland support local Infection Prevention and Control Teams and Health Protection Teams to prevent, prepare for, and manage outbreaks and incidents, as well as share lessons learned throughout Scotland.

ARHAI Scotland use an Outbreak Reporting Tool (ORT) to collect and analyse COVID-19 cluster data and other incidents assessed using the **Healthcare Infection Incident Assessment Tool (HIIAT)** in line with Chapter 3 of the National Infection Prevention and Control Manual (NIPCM). This system continued to evolve during 2021 and has enabled comprehensive and timely reporting of outbreaks and incidents across NHS Scotland and sharing of best practice in managing and preventing incidents. The establishment of regular meetings has allowed this sharing to be achieved in a real-time, proactive environment covering COVID-19 and non-COVID-19 incidents and outbreaks.



In **2021**, there were **118 healthcare infection incidents and outbreaks** (excluding COVID-19 clusters).

**Incidents and outbreaks reported as HIIATs are categorised as Red, Amber or Green.** Of the **total number of reports**, there were

**23 Red**

**22 Amber**

**73 Green**

Of the **total number of incidents and outbreaks** in **2021**



**12.7%** (n = 15)

of **incidents** were **bloodstream infection incidents**

**11.9%** (n = 14)

of **incidents** were **gastrointestinal incidents** (excluding Norovirus)

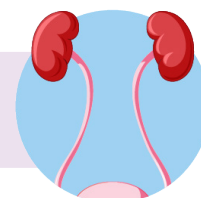


**5.1%** (n = 6) of **incidents** were

**respiratory infection incidents** (excluding COVID-19)

**4.2%** (n = 5)

of **incidents** were **urinary tract infection incidents**



## Development of incident and outbreak assessment

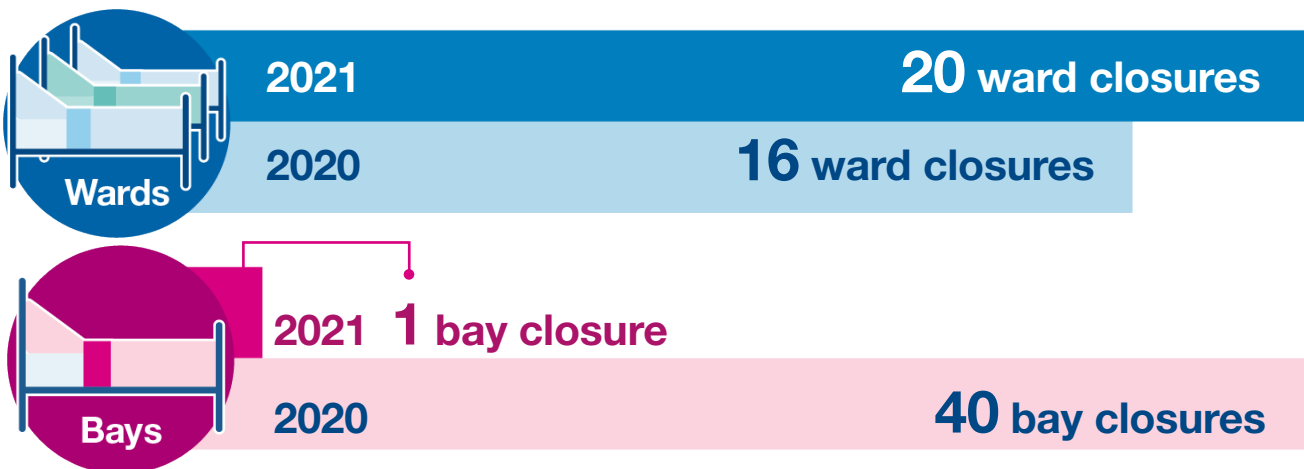
The HIIAT tool requires Infection Prevention and Control Teams (IPCT) or Health Protection Teams (HPT) within NHSScotland health boards to assess every healthcare infection incident. For example: all outbreaks and incidents (including decontamination incidents and near misses) in any healthcare setting as outlined in Chapter 3 of the NIPCM. During 2022, the HIIAT tool will be revised in collaboration with stakeholders. The aim is to address some inconsistencies that may occur with the assessment of risk criteria. This will provide a more structured approach for the NHSScotland health boards in determining risk associated with an incident or outbreak and consistency in the subsequent reporting across all levels.

## Norovirus outbreaks

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

NHSScotland health boards reported **21** closures due to **Norovirus** in **2021**

↓ A **decrease** of **62.5%** from **56** closures in **2020**



There were **107** suspected or confirmed cases of **Norovirus** associated with reported ward or bay closures in **2021**

↓ A **decrease** of **58.4%** from **257** cases in **2020**



# List of Abbreviations and Acronyms

<b>AGP</b>	Aerosol Generating Procedure
<b>AMR</b>	Antimicrobial Resistance
<b>ARHAI</b>	Antimicrobial Resistance and Healthcare Associated Infections
<b>CDI</b>	<i>Clostridioides difficile</i> Infection
<b>CDW</b>	Corporate Data Warehouse
<b><i>C. difficile</i></b>	<i>Clostridioides difficile</i>
<b>CNRG</b>	COVID-19 Nosocomial Review Group
<b>COVID-19</b>	Coronavirus disease 2019 COVID-19
<b>CPE</b>	Carbapenemase-Producing Enterobacterales
<b>CRA</b>	Clinical Risk Assessment
<b><i>E. coli</i></b>	<i>Escherichia coli</i>
<b>ECB</b>	<i>Escherichia coli</i> Bacteraemia
<b>ECOSS</b>	Electronic Communication of Surveillance in Scotland
<b>HBE</b>	Healthcare Built Environment
<b>HCAI</b>	Healthcare Associated Infection
<b>HIIAT</b>	Healthcare Infection Incident Assessment Tool
<b>HIIORT</b>	Healthcare Infection, Incident and Outbreak Reporting Template
<b>HPT</b>	Health Protection Team
<b>IPC</b>	Infection Prevention and Control
<b>IPCM</b>	Infection Prevention Control Manual
<b>IPCT</b>	Infection Prevention and Control Team
<b>ISD</b>	Information Services Division
<b>MRSA</b>	Meticillin-resistant <i>Staphylococcus aureus</i>
<b>MSSA</b>	Meticillin-sensitive <i>Staphylococcus aureus</i>
<b>NES</b>	NHS Education for Scotland
<b>NHS</b>	National Health Service
<b>NIPCM</b>	National Infection Prevention and Control Manual
<b>NNU</b>	Neonatal Unit
<b>NRS</b>	National Records of Scotland
<b>NSS</b>	National Services Scotland
<b>ORT</b>	Outbreak Reporting Tool
<b>PCR</b>	Polymerase Chain Reaction
<b>PWID</b>	People Who Inject Drugs
<b>RAPID</b>	Rapid Admission Preliminary Inpatient Data
<b><i>S. aureus</i></b>	<i>Staphylococcus aureus</i>
<b>SAB</b>	<i>Staphylococcus aureus</i> Bacteraemia

<b>SAPG</b>	Scottish Antimicrobial Prescribing Group
<b>SICPs</b>	Standard Infection Control Precautions
<b>SMR</b>	Scottish Morbidity Record
<b>SONAAR</b>	Scottish One Health Antimicrobial Use and Antimicrobial Resistance
<b>SOHNAAP</b>	Scottish One Health National AMR Action Plan
<b>SSI</b>	Surgical Site Infection
<b>TBPs</b>	Transmission Based Precautions
<b>UK</b>	United Kingdom
<b>UTI</b>	Urinary Tract Infection
<b>VAD</b>	Vascular Access Device
<b>VHF</b>	Viral Haemorrhagic Fever
<b>WGS</b>	Whole Genome Sequencing
<b>XDR-TB</b>	Extremely Drug Resistant-Tuberculosis

# Appendix 1 – Publication metadata

## Publication title

ARHAI Scotland 2021 Annual Report

## Description

This release provides information on healthcare associated infections in Scotland for the period January to December 2021.

## Theme

Healthcare associated infections in Scotland

## Topic

Healthcare associated infections  
Infection prevention and control

## Format

Online resource (PDF)

## Data source(s)

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:**

Acute hospital admissions data: Public Health Scotland SMR01

Total occupied bed days: Public Health Scotland ISD(S)1

Elective admissions data: Public Health Scotland, Acute hospital activity and NHS beds information (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Emergency admissions data: Public Health Scotland, Acute hospital activity and NHS beds information (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Day cases data: Public Health Scotland, Acute hospital activity and NHS beds information (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Acute admissions by patient age: Public Health Scotland SMR01

### ***Clostridioides difficile* infection:**

Case data: Electronic Communication of Surveillance in Scotland (ECOSS)

Data linkage source: general / acute inpatient and day case Scottish Morbidity Records (SMR01): Public Health Scotland

Healthcare associated denominator: total occupied bed days: Public Health Scotland ISD(S)1

Community associated denominator: National Records of Scotland (NRS) mid-year population estimates

### ***Staphylococcus aureus* bacteraemia:**

Case data: ECOSS Enhanced Surveillance Web Tool

Healthcare associated denominator: total occupied bed days: Public Health Scotland ISD(S)1



Community associated denominator: NRS mid-year population estimates

### **Gram-negative bacteraemia:**

Case data: ECOSS and ECOSS Enhanced Surveillance Web Tool

Healthcare associated denominator: total occupied bed days: Public Health Scotland ISD(S)<sup>1</sup>

Community associated denominator: NRS mid-year population estimates

### **Hospital onset COVID-19:**

Case data: ECOSS and Corporate Data Warehouse (CDW)

Admissions data: Rapid Admission Preliminary Inpatient Data (RAPID), validated/supplemented by local patient admissions systems.

**Incidents and Outbreaks:** healthcare infection incidents reported to National Services Scotland (NSS) through the Healthcare Infection, Incident and Outbreak Reporting Template (HIORT) reporting process and the ARHAI Outbreak Reporting Tool (ORT).

**Norovirus outbreaks:** Norovirus outbreaks reported to NSS.

## **Date that data are acquired**

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** 28 June 2021

***Clostridioides difficile* infection:** 22 April 2022

***Staphylococcus aureus* bacteraemia:** 02 June 2022

**Gram-negative bacteraemia:** 07 July 2022 (with the exception of *Escherichia coli* bacteraemia)

***Escherichia coli* bacteraemia:** 02 June 2022

**Hospital onset COVID-19:** 06 July 2021

**Incidents and Outbreaks:** 28 June 2022

**Norovirus outbreaks:** 07 July 2022

## Release date

20 September 2022

## Frequency

Annual

## Timeframe of data and timeliness

The latest iteration of data are to 31 December 2021, therefore nine months in arrears.

**Norovirus outbreaks:** the data are reported on a weekly basis by NHSScotland health boards and the reporting method has capacity to be retrospective due to only being reported when the bay/ward has reopened. Therefore, the data should not be used for benchmarking or comparison but only for NHSScotland health boards assessment for risk and outbreak preparedness.

## Continuity of data

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

## **The impact of the pandemic on healthcare activity and the inpatient population:** None

***Clostridioides difficile* infection:** changes in the hospital population and activity during 2020/21 may have affected the epidemiology of *Clostridioides difficile* infection and comparison of results should be interpreted with caution.

***Staphylococcus aureus* bacteraemia:** changes in the hospital population and activity during 2020/21 may have affected the epidemiology of *Staphylococcus aureus* infection and comparison of results should be interpreted with caution.

**Gram-negative bacteraemia:** changes in the hospital population and activity during 2020/21 may have affected the epidemiology of Gram-negative bacteraemia and comparison of results should be interpreted with caution.

**Hospital onset COVID-19:** changes in the hospital population, hospital activity, COVID-19 testing, vaccination rates and circulation of different variants during 2020/21 may have affected the epidemiology of hospital onset COVID-19 cases and hospital onset COVID-19 mortality; comparison of results should be interpreted with caution.

**Incidents and Outbreaks:** changes in the hospital population and activity during 2020/21 may have affected the epidemiology of healthcare outbreaks and incidents and comparison of results should be interpreted with caution.

**Norovirus outbreaks:** changes in the hospital population and activity during 2020/21 may have affected the epidemiology of Norovirus outbreaks and comparison of results should be interpreted with caution.

## **Revisions statement**

These data are not subject to planned major revisions. However, our aim is to continually improve the interpretation of the data and therefore analysis methods are regularly reviewed and may be updated in the future.

## Revisions relevant to this publication

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** N/A

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** none

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication <https://publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland>

**Incidents and Outbreaks:** N/A

**Norovirus outbreaks:** none

## Concepts and definitions

Statistical significance:

Please note an increase or decrease stated in this report refers to a statistically significant change, and where a trend is referred to as stable, or there has been no change, this means that there has been no significant increase or decrease.

Case fatality:

*Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia: The definition of 30 day all cause case fatality is any death occurring within 30 days of the first positive specimen date within each infection episode. Therefore, the data includes deaths where *Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia or *Escherichia coli* bacteraemia may not have been either the underlying or contributory cause of death. All cause case fatality depends solely on the number of deaths identified and is not subject to bias that may be introduced as a result of inaccuracies in completion of the death certificate or coding of the cause of death. If more than one episode occurs in the 30 days prior to death, only the latest episode will be counted as a death. Some cases may not be able to be linked to NRS death data due to missing or invalid CHI numbers.

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:**

Acute hospital admissions data: total number of unique patients admitted to hospital in 2019, 2020 and 2021 as per Public Health Scotland SMR01.

Total occupied bed days: total number of occupied bed days for years 2017-2021, as per Public Health Scotland ISD(S)1.

Elective admissions data: details provided in Public Health Scotland publication (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Emergency admissions data: details provided in Public Health Scotland publication (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Day cases data: details provided in Public Health Scotland publication (<https://publichealthscotland.scot/publications/acute-hospital-activity-and-nhs-beds-information-quarterly/acute-hospital-activity-and-nhs-beds-information-quarterly-quarter-ending-31-december-2021/data-summary/>)

Acute admissions by patient age: ages of unique patients admitted to acute hospitals in 2019, 2020 and 2021 as per Public Health Scotland SMR01.

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** gram-negative organisms including *Enterobacterales*, (comprising amongst others *Escherichia coli*, *Klebsiella oxytoca*, and *Klebsiella pneumoniae*), and non-fermenters, (comprising amongst others *Pseudomonas aeruginosa*, and *Acinetobacter* species), cause serious infections including bacteraemia, pneumonia, meningitis, and surgical site infections (SSIs). Gram-negative bacteraemia is a public health and clinical concern because of:

- the severity of infection, commonly occurring among vulnerable patients often at the extremes of life and/or with comorbidities

- the large number of cases of Gram-negative bacteraemias each year, and high prevalence of Gram-negative infections
- the association with receiving healthcare in community and healthcare settings
- their ability to become resistant to multiple classes of antibiotics, limiting treatment options

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication [www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/](http://www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/)

**Incidents and Outbreaks:** healthcare infection incidents reported to NSS.

Healthcare associated infection incidents are defined within Chapter 3 of the National Infection Prevention and Control Manual

<http://www.nipcm.scot.nhs.uk/chapter-3-healthcare-infection-incident-outbreaks-and-data-exceedance/>

**Norovirus outbreaks:** outbreaks of Norovirus are defined as two or more linked cases associated with the same healthcare setting over a specified time period, and confirmed/suspected cases are as submitted by NHSScotland health boards as the number of cases associated with reported Norovirus outbreaks.

## Relevance and key uses of the statistics

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** figures provided are used for management information for resource planning, surveillance and research in NHS Scotland.

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** the outputs of the surveillance programme are intended to support the NHSScotland health boards in controlling and reducing the burden of Gram-negative bacteraemia.

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication <https://www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/>

**Incidents and Outbreaks:** to identify risks or trends in the organisms, types of infection, procedures, patients, or clinical specialities associated with healthcare infection incidents and outbreaks. This informs the production of guidance, tools or policy and assists in preparing for, preventing, detecting and managing healthcare infection incidents and outbreaks.

**Norovirus outbreaks:** Norovirus outbreak data are used to provide more robust data on Norovirus outbreaks thus assisting preparedness for future seasons.

### **Key to NHSScotland health boards**

AA = Ayrshire & Arran

BR = Borders

DG = Dumfries & Galloway

FF = Fife

FV = Forth Valley

GGC = Greater Glasgow & Clyde



GJ = Golden Jubilee  
GR = Grampian  
HG = Highland  
LN = Lanarkshire  
LO = Lothian  
OR = Orkney  
SH = Shetland  
TY = Tayside  
WI = Western Isles

## Accuracy

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** details available as per each data source.

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** Gram-negative bacteraemia data are the product of the ECOSS. Participating laboratories routinely report all identifications of organisms, infection or microbiological intoxication and where possible the antimicrobial resistance data unless they are known to be of no clinical or public health importance. The collected data are used for the identification of single cases of severe disease, outbreaks, antimicrobial resistance patterns and longer-term trends in the incidence of laboratory reported infections, enhanced surveillance, health protection, analytical and statistical use.

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication <https://www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/>

**Incidents and Outbreaks:** NSS are aware that the healthcare infection incident assessment tool (HIIAT) is subjective and there is variation in how NHSScotland health boards assess and therefore report healthcare infection incidents.

**Norovirus outbreaks:** data are quality checked when reports first come in for accuracy and NHSScotland health boards are contacted if there are any data issues. The data are then added onto a spreadsheet holding all the 2020-2021 figures, where data are quality assured further before figures are reported.

## Completeness

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** details available as per each data source.

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** all data for the reporting period have been included in the analysis.

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication <https://www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/>

**Incidents and Outbreaks:** NSS are aware that the healthcare infection incident assessment tool (HIIAT) is subjective and there is variation in how NHSScotland health boards assess and therefore report healthcare infection incidents. The extent of variation in assessment and unreported incidents has not been fully quantified.

**Norovirus outbreaks:** NHSScotland health boards only send data when their ward/bay has reopened so data are included in a retrospective way.

## Comparability

Changes in the hospital population and activity during 2020/21 may have affected the comparison of results and therefore should be interpreted with caution.

**Infection Prevention and Control Guidance:** N/A

**Reducing Risk in the Healthcare Built Environment:** N/A

**Antimicrobial Resistance:** N/A

**The impact of the pandemic on healthcare activity and the inpatient population:** N/A

***Clostridioides difficile* infection:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

***Staphylococcus aureus* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Gram-negative bacteraemia:** details provided in annual publication <https://www.hps.scot.nhs.uk/web-resources-container/scottish-one-health-antimicrobial-use-and-antimicrobial-resistance-in-2020/>

***Escherichia coli* bacteraemia:** details provided in quarterly publication <https://www.hps.scot.nhs.uk/data/healthcare-associated-infection-quarterly-epidemiological-commentary/>

**Hospital onset COVID-19:** details provided in weekly publication <https://www.publichealthscotland.scot/publications/hospital-onset-covid-19-cases-in-scotland/>

**Incidents and Outbreaks:** N/A, reporting of all HCAI outbreaks is not mandatory elsewhere in the UK and comparable data are not published.

**Norovirus outbreaks:** United Kingdom Health Security Agency (UKHSA) produce a national Norovirus surveillance report, however, reporting is voluntary and not comparable to Scottish data collected through mandatory reporting <https://www.gov.uk/government/collections/norovirus-guidance-data-and-analysis>

## Accessibility

It is the policy of NSS to make its website and products accessible according to published guidelines.

## Coherence and clarity

Development of guidance: all National Infection Prevention and Control Manual (NIPCM) reviews and resources are produced using a defined process which ensures clarity and coherence. <https://www.nipcm.scot.nhs.uk/resources/development-process/>

## Value type and unit of measurement

Healthcare associated cases and incidence rates (per 100,000 total occupied bed days) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia and *Staphylococcus aureus* bacteraemia.

Community associated cases and incidence rates (per 100,000 population) for *Clostridioides difficile* infection, *Escherichia coli* bacteraemia and *Staphylococcus aureus* bacteraemia.

MRSA Clinical Risk Assessment (CRA) Uptake % = number of patients where CRA undertaken / all patients in audit sample.

Carbapenemase-Producing Enterobacterales (CPE) CRA Uptake % = number of patients where CRA undertaken / all patients in audit sample.

Count and proportion of COVID-19 cases by hospital onset status. Count and proportion of hospital onset COVID-19 cases with all cause fatality at 28 days.

Healthcare outbreaks and incidents: total number of reported incidents is counted, and reported as a proportion of infection type.

Norovirus outbreaks: number of wards/bays closed as a result of Norovirus outbreaks, and number of patients included within reported Norovirus outbreaks in hospitals.

## Disclosure

The NSS protocol on **Statistical Disclosure Protocol** is followed.

## Official Statistics designation

Not Assessed

## UK Statistics Authority Assessment

Not Assessed

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25 May 2015

## Help email

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## Date form completed

20 September 2022

# Appendix 2 – Early Access Details

## Pre-Release Access

Under terms of the ‘Pre-Release Access to Official Statistics (Scotland) Order 2008’, NSS is obliged to publish information on those receiving Pre-Release Access (‘Pre-Release Access’ refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

### Standard Pre-Release Access

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads



## Appendix 3 – NSS and Official Statistics

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Our statistics comply with the **Code of Practice for Statistics** in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the **'five safes'**.