Public Services Delivery
Scotland

NHS SCOTLAND

ARHAI Scotland Annual Report 2025



Antimicrobial Resistance and
Healthcare Associated Infection
An NHS Scotland Assure Service

Contents

About ARHAI Scotland	3
ARHAI Scotland activities 2025	5
Infection prevention and control evidence and guidance	7
Reducing risk in the healthcare-built environment	13
IPC workforce development	17
Development and Sharing of Evidence through Publication	21
Surveillance and monitoring	22
Incidents and outbreaks	58
Antimicrobial use and antimicrobial resistance	62
List of abbreviations	65
Appendix 1 - Background Information	69
Appendix 2 – Publication metadata	73
Appendix 3 – Early Access Details	92
Appendix 4 – PSD Scotland and Official Statistics	92



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About ARHAI Scotland

Vision

To enable Scotland to take a comprehensive and effective approach to reducing the burden of infection and antimicrobial resistance (AMR).



Mission

To improve the health and wellbeing of the population by reducing the burden of infection and AMR within Scottish care settings.

We will achieve this by

- Establishing a robust evidence base for best practices across Scottish care settings.
- Connecting with broader health and care settings, and public health systems across Scotland and beyond.
- Developing and improving mechanisms to monitor critical priority areas.
- Collaborating with key delivery partners, including regional and special NHS boards, care providers, and other national bodies as directed by the Scottish Government.

ARHAI Scotland collaborate with stakeholders across health, care and other sectors to fulfil a range of comprehensive functions, which include:

ARHAI Scotland's functions:

- **Surveillance and Monitoring:** Assessing the impact of infections and AMR on health.
- **Clinical Assurance:** IPC support for new construction or refurbishment projects.
- **Programme Coordination:** Overseeing national Infection Prevention and Control (IPC) and AMR programmes.
- **Expert Advice and Horizon Scanning:** Providing specialised IPC/AMR guidance and foresight.
- **Outbreak Response:** Preparing for and responding to healthcare-associated infection (HCAI) outbreaks and incidents.
- **Workforce Development:** Collaborating with NHS Education for Scotland and higher education institutions to cultivate a confident, knowledgeable, and competent IPC workforce.
- **Professional Practice:** Promoting high standards of professional conduct.
- **Research and Innovation:** Conducting research to generate evidence for actionable interventions.
- **Guidance Development:** Creating and maintaining national evidence-based IPC guidelines for Scotland.

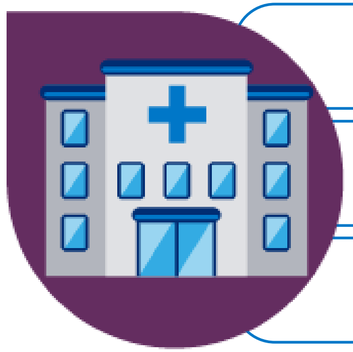


ARHAI Scotland activities 2025

Healthcare associated infections (HCAI) and antimicrobial resistance (AMR) are major public health concerns and a significant cause of morbidity and mortality globally. They continue to pose important challenges to patient safety and healthcare delivery in all settings where care is provided.

This annual report focuses on the key workstreams ARHAI Scotland has developed and delivered in 2025 to promote best practice in infection prevention and control (IPC), reduce the burden of HCAI, tackle AMR and ensure patient safety. Alongside these planned programmes of work, ARHAI Scotland also provided planned and reactive real time expert IPC advice and support whenever it was required, ensuring a responsive and resilient approach across Scotland's health and care settings.

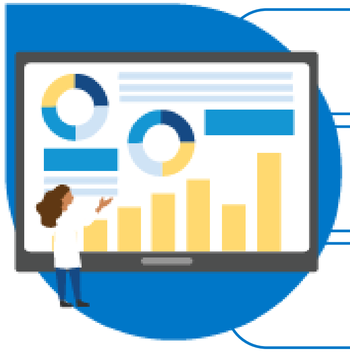
In 2025, ARHAI Scotland:



- Provided guidance and expertise
- Facilitated the delivery of the HCAI strategy
- Supported local incident management teams



- Promoted national IPC campaigns
- Supported national public inquiries
- Supported national incident and management teams



- Trained infection prevention and control professionals
- Attended and presented at conferences and training sessions
- Facilitated and participated in stakeholder engagement sessions



- Provided data for action reactively and published routine reports
- Furthered the global evidence base through peer-reviewed publications
- Completed literature reviews



Read more about ARHAI Scotland's work in 2025 by clicking below:



- **Infection Prevention and Control**
  - National Infection Prevention and Control Manual
  - Care Home Infection Prevention and Control
- **Reducing Risk in Healthcare-Built Environment**
  - ARHAI Scotland Infection Control in the Built Environment and Decontamination (ICBED)
  - Clinical Assurance and IPC for Major Infrastructure Projects
- **IPC Workforce Development**
  - Cross-organisational educational support
  - National campaigns and guidance
- **Development and Sharing of Evidence through Publication**
- **Surveillance and Monitoring**
  - Healthcare demand, capacity and flow
  - *Clostridioides difficile* infection
  - *Staphylococcus aureus* bacteraemia
  - *Escherichia coli* bacteraemia
  - Carbapenemase producing Enterobacterales
  - Multi-drug resistant organism admission screening
- **Incidents and Outbreaks**
- **Antimicrobial Resistance**

Infection prevention and control evidence and guidance

National Infection Prevention and Control Manual (NIPCM)

The National Infection Prevention and Control Manual (NIPCM) provides a single source of evidence-based Infection Prevention and Control (IPC) guidance that is regarded as best practice for all health and care settings in Scotland.

Since its introduction in 2012, the NIPCM has provided evolving evidence-based IPC guidance, supplemented by expert opinion where required, enabling healthcare staff to make informed decisions and implement effective IPC measures.

The NIPCM remains accessible through a web-based platform with 137,290 users worldwide in 2025. Of these, 103,793 users (75.6%) were based in the United Kingdom (UK).

The NIPCM evidence base has informed national policies beyond Scotland. Both England and Northern Ireland continue to draw on its content to shape their national IPC guidance, while NHS Wales have adopted the NHS Scotland NIPCM in full.

ARHAI Scotland is committed to the ongoing review of the NIPCM, which includes the development, maintenance and improvement of all chapters and resources published within the NIPCM. Horizon scanning for new and emerging scientific evidence, stakeholders' feedback, national policy and strategy, and insights gained from incidents and outbreaks continue to shape the NIPCM content. Quarterly updates are provided to the A-Z of pathogens, HAI Compendium, glossary and literature review evidence tables. This ensures the NIPCM is updated in real-time. Our stakeholders play a vital role in shaping our work. Their feedback, particularly on the clinical and technical aspects of our scientific literature reviews, helps ensure that our guidance is both evidence-based and practical, supporting real world healthcare delivery.

Key improvements for 2025 were as follows:

Following the completion of six literature reviews in 2025, the NIPCM was updated to reflect the following:



- **Linen:** This literature review update provides new good practice points and recommendations for handling, transporting and management of linens, including uniforms and curtains, used in health and care settings. This includes during outbreak investigation and managing patients with High-consequence infectious diseases (HCIDs).



- **Safe disposal of waste:** This literature review update provides new good practice points and recommendations for segregation, disposal, transportation, storage, and management of waste in health and care settings, in line with the most recent version of NHS Scotland Waste Management Guidance Scottish Health Technical Note (SHTN) 03-01.



- **Aprons and Gowns:** This literature review update combined the previously separated SICPs and transmission based precautions (TBPs) specific objectives to focus on “use in health and care settings”, in line with the updated ARHAI Scotland methodology. Good practice points were provided to clarify when, how and where aprons and gowns should be worn and removed or changed in health and care settings. This includes steps for donning (putting on) and doffing (taking off).



- **Eye and Face protection:** This update supports a new recommendation advising that the decision to wear eye/face protection should be based on anticipated risk of splashing and/or spraying of blood and body fluids, while considering appropriateness for the task being undertaken and fit of eye/face protection. This review update also provides new good practice points and recommendations regarding when to wear and types of eye/face protection suitable for use in health and care settings.



- **Footwear:** There was no significant change to practice as a result of this literature review update. Research questions were refreshed, and recommendations and good practice points developed are reflective of current practice.

The updated good practice points and recommendations from the above reviews have resulted in key changes being made across relevant resources, including the NIPCM and Care Home Infection Prevention and Control Manual (CHIPCM).

Transmission-based precautions (TBPs)

ARHAI Scotland continue to work with our colleagues in all sectors to update our TBP guidance, with more than 20 working group meetings developing evidence-based guidance. National and International experts have also been involved.

- Evidence shows droplet and airborne definitions are outdated.
- Transmission risk varies with proximity, exposure time, ventilation and individual factors.
- Many aerosol generating procedures (AGPs) are not considered to present a higher exposure risk than coughing.
- Updated guidance will move away from a rigid framework used to outline TBPs to a risk based approach which more accurately reflects a continuum of particle sizes.

Proposed guidance is currently in the early consultation stage and is supported by the Scottish Government Chief Nursing Officer Directorate. ARHAI Scotland are planning a full implementation package which will be provided to NHS Scotland Boards. ARHAI Scotland have also been working with colleagues in NHS Education for Scotland (NES) to develop a TBP module on TURAS which will launch alongside the guidance.

ARHAI Scotland have presented to the World Health Organization (WHO) over the course of this project and feedback received has been positive. WHO, having learned about our TBP work have also invited ARHAI Scotland to present this work at the WHO guidance development group for epidemic and pandemic prone acute respiratory infections guidance.

High Consequence Infectious Disease (HCID)

The introduction of the Addendum for High Consequence Infectious Disease (HCID) into the NIPCM was a significant development in manual content for 2025. The content was developed collaboratively with stakeholders, drawing on evidence from the HCID personal protective equipment (PPE) literature review. It aligns Scotland with the rest of the UK through the adoption of a unified HCID assessment PPE ensemble that is used across the 4 nations of the UK.

The move to a single UK wide PPE ensemble is the most notable change to practice introduced as a result of this update. The change aims to improve consistency and safety across the UK when assessing patients with known or suspected HCID. The introduction of the UK unified ensemble for HCID replaces previous recommendations of using risk assessment in PPE selection and selecting between two differing ensembles depending on infectious agent transmission route.

Furthermore, updated good practice points were provided for donning and doffing, to reflect the recommended ensemble.

Manual Methodology

Following a 2022 evaluation and informed by lessons from the COVID-19 pandemic, the NIPCM guidance development process was reviewed to improve transparency and support auditable decision-making. Elements from two relevant 'evidence to decision frameworks; the SIGN50 Considered Judgement Form (based on GRADE) and the 'Justification for Choice of Recommendation Strength system published by the Centers for Disease Control and Prevention (CDC) Healthcare Infection Control Practices Advisory Committee (HICPAC) were incorporated into ARHAI Scotland's new 'Considered Judgement Form' (CJF), with the notable addition of a dedicated 'Expert opinion' section. A grading system for recommendations was also developed with a move from a lettered system (A-C) to use of the terms 'recommendation' and 'good practice point'. By clearly documenting decision making, context and expert opinion, the new CJF improves transparency and supports guidance users with interpretation and implementation. The new grading system more adequately conveys the strength of supportive evidence and practical intent of recommendations.

More detail can be found here in our Development Methodology.

Rapid Review Methodology was also developed and is planned for publication in 2026/7 as part of a suite of emergency incident/ pandemic preparedness work.

Overview of NIPCM Publications and updates

- Publishing of HCID addendum
- NHS Scotland Staff Competency Checklist for HCID assessment PPE ensemble
- Pneumocystis Pneumonia (PCP) information for staff updated
- Appendix 6: Steps for Putting on and Removing PPE
- Appendix 15: Selection of Personal Protective Equipment (PPE) by health and care workers (HCWs) during the provision of care
- Appendix 13: NHS Scotland Minimum Alert organism and condition list
- Poster: PPE when undertaking Aerosol Generating Procedures (AGPs) within health & social care settings.

Key commissioned work completed:

External bodies commissioned ARHAI to support the following key pieces of work which were completed and published in 2025:

- Administering Vaccines in Infants and Young Children
  This document was developed in collaboration with NES providing interactive practical guidance on safe vaccine administration in infants and young children
- ARHAI Scotland provided specific guidance to the Scottish Government on where IPC controls should be extended over winter.
- ARHAI Scotland supported Public Health Scotland in a review of Guidance for the public health management of MERS-CoV infections. Guidance for the public health management of MERS-CoV infections - Publications - Public Health Scotland.
  This document informs planning and response to MERS-CoV. It is for use by NHS Health Protection Teams (HPT), Public Health Scotland (PHS) and other stakeholders.
- ARHAI Scotland also supported the development of PHS guidance for zoonotic flu in Scotland (completed in early 2026). Guidance for public health management of zoonotic influenza in Scotland - Publications - Public Health Scotland. It is designed to support the development of local arrangements and assist in response.
- Improving FFP3 access: ARHAI Scotland provided recommendations to Scottish Government to support understanding of the current situation in relation to face fit testing for FFP3 masks across Health and Social Care.

ARHAI Scotland National Policies Guidance and Evidence (NPGE) Key Priorities for 2026/27

- Review and relaunch of The Healthcare Infection Incident Assessment Tool (HIIAT) and the piloting of a new pathway to enhance the assessment and reporting of healthcare infection incidents, promoting a more consistent and reliable approach. This work will also be aligned to the upcoming incidents and outbreaks literature review.
- A number of scientific literature reviews are planned for 2026 as part of our ongoing manual methodology to review and support the development of national guidance. These literature reviews will enable us to review and update core NIPCM content:
  - Standard Infection Control Precautions (SICPs) and Transmission Based Precautions (TBPs) literature review: Surgical Face Masks
  - Standard Infection Control and Transmission Based Precautions Literature Review: Personal Protective Equipment (PPE): Gloves
  - Transmission Based Precautions Literature Review: Respiratory Protective Equipment (RPE)
  - Transmission Based Precautions (TBPs) Definitions Literature Review
  - Healthcare infection incidents and outbreaks literature review: Healthcare infection incidents and outbreaks in Scotland
  - Infection Prevention and Control during care of the deceased

Care Home Infection Prevention and Control

The Care Home Infection Prevention and Control Manual (CHIPCM) is a dedicated resource for IPC in the adult care home sector. It remains the Scottish Government's expectation that the CHIPCM is adopted and implemented in all care homes in Scotland.

The core chapters, Standard Infection Control Precautions (SICPs) and Transmission Based Precautions (TBPs), remain fully aligned with the NIPCM evidence base and are supported by additional context-specific materials and resources. The Care Home IPC Manual continues to be shaped by the current evidence base and our stakeholder feedback.

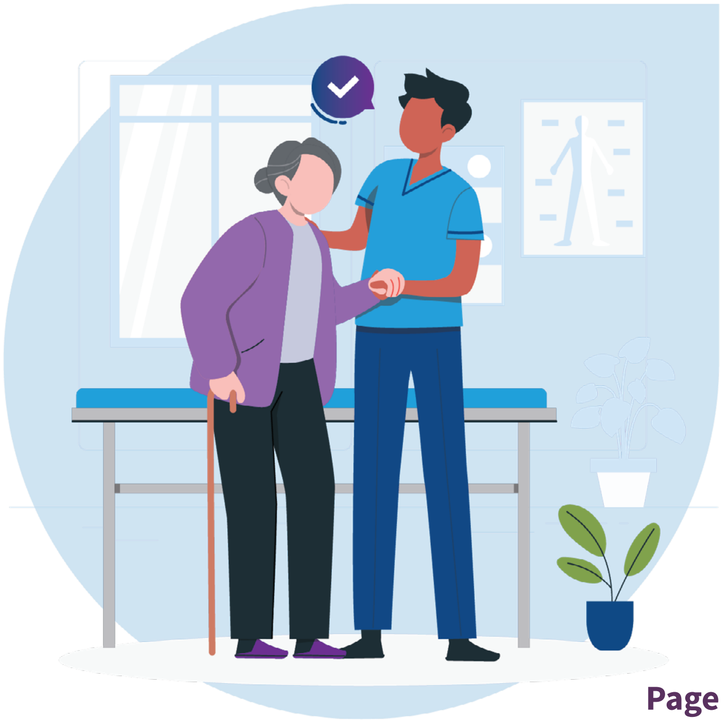
Key Care Home IPC deliverables for 2025:

A Care Home IPC Resource Toolkit has been developed through the Care Home IPC (CHIPC) programme. The Toolkit provides a comprehensive collection of IPC guidance, resources and tools specifically for care homes. As a regularly updated resource, it is intended to support consistent adoption and effective implementation of IPC practices at a local level. The Toolkit brings together key materials from ARHAI Scotland, NES, Scottish Antimicrobial Prescribing Group (SAPG) and other national and international organisations, with a focus on those most relevant to care home settings.

Stakeholder feedback during 2024 highlighted the need for sector specific resources for care home settings. In response the Care home IPC resource for gastro-intestinal (GI) illness and Care home IPC resource for respiratory illness have been updated, which support care home staff with the management of suspected and confirmed residents with GI illness and Respiratory illness of an infectious nature. Understanding incubation periods and periods of infectivity will support resident assessment, placement and enable the identification of possible exposed residents for ongoing symptom monitoring and early detection of new cases and includes guidance on seasonal preparation.

A Care Home IPC Standards Checklist was also developed and a pilot of the draft was undertaken and concluded in December 2025. The checklist was designed to support care homes in self-assessment, assurance and monitoring of compliance with the IPC standards to supplement existing local IPC governance. The pilot was conducted across a total of 42 volunteer care homes across a number of regions, including NHS Dumfries and Galloway, NHS Greater Glasgow and Clyde, NHS Lothian and NHS Tayside.

ARHAI Scotland anticipate publication of the final checklist in 2026-2027.



Other key updates and improvements for 2025

Contribution to development of PHS Guidance which has included:

- Guidance for the public health management of acute respiratory infections (ARI) in community, social and residential care settings
- Public Health Management of Scabies (V1.0)
- Health protection in children and young people settings, including education



ARHAI Scotland Care Home IPC (CHIPC) Key Priorities for 2026/27

- Continued evidence-based updates and improvement to the CHIPCM including development of an additional chapter for IPC advice in outbreak situations.
- CHIPC Webinars
  - Delivering Care Home IPC - Taking smoother steps to safer spaces
  - Supporting roll out and implementation of TBPs
- Care Home IPC Standards Checklist to be published to the CHIPCM resources section
- Phase One development of a Safe and Clean Care Home Audit Tool
- Updates to the Maintenance and Management of the Care Home Respiratory Illness IPC Resource
- Updates to the Maintenance and Management of the Care Home GI Illness IPC Resource
- Assessment of the applicability of Chapter 4 to the Care Home environment

Reducing risk in the healthcare-built environment



ARHAI Scotland Infection Control in the Built Environment and Decontamination (ICBED)

Reducing environmental infection prevention and control (IPC) risk in the healthcare-built environment remains a key priority for ARHAI Scotland. In 2025, significant progress was made to further progress Chapter 4: Infection Control in the Built Environment and Decontamination, within the NIPCM.

Guidance on the use of water in hospitals was implemented in January of 2025 and supported by the Scottish Government in a Directors Letter DL (2024) 17 – 'Launch of the new 'water' section in chapter 4 of the National Infection Prevention and Control Manual'.

This chapter provides a central, evidence-based resource to support safe practices related to the built environment and decontamination within healthcare settings.

Key improvements for 2025:

- A Scoping review was undertaken and completed to support the commencement of guidance development for Filamentous Fungal pathogens in the built environment
- A Scoping review was completed to support the commencement of guidance development for environmental surface sampling
- A Scoping review was completed to support the commencement of guidance development for water in relation to drains in the hospital-built environment
- Resource materials were consulted upon as part of the development of a suite of resources to support indications for and the management of point of use filters
- Commenced on the development of evidence and guidance production for Ventilation content for NIPCM Chapter 4 (Infection Prevention & Control of Air Transmitted Infectious Agents of Environmental Origin) Research questions and search strategy have been completed and membership of Short Life Working Group (SLW) agreed
- Commencement of the development of evidence and guidance production for Filamentous Fungal pathogens in the built environment

NIPCM Publications and updates

- Healthcare Water Systems Associated Organisms Incident or Outbreak Checklist. This checklist is an adaptation of the 2015 *Pseudomonas aeruginosa* Outbreak Checklist and has been produced pending the development of new resources. It aligns with the findings of the Infection prevention and control (IPC) for safe healthcare water systems literature review and should be used in conjunction with the guidance contained within Chapter 4 of the NIPCM.

ARHAI Scotland ICBED Key Priorities for 2026/27

Evidence & Publications

- Complete scientific literature review for dental unit waterlines to develop IPC good practice points and recommendations.
- Continue to progress scientific ventilation literature review. Research findings will inform new IPC ventilation related content within Chapter 4.
- To develop national guidance for the investigation, management and risk reduction of Filamentous fungal pathogens in healthcare settings.
- Provide subject matter expertise input into the review and update of The Healthcare Infection Incident Assessment Tool (HIIAT) and the piloting of a new pathway to enhance the assessment and reporting of healthcare environmental infection incidents and decontamination related incidents, promoting a more consistent and reliable approach.
- Undertake scientific literature review for environmental surface sampling. Research findings will inform the development and scoping of new environmental sampling related content for Chapter 4.
- Commence scientific literature review for drain management. Research findings will inform the development of new IPC drainage system related content within Chapter 4.
- Undertake scientific literature review for Cardiac Heater Coolers. Research findings will inform updates to guidance on the decontamination and testing of cardiac water heater cooler units.
- Progress the further development of Chapter 4, informed by feedback from a survey of Board stakeholders exploring implementation challenges associated with this new chapter.
- Production of an Environmental Alert Organism List, development of environmental organism triggers for high-risk units and a rapid review of polyclonal and polymicrobial outbreaks.
- Production of support resources for the installation, monitoring and use of Point of Use Water Filters.

Commissions

- ARHAI Scotland received a commission from the Centre for Sustainable Delivery's (CfSD) Perioperative Delivery Group (PDG) to work in collaboration to :
  - identify approaches that support ring-fenced planned capacity
  - identify procedures that can be considered appropriate for delivery outside of a traditional theatre environment
  - recognise innovative approaches to the use of space and the environment.



Clinical Assurance and IPC for Major Infrastructure Projects

National specialist IPC support guides healthcare construction projects to promote safety, compliance and IPC risk reduction across NHS Scotland. Through the Key Stage Assurance review (KSAR) and the National Design Assessment Process (NDAP), they empower NHS boards to meet IPC requirements. ARHAI Scotland support these projects, as part of multidisciplinary teams, ensuring infection risks are considered throughout the building lifecycle.

2025

- **8** KSARs completed
- **7** health boards involved
- **7** construction projects across NHS Scotland
- **3** NDAP reviews

During 2025, 8 KSAR projects were supported by ARHAI Scotland in various stages of development across 7 Health boards underpinning the IPC progression of healthcare design and construction projects across NHS Scotland.

- NHS Ayrshire & Arran National Secure Adolescent Inpatient Services (NSAIS) – Close out for Commissioning and previous stages and preparation for Handover KSAR
- NHS Forth Valley National Treatment Centre Modular Ward – Close out for Commissioning and previous stages
- NHS Grampian Baird Family Hospital – Board submission of evidence for close out for Construction action plan and preparation for Commissioning KSAR
- NHS Grampian Anchor – Board submission of evidence for close out for Commissioning action plan and preparation for Handover
- NHS Greater Glasgow & Clyde Radionuclide – Construction KSAR completed
- NHS Highland Lochaber (Belford) – Preparation for Outline Business Case (OBC) KSAR
- NHS Lanarkshire Monklands Replacement Project – Developing Full Business Case KSAR and close out of OBC KSAR
- NHS Lothian Princess Alexandra Eye Pavillon – Preparation for OBC KSAR

3 NDAP reviews were also supported by ARHAI during 2025

- NHS Highland Lochaber Redesign NDAP;
- NHS Lothian Regional Infectious Diseases Unit Design Support commission to redevelop
- NHS Lothian Princess Alexandra Eye Pavillion NDAP

Key updates and improvements for 2025:

A suite of Notes for Board resources to assist board IPC teams through health care construction projects has been further developed to include:

- Notes for Boards: IPC considerations for design of isolation rooms and patient placement
- Notes for Boards: IPC risks associated with water ingress during construction of a healthcare-built environment
- Notes for Boards: IPC considerations for the design of a reduced water healthcare facility



ARHAI Scotland Clinical Assure (CA) Key Priorities for 2026/27

- Literature review: IPC considerations for the design of Bone Marrow Transplant (BMT)/haemato-oncology, critical care and neonatal units
- Notes for Boards: IPC considerations for the design of an operating theatre
- Notes for Boards: IPC considerations for the design of a high risk out-patient facility
- Further development of animations to support IPC considerations associated with the design, construction, commissioning and handover of a safe healthcare ventilation system
- Develop/Publish Toolbox Talk focused on IPC risks in the healthcare-built environment, tailored for IPC, Clinical, estates and design teams
- Phase 1 of the Literature Review of the current guidance and extant scientific literature for:
  - IPC risks associated with the Design of a haemato-oncology and BMT facilities
  - IPC risks associated with the Design of a Critical Care unit
  - IPC risks associated with the Design of a Neonatal unit
- Provide a focussed programme of drop-in surgeries to support evaluation of Construction & Refurbishment & IPC (CRIPCs)

IPC workforce development

Throughout 2025, ARHAI Scotland remained committed to workforce development, patient safety and quality improvement through our continued delivery of Infection Prevention and Control (IPC) education and training. ARHAI Scotland supported staff in IPC to enable them to minimise infection risks across all health and care settings.

Cross-organisational educational support

Collaboration with national organisations, including NHS Education for Scotland (NES), Public Health Scotland (PHS), and Glasgow Caledonian University (GCU), continues to reinforce ARHAI Scotland's position as subject matter experts, supporting and delivering both academic and educational IPC content.

GCU IPC in a Global Context

ARHAI Scotland contributed to the delivery of GCU's postgraduate module, IPC in a Global Context, providing expert input through course material development and live student engagement sessions. Learning focused on core IPC principles, including:

- Routes of transmission
- Hierarchy of controls
- Epidemiology and surveillance of healthcare associated infection (HCAI)
- Development of a national surveillance system
- IPC evidence for HCAI prevention
- Development of evidence-based IPC guidance
- Outbreak management

NES Scottish Infection Prevention and Control Education Pathway (SIPCEP) modules

ARHAI Scotland continues to support the development of the NES Scottish Infection Prevention and Control Education Pathway (SIPCEP) modules, which are used across health and social care settings in Scotland. Through the provision of IPC subject matter expertise, ARHAI Scotland helps ensure educational content remains aligned with the National Infection Prevention and Control Manual (NIPCM) and reflects the current evidence base underpinning national IPC guidance, supporting consistent and evidence-based practice across Scotland.

Epidemiology and surveillance for IPC training course

Following on from the successes of previous courses, ARHAI Scotland and NES jointly delivered the Epidemiology and Surveillance for Infection Prevention and Control training course in 2025. The course provides IPC professionals with the knowledge and practical skills required to support surveillance activities and outbreak investigations within health and care settings.

Course content covered:

- Foundational epidemiology for healthcare associated infections
- National and local surveillance systems for outbreak investigations
- Statistical methods for epidemiological analysis
- Interactive sessions on case definitions, line lists epidemic curves and epidemiological timelines

In 2025, 29 IPC professionals completed the course, bringing the total number trained to 169 across Scotland. Participant feedback demonstrated that learning objectives were achieved and that attendees reported increased knowledge and understanding of key epidemiology and surveillance concepts.

A medium-long term evaluation undertaken in 2025 demonstrated a positive impact on professional practice. Participants reported the successful application of epidemiological methods and frameworks to support outbreak investigations and surveillance activities alongside increased confidence in communicating with colleagues on these topics. The evaluation highlighted the value of strengthening epidemiology and surveillance capability within IPC workforce and will inform the continued future development of training and resources for the IPC workforce.

Scottish Care Home IPC webinars

ARHAI Scotland continues to engage directly with the care home workforce to support targeted IPC education and the sharing of best practice. During 2025, the focus of the Care Home IPC Webinar was the prevention of catheter-associated urinary tract infections (CAUTI), a significant contributor to avoidable harm and *Escherichia coli* bacteraemia (ECB).

The webinar, Actively Preventing CAUTI in Care Homes, featured contributions from NHS Fife and NHS Dumfries and Galloway, providing practical education on urinary catheter management, infection prevention and quality improvement. The event was attended by 200 participants from across Scotland, with evaluation feedback demonstrating increased knowledge and confidence in supporting CAUTI prevention in care home settings.

Healthcare-Built Environment IPC Toolbox Talks

In 2025, ARHAI Scotland published two of four planned educational Toolbox talks on IPC risks within the healthcare-built environment (HBE). The resources were developed for healthcare construction staff and building services teams, supporting early identification and management of IPC risks associated with construction and refurbishment activities within healthcare settings.

- IPC risks in the HBE: engineering services and You Tube link IPC risks in the HBE: engineering services (no log in required)
- IPC risks in the HBE: building services and You Tube link IPC risks in the HBE: building services (no log in required)

The remaining two Toolbox Talks, aimed at IPC teams and clinical staff are scheduled for publication in 2026/27, completing a suite of resources designed to promote awareness of built environment-related IPC risks across a range of professional groups.

IPC educational animations

Following publication of the first animation in 2024, ARHAI Scotland completed a further two educational animations in 2025 as part of a five-part series on IPC Considerations for the Design, Construction, Commissioning and Handover of Healthcare Water and Above Ground Drainage Systems. The remaining two animations are scheduled for completion in 2026.

- Healthcare water and drainage systems

Work also commenced on a new five-part animation series covering IPC considerations for the design, construction, commissioning and handover of a healthcare ventilation system, with the introductory animation currently in development.

Education and training goals for 2026

In 2026, ARHAI Scotland plan to continue supporting the delivery of high quality, evidence-based IPC and HAI education and resources across Scotland.



Key priorities include:

- Supporting implementation of updated Transmission Based Precautions definitions through the development of guidance and educational resources including a risk assessment education module.
- Continuing to provide expert support to Higher Education Institutions delivering IPC & HCAI related programmes.
- Delivering further epidemiology and surveillance training events to strengthen IPC workforce capability.
- Promoting and sharing ARHAI Scotland's work through conferences, events and professional networks.
- Continuing delivery of care home IPC webinars and educational resources to support frontline staff.
- Supporting and promoting national IPC & HCAI awareness campaigns.
- Working in partnership with national organisations, including NES, to support education and workforce development.
- Completing the five-part planned educational animation series on IPC considerations for the: design, construction, commissioning and handover of a healthcare water and above ground drainage systems.
- Progressing the development of a five part educational animation series on IPC considerations for the design, construction of a healthcare ventilation system.
- Publish additional Toolbox Talks for IPC teams, clinical staff and ventilation designers to support the identification and management of built environment IPC related risks.

National campaigns and guidance

Each year NES and ARHAI Scotland support and promote national campaigns for World Hand Hygiene Day and Winter Preparedness. In 2025, to strengthen communications, campaign web pages were updated on the NIPCM website.

World Hand Hygiene Day 5th May 2025

The WORLD HEALTH ORGANIZATION (WHO) SAVE LIVES: Clean your hands' campaign, global theme for 2025 was ' It might be gloves. It's always hand hygiene," promoting optimal hand hygiene and appropriate glove use. ARHAI Scotland also worked in partnership with NHS Sustainability Action programme to raise awareness of the environmental and climate impact of unnecessary glove use. The initiative promoted appropriate glove use in line with IPC principles, supporting safe care while reducing avoidable waste.
ARHAI Scotland promoted 'Be #GloveAware' campaign messages via social media using materials, including posters, banners, newsletters and weblinks.

Winter preparedness

The winter campaign page was updated and re-launched in 2025 to support health and care staff in reducing the risk of seasonal infections such as influenza and norovirus. This page provided accessible IPC guidance, campaign assets to aid local communications, and direct links to relevant resources within the NIPCM and Care Home Infection Prevention and Control Manual (CHIPCM). This page was designed to strengthen winter preparedness and promote effective IPC practices.

Subject matter expert support to national guidance outwith ARHAI Scotland

As the national body responsible for IPC guidance in Scotland, ARHAI Scotland continued to provide IPC subject matter expertise for commissioned work and contributed to the development of National Guidance:

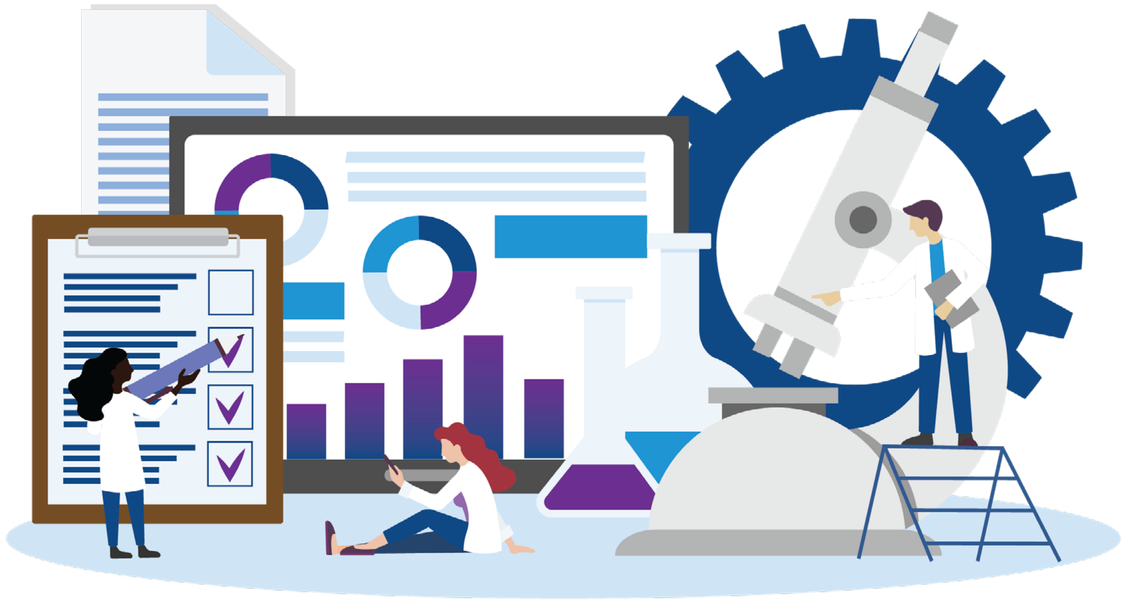
- Support to the Guideline Advisory Group for development of Epic4 guidelines for the prevention of healthcare-associated infections in hospitals in England. These are NICE accredited guidelines based on a rigorous systematic review of evidence and the involvement of key stakeholders in the scoping and evaluation process. The guideline informs IPC policy and practice across all NHS and private healthcare settings in the United Kingdom (UK).
- Support to the addendum for UK Health Security Agency (UKHSA) Pertussis guidelines
- Support to the development of Public Health Scotland guidance for Avian Influenza
- Support to the Future Pandemic Guidance Development Group (FPGDG) established by the Scottish Government

Development and Sharing of Evidence through Publication

ARHAI Scotland continues to contribute to the evidence base for infection prevention and control through publication in international peer reviewed journals.

Further information on these publications can be accessed via the links below:

- *Candidozyma auris* Reported in Scotland: A Call for Vigilance Amid Global Rise (ARHAI and Glasgow Caledonian University).
- A narrative review with grounded theory to evaluate the evidence for cleaning the filter body of point-of-use tap water filters
- Infection risk from drinking water in haematology units: Need for review - PubMed
- Competitive behaviours in *Serratia marcescens* are coordinately regulated by a lifestyle switch frequently inactivated in the clinical environment - PubMed
- Applying the theoretical framework of behavioural change to sustainable infection prevention and control based on a binational workshop - ScienceDirect (University of Göttingen, Germany and ARHAI Scotland)
- The Impact of the COVID-19 Pandemic on Healthcare Associated Bloodstream Infections in Scottish Intensive Care Units: A Retrospective Cohort Study



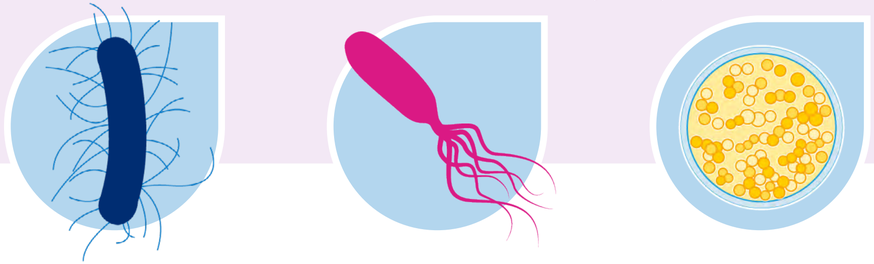
Surveillance and monitoring

Surveillance of healthcare associated infection in Scotland

ARHAI Scotland coordinates the national surveillance and monitoring programme for healthcare associated infection (HCAI).

In 2025, the national mandatory programme included surveillance of three key infections:

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



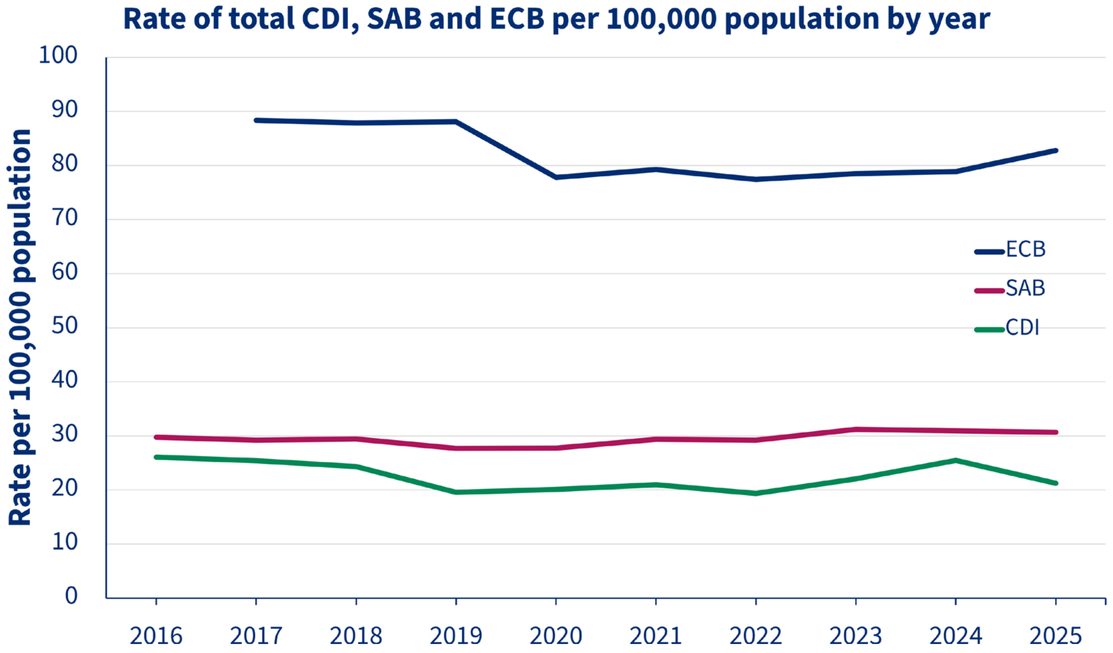
The **highest burden** among these infections is due to **ECB**, where the rates are **more than three times higher** than SAB and CDI.

Full details of methods can be found in the national surveillance protocols:

- Protocol for the surveillance of *Clostridioides difficile* infection.
- Protocol for National Enhanced Surveillance of Bacteraemia.

Conducting national surveillance enables ARHAI Scotland to:

- Measure the burden of infection
- Identify at-risk populations and target interventions
- Support benchmarking
- Describe trends over time
- Support and evaluate quality improvement and reduction strategies





As healthcare delivery changes, the risk of patients developing HCAI is not limited to healthcare settings. Furthermore, infections often associated with healthcare are also found in the community in people without healthcare exposure, highlighting the need for a whole-systems approach to reduce the risk to patients and wider population.

This report presents the total incidence of key infection types, including healthcare and community associated infections.

In this report, the incidence rates in 2024 and 2025 are compared and longer-term trends modelled to identify changes over time and to describe changes in the incidence rates observed since the beginning of the COVID-19 pandemic in 2020.

More information on methods is available in the metadata.

The association between health inequalities and infection is complex and multifactorial. Within the **UK AMR National Action Plan** there is an ambition to further consider the relationship between inequalities and infection.

Health inequalities such as age, sex, deprivation and geography can all affect the risk of infection, other health outcomes and access to healthcare. This report presents infection rates by important health inequality metrics.

The Scottish Index of Multiple Deprivation (SIMD) is used as a relative measure of deprivation across Scotland and the Scottish Government Urban Rural Classification defines urban and rural areas across Scotland, based on population and accessibility.

The risk of infection may also vary by season which could reflect temperature and lifestyle changes, demands on the healthcare system, as well as other external factors. This report presents infection rates by quarter to describe seasonal variation in the incidence rates of CDI, SAB and ECB.

Additional surveillance activities in 2025

Review of the national HCAI surveillance programme in Scotland

The review considered the future direction of the national surveillance programme. It aimed to ensure that surveillance is relevant, data capture is timely and the output supports quality improvement initiatives both locally and nationally (Scottish Government HCAI Strategy 2023-2025).

Extensive engagement was undertaken via targeted surveys and stakeholder meetings. The final recommendations were co-created with stakeholders and provided to Scottish Government for policy decision making.

The need for a whole-systems approach to surveillance and prevention was identified. Wider public health interventions will be critical to reduce risk across healthcare and community settings, and broader collaboration across sectors is required. Flexible and smarter surveillance systems are required to support local and national quality improvement initiatives.

Implementation of agreed recommendations arising from the national surveillance review will commence in 2026, supporting the continued development of a responsive and effective HCAI surveillance programme for Scotland.



Stakeholder engagement and reporting of epidemiological intelligence

ARHAI Scotland continued to provide epidemiological data and intelligence to clinical networks in support of quality improvement and reduction strategies focused on specialist areas of clinical practice.

- Contributed to the Scottish Intensive Care Society Audit Group (SICSAG) Minimum Standards and Quality Indicators for Critical Care.
- Supported the monitoring of Scottish Renal Registry National Clinical Standards.

Supported the development of a business case for a national electronic Infection Prevention and Control (IPC) surveillance system. The system will enhance local and national IPC surveillance capabilities to manage individuals, patients and incidents, and enable timely and accurate assessments of wider current and emerging threats across Scotland.

ARHAI Scotland continued to develop a tool to support local surveillance and assist NHS boards with the pro-active identification and monitoring of organisms which may have an environmental source. This includes the scoping of triggers in high-risk units to assist NHS boards to identify when further investigation may be required.

Trends in key HCAI rates continued to be published quarterly in 2025 and provided in Discovery, supporting local NHS boards with data for monitoring and benchmarking and to inform quality improvement and reduction strategies.



Surveillance and epidemiology priorities for 2026

Commence implementation of changes to the Scottish national HCAI surveillance programme based on the agreed recommendations from the surveillance review. This will require collaboration with key stakeholders from various settings to ensure effective surveillance which supports local and national goals.

Improve understanding of the impact of health inequalities on infection risk, alongside ARHAI Scotland's commitment to understanding health inequalities in tackling antimicrobial resistance (AMR) in the UK AMR National Action Plan (NAP) 2024-2029 "Confronting Antimicrobial Resistance".

Improve intelligence relating to cases of HCAI using existing national data sources to investigate recent increases in infection rates.

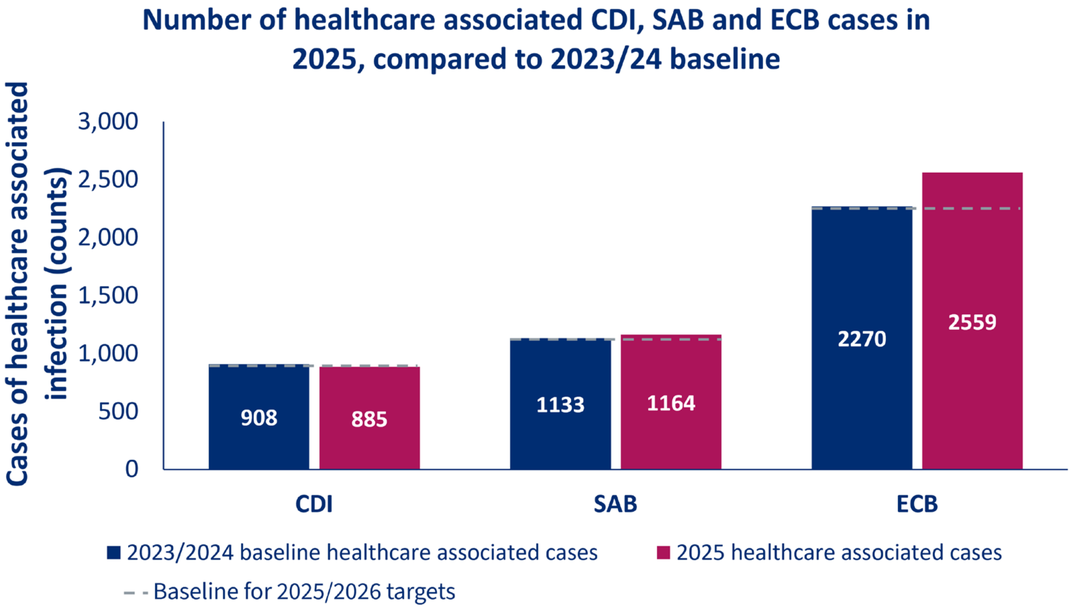
Support NHS boards in voluntary local surgical site infection (SSI) surveillance whilst awaiting recommendations for future mandatory national surveillance.

Support academic research projects by provision of HCAI data and subject matter expertise.

Complete resource to support NHS boards to identify and monitor organisms which may have an environmental source, develop triggers for investigation and include in Chapter 4 of the National Infection Prevention and Control Manual (NIPCM).

Collaborate with Four Nations partners to model the burden of drug-resistant infections and mortality due to AMR.

HCAI targets progress



- HCAI targets were agreed between the Scottish Government and NHS boards for financial year 2025/2026. They provide assurance on NHS Scotland performance and support the ambitions of the UK AMR National Action Plan.
- The HCAI targets aim for no increase in the number of cases of healthcare associated CDI, ECB and SAB by 2025/26 from the 2023/24 baseline. As of year-ending 2025, the number of CDI cases was below the target baseline. The numbers of ECB and SAB cases were above the target baseline.
- ARHAI Scotland will review the number of cases reported for the year ending March 2026, assess whether the current targets have been met, and provide recommendations to the Scottish Government on future targets.

Healthcare demand, capacity and flow

As healthcare delivery, service activity and the patient populations continue to evolve, the occurrence and transmission of HCAI have become increasingly complex. These are influenced by a combination of patient specific and wider contextual factors related to the settings in which care is provided. Variation in HCAI rates may therefore reflect a complex interaction of factors, including patient-level risk factors, healthcare delivery and activity, IPC practices, and characteristics of the healthcare-built environment. HCAI epidemiology should be interpreted with caution and within the wider context of healthcare systems.

Hospital activity



Total occupied bed days

6,135,431 occupied bed days in **2025** compared to **6,261,731** in **2024**.



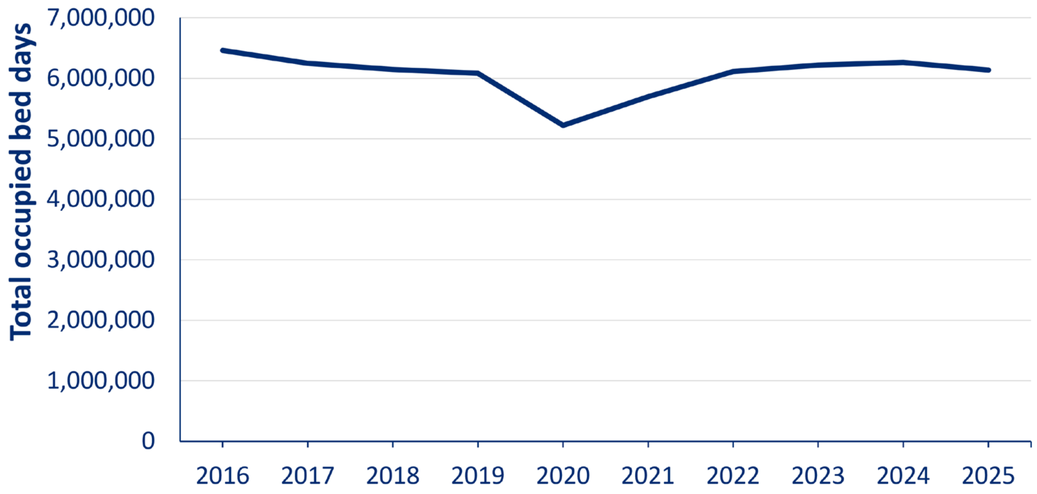
Elective and emergency admissions

478,908 emergency inpatient admissions in **2025** compared to **480,345** in **2024**.

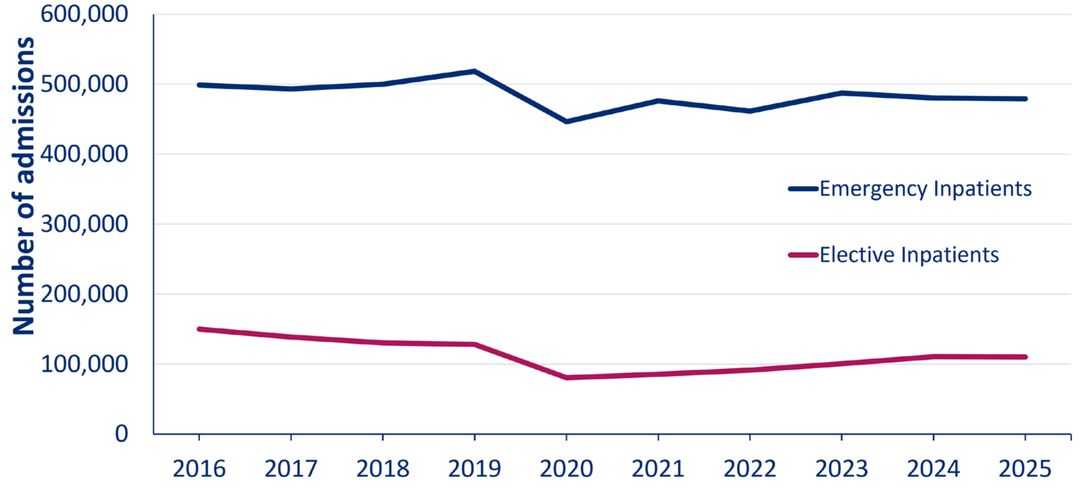
110,245 elective inpatient admissions in **2025** compared to **110,558** in **2024**.



Total occupied bed days by year



Number of elective and emergency admissions by year



Hospital demand and flow

Delayed discharges and patterns of urgent and emergency care activity provide important context when interpreting HCAI epidemiology. These factors can influence patient flow, length of stay, patient placement and the characteristics of the inpatient population, all of which may affect opportunities for the occurrence and transmission of infection.



Delayed discharges

The percentage of total occupied bed days due to **delayed discharges** was **12.0%** in **2025** and in **2024**.

The average percentage **was higher during 2023 to 2025, compared to 2017 to 2019**.

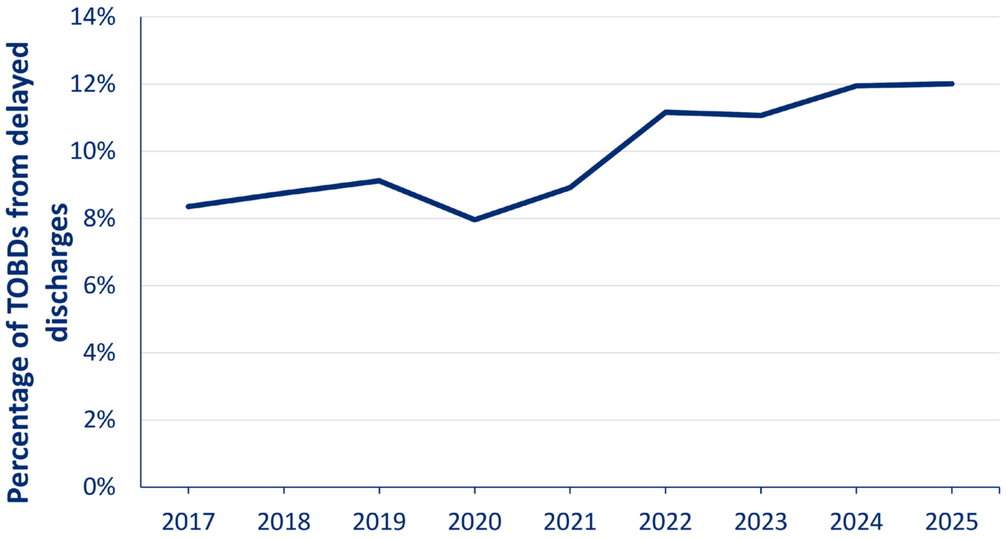


Accident and Emergency (A&E) attendances

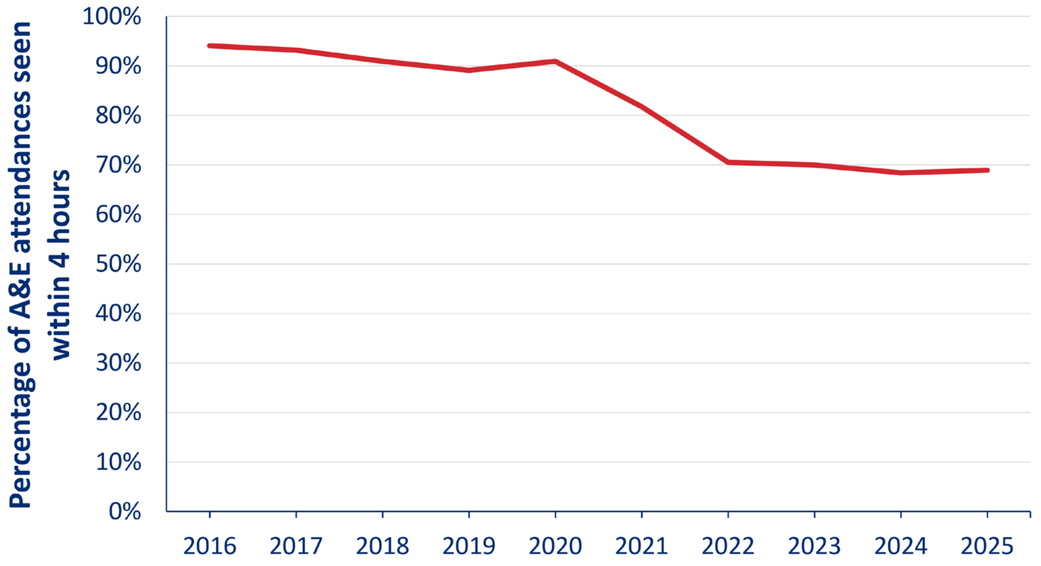
The **percentage of A&E attendances** seen within the **4-hour target** was **68.9%** in **2025** compared to **68.4%** in **2024**.

The average percentage **was lower during 2023 to 2025, compared to 2016 to 2019**.

Percentage of TOBDs from delayed discharges by year

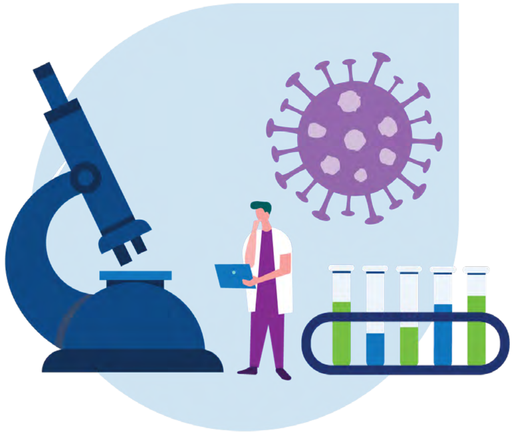


Percentage of A&E attendances seen within 4 hours by year



Clostridioides difficile infection

Epidemiological data

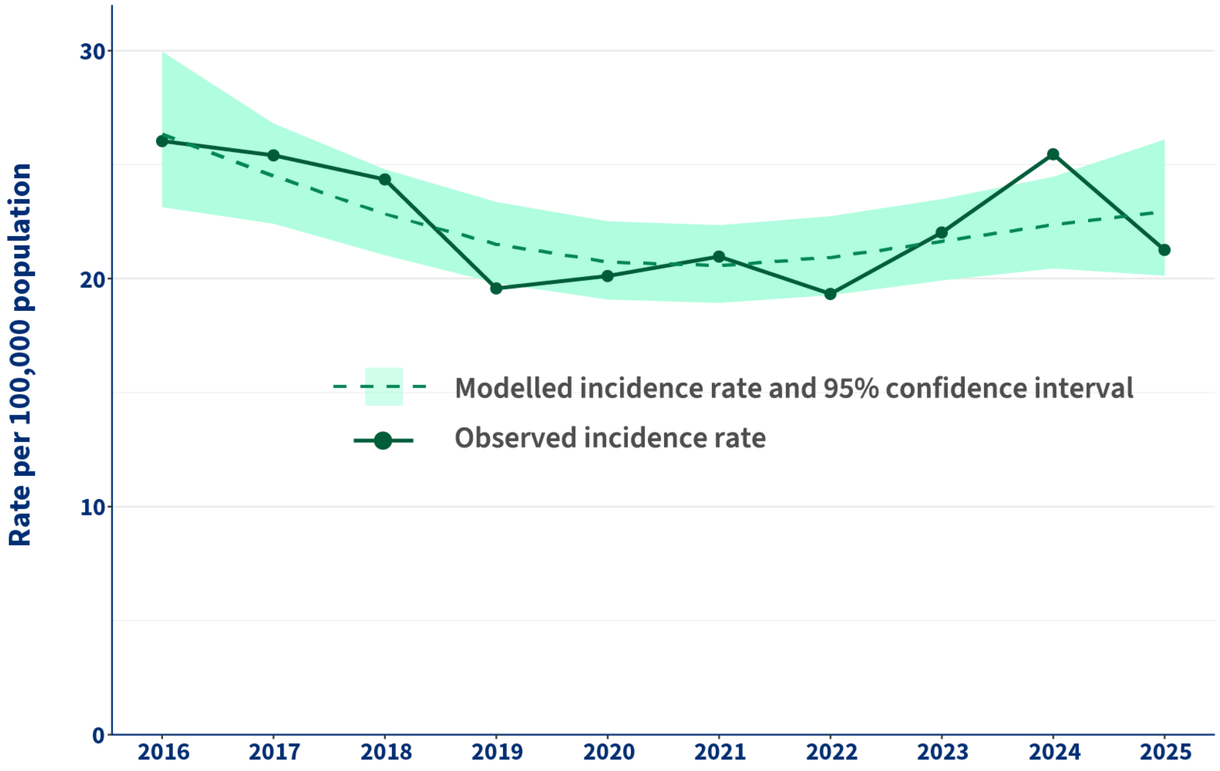


In **2025**, there were **1,179** cases of ***Clostridioides difficile* infection (CDI)** reported in patients aged 15 years and older in Scotland, compared to **1,412** cases in **2024**.

The **annual incidence rate in 2025** was **21.3** per 100,000 population. There has been a **16.5% decrease** in the **rate** between **2024** and **2025**.

From **2016** to **2019**, the rate **decreased by 8.5%** on average each year. **Since 2020**, there has been a **marginal increase** of **3.0%** each year. [1]

Total CDI and modelled rate per 100,000 population

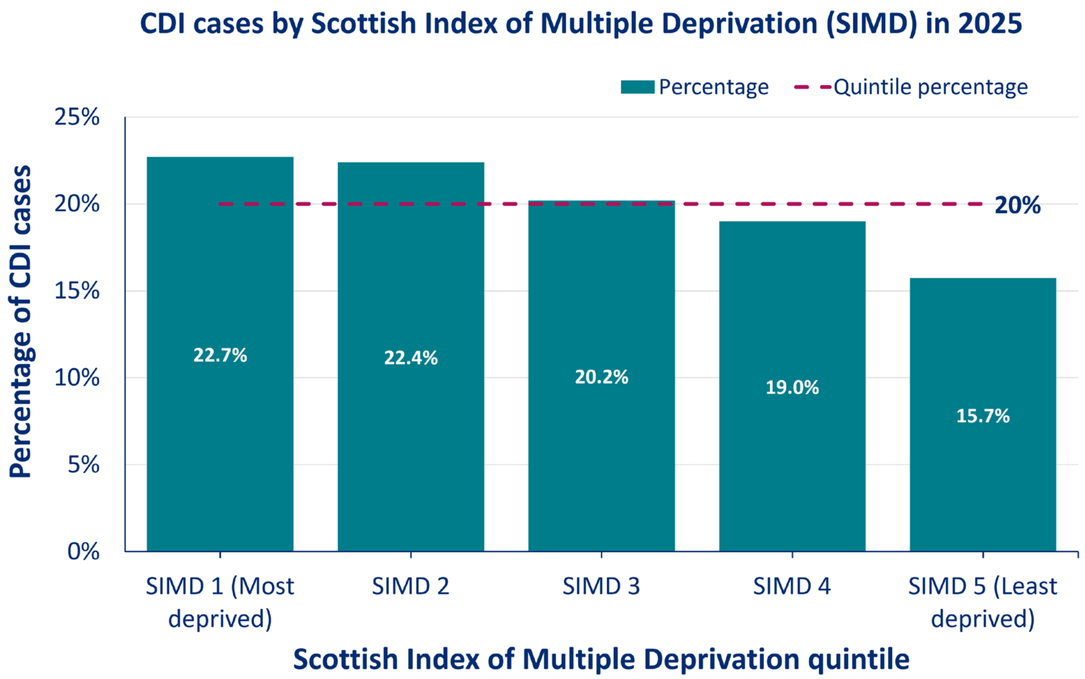


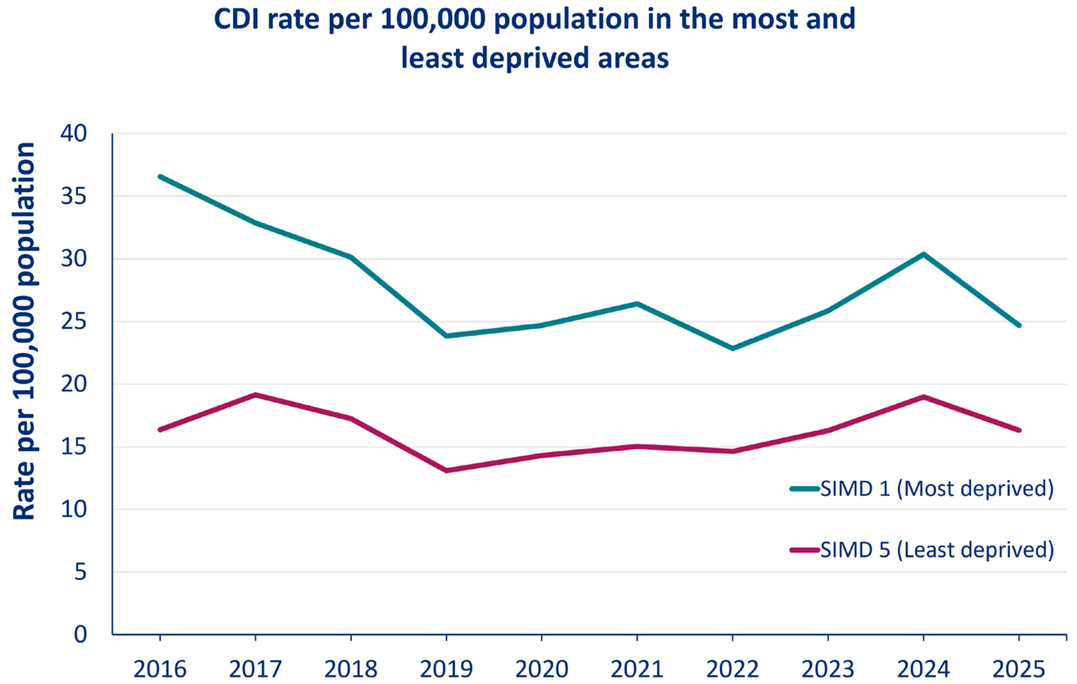
[1] Marginal trends are not currently statistically significant (p = 0.063).

Health inequalities and demographics

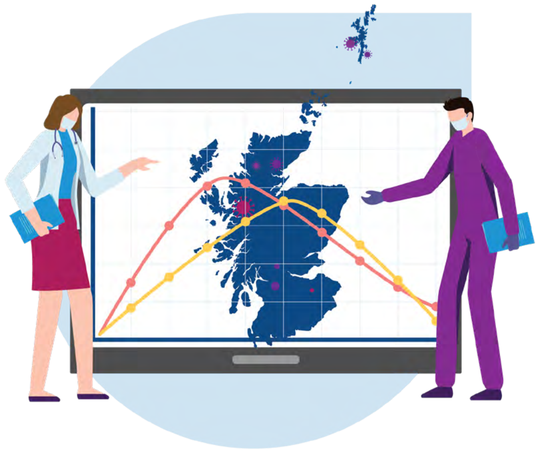
In **2025**, **45.1%** of CDI cases occurred in **people living in the 40% of areas with the highest levels of deprivation** (SIMD 1 and SIMD 2) **in Scotland.**[2]

The **annual CDI incidence rate in 2025** was **higher** in the **most deprived areas** (**24.7** per 100,000 population) than in the **least deprived areas** (**16.3** per 100,000 population).



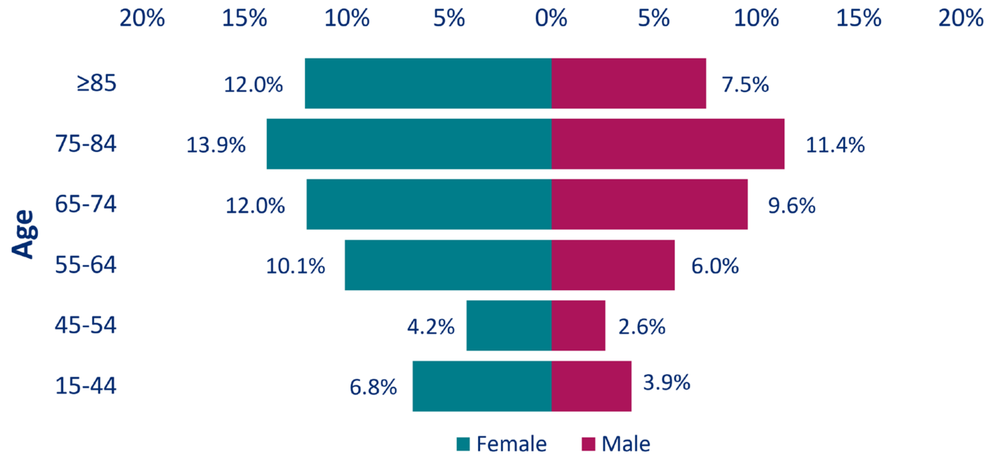


[2]Data for SIMD quintile or Urban/Rural classification were not available for 1.2% of patients in 2025, therefore percentages include patients for whom these data were available.

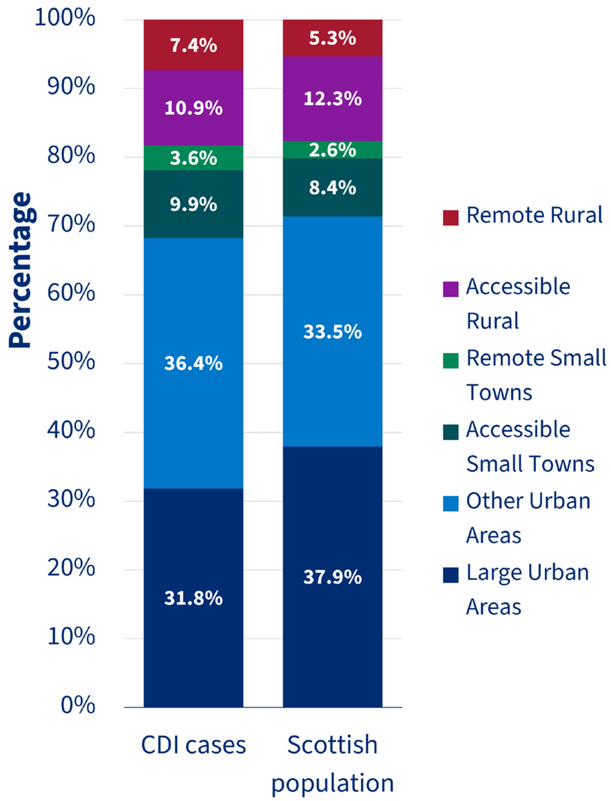


In **2025**, **58.9%** of CDI cases were **female** and **66.4%** were aged **65 and over**. The **annual incidence rate in 2025** was **68.8** per 100,000 population in people **aged 65 and over**. This was **higher** than the annual incidence rate in those **aged 15 to 64** (**11.1** per 100,000 population).

Age and sex of CDI cases in 2025



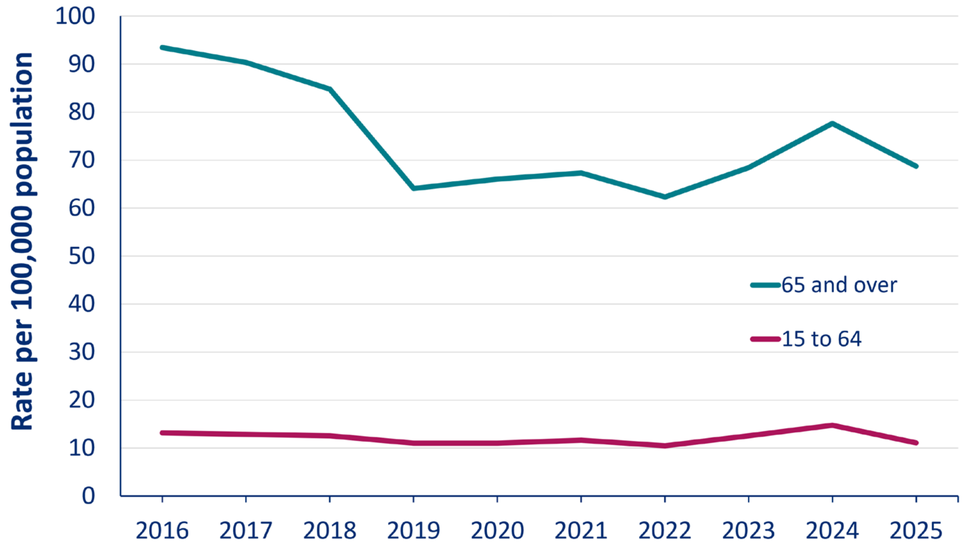
CDI cases in urban and rural areas in 2025



In **2025**, the majority of CDI cases were in people who resided in **large or other urban areas**. **11.0%** of CDI cases lived in **remote areas** in Scotland and **18.3%** in **rural areas**, compared to **7.9%** and **17.6%** of the Scottish population, respectively.[3]

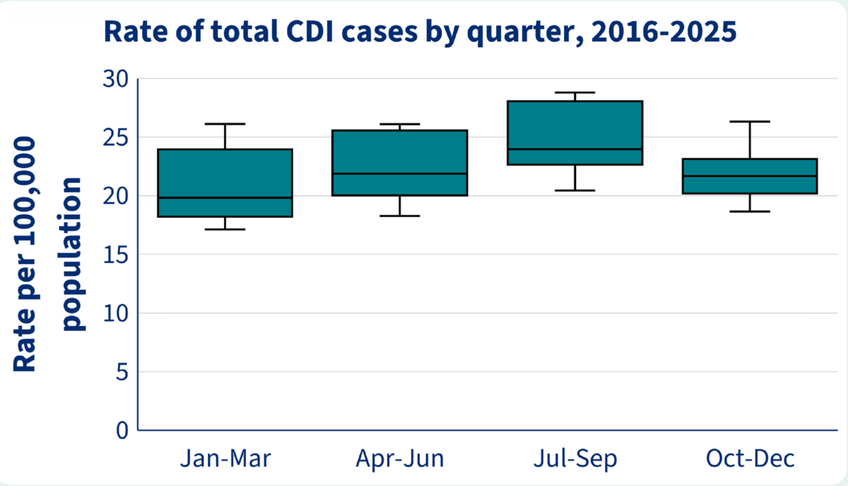
[3]Data for SIMD quintile or Urban/Rural classification were not available for 1.2% of patients in 2025, therefore percentages include patients for whom these data were available.

CDI rate per 100,000 population in 15 to 64 and 65 years and over age groups



Seasonality

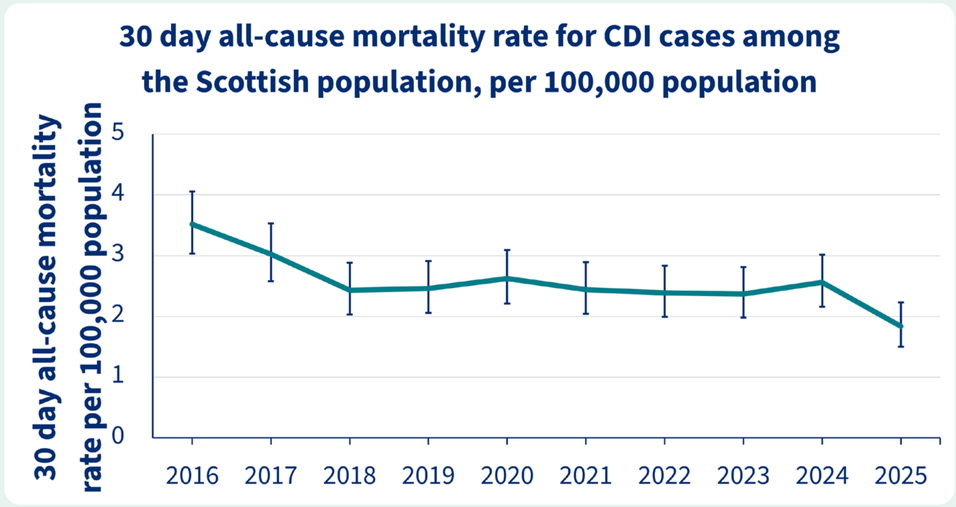
The **incidence rate of CDI** demonstrates **seasonal variation**, with **higher rates** being reported in **July-September** compared to overall annual CDI rates. [4]

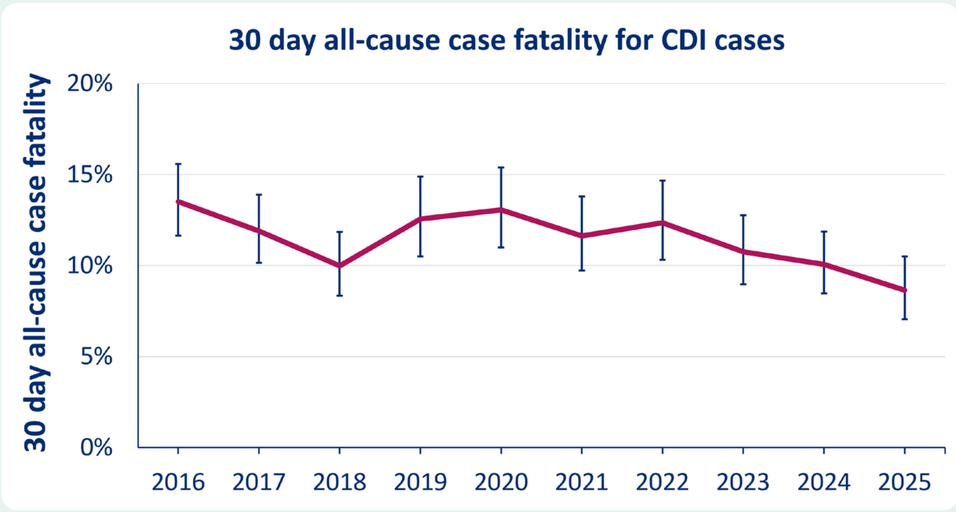


[4] Boxplots show medians, interquartile ranges and minimum and maximum values for each quarter over 10 years of data.

All-cause mortality rate and case fatality

In **2025**, there were **102 deaths** within 30 days of a confirmed CDI, resulting in a **30 day all-cause mortality rate** of **1.8 per 100,000 population**, compared to **2.6** per 100,000 population in **2024**. Amongst CDI cases only, this was a **30 day all-cause case fatality of 8.7%**. [5]



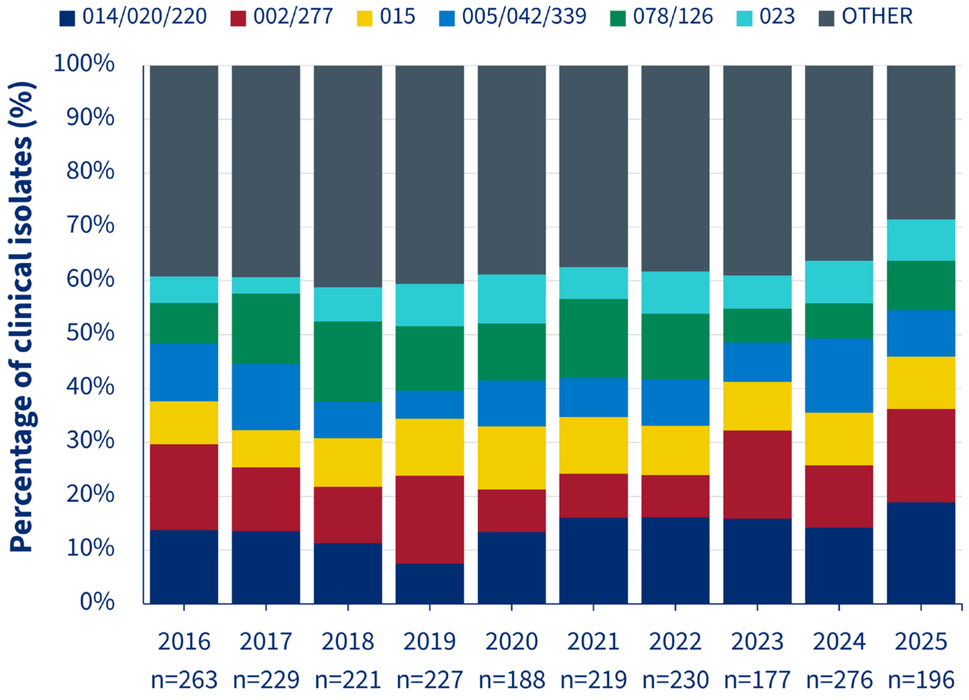


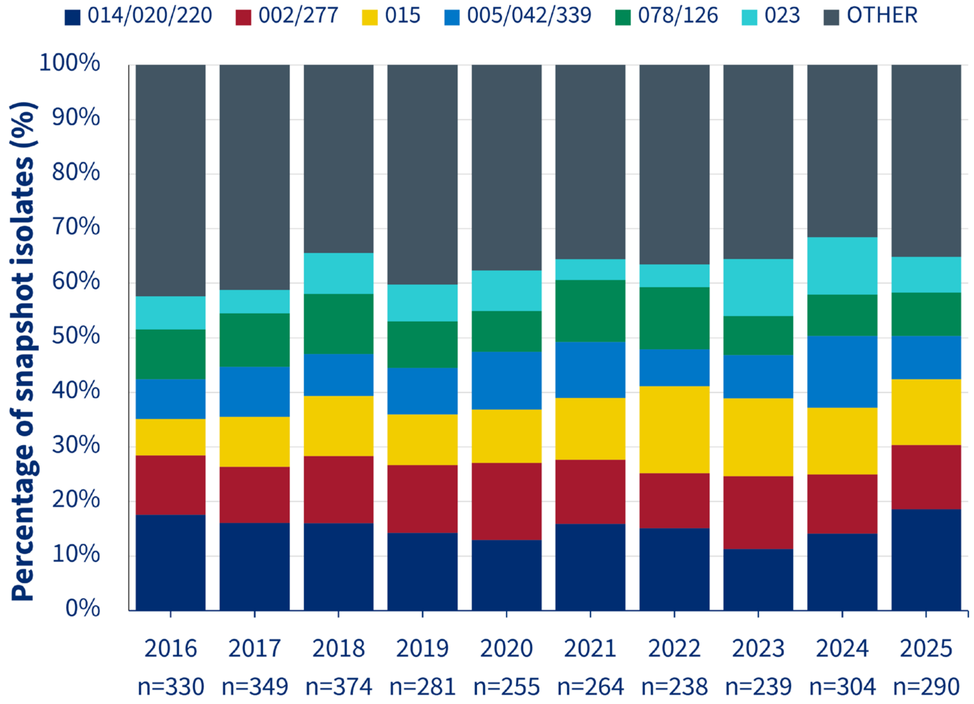
[5] Data are presented on all-cause mortality, and therefore include deaths that may not be directly attributable to the infections. The CDI mortality rate represents the number of people who died from any cause within 30 days of a confirmed CDI per 100,000 total Scottish population. Case fatality rates represent the percentage of patients with a confirmed CDI that died within 30 days. Case fatality rates are not affected by the incidence of CDI within the population.

Molecular epidemiological data

The **three most prevalent ribotypes** (RT) reported by **clinical surveillance** in **2025** were **RT 014/020/220 (18.9%)**, **RT 002/277 (17.3%)** and **RT 015 (9.7%)**. [6]

The **three most prevalent RT** reported by the **snapshot surveillance scheme** in **2025** were **RT 014/020/220 (18.6%)**, **RT 015 (12.1%)** and **RT 002/277 (11.7%)**. [6]





[6] Graphs are inclusive of both healthcare and community associated CDI. Any ribotypes with an average reporting percentage of <3% were grouped in the OTHER category.

The distribution of CDI ribotypes observed in Scotland, where the frequency of most common ribotypes has remained fairly consistent, aligns with that observed across the UK.

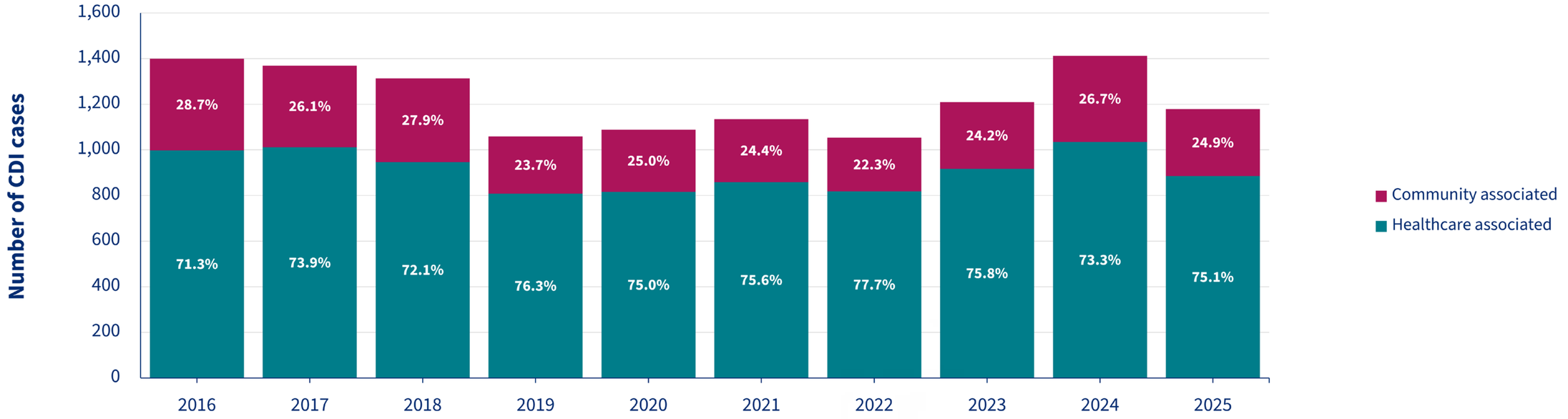
Origin of infection

In **2025**, **75.1%** of CDI cases were healthcare associated.[7]

The **percentage** of cases identified as healthcare associated has **remained unchanged** between **2024** and **2025**.



CDI cases by origin of infection



[7] Healthcare associated infections include hospital acquired infections, see metadata for definitions of healthcare and community associated infections.

Healthcare associated CDI

There were **885 healthcare associated CDI cases** in patients aged 15 years and older in **2025**.

The **annual incidence rate** in 2025 was **14.4** per 100,000 bed days. There has been a **12.7% decrease** in the **rate** between **2024** and **2025**.

From **2016** to **2019**, the rate **marginally decreased by 4.8%** on average each year. [8] **Since 2020**, there has been **no observed increasing or decreasing trend**.

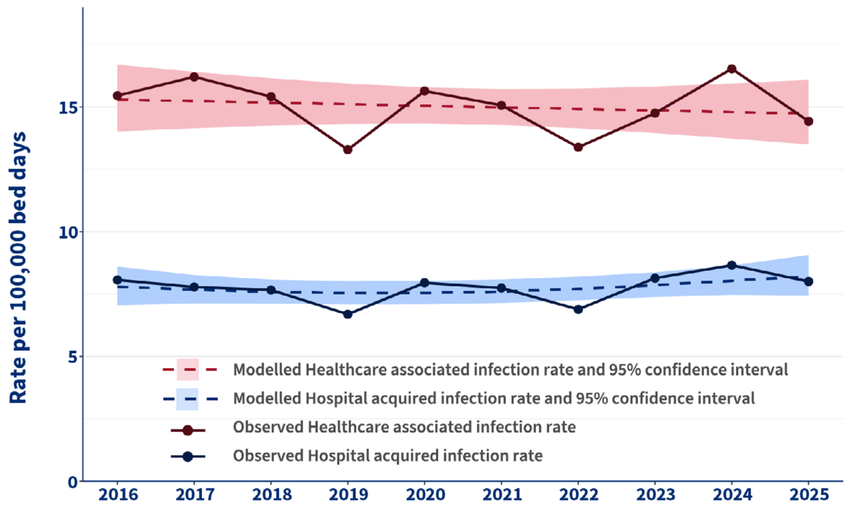
Hospital acquired CDI

Of the **885** healthcare associated CDI cases, **491 (55.5%)** were **hospital acquired infections**.

The **annual incidence rate** in 2025 was **8.0** per 100,000 bed days. The rate has **remained unchanged** between **2024** and **2025**.

From **2016** to **2019**, the rate **decreased by 5.5%** on average each year. **Since 2020**, there has been **no observed increasing or decreasing trend.**

Rate of healthcare associated CDI and modelled rate per 100,000 TOBD



[8] Marginal trends are not currently statistically significant: (p=0.062).

Community associated CDI

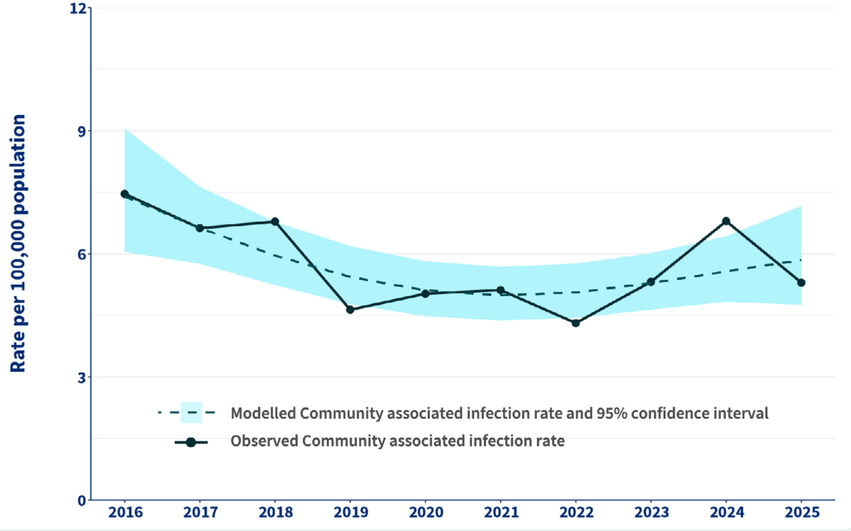
There were **294 cases** of **community associated CDI** aged 15 years and older in **2025**.

The **annual incidence rate** in 2025 was **5.3** per 100,000 population.

There has been a **22.0% decrease** in the **rate** between **2024** and **2025**.

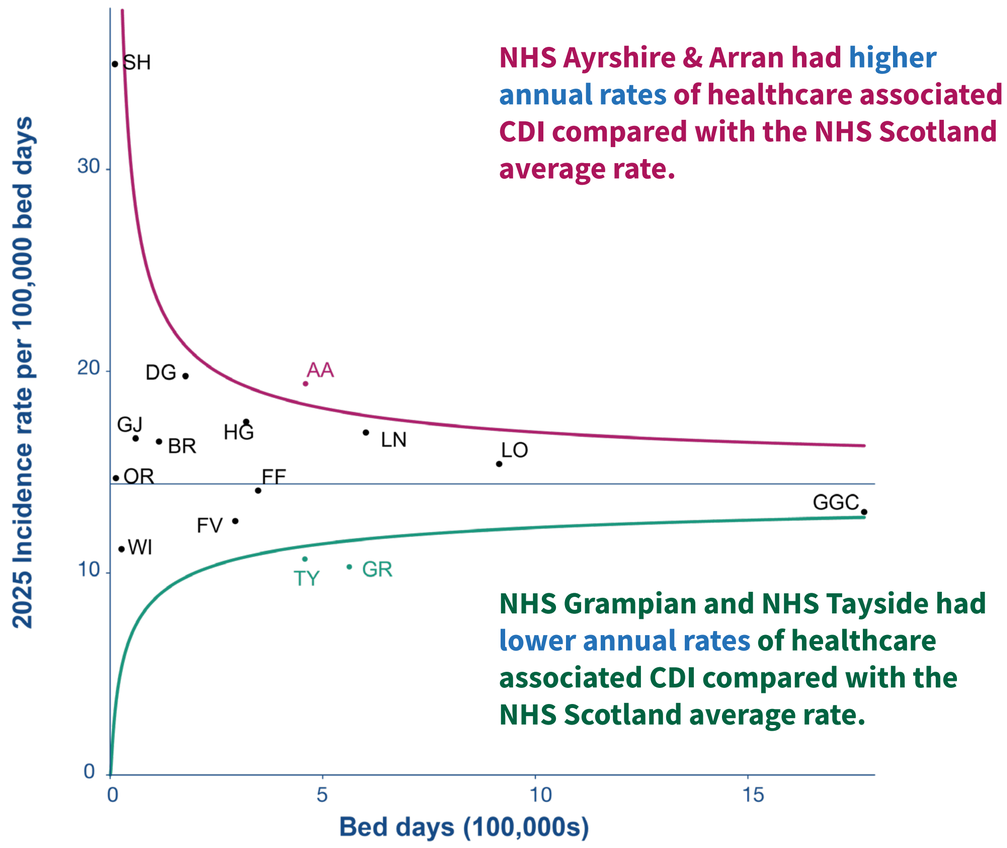
From **2016** to **2019**, the rate **decreased by 12.7%** on average each year. **Since 2020**, there has been **no observed increasing or decreasing trend.**

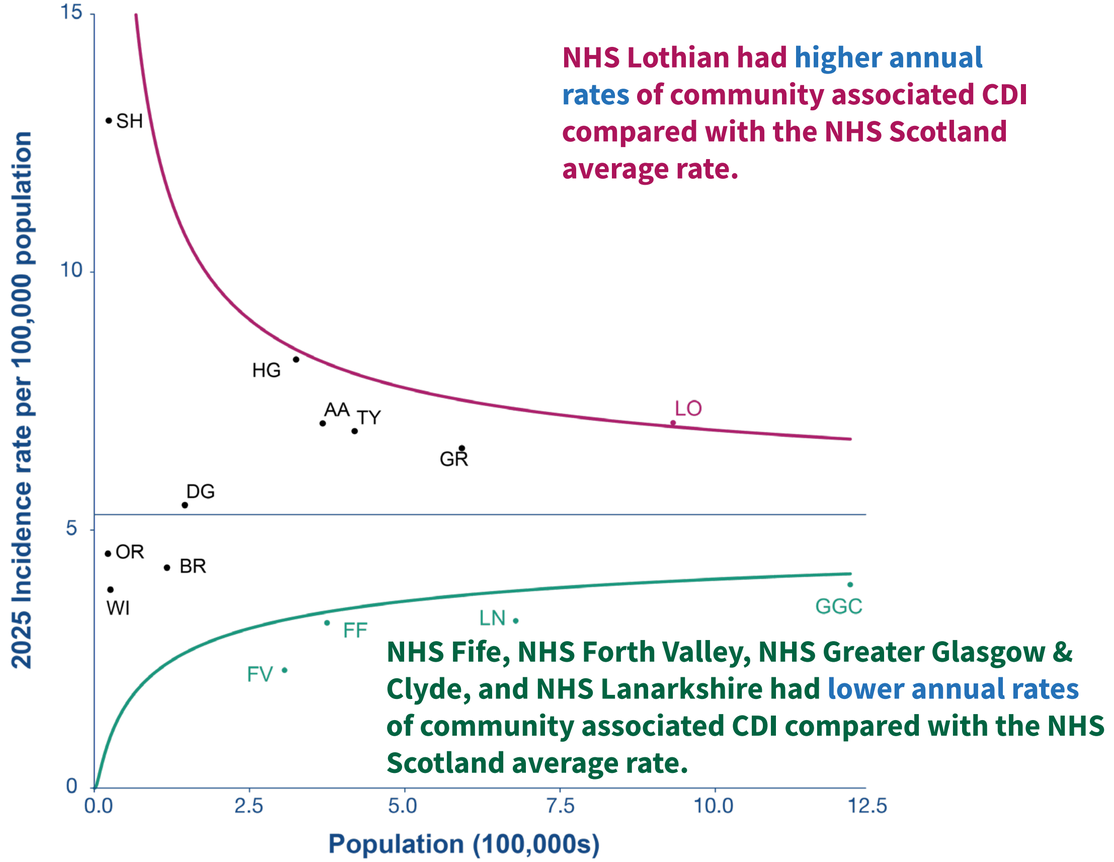
Rate of community associated CDI and modelled rate per 100,000 population



Variation by health board

ARHAI Scotland facilitate monitoring and benchmarking of data by NHS board to support local and national quality improvement initiatives. Annual **funnel plot analysis** can identify NHS boards with rates that are higher or lower than the NHS Scotland **annual rate**. [9]





[9] NHS board rates are not adjusted for differences in the patient population (i.e. demographic differences between health boards).

Quarterly Data Exceedance Reporting

NHS boards are required to submit improvement plans in response to **higher than average quarterly rates** of **healthcare or community associated CDI**, as identified through the exception reporting process.

Three improvement plans were developed by **NHS boards** during **2025**, **two** in response to **higher than average quarterly rates** of **healthcare associated CDI**, and **one** in response to **a higher than average quarterly rate** of **community associated CDI**.

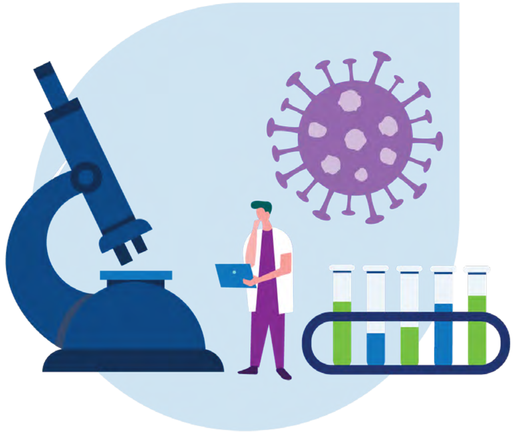
For further information please see the quarterly epidemiological reports.

More information on all data sources and methods is available in the metadata.



Staphylococcus aureus bacteraemia

Epidemiological data

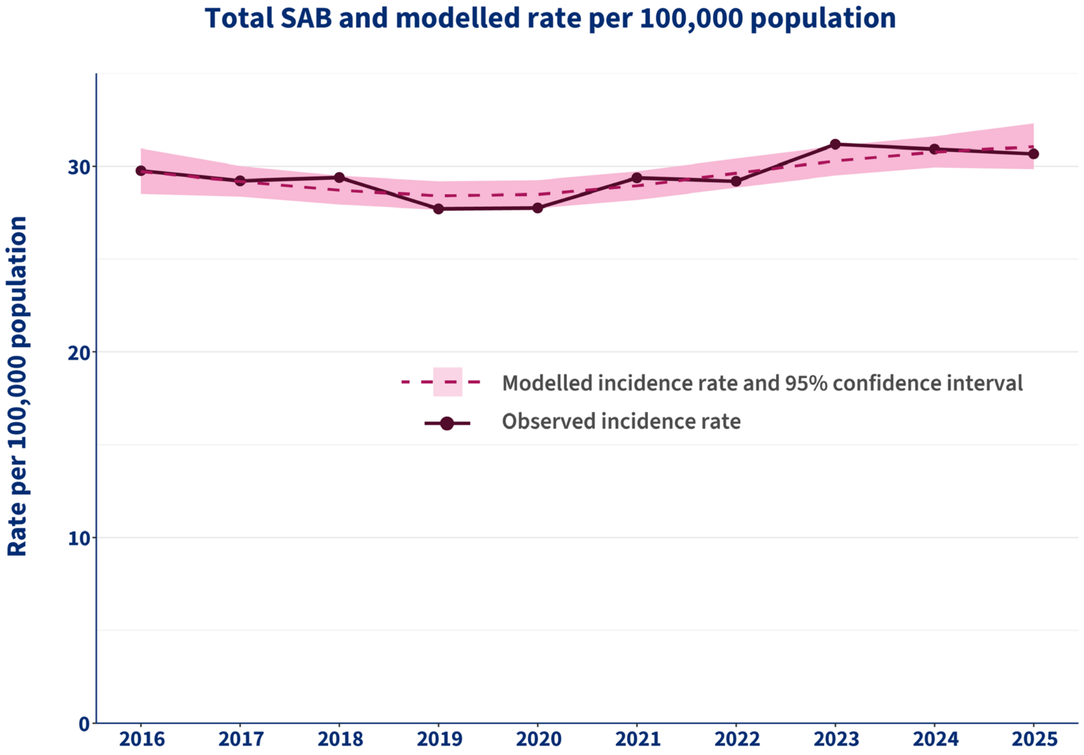


In **2025**, there were **1,701** cases of ***Staphylococcus aureus* bacteraemia (SAB)** reported in Scotland, compared to **1,715** cases in **2024**.

The annual incidence rate in **2025** was **30.7** per 100,000 population.

The **rate remained unchanged** between **2024** and **2025**.

From **2016** to **2019**, the rate was **marginally decreasing** by **2.0%** on average each year. [10] **Since 2020**, there has been an average **increase** of **2.0%** each year.



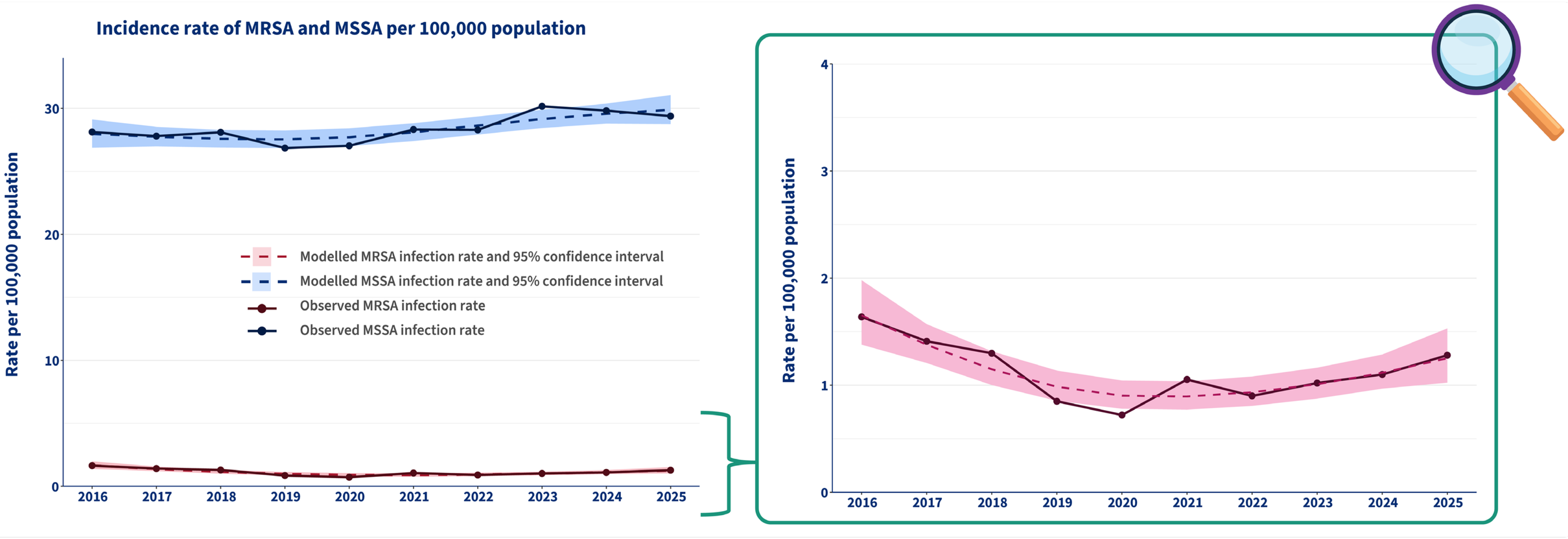
[10] Marginal trends are not currently statistically significant (p=0.068).

95.8% (n = 1,630) of all **SAB** cases were **meticillin-sensitive *Staphylococcus aureus* (MSSA)**. The **rate of MSSA** bacteraemia in **2025** was **29.4** per 100,000 population. The **rate remained unchanged** between **2024** and **2025**.

From **2016** to **2019**, there was **no observed increasing or decreasing trend**. **Since 2020**, there has been an average **increase of 1.8%** each year.

4.2% (n = 71) of all **SAB** cases were **meticillin-resistant *Staphylococcus aureus* (MRSA)**. The **rate of MRSA** bacteraemia in **2025** was **1.3** per 100,000 population. The **rate remained unchanged** between **2024** and **2025**.

From **2016** to **2019**, the rate was **decreasing** by **17.5%** on average each year. **Since 2020**, there has been an average **increase of 9.1%** each year.

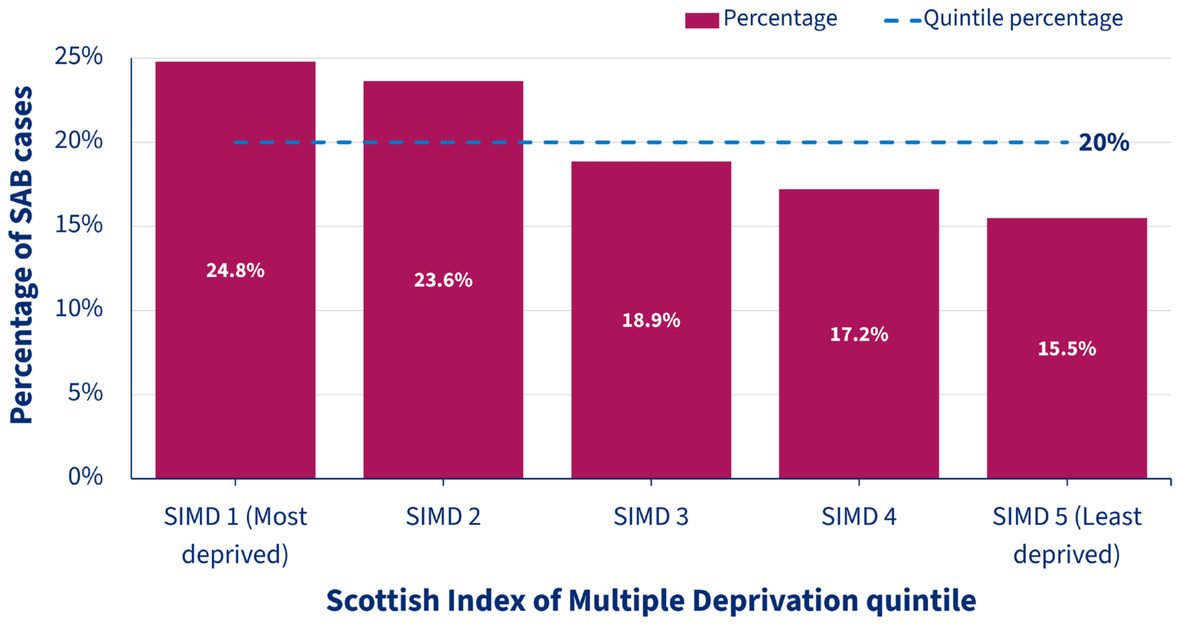


Health inequalities and demographics

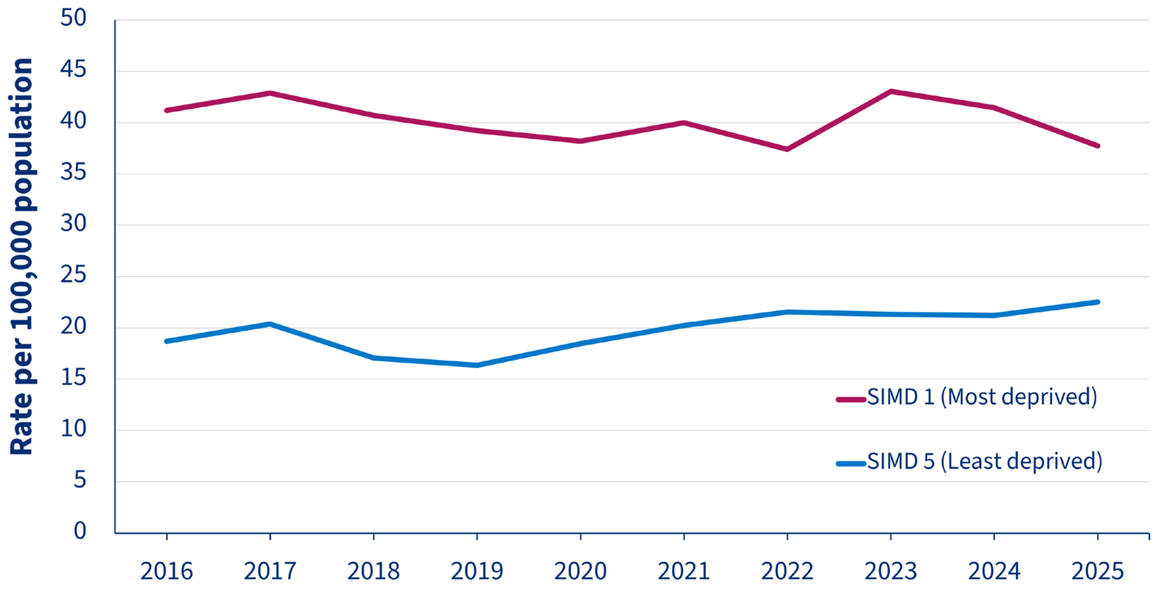
In **2025**, **48.4%** of SAB cases occurred in people living in the **40%** of areas with the **highest levels of deprivation (SIMD 1 and SIMD 2)** in **Scotland**.[11]

The **annual incidence rate** in **2025** was **higher in the most deprived areas** (**37.7** per 100,000 population) than in the **least deprived areas** (**22.5** per 100,000 population).

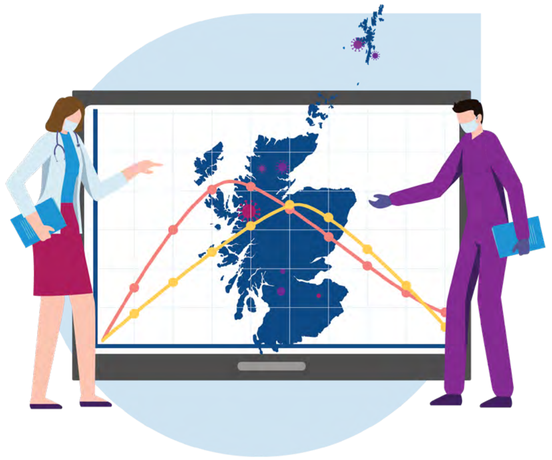
SAB cases by Scottish Index of Multiple Deprivation (SIMD) in 2025



SAB rate per 100,000 population in the most and least deprived areas

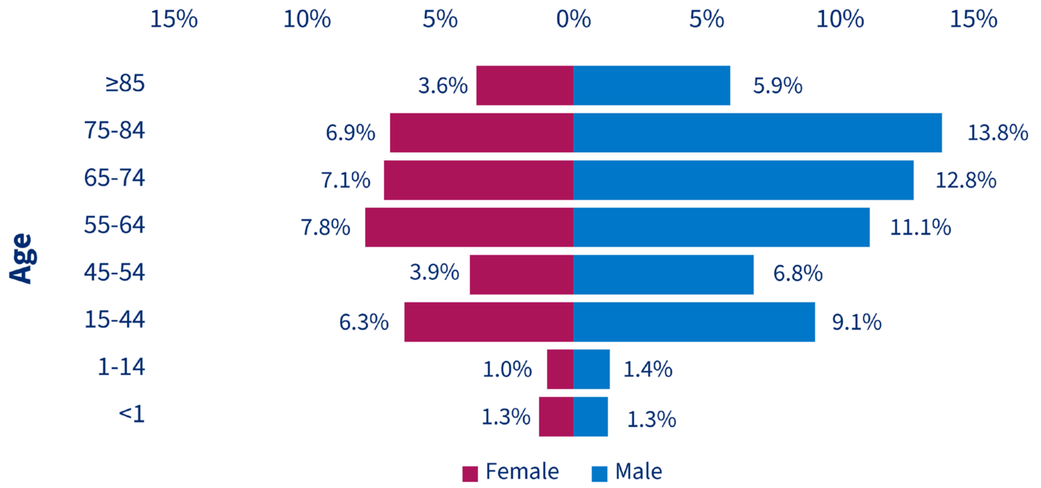


[11] Data for SIMD quintile or Urban/Rural classification were not available for 4.0% of patients in 2025, therefore percentages include total patients for whom these data were available.

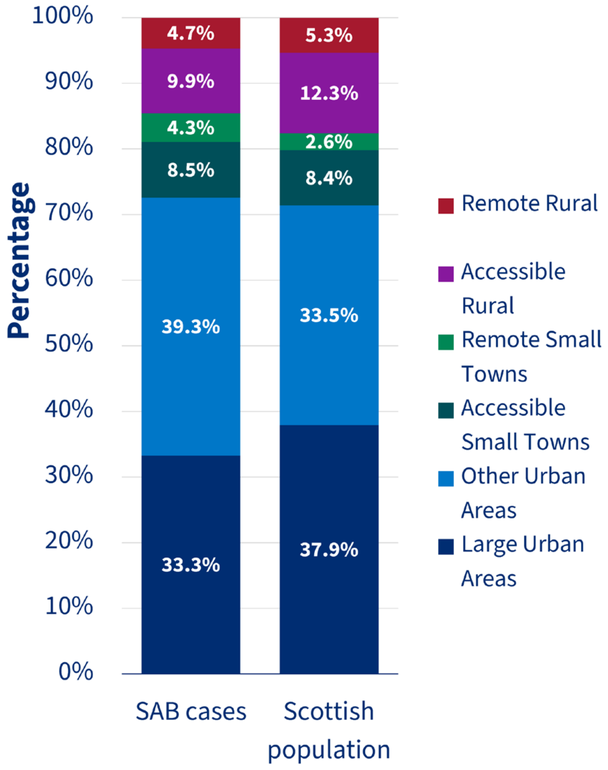


In **2025**, **62.0%** of SAB cases were **male** and **50.1%** were **aged 65 and over**. The **annual incidence rate in 2025** was **74.8** per 100,000 population in people **aged 65 and over**. This was **higher than the annual incidence rate** in those **aged 15 to 64** (**21.4** per 100,000 population) and those **aged under 15** (**10.1** per 100,000 population).

Age and sex of SAB cases in 2025



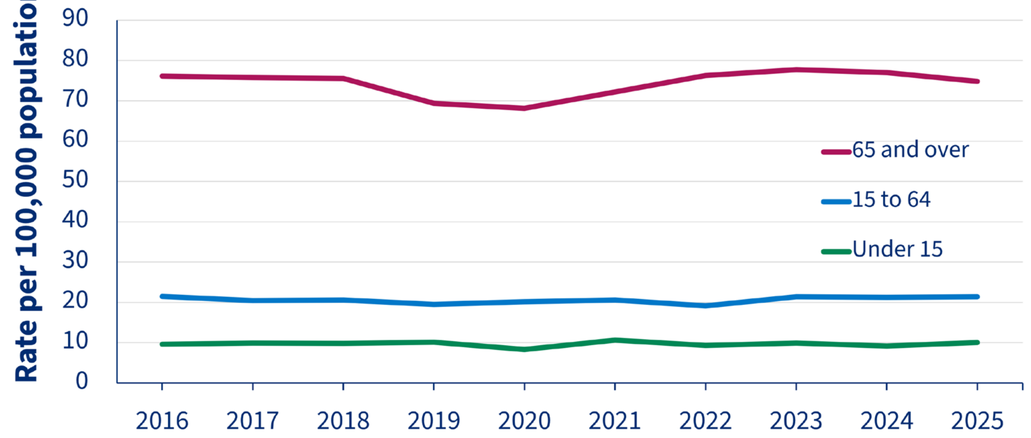
SAB cases in urban and rural areas in 2025



In **2025**, the majority of SAB cases were in people who resided in **large or other urban** areas. **9.1%** of SAB cases lived in **remote areas** in Scotland and **14.6%** in **rural areas**, compared to **7.9%** and **17.6%** of the Scottish population, respectively. [12]

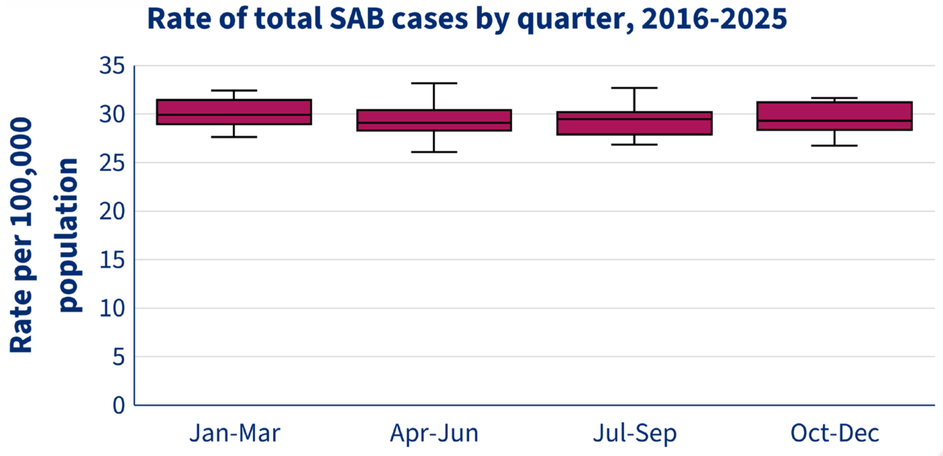
[12] Data for SIMD quintile or Urban/Rural classification were not available for 4.0% of patients in 2025, therefore percentages include total patients for whom these data were available.

SAB rate per 100,000 population in under 15 years, 15 to 64, and 65 and over age groups



Seasonality

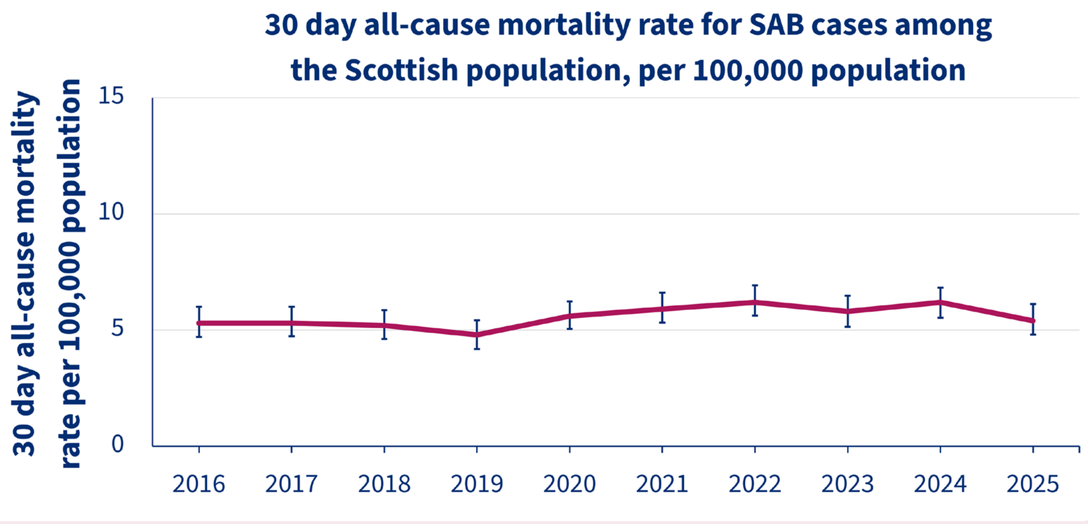
The incidence rate of SAB showed **no difference in rates across quarters** and **no evidence** of seasonal variation. [13]



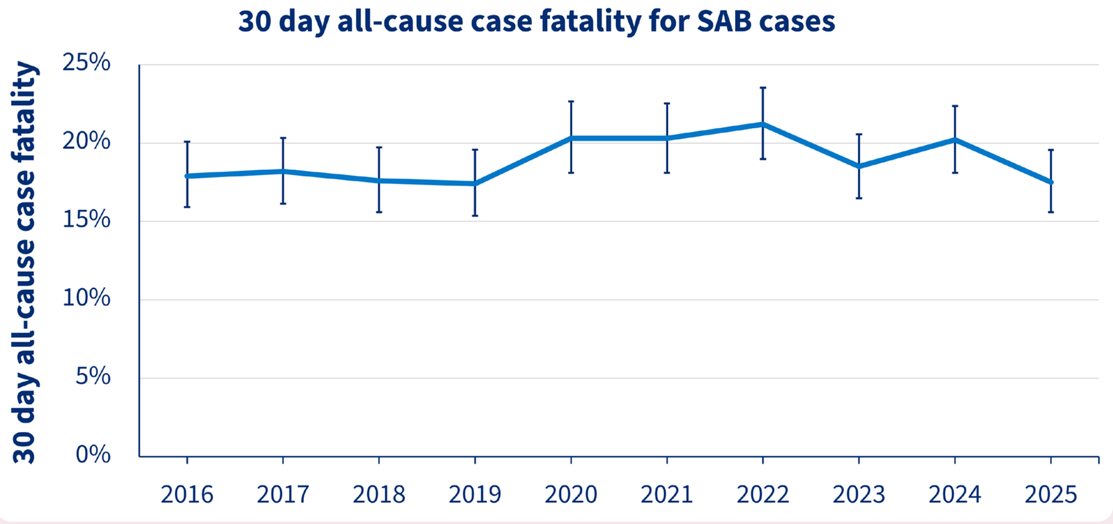
[13] Boxplots show medians, interquartile ranges and minimum and maximum values for each quarter over 10 years of data.

All-cause mortality rate and case fatality

In **2025**, there were **298** deaths within 30 days of a confirmed SAB, resulting in a **30 day all-cause mortality rate** of **5.4 per 100,000 population**. This was unchanged compared to in **2024** (**6.2** per 100,000 population).



Amongst **SAB cases only**, this was a **30 day all-cause case fatality** of **17.5%.**[14] There was **no difference** in the case fatality between **patients with MRSA bacteraemia** (**16.9%**) and **patients with MSSA bacteraemia** (**17.5%**).



[14] Data are presented on all-cause mortality, and therefore include deaths that may not be directly attributable to the infections. The SAB mortality rate represents the number of people who died from any cause within 30 days of a confirmed SAB per 100,000 total Scottish population. Case fatality rates represent the percentage of patients with a confirmed SAB that died within 30 days. Case fatality rates are not affected by the incidence of SAB within the population.

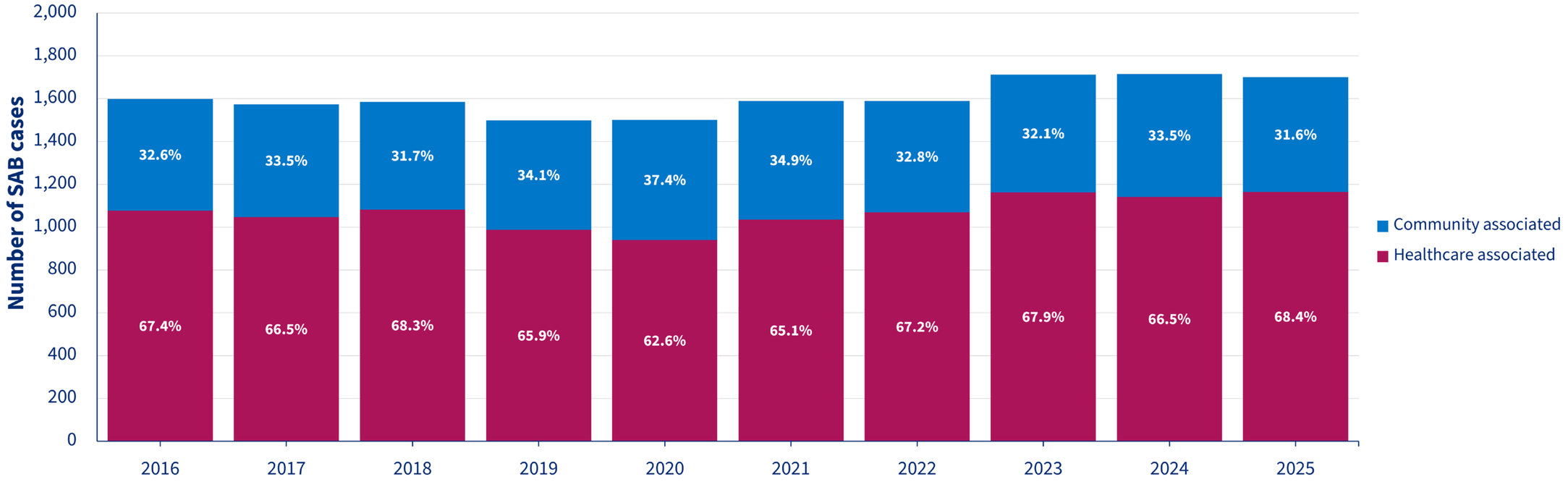
Origin of infection



In **2025**, **68.4%** of SAB cases were healthcare associated. [15]

The **percentage** of cases identified as healthcare associated has **remained unchanged** between **2024** and **2025**.

SAB cases by origin of infection



[15] Healthcare associated infections include hospital acquired infections, see metadata for definitions of healthcare and community associated infections. Between 2020 and 2022 NHS boards were only required to report case numbers and origin of infection and were not required to report any additional risk factor data.

Healthcare associated SAB

There were **1,164 healthcare associated SAB cases** cases in **2025**.

The **annual incidence rate in 2025** was **19.0** per 100,000 bed days. The rate has **remained unchanged** between **2024** and **2025**.

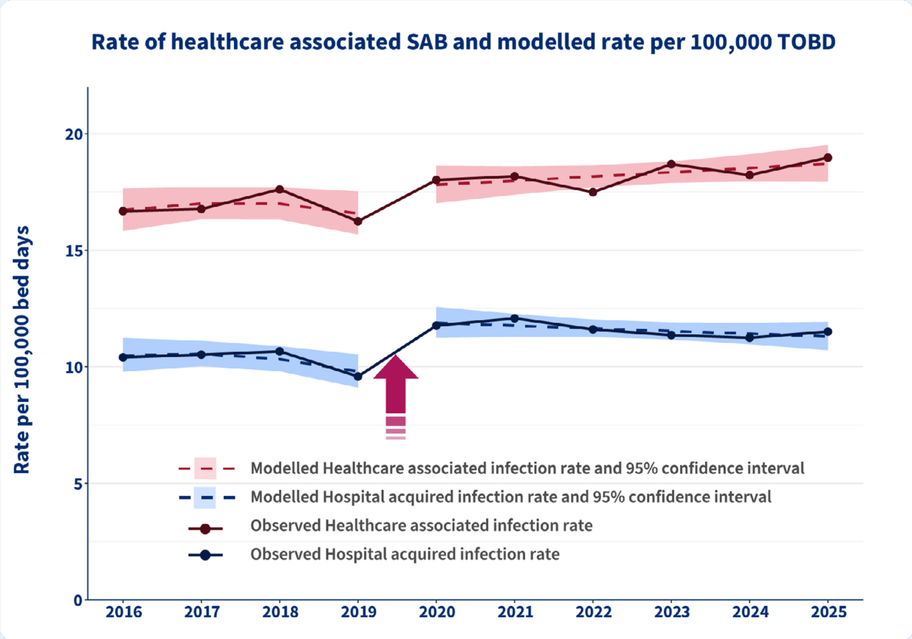
Before and since 2020, there were **no observed increasing or decreasing trends**.

Hospital acquired SAB

Of the **1,164** healthcare associated SAB cases, **706 (60.7%)** were **hospital acquired infections**.

The **annual incidence rate in 2025** was **11.5** per 100,000 bed days. The rate has **remained unchanged** between **2024** and **2025**.

There was **no observed increasing or decreasing trends before or since 2020**. **However**, the average **rate of hospital acquired SAB** was **higher since 2020** compared to **2016** to **2019**.



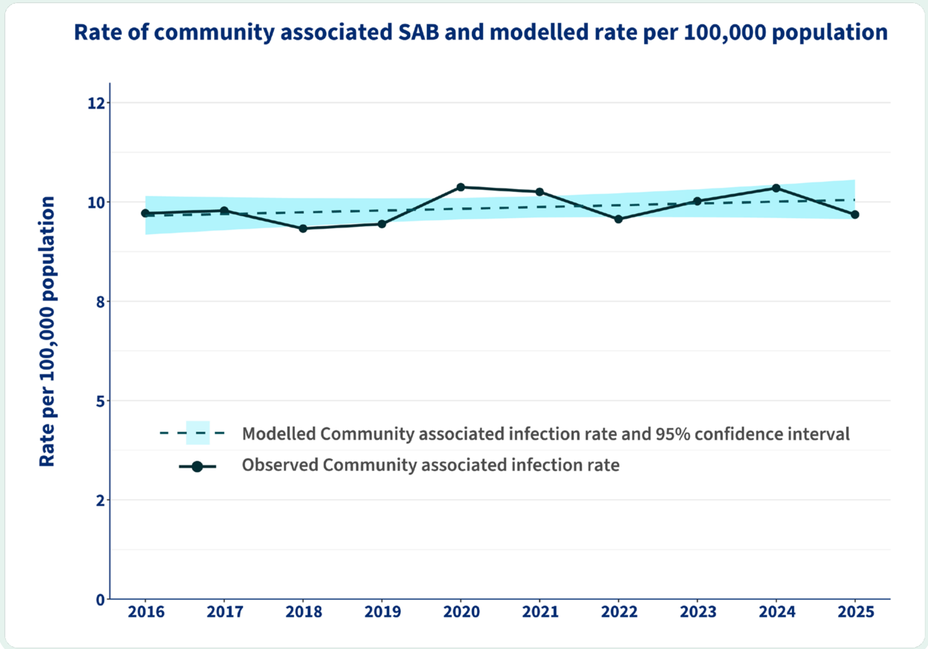
Community associated SAB

There were **537** cases of **community associated SAB** in **2025**.

The **annual incidence rate in 2025** was **9.7** per 100,000 population.

The rate **remained unchanged** between **2024** and **2025**.

There was **no observed increasing or decreasing trend before** or **since 2020**.



Primary source

Information on primary source can be used by NHS boards to assist in prioritising intervention strategies for patients at risk.

In **2025**, the **primary source** for **healthcare associated SAB** was known for **77.0%** of cases.

Where source was known, the most common primary sources include: [16]

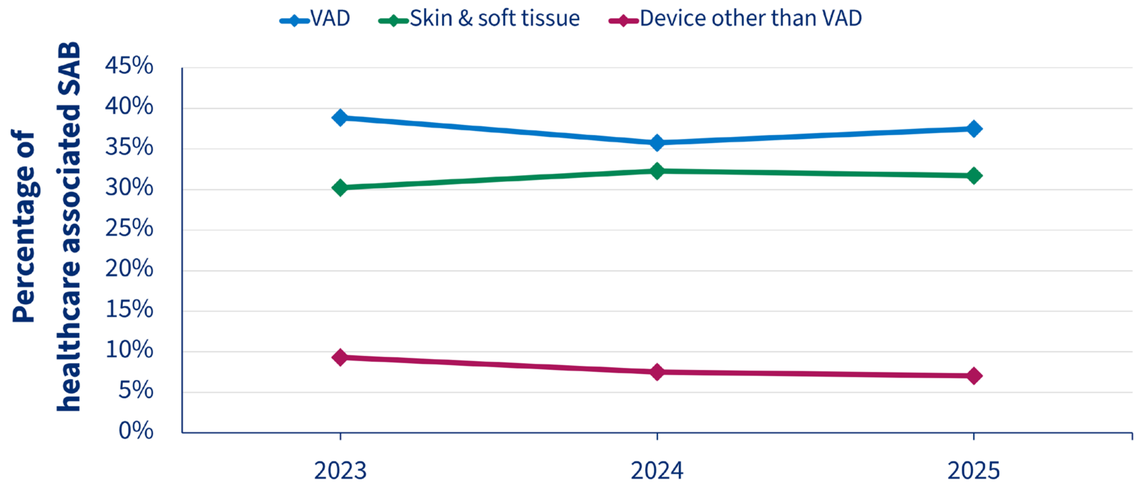
- **37.5% Vascular Access Device (VAD)**
- **31.7% Skin And Soft Tissue**
- **7.0% device other than VAD**

In **2025**, the **primary source** for **community associated SAB** was known for **60.0%** of cases.

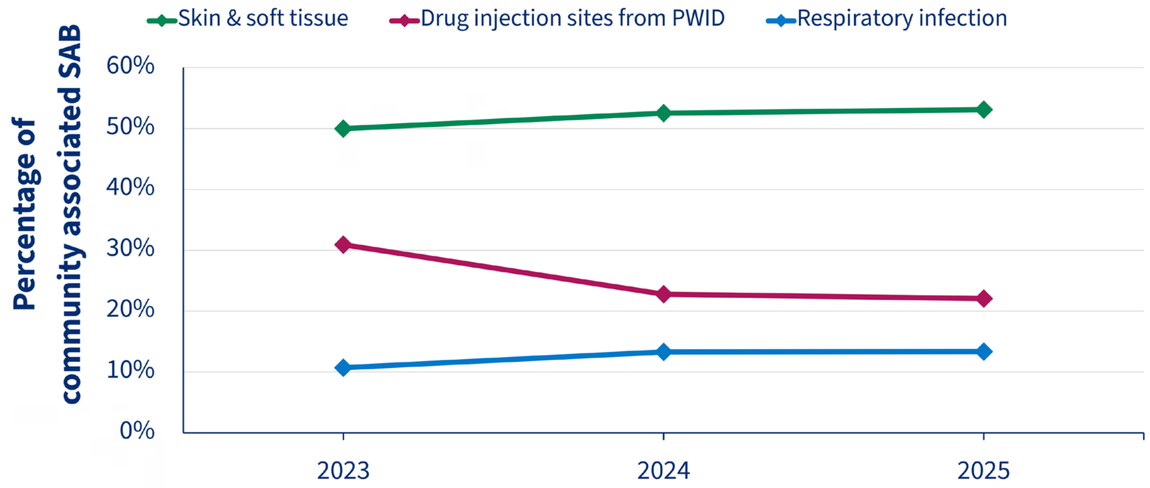
Where source was known, the most common primary sources include: [16]

- **53.1% Skin And Soft Tissue**
- **22.0% Drug Injection Sites from People Who Inject Drugs (PWID)**
- **13.4% Respiratory Infection**

Most common primary sources of SAB in healthcare associated infections with known source



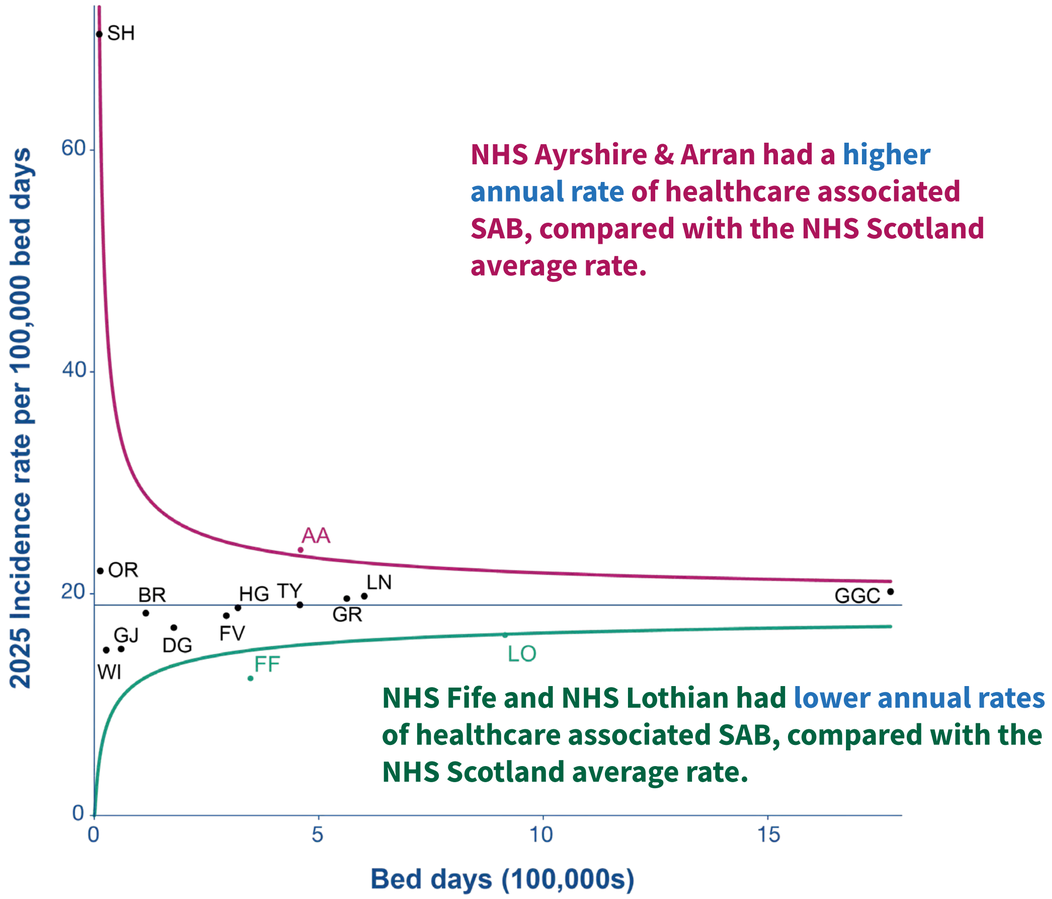
Most common primary sources of SAB in community associated infections with known source

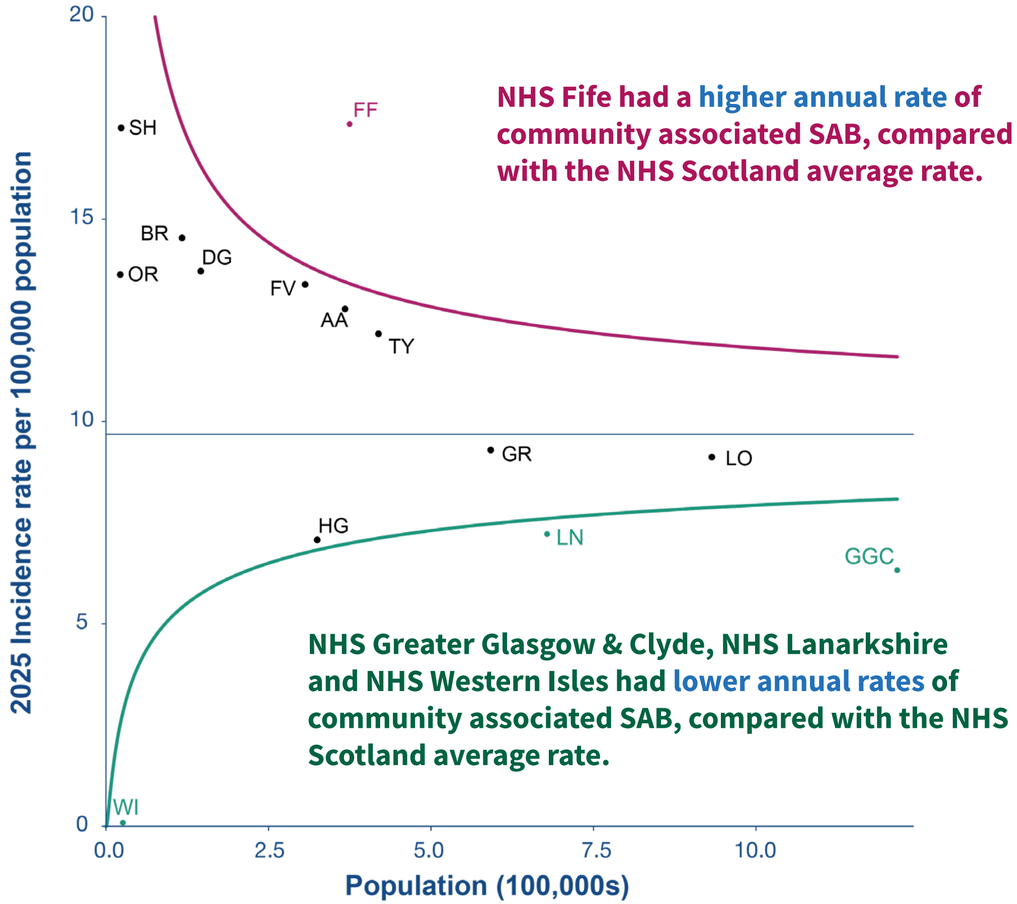


[16] Primary sources as determined by clinical team.

Variation by health board

ARHAI Scotland facilitate monitoring and benchmarking of data by NHS board to support local and national quality improvement initiatives. Annual **funnel plot analysis** can identify NHS boards with rates that are higher or lower than the NHS Scotland **annual rate**. [17]





[17] NHS board rates are not adjusted for differences in the patient population (i.e. demographic differences between health boards).

Quarterly Data Exceedance Exception Reporting

NHS boards are required to submit improvement plans in response to **higher than average quarterly rates** of **healthcare or community associated SAB**, as identified through the exception reporting process.

Two improvement plans were developed by **NHS boards** during **2025, one** in response to a **higher than average quarterly rate** of **healthcare associated SAB**, and **one** in response to a **higher than average quarterly rate** of **community associated SAB**.

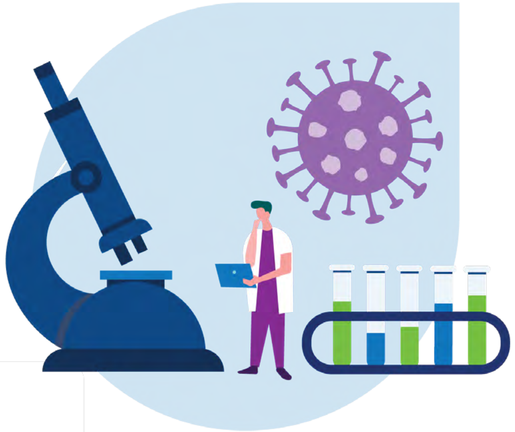
For further information please see the quarterly epidemiological reports.

More information on all data sources and methods is available in the metadata.



Escherichia coli bacteraemia

Epidemiological data

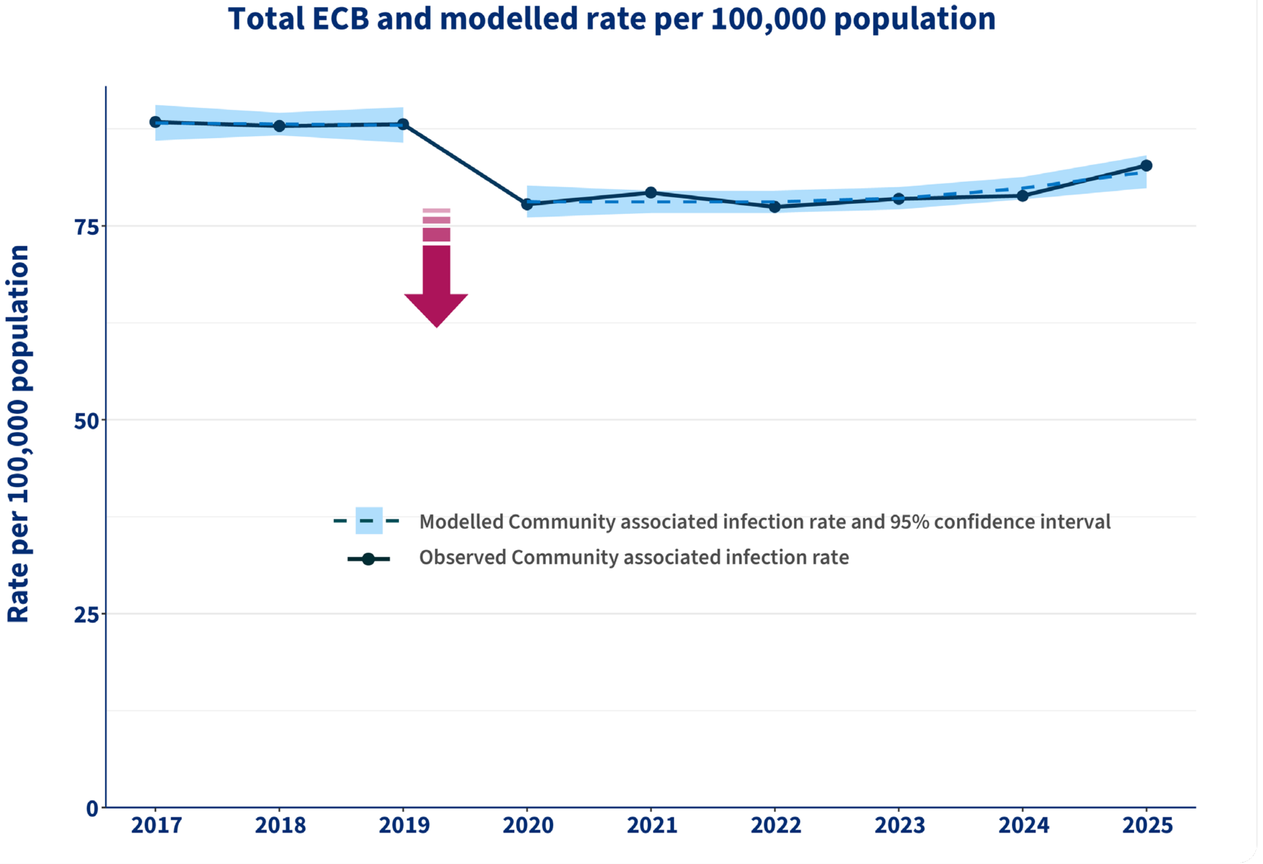


In **2025**, there were **4,592** cases of ***Escherichia coli* bacteraemia (ECB)** reported in Scotland, compared to **4,375** cases in **2024**.

The **annual incidence rate** in 2025 was **82.8** per 100,000 population. There has been a **5.0% increase** in the **rate** between **2024** and **2025**.

From **2017** to **2019**, there was **no observed increasing or decreasing trend**, however, the average rate of total ECB was **lower since 2020** compared to **2017** to **2019**.

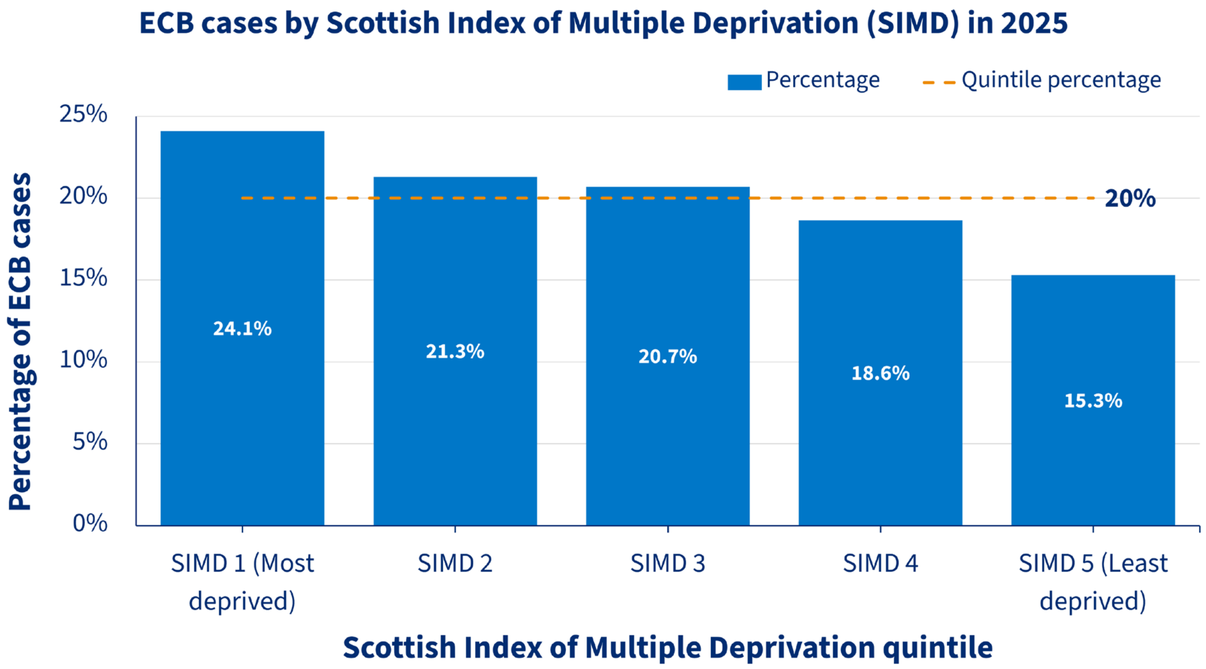
Since 2020, there has been an average **increase of 0.9%** each year.

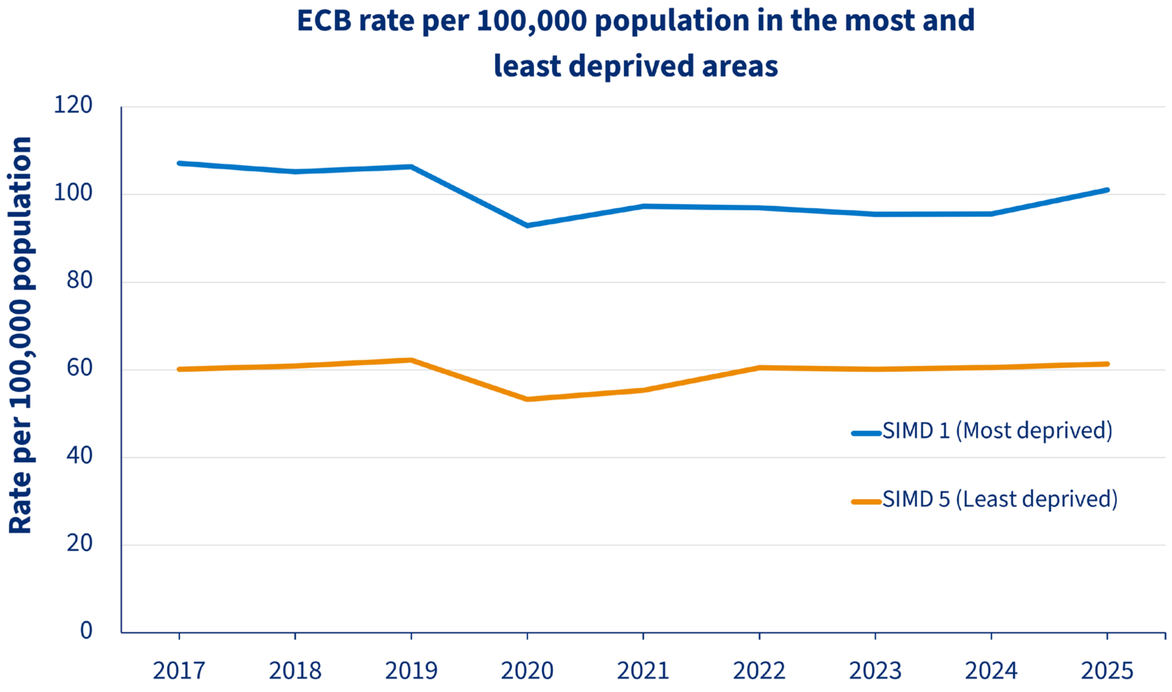


Health inequalities and demographics

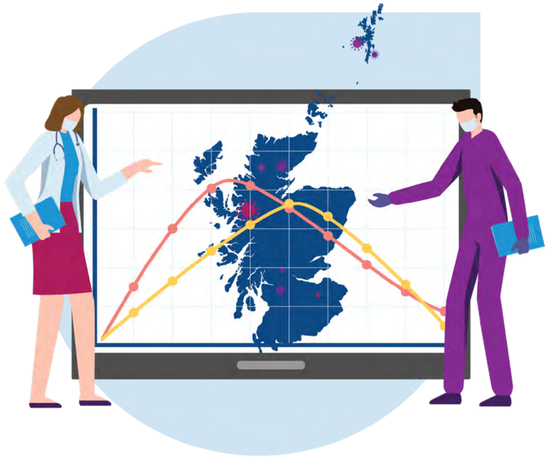
In **2025**, **45.4%** of ECB cases occurred in **people living in the 40% of areas with the highest levels of deprivation** (SIMD 1 and SIMD 2) **in Scotland**. [18]

The **annual incidence rate in 2025** was **higher** in the most deprived areas (**101.0** per 100,000 population) than in the least deprived areas (**61.4** per 100,000 population).



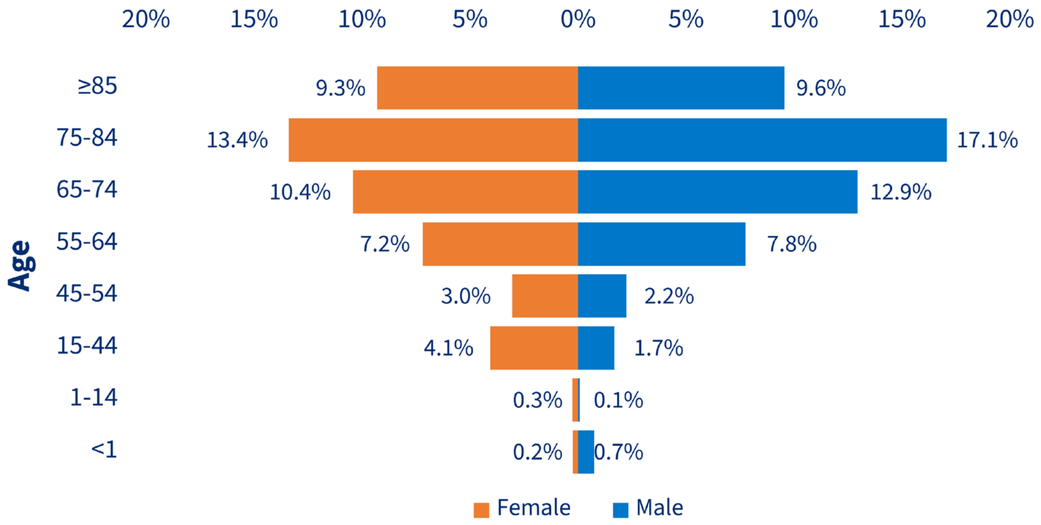


[18] Data for SIMD quintile or Urban/Rural classification were not available for 1.9% of patients in 2025, therefore percentages include total patients for whom these data were available.

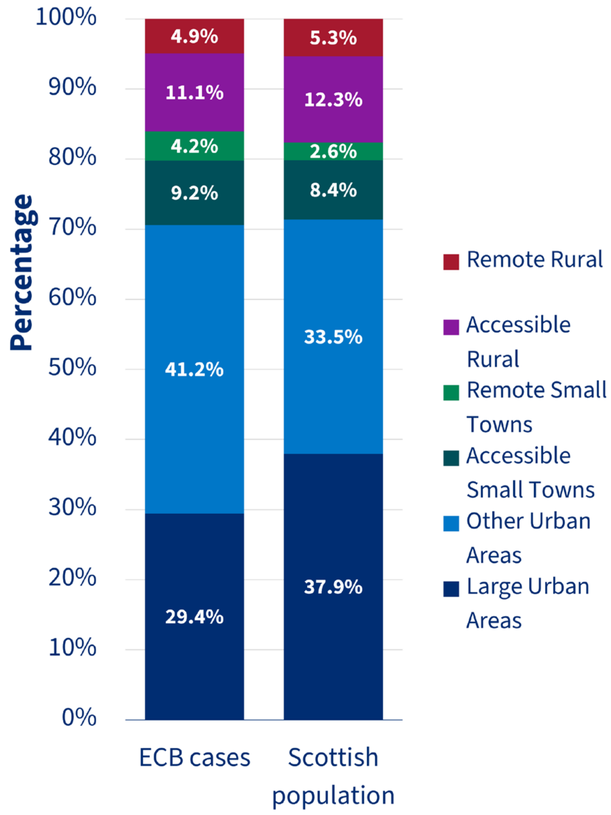


In **2025**, **52.1%** of ECB cases were male and **72.7%** were **aged 65 and over**. The **annual incidence rate in people aged 65 and over** was **293.1** per 100,000 population in 2025. This was **higher** than the annual incidence rate **in those aged 15 to 64** (**33.4** per 100,000 population) and those **aged under 15** (**7.3** per 100,000 population) in 2025.

Age and sex of ECB cases in 2025



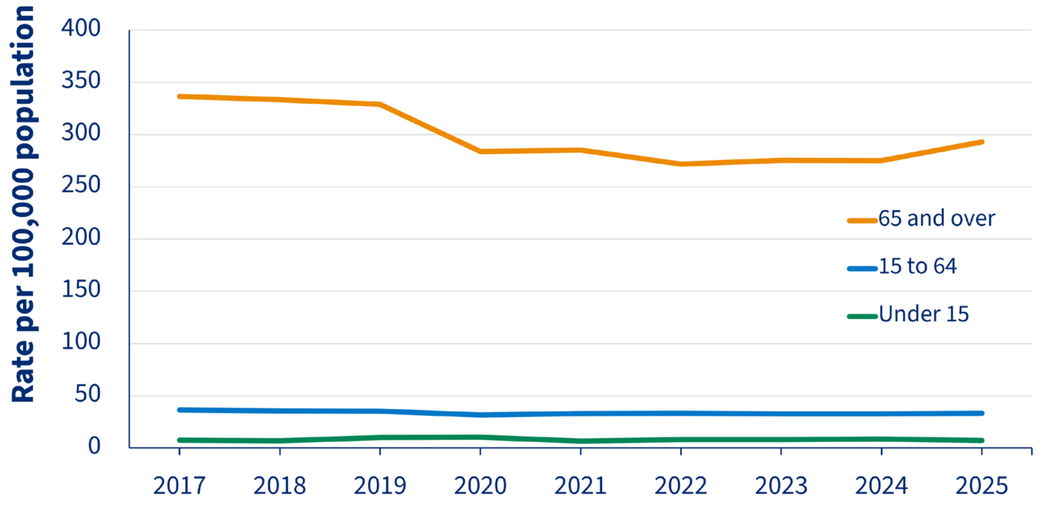
ECB cases in urban and rural areas in 2025



In **2025**, the majority of ECB cases were in people who resided in **large or other urban areas**. **9.1%** of ECB cases lived in **remote areas** in Scotland and **16.0%** in rural areas, compared to **7.9%** and **17.6%** of the Scottish population, respectively. [19]

[19] Data for SIMD quintile or Urban/ Rural classification were not available for 1.9% of patients in 2025, therefore percentages include total patients for whom these data were available.

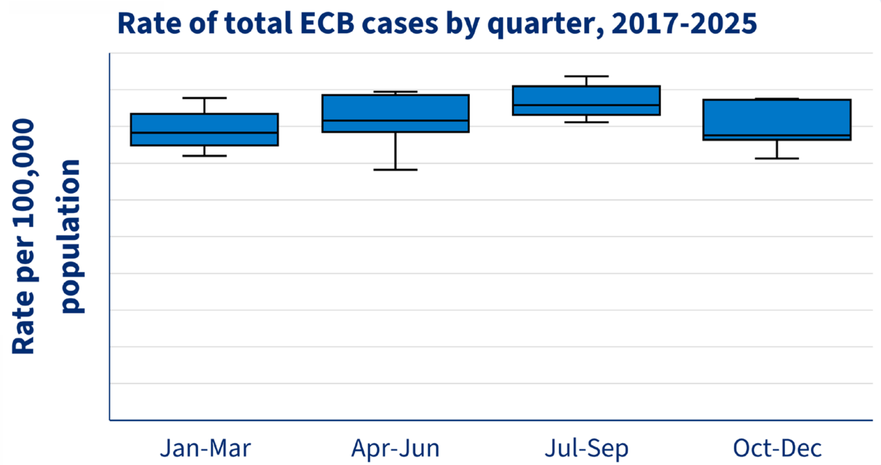
ECB rate per 100,000 population in under 15 years, 15 to 64, and 65 years and over age groups



Seasonality

The incidence rate of ECB demonstrates seasonal variation, with **higher rates** being reported in **July-September** compared to overall annual ECB rates. [20]

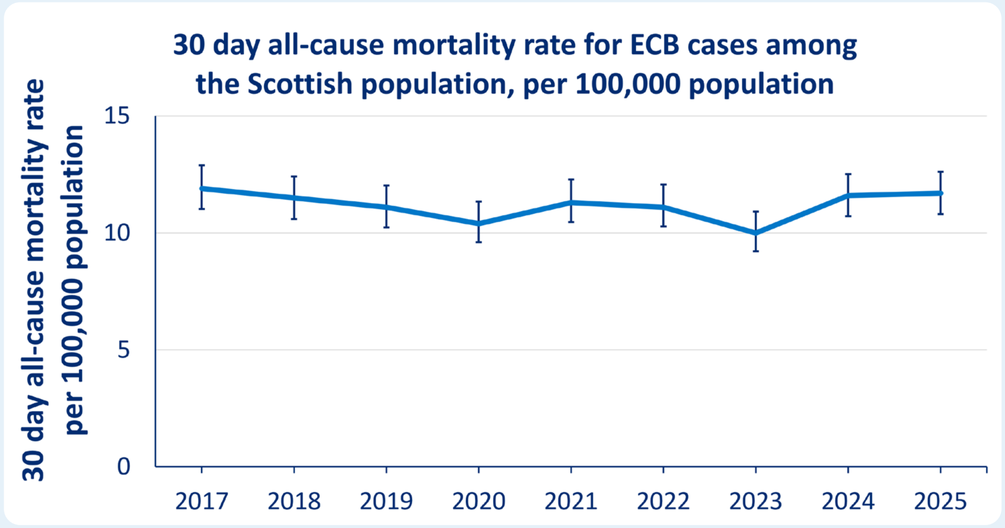
[20] Boxplots show medians, interquartile ranges and minimum and maximum values for each quarter over nine years of data.

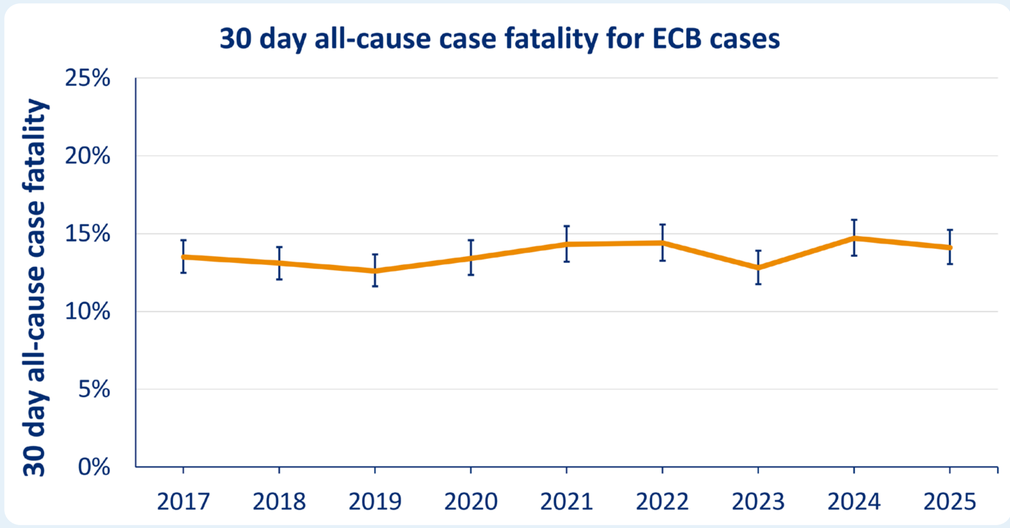


Higher incidence rates of ECB within the summer months highlight the public health importance of hydration. Materials to promote the public health benefits of good hydration are available here.

All-cause mortality rate and case fatality

In **2025**, there were **648 deaths** within 30 days of a confirmed ECB, resulting in a **30 day all-cause mortality rate** of **11.7 per 100,000 population**, compared to **11.6 per 100,000 in 2024**. Amongst ECB cases only, this was a **30 day all-cause case fatality** of **14.1%**. [21]





[21] Data are presented on all-cause mortality, and therefore include deaths that may not be directly attributable to the infections. The ECB mortality rate represents the number of people who died from any cause within 30 days of a confirmed ECB per 100,000 total Scottish population. Case fatality rates represent the percentage of patients with a confirmed ECB that died within 30 days. Case fatality rates are not affected by the incidence of ECB within the population.

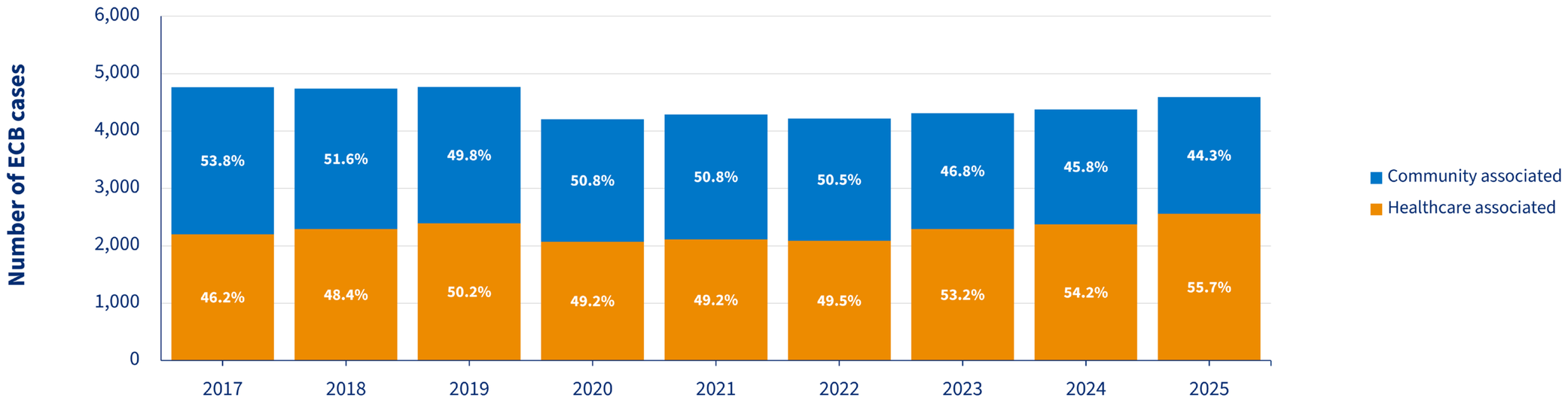
Origin of infection



In **2025**, **55.7%** of ECB cases were **healthcare associated**. [22]

The **percentage** of cases identified as healthcare associated **remained unchanged** between **2024** and **2025**, but was **higher** compared to when surveillance began in **2017** (**46.2%**).

ECB cases by origin of infection



[22] Healthcare associated infections include hospital acquired infections, see metadata for definitions of healthcare and community associated infections. Between 2020 and 2022 NHS boards were only required to report case numbers and origin of infection and were not required to report any additional risk factor data.

Healthcare associated ECB

There were **2,559 cases of healthcare associated ECB** in 2025.

The **annual incidence rate** in 2025 was **41.7** per 100,000 bed days. There has been a **10.1% increase** in the **rate** between **2024** and **2025**.

The rate was **increasing** by **5.6%** each year from **2017** to **2019**, then **decreasing** by **7.2%** each year **from 2020 to 2022**. Since **2023**, there has been an average **increase** of **6.4% each year**.

Hospital acquired ECB

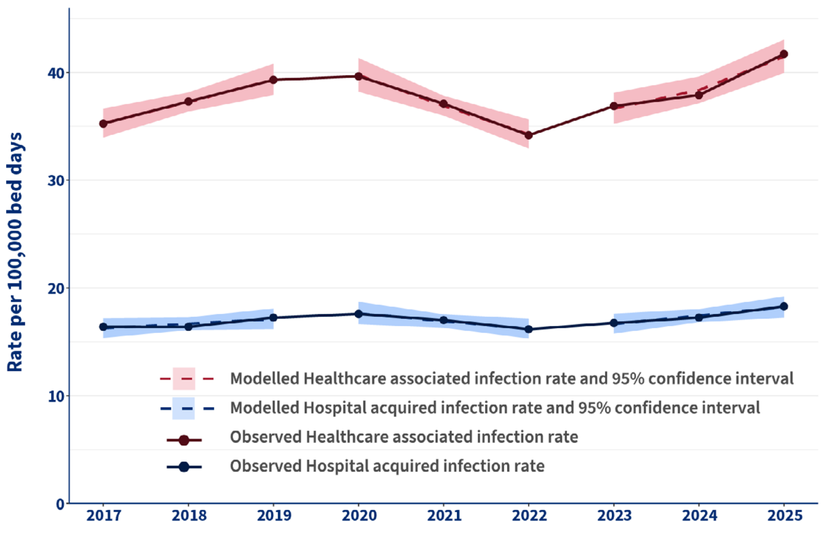
Of the **2,559** healthcare associated ECB cases, **1,122** (**43.8%**) were **hospital acquired infections**.

The **annual incidence rate** in 2025 was **18.3** per 100,000 bed days. The **rate** has **remained unchanged** between **2024** and **2025**.

From **2017** to **2019**, there was **no observed increasing or decreasing trend**. The rate was then **marginally decreasing by 4.2%** on average each year **2020** to **2022**. [23] **Since 2023**, there has been an average **increase** of **4.5% each year**.

[23] Marginal trends are not currently statistically significant (p=0.064). Due to the observed trends in healthcare associated and hospital acquired ECB during this period, the rates were modelled in three separate segments.

Rate of healthcare associated ECB and modelled rate per 100,000 TOBD



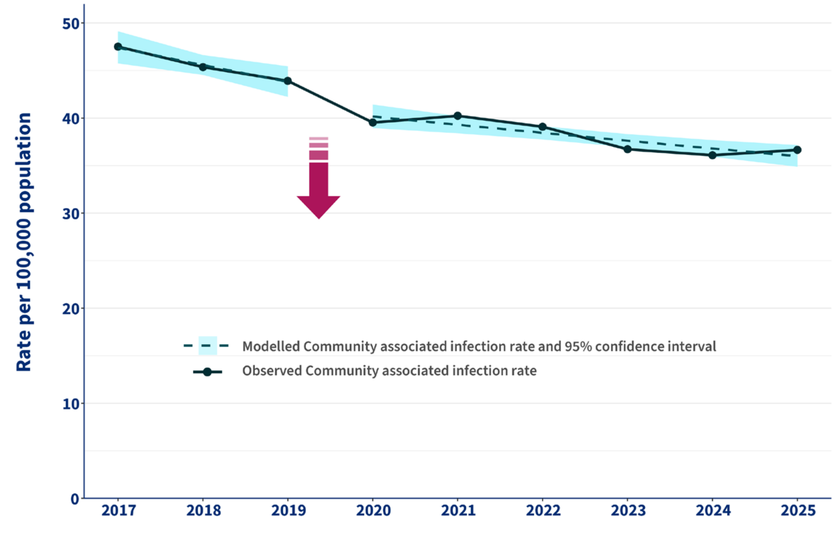
Community associated ECB

There were **2,033** cases of **community associated ECB** in 2025.

The **annual incidence rate** in 2025 was **36.7** per 100,000 population. The rate **remained unchanged** between **2024** and **2025**.

The average rate of community associated ECB was **lower since 2020** compared to **2017 to 2019**. From **2017** to **2019**, the rate **decreased** by **3.9%** on average each year. **Since 2020**, there has been an **average decrease** of **2.2% each year**.

Rate of community associated ECB and modelled rate per 100,000 population



Primary source

Information on primary source can be used by NHS boards to assist in prioritising intervention strategies for patients at risk.

In **2025**, the **primary source** for **healthcare associated ECB** was known for **85.9%** of cases.

Where source was known, the most common primary sources include: [24]

57.0% Urinary Tract Infections (UTI):
- **27.1% Lower UTI**
- **24.3% Catheter Associated UTI (CAUTI)**
- **5.6% Pyelonephritis**

19.1% Hepatobiliary Infection

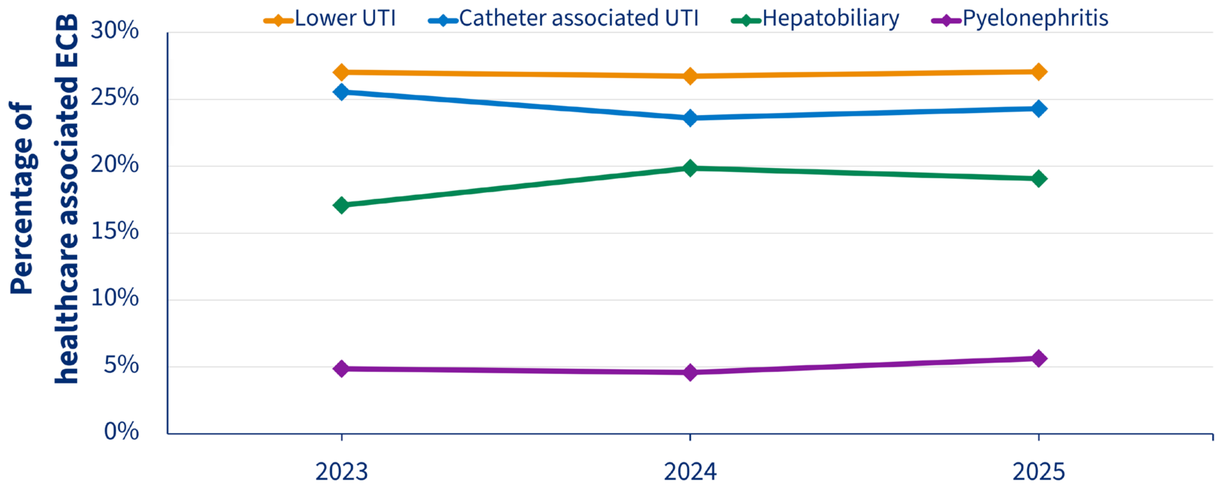
In **2025**, the **primary source** for **community associated ECB** were known for **89.8%** of cases.

Where source was known, the most common primary sources include: [24]

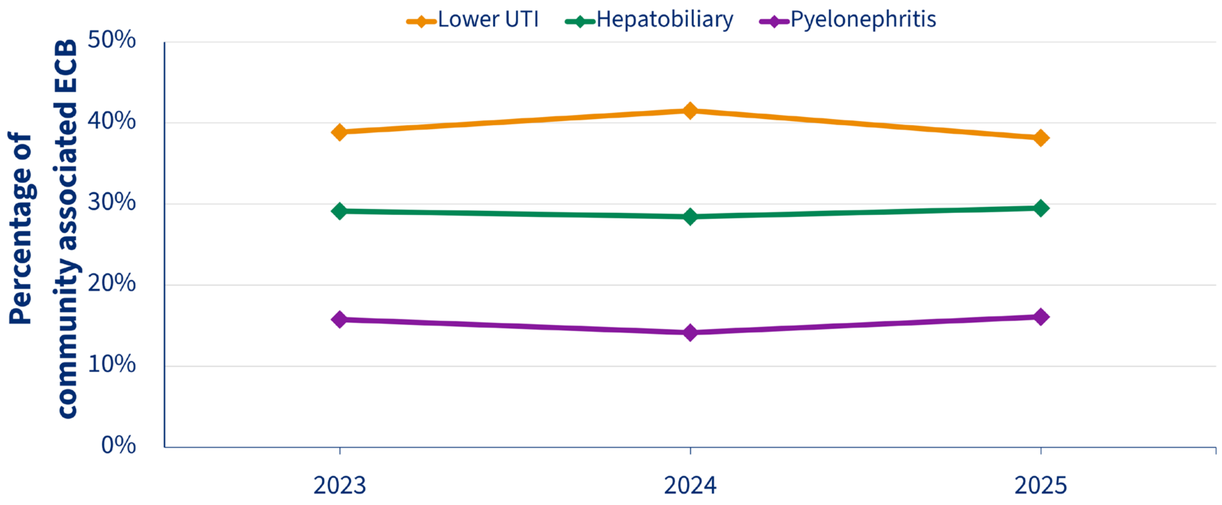
54.2% UTI
- **38.2% Lower UTI**
- **16.1% Pyelonephritis**

29.5% Hepatobiliary Infection

Most common primary sources of ECB in healthcare associated infections with known source



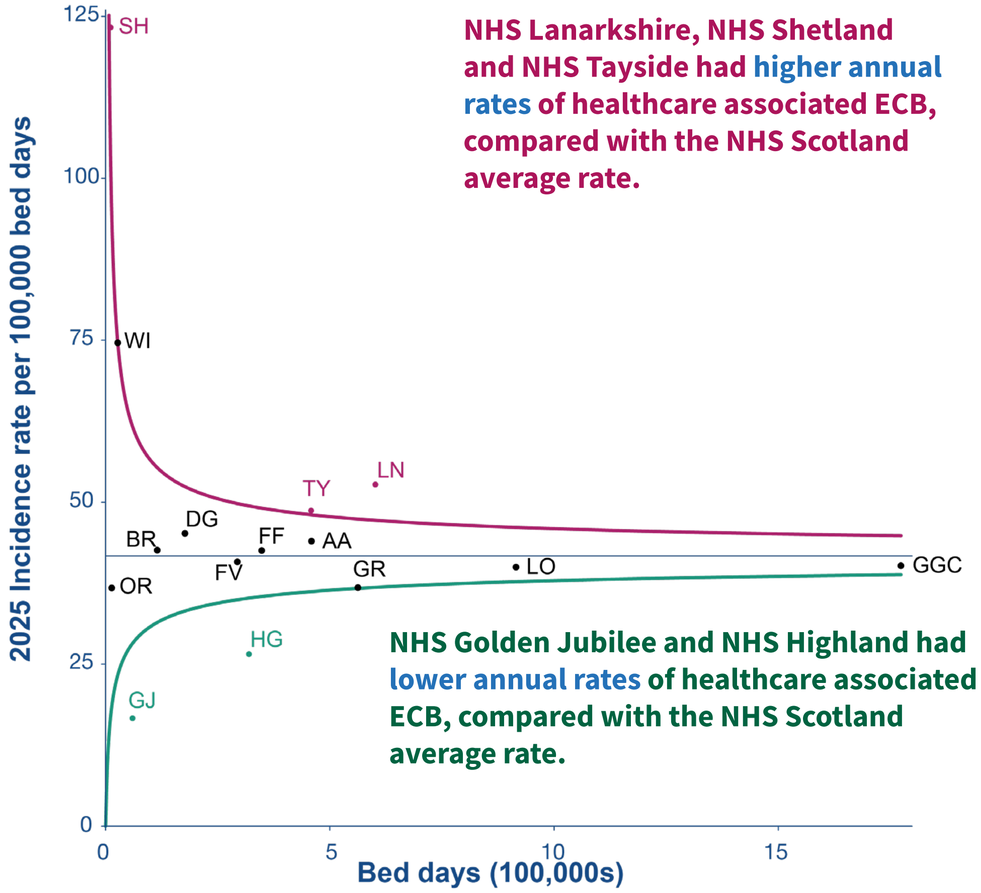
Most common primary sources of ECB in community associated infections with known source



[24] Primary sources as determined by clinical team.

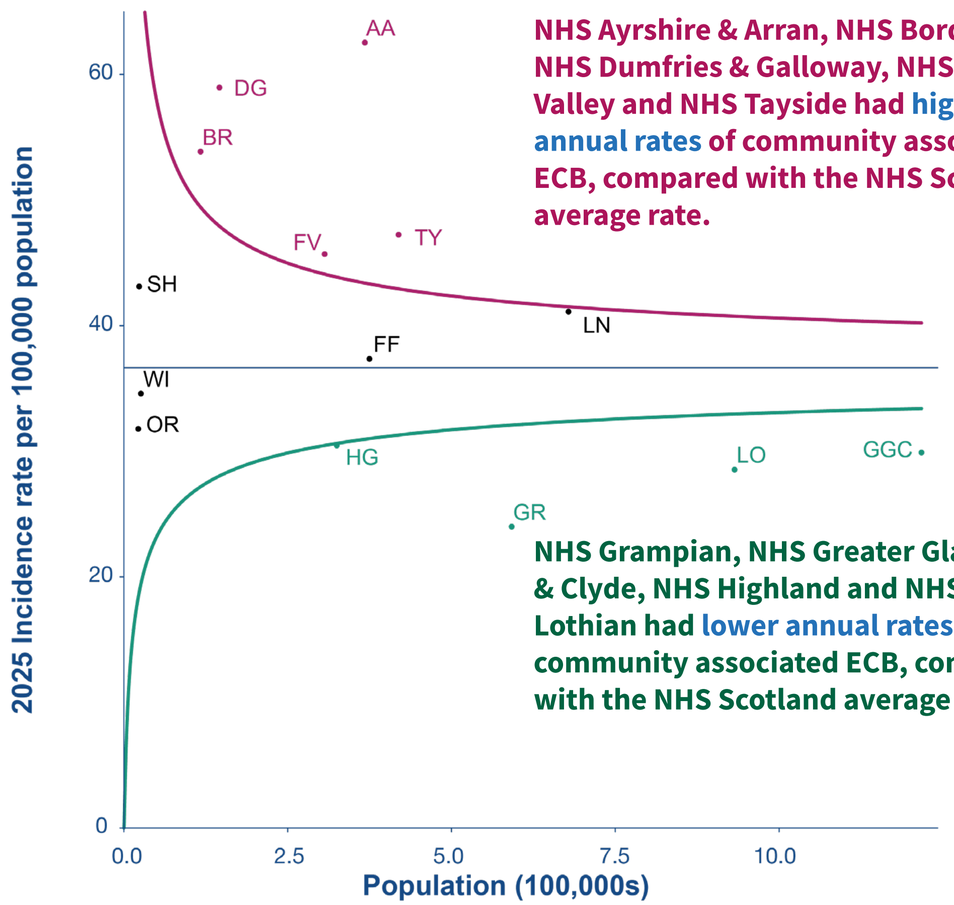
Variation by health board

ARHAI Scotland facilitate monitoring and benchmarking of data by NHS board to support local and national quality improvement initiatives. Annual **funnel plot analysis** can identify NHS boards with rates that are higher or lower than the NHS Scotland **annual rate**. [25]



NHS Lanarkshire, NHS Shetland and NHS Tayside had higher annual rates of healthcare associated ECB, compared with the NHS Scotland average rate.

NHS Golden Jubilee and NHS Highland had lower annual rates of healthcare associated ECB, compared with the NHS Scotland average rate.



NHS Ayrshire & Arran, NHS Borders, NHS Dumfries & Galloway, NHS Forth Valley and NHS Tayside had higher annual rates of community associated ECB, compared with the NHS Scotland average rate.

NHS Grampian, NHS Greater Glasgow & Clyde, NHS Highland and NHS Lothian had lower annual rates of community associated ECB, compared with the NHS Scotland average rate.

[25] NHS board rates are not adjusted for differences in the patient population (i.e. demographic differences between Health Boards).

Quarterly Data Exceedance Reporting

NHS boards are required to submit improvement plans in response to **higher than average quarterly rates** of **healthcare or community associated ECB**, as identified through the exception reporting process.

Three improvement plans were developed by **NHS boards** during **2025** in response to **higher than average quarterly rates** of **healthcare associated ECB** and **eight improvement plans** were developed in response to **higher than average quarterly rates** of **community associated ECB**.

In response to a national increase in the incidence of ECB in Scotland, ARHAI Scotland supported stakeholders by providing a situation report and recommendations to raise awareness and direct stakeholders to existing guidance and resources.

For further information please see the quarterly epidemiological reports.

Further information on the burden of *E. coli* and other Gram-negative organisms in Scotland, will be published in the annual SONAAR report. More information on all data sources and methods is available in the metadata.



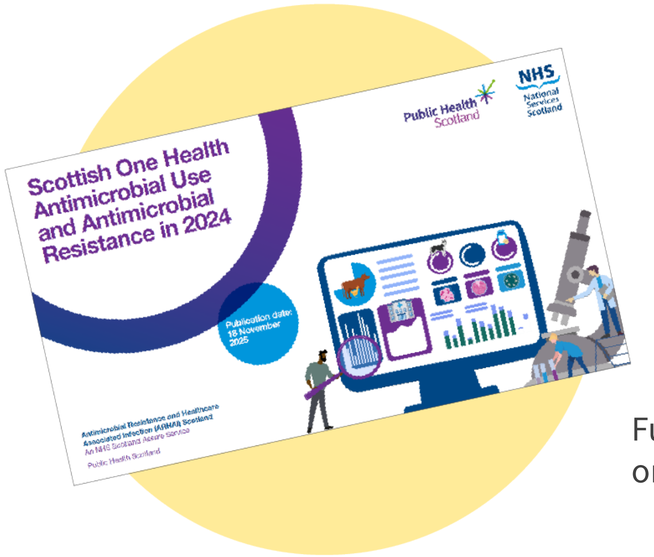
Carbapenemase-producing Enterobacterales

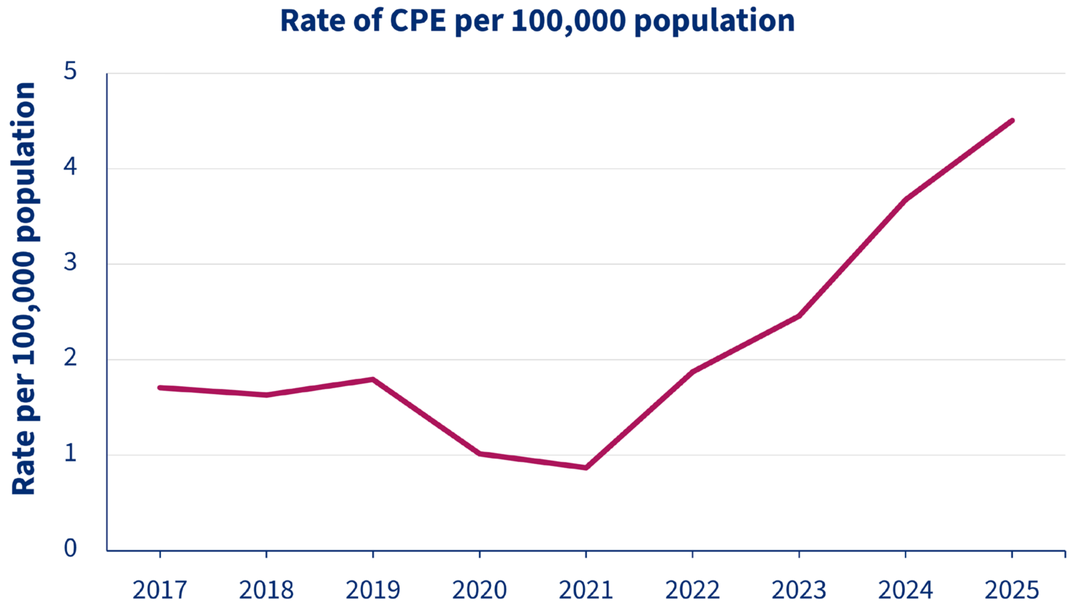
In **2025**, there were **250** cases of **carbapenemase-producing Enterobacterales (CPE) reported** in Scotland, compared to **204** in **2024**.

The **annual incidence rate** of **CPE** was **4.5 per 100,000 population**. There has been a **22.6% increase** in the **rate** between **2024** and **2025**.

Since 2021, there has been an average **increase of 42.9%** each year. [26]

62.0% of CPE cases reported in 2025 were in **females** and **45.6%** in those aged **65 and over**.





[26] CPE incidence is influenced by a number of external factors including changes in local screening practices and travel, therefore rates may not be comparable over time. The COVID-19 pandemic, including international travel restrictions, may have influenced incidence in 2020 - 2022.

Further detail on antimicrobial use and antimicrobial resistance, including carbapenemase-producing organisms and CPE enzymes, will be published in the annual SONAAR report.

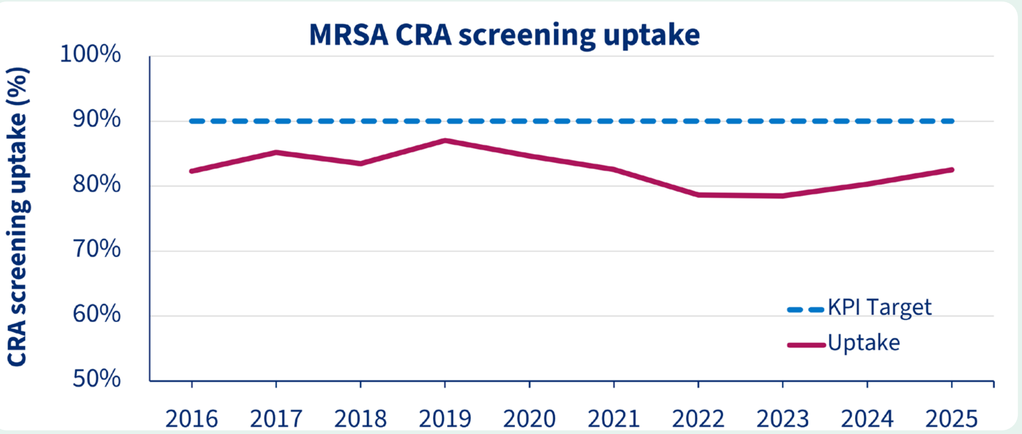
Multi-drug resistant organism (MDRO) admission screening

Education and training materials are available on **TURAS** to support NHS staff in carrying out the two-step admission screening process.

MRSA CRA screening

In **2025**, **82.5%** of patients audited underwent a **clinical risk assessment (CRA)** for **meticillin-resistant *Staphylococcus aureus* (MRSA)**.

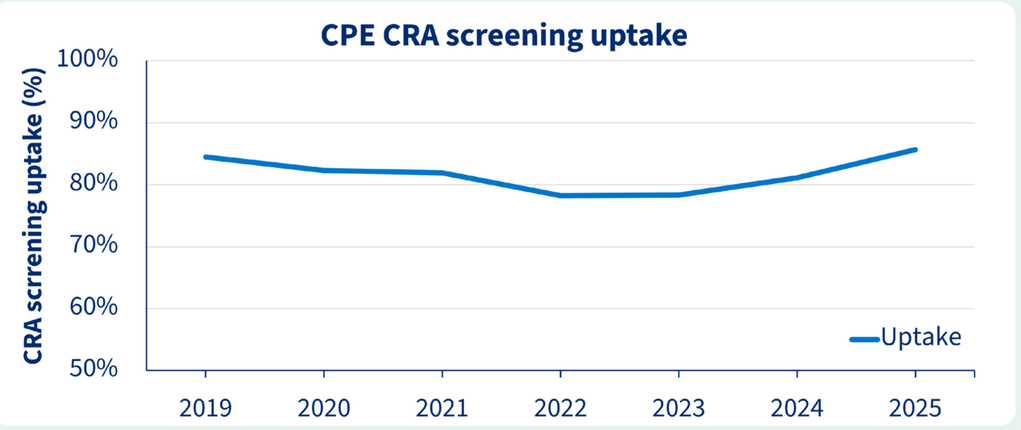
Uptake of screening has **increased in 2025 compared to 2024** (**where uptake was 80.3%**). However, the **2025** level **remains below** the **90%** Key Performance Indicator (KPI) target.



CPE CRA screening

In **2025**, **85.7%** of patients audited underwent a **CRA** for **carbapenemase-producing Enterobacterales (CPE)**.

Uptake of CPE screening **increased** in **2025** compared to **2024** (where uptake was **81.1%**).





Screening on admission to hospital is key for early identification and management of patients at high risk of carrying MDRO, reducing onwards transmission in healthcare settings.

Incidents and outbreaks

ARHAI Scotland supports local Infection Prevention and Control (IPC) Teams and Health Protection Teams (HPTs) across Scotland in the prevention, preparedness, and management of infection related incidents and outbreaks within health and social care settings. This support is delivered through the provision of IPC guidance, educational resources and interactive dashboards. In addition, ARHAI Scotland monitors data on incidents and outbreaks and reported by NHS boards at a national level.

In collaboration with key stakeholders, work to revise the HIIAT format continues. This aims to reduce potential variation in the assessment criteria, introduce a more structured risk assessment approach and ensure consistent reporting across Scotland.

IPC teams and HPTs identify incidents and outbreaks associated with healthcare, including decontamination incidents and near misses, in line with Chapter 3 of the National Infection Prevention and Control Manual (NIPCM). These events are assessed using the Healthcare Infection Incident Assessment Tool (HIIAT) and categorised as Red, Amber or Green based on factors such as severity of illness, impact on services, risk of transmission and anticipated public anxiety. HIIAT assessed incidents and outbreaks are reported to ARHAI Scotland through the Outbreak Reporting Tool (ORT). The ORT facilitates the collation of epidemiological data and lessons learned which contribute to the development of national guidance and help inform local incident and outbreak management.



In **2025**, there were **166 healthcare infection incidents** and **outbreaks** reported to ARHAI Scotland (excluding those where COVID-19, influenza, respiratory syncytial virus (RSV), or norovirus was the sole pathogen as these are reported separately), with HIIATs categorised as **Red**, **Amber** or **Green**.

Of these 166 reports, there were:

15 Red	14 Amber	137 Green

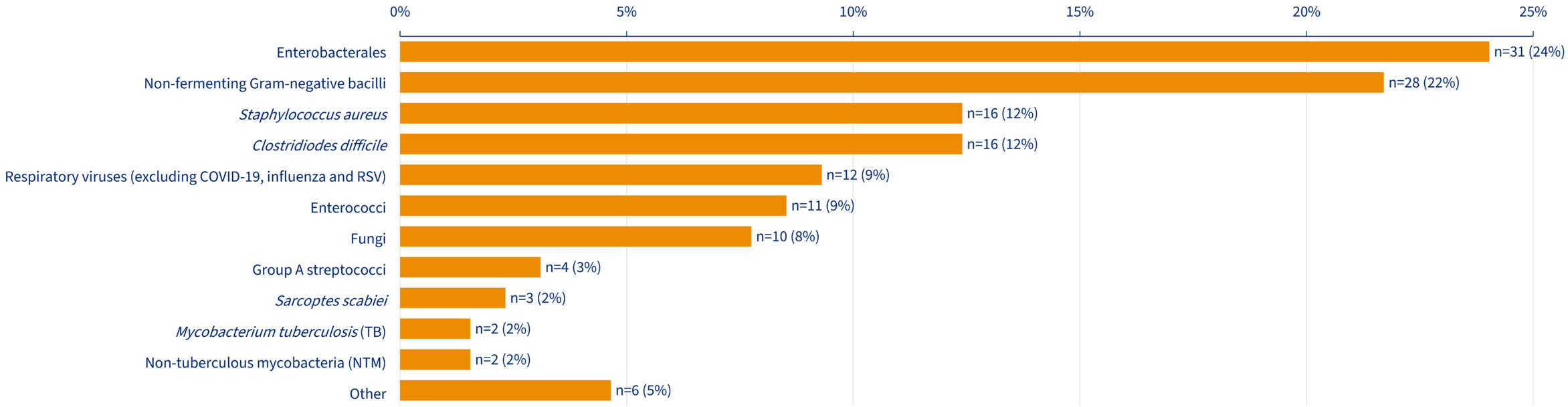
Of the **166 incidents and outbreaks**, **131** were **reported with one or more confirmed patient cases**.

38 involved a single confirmed patient case.

13 involved two or more organisms.

There were 32 decontamination, environmental or near miss incidents reported with no patient cases.

Distribution of organism categories for incidents and outbreaks with one or more confirmed patient cases and one or more reported organisms (n=129), 2025 [27]



[27] Other includes other viruses (excluding COVID-19, influenza, RSV and norovirus) and other Gram-positive bacteria. Some incidents included multiple organisms therefore total percentages do not add up to 100%.

During 2025, **28 incidents and outbreaks** reported by NHS Scotland boards via the ORT **requested ARHAI Scotland support in attending Incident Management Teams (IMTs)**. This was in addition to varying levels of formal and informal support provided to NHS boards throughout this period in relation to outbreak reporting and incident management.

Incidents and outbreaks associated with UK Health Security Agency (UKHSA) incidents

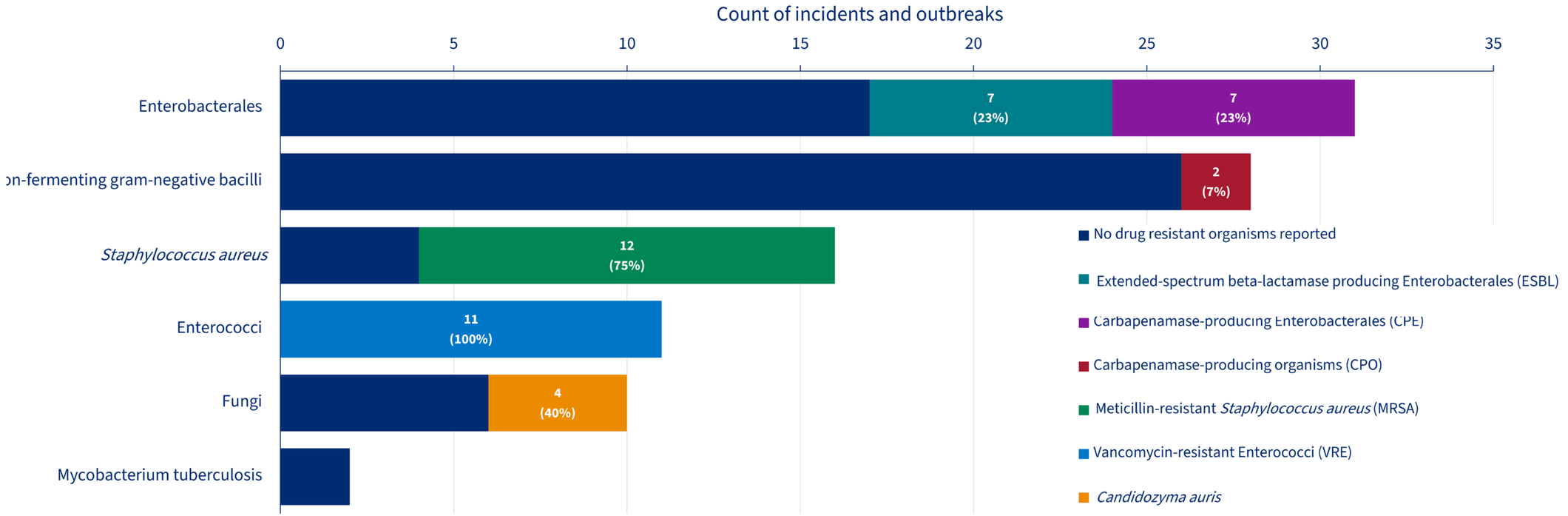
During 2025 ARHAI Scotland were members of a UK Health Security Agency led Incident Management Team investigating an outbreak of *Burkholderia stabilis* ST480 linked to non-sterile alcohol-free skin cleansing wipe products. This incident spanned a period of several years with four Scottish cases identified in 2020 to 2021.

Incidents such as this highlight the importance of reporting such organisms to enable detection of outbreaks linked to products which may span more than one health board or geographical area.

Incidents and outbreaks involving multi-drug resistant organisms

NHS boards notify ARHAI Scotland if incidents and outbreaks involve multi-drug-resistant organisms (MDRO).

Incidents and outbreaks with one or more confirmed patient cases involving key MDRO, as a percentage of organism category, 2025 [28]



[28] Organisms reported as CPE are not counted as ESBL-E separately.

Key respiratory virus incidents and outbreaks

In **2025**, there were **552** COVID-19, influenza and RSV healthcare infection incidents and outbreaks reported to ARHAI Scotland, with HIIATs categorised as Red, Amber or Green.

Of these 552 reports, there were:

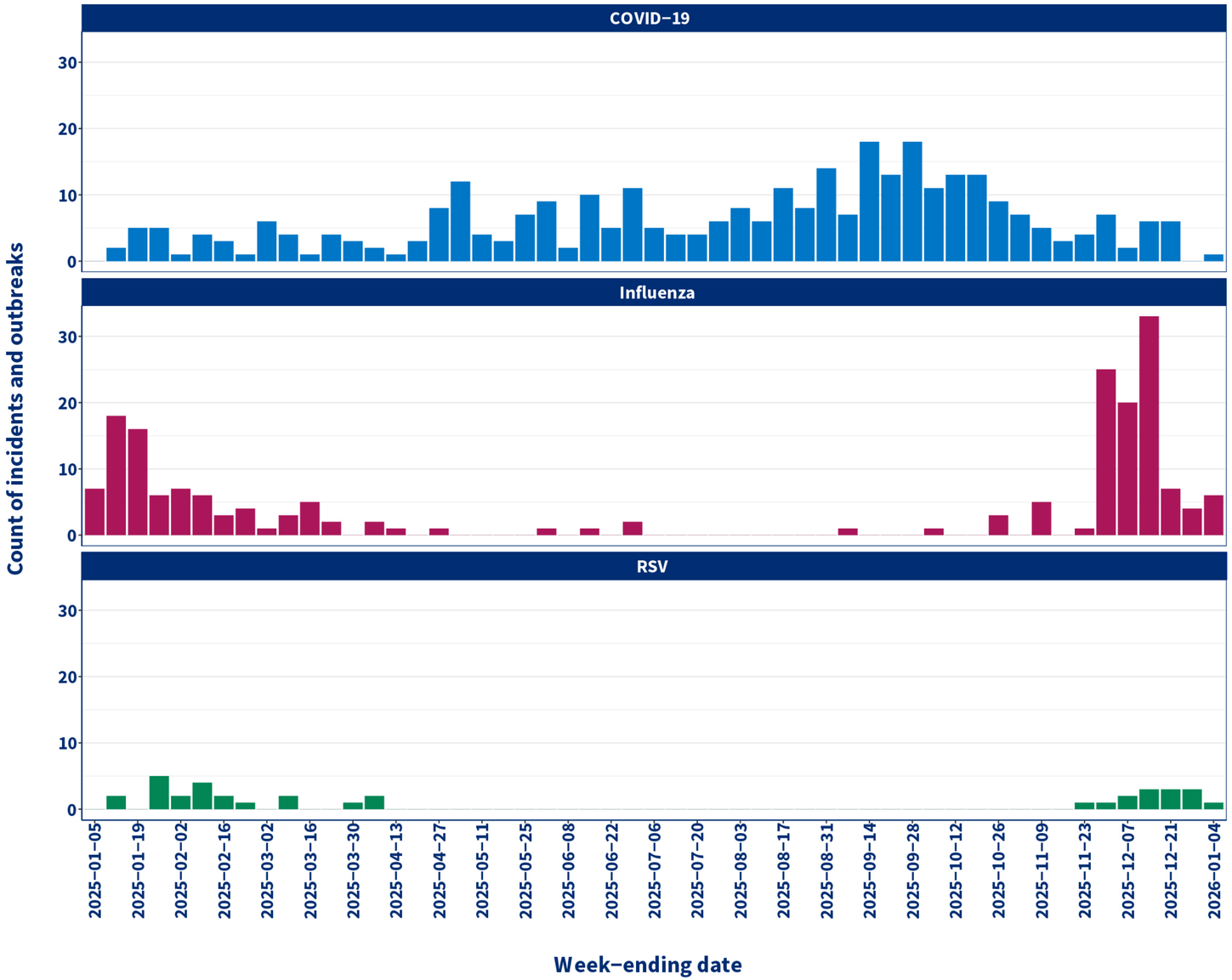
53 Red	85 Amber	414 Green

Of the **552** key respiratory virus incidents and outbreaks:

- **325 were COVID-19**
- **192 were influenza**
- **35 were RSV**

In 2025, NHS boards used the new ORT respiratory short form minimum dataset to report the majority of incidents or outbreaks involving COVID-19, influenza or RSV only, where IPC measures were aligned with the checklist and ARHAI support was not requested. A small number were reported using the Healthcare Infection Incident and Outbreak Reporting Template (HIIORT) form.

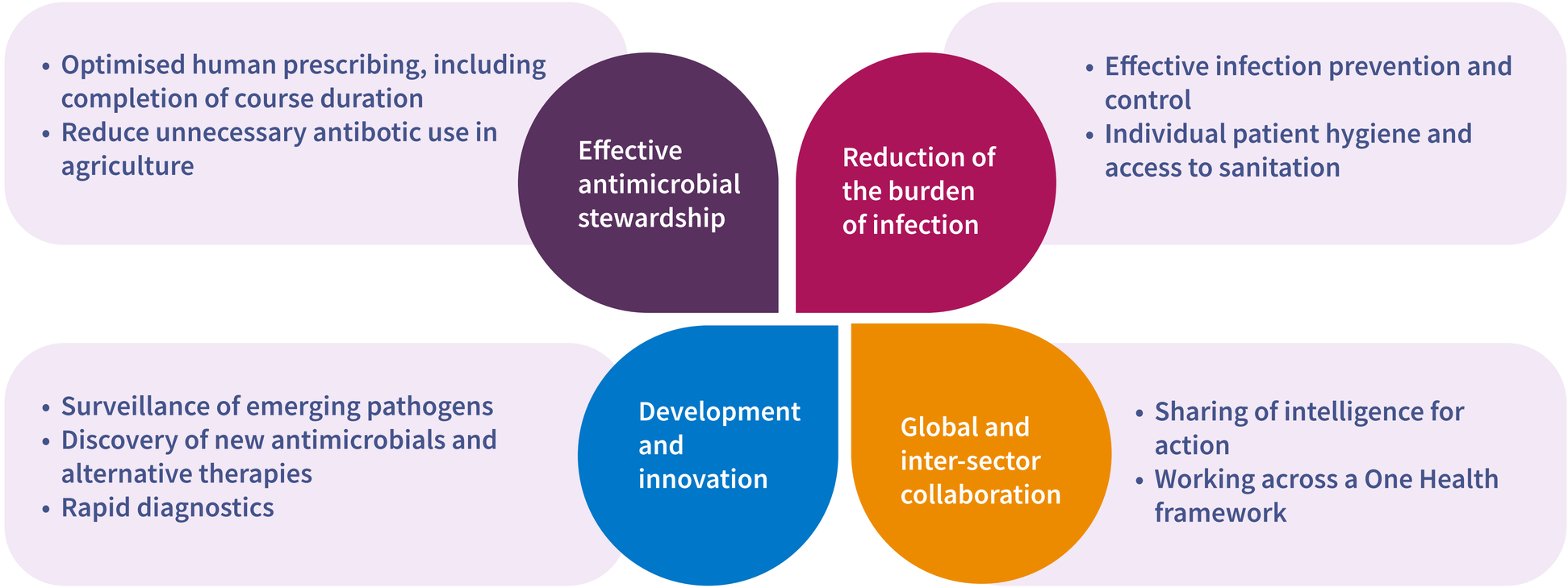
Weekly count of key respiratory virus incidents and outbreaks reported to ARHAI Scotland



Antimicrobial use and antimicrobial resistance

Antimicrobial resistance (AMR) occurs when microorganisms, including bacteria and fungi, evolve to withstand the effects of antimicrobial treatments. As a result of rising rates of AMR, infections are becoming increasingly difficult to treat, raising the risks associated with routine and complex healthcare interventions such as surgery, cancer therapy, and organ transplantation. The World Health Organization (WHO) recognises AMR as one of the most significant and sustained threats to patient safety, health system sustainability, socio-economic development, and global public health.

Mitigation of the Risks of Antimicrobial Resistance can be achieved through:



ARHAI Scotland's role in tackling AMR

Addressing the threat of AMR requires a coordinated, multisectoral, One Health approach which supports integrated action across sectors to reduce the emergence and spread of resistance and preserve the effectiveness of antimicrobials.

Supporting the UK National Action Plan (2024-2029): Confronting Antimicrobial Resistance

ARHAI Scotland plays a central role in supporting Scotland's contribution to the UK AMR NAP 2024-2029 and the longer-term UK AMR 20-year vision to 2040. To support delivery of the UK AMR NAP 2024-2029, ARHAI Scotland contributed to the new national antibiotic indicators for primary care, secondary care and dental prescribing. ARHAI Scotland monitor progress towards these indicators through national surveillance and reporting and provide data and intelligence to support local action by health boards.

ARHAI Scotland leads on healthcare associated infection prevention and control (IPC), surveillance and early warning of AMR in healthcare settings, and antimicrobial stewardship, the latter in collaboration with the Scottish Antimicrobial Prescribing Group (SAPG). These functions are delivered in an integrated way, focusing on core areas of action, including:

- IPC through national standards and guidance
- Surveillance and early warning systems to detect emerging threats
- Antimicrobial stewardship to optimise prescribing and reduce unnecessary antimicrobial use (AMU)

ARHAI Scotland's 2025 achievements in tackling AMR

ARHAI Scotland continue to publish data and intelligence on trends in AMU and AMR in Scotland jointly with Public Health Scotland (PHS) in the annual Scottish One Health Antimicrobial Use and Antimicrobial Resistance (SONAAR) report, providing a One Health overview across human, animal, and environmental sectors.



Through SONAAR, we continue to strengthen our understanding of AMU in humans, and AMR in humans, animals and the environment.
This is achieved through the provision of data to generate actionable intelligence to support clinical and public health decision-making, underpinned by the One Health framework.

Findings include the stratification of data by health inequality measures, including age, sex, deprivation, and geography, essential to improve insights into health inequalities, inequitable AMR burden, and variation in prescribing.

ARHAI Scotland's other key achievements for 2025 include:

- Continuing to strengthen surveillance systems to support early detection and response to AMR threats across healthcare settings through enhanced reporting, data analysis, and surveillance outputs to provide timely and robust intelligence.
- Monitoring of emerging resistance in microorganisms, such as carbapenemase-producing organisms (CPO), *Candidozyma auris*, and Vancomycin resistance Enterococci (VRE), in addition to other unusual antimicrobial resistance phenotypes (AMRP), through the AMR Early Warning System.
- Quarterly reporting to diagnostic laboratories on unusual AMRP and emerging threats identified through the AMR Early Warning System.
- Contributions to national clinical networks, including the Scottish Microbiology and Virology Forum (SMVF) and Scottish Antimicrobial Prescribing Group (SAPG).
- Routine prescribing intelligence shared with NHS boards, GP practices, and SAPG.

List of abbreviations

Acronym	Definition
A&E	Accident and Emergency
AGP	Aerosol generating procedures
AMR	Antimicrobial resistance
AMRP	Antimicrobial resistance phenotypes
AMU	Antimicrobial use
ARHAI	Antimicrobial Resistance and Healthcare Associated Infections
ARI	Acute respiratory infections
BMT	Bone Marrow Transplant
CA	Clinical Assurance
CAUTI	Catheter associated urinary tract infection
C. difficile	*Clostridioides difficile*
CDC	Centers for Disease Control and Prevention
CDI	*Clostridioides difficile* Infection
CfSD	Centre of Sustainable Delivery
CHIPC	Care Home Infection Prevention and Control
CHIPCM	Care Home Infection Prevention and Control Manual
CJF	Considered Judgement Form
COVID-19	Coronavirus disease 2019
CPE	Carbapenemase-producing Enterobacterales
CPO	Carbapenemase-producing organisms
CRA	Clinical Risk Assessment
CRIPC	Construction & Refurbishment & Infection Prevention and Control
DL	Directors Letter
EBIS	Enteric Bacterial Infections Service
E. coli	*Escherichia coli*
ECB	*Escherichia coli* Bacteraemia
ECOSS	Electronic Communication of Surveillance in Scotland

Acronym	Definition
edf	Effective degrees of freedom
ESBL-E	Extended beta-lactamase producing Enterobacterales
FPGDG	Future Pandemic Guidance Development Group
GAM	Generalised Additive Model
GCU	Glasgow Caledonian University
GI	Gastro-intestinal
GLM	Generalised Linear Model
GPP	Good practice points
HAI	Hospital Acquired Infection
HBE	healthcare-built environment
HCAI	Healthcare Associated Infection
HCID	High consequence infectious disease
HCW	health and care workers
HICPAC	Healthcare Infection Control Practices Advisory Committee
HIIAT	Healthcare Infection Incident Assessment Tool
HIIORT	Healthcare Infection, Incident and Outbreak Reporting Template
HPT	Health Protection Team
ICBED	Infection Control in the Built Environment and Decontamination
IMT	Incident Management Team
IPC	Infection Prevention and Control
ISD	Information Services Division
KPI	Key Performance Indicator
KSAR	Key Stage Assurance Review
MDRO	Mult-drug resistant organisms
MLST	Multi-locus sequence typing
MRSA	Meticillin-resistant *Staphylococcus aureus*
MSSA	Meticillin-sensitive *Staphylococcus aureus*
NAP	National Action Plan
NDAP	National Design Assessment Process

Acronym	Definition
NES	NHS Education for Scotland
NHS	National Health Service
NIPCM	National Infection Prevention and Control Manual
NPGE	National Policies Guidance and Evidence
NRS	National Records of Scotland
NSAIS	National Secure Adolescent Inpatient Services
NSS	National Services Scotland
OBC	Outline Business Case
ORT	Outbreak Reporting Tool
PCP	*Pneumocystis Pneumonia*
PCR	Polymerase Chain Reaction
PDG	Perioperative Delivery Group
PHS	Public Health Scotland
PPE	Personal protective equipment
PSD Scotland	Public Services Delivery Scotland
PWID	People Who Inject Drugs
RPE	Respiratory Protective Equipment
RSV	Respiratory syncytial virus
RT	Ribotype
S. aureus	*Staphylococcus aureus*
SAB	*Staphylococcus aureus* Bacteraemia
SAMRS	Scottish Antimicrobial Resistance Service
SAPG	Scottish Antimicrobial Prescribing Group
SHTN	Scottish Health Technical Note
SICP	Standard Infection Control Precautions
SICSAG	Scottish Intensive Care Society Audit Group
SIMD	Scottish Index of Multiple Deprivation
SIPCEP	Scottish Infection Prevention and Control Education Pathway
SLW	Short Life Working Group
SMiRL	Scottish Microbiology Reference Laboratories

Acronym	Definition
SMR	Scottish Morbidity Records
SMVF	Scottish Microbiology and Virology Forum
SONAAR	Scottish One Health Antimicrobial Use and Antimicrobial Resistance
SSI	Surgical Site Infection
TBP	Transmission Based Precautions
TOBD	Total Occupied Bed Days
UK	United Kingdom
UKHSA	United Kingdom Health Security Agency
UTI	Urinary tract infection
VAD	Vascular Access Device
VRE	Vancomycin-resistant Enterococci
WGS	Whole Genome Sequencing
WHO	World Health Organization

Appendix 1 - Background Information

Description of Revision	First report revision applied	Report section(s) revision applies to	Rationale for revision
Addition of healthcare/ community case assignment.	Quarterly publication October 2017	CDI/ECB/SAB	An increasing awareness of those infections occurring in community settings warranted measurement of incidence rates by healthcare setting (healthcare settings vs. community settings) to enable interventions to be targeted to the relevant settings.
Use of standardised denominator data for CDI/ECB/SAB.	Quarterly publication October 2017	CDI/ECB/SAB	The 'total occupied bed days' data will be extracted from the ISD(S)1 data collection which contains aggregated information on acute and non-acute bed days including geriatric medicine and long-term stays in real-time. The standardisation of denominator data across the three surveillance programmes could result in slightly less accurate denominators due to inclusion of persons in the denominator who are at slightly lower risk of infection. However, in surveillance programmes developed for the purpose of preventing infection and driving quality improvement in care, consistency of the denominators over time tends to be more important than getting a very precise estimate of the population at risk, as the primary aim is to reduce infection to a lower incidence relative to what it was at the initial time of benchmarking.
Reporting of CDI cases aged 15 years and above only.	Quarterly publication October 2017	CDI	Current Scottish Government Local Delivery Plan (LDP) Standards are based on the incidence rate in cases aged 15 years and above, therefore the report has been aligned to reflect this. ARHAI will continue to monitor CDI incidence rates in the separate age groups (15-64 years and 65 years and above).

Description of Revision	First report revision applied	Report section(s) revision applies to	Rationale for revision
Name change for Clostridium difficile to Clostridioides difficile.	Quarterly publication October 2018	CDI	A novel genus *Clostridioides* has been proposed for *Clostridium difficile* which will now be known as *Clostridioides difficile*. There are no implications with regards to the natural history of infection, infection prevention and control, or clinical treatment.
Changes to data collection in response to COVID-19.	Quarterly publication July 2020	CDI/ECB/SAB/SSI	A CNO letter sent 25th March 2020 asked NHS boards to continue to report case numbers and origin of infection data but they would not be required to report risk factor data as would normally be expected under enhanced/extended surveillance for *Staphylococcus aureus* bacteraemia (SAB), *Escherichia coli* bacteraemia (ECB) and *Clostridioides difficile* infection (CDI). All mandatory and voluntary Surgical Site Infection (SSI) surveillance was paused until further notice.
Change from Health Protection Scotland to ARHAI Scotland.	Quarterly publication October 2020	Whole report	In April 2020, as part of launch of Public Health Scotland, the ARHAI Group within Health Protection Scotland (HPS) became ARHAI Scotland and remained within National Services Scotland. ARHAI Scotland will continue to support NHS boards in the prevention and control of healthcare associated infections. The report was updated to reflect this branding change.
Change from National Waiting Times Centre (NWTC) to NHS Golden Jubilee (GJ).	Quarterly publication January 2021	All sections	Labelling updated.
Recommencement of mandatory surveillance following COVID-19 response.	Quarterly publication April 2023	CDI/ECB/SAB/SSI	As part of a return to pre-pandemic surveillance, for data collected from October 2022 onwards enhanced/extended surveillance for *Escherichia coli* bacteraemia (ECB) and *Staphylococcus aureus* bacteraemia (SAB) has been reinstated. Mandatory surveillance of enhanced fields including source of infection/entry point and risk factors as appropriate has resumed in line with the bacteraemia surveillance protocol. Previously, for data collected from 25 March 2020 onwards, only origin of infection was mandatory for ECB and SAB surveillance.

Description of Revision	First report revision applied	Report section(s) revision applies to	Rationale for revision
Update to CDI surveillance protocol	Quarterly publication September 2024	CDI	This protocol update should not have any impact on current CDI surveillance activities but has been updated to better reflect the current data handling methodologies as well as updating links to relevant documents.
Update to CDI snapshot surveillance protocol	Quarterly publication September 2024	CDI	This protocol update reflected changes in laboratory reporting criteria and links to relevant documents were updated throughout.
Update to reporting methodology of respiratory incidents and outbreaks.	Annual publication 2025	Respiratory Incidents and Outbreaks	During 2024 and 2025, NHS boards have been using the Respiratory Short Form minimum dataset to report incidents/outbreaks from key respiratory viruses (COVID-19, influenza and respiratory syncytial virus (RSV) only, where IPC measures align with checklist and NIPCM and ARHAI support was not requested. The respiratory short form was established as an alternative to the Healthcare Infection Incident and Outbreak Reporting Template (HIIORT). This contains fewer fields than the HIIORT form and was deemed especially useful in the winter months where healthcare delivery experiences additional pressures. The respiratory short forms were only used where it was appropriate to do so i.e. where infection prevention and control (IPC) measures were aligned with the IPC checklist and where ARHAI Scotland support was not requested by local IPC teams. Incidents which require additional support continue to be reported via the HIIORT form similarly to non-respiratory incidents and outbreaks.

Description of Revision	First report revision applied	Report section(s) revision applies to	Rationale for revision
Update to branding	Annual publication 2025	Whole report	The branding in this report has been updated in line with the current organisational arrangements of ARHAI Scotland as an NHS Scotland Assure service.
Change from NHS National Services Scotland	Annual publication 2025	Whole report	In April 2026, NHS National Services Scotland and NHS Education for Scotland formed a single national organisation, Public Services Delivery Scotland. ARHAI Scotland continues as an NHS Scotland Assure service, which now sits within Public Services Delivery Scotland. ARHAI Scotland will continue to support NHS boards in the prevention and control of healthcare associated infections.

Appendix 2 – Publication metadata

Publication title

ARHAI Scotland 2025 Annual Report

Description

This release provides information on activity within Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland for the period January to December 2025.

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 evidence and guidance: N/A

Reducing infection related risk in the healthcare built environment: N/A

Infection prevention and control workforce development: N/A

Healthcare demand, capacity and flow:

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

Elective admissions data : Public Health Scotland, Acute hospital activity and NHS beds information

Emergency admissions data [29]: Public Health Scotland, Acute hospital activity and NHS bed information

Delayed discharges data: Scottish Health and Social Care Open Data platform, Delayed discharges in NHS Scotland

Accident & Emergency (A&E) waiting times data: Scottish Health and Social Care Open Data platform, Monthly A&E Activity and Waiting Times

[29] As data on elective and emergency admissions are updated quarterly and do not contain 10 full years of data, data extracts to December 2020 and December 2025 were combined for analysis of 10 years of data.

***Clostridioides difficile* infection:**

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

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

Case fatality and mortality data: NRS Deaths Data.

Molecular typing data: ECOSS, Enteric Bacterial Infections Service (EBIS SMiRL, Glasgow).

Health inequalities SIMD: Scottish Government Scottish Index of Multiple Deprivation (SIMD).

Health inequalities Urban/Rural: Scottish Government Urban/Rural Classification.

***Staphylococcus aureus* bacteraemia:**

Case data and demographics: ECOSS and ECOSS Enhanced Surveillance Web Tool.

Case fatality and mortality data: NRS Deaths Data.

Health inequalities SIMD: Scottish Government Scottish Index of Multiple Deprivation (SIMD).

Health inequalities Urban/Rural: Scottish Government Urban/Rural Classification.

***Escherichia coli* bacteraemia**:

Case data and demographics: ECOSS and ECOSS Enhanced Surveillance Web Tool.

Case fatality and mortality data: NRS Deaths Data.

Health inequalities SIMD: Scottish Government Scottish Index of Multiple Deprivation (SIMD).

Health inequalities Urban/Rural: Scottish Government Urban/Rural Classification.

Denominators:

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

Whole population and community associated denominator: National Records of Scotland (NRS) mid-year population estimates.

Health inequalities Scottish population: NRS Other geographies mid-year population estimates.

Multi-drug resistant organism admission screening: National multi-drug resistant organism (MDRO) Admission Screening Uptake Monitoring Tool.

Carbapenemase-producing Enterobacterales: ECOSS, Scottish Antimicrobial Resistance Service (SAMRS SMiRL, Glasgow).

Incidents and Outbreaks: Healthcare infection incidents and outbreaks reported to ARHAI Scotland through the ARHAI Scotland Outbreak Reporting Tool (ORT), using either the Healthcare Infection, Incident and Outbreak Reporting Template (HIIORT) or respiratory short form reporting process.

Antimicrobial Use and Antimicrobial Resistance: N/A

Date that data are acquired

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow:

Total occupied bed days: 14 April 2026
Elective admissions: 27 April 2026
Emergency admissions: 27 April 2026
Delayed discharges: 27 April 2026
Accident & Emergency (A&E) waiting times: 27 April 2026

***Clostridioides difficile* infection:**
Case data: 19 March 2026
Healthcare associated denominator: 14 April 2026
Community associated denominator: 10 April 2026
Age stratified population: 30 April 2026
Health inequalities: 20 March 2026

***Staphylococcus aureus* bacteraemia:**
Case data: 19 March 2026
Healthcare associated denominator: 14 April 2026
Community associated denominator: 10 April 2026
Age stratified population: 30 April 2026
Health inequalities: 20 March 2026

***Escherichia coli* bacteraemia**:
Case data: 19 March 2026
Healthcare associated denominator: 14 April 2026
Community associated denominator: 10 April 2026
Age stratified population: 30 April 2026
Health inequalities: 20 March 2026

Multi-drug resistant organism admission screening: 15 April 2026

Carbapenemase-producing Enterobacterales:
Case data: 15 May 2026
Population denominator: 14 April 2026

Incidents and Outbreaks: 15 April 2026

Antimicrobial Use and Antimicrobial Resistance: N/A

Release date

13 October 2026

Frequency

Annual

Timeframe of data and timeliness

The latest iteration of data are to 31 December 2025, therefore 10 months in arrears.

Continuity of data

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Implications of pandemic and post-pandemic period: Changes in the hospital population and activity during and after the pandemic period impacted healthcare delivery and have implications for the interpretation of all measures.

Healthcare demand, capacity and flow: Please see each data source for any additional relevant information.

***Clostridioides difficile* infection:** Since 2019, the origin of infection of CDI cases has been assigned using a combination of NHS board validation and linkage with the Scottish Morbidity Records (SMR) which include any discharge from hospital. Before this time, the origin of infection was assigned solely using SMR. This could result in minor differences in the assignment of CDI origin of infection before and after this change.

Due to a shortage of DNA polymerase in 2022 and early 2023, *Clostridioides difficile (C. difficile)* ribotypes were inferred from whole genome sequencing (WGS) derived Multi-Locus Sequence Typing (MLST) in place of polymerase chain reaction (PCR) ribotyping. Ribotypes were inferred from the sequence type and therefore ribotypes belonging to the same sequence type have been grouped together for analysis. PCR ribotyping was resumed in early 2023. Caution is advised in interpretation of the annual ribotype distributions due to the differences in typing methods.

***Staphylococcus aureus* bacteraemia:** Case data are validated by local NHS boards. Assignment of the origin of infection reported is dependent on data available and application of the epidemiological surveillance case definitions. Between 2020 and 2022 NHS boards were only required to report case numbers and origin of infection for SAB cases and were not required to report primary source or any additional risk factor data.

***Escherichia coli* bacteraemia**: Case data are validated by local NHS boards. Assignment of the origin of infection reported is dependent on data available and application of the epidemiological surveillance case definitions. Between 2020 and 2022 NHS boards were only required to report case numbers and origin of infection for ECB cases and were not required to report primary source or any additional risk factor data.

Multi-drug resistant organism admission screening: N/A

Carbapenemase-producing Enterobacterales: In addition to changes in the hospital population and activity during and after the pandemic period, international travel restrictions may have affected the epidemiology of CPE and comparison of results after 2020 should be interpreted with caution. CPE screening uptake has varied since rollout and this may impact on case ascertainment.

Incidents and Outbreaks: Updates to the nationally agreed minimum list of alert organisms in 2025, as per the Appendix 13 – NHS Scotland Minimum Alert organism and condition list, and the launch of new content supporting the prevention and management of water related infection incidents and outbreaks within the NIPCM, may have affected the reporting of healthcare incidents and outbreaks, and mean results should be interpreted with caution.

Antimicrobial Use and Antimicrobial Resistance: N/A

Revisions statement

In April 2026, National Services Scotland and NHS Education for Scotland formed a single national organisation, Public Services Delivery Scotland (PSD Scotland). ARHAI Scotland continues as an NHS Scotland Assure service, which now sits within PSD Scotland. ARHAI Scotland continue to support NHS boards in the prevention and control of healthcare associated infections. Report branding has been updated in line with the current organisation arrangements. 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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow: Please see each data source for any relevant information.

***Clostridioides difficile* infection:**

CDI case numbers stratified by origin of infection for 2024 were retrospectively amended following updates to the Scottish Morbidity records. The case numbers changed to:

Year	Number of cases	Previous	Updated
2024	Hospital acquired infections	540	542

In the ARHAI Annual Report 2024, the number of *Clostridioides difficile* specimens sent for ribotyping included in the ribotype distribution charts were erroneously doubled. Despite this the proportions shown and messages remain the same. These numbers have been updated in this publication.

***Staphylococcus aureus* bacteraemia:**

SAB case numbers stratified by origin of infection for 2024 were retrospectively amended, and additional an SAB case was removed from 2021. The case numbers changed to:

Year	Number of cases	Previous	Updated
2024	Hospital acquired infections	707	706
2021	Total infections	1,761	1,760
2021	Community associated infections	556	555

***Escherichia coli* bacteraemia**:

The ECB case numbers stratified by origin of infection for 2024, were retrospectively amended. The case numbers changed to:

Year	Number of cases	Previous	Updated
2024	Healthcare associated infections	2,375	2,373
2024	Hospital acquired infections	1,081	1,080
2024	Community associated infections	2,000	2,002

Population estimates:

Population estimates for mid-2024 were revised following publication of the NRS mid-year population estimate for 2024.

Multi-drug resistant organism admission screening: None.

Carbapenemase-producing Enterobacterales: None.

Incidents and Outbreaks: None.

Antimicrobial Use and Antimicrobial Resistance: None

Concepts and definitions

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Statistical significance: Please note an increase or decrease stated in this report refers to a statistically significant change ($p < 0.05$). Where no trend is said to have been observed or there was no change between years, this means that there has been no significant increase or decrease. When $p \geq 0.05$ and $p \leq 0.07$, the trend was described as marginal. Marginal trends are not confirmed trends.

Healthcare demand, capacity and flow: Total occupied bed days (TOBD): Total number of occupied bed days for years 2016 - 2025, as per Public Health Scotland ISD(S)1.

Elective admissions data: Details are provided within Public Health Scotland Acute hospital activity and NHS beds information quarterly publication.

Emergency admissions data: Details are provided within Public Health Scotland Acute hospital activity and NHS beds information quarterly publication.

Delayed discharges data: Details are provided on the Scottish Health and Social Care Open Data platform. These data include the number of hospital bed days occupied by people aged 18 and over who were clinically ready for discharge. Data are presented as a percentage of total hospital occupied bed days. However, to provide a representative population at risk, the denominator excludes TOBDs from NHS Golden Jubilee, paediatric specialties and TOBDs from children's hospitals.

A&E waiting times data: Details are provided within Scottish Health and Social Care Open Data platform.

Year-to-year comparisons: The current calendar year is compared to the previous calendar year using two sided z-tests to compare the two proportions and rate ratio tests (assuming either Poisson or negative binomial distributions for the counts depending on degree of variation in the data) for the incidence rates. A resulting p-value <0.05 was deemed statistically significant to determine an increase or decrease relative to the previous year.

Long term trends:

Identifying linear and non-linear relationships

ARHAI Scotland reviewed the change in the incidence rate of total infections, healthcare associated infections, hospital acquired infections and community associated infections for CDI and SAB between 2016 and 2025, and for ECB between 2017 and 2025.

Generalised Additive Models (GAMs), flexible statistical models that can model linear or non-linear relationships in data, were used to assess whether the long-term relationship between year and incidence rates should be modelled as linear or non-linear. Relationships were assessed visually and evidence of the non-linearity of the relationship was supported/indicated when the effective degrees of freedom (edf) of the GAM were greater than 1.

Analysing trends

Once the natures of the relationships were determined, segmented negative binomial generalised linear models (GLMs) were fitted to analyse linear trends in more detail, incorporating one or two prespecified change points (to allow for differences in trends around the time of the COVID-19 pandemic). This method allowed any changes in both the intercept (i.e. the level of incidence rate at the prespecified change points) and changes in the slope (i.e. increasing or decreasing trends over time) to be estimated. The most appropriate model for each relationship was selected based on clinical and epidemiological judgement.

Incidence rates of CPE over the past five years are modelled using Poisson regression. This is performed to determine the presence of a significant upwards or downwards linear trend in the changing incidence rate, and the corresponding rate of change of the best-fit gradient from 2021 to 2025.

Visualising trends

The observed incidence rates of CDI, SAB and ECB have been shown over time using point markers, joined together with a solid unbroken line.

The incidence rates modelled by the negative binomial GAMs are shown as a dashed line, with the associated 95% confidence intervals represented by the surrounding shaded areas.

Where appropriate, change points were applied to the GAM model to aid visualisation. An arrow indicates the direction of the intercept shift between time segments.

Interpreting trends

Trends (i.e. increases or decreases in rate over time) were confirmed when a statistically significant value of $p<0.05$ was calculated by the model. When $p\geq0.05$ and $p\leq0.07$, the trend was described as marginal. Marginal trends are not confirmed trends.

Where a year-on-year increase or decrease has been reported, this represents a significant linear trend over the identified period.

Where no significant increases or decreases have been detected, these are reported as no observed trend.

When there was no observed trend, but the intercept was higher or lower following a change point, this was described as a difference in the level of the incidence rates between the two time periods.

Demographics: Details provided in surveillance protocol and quarterly publication.

Health inequalities:

Scottish Index of Multiple Deprivation (SIMD):

The SIMD is a relative measure of deprivation across 6,976 small areas (called data zones). The SIMD ranks data zones from most deprived (ranked 1) to least deprived (ranked 6,976). The areas have been divided into five quintiles with those in quintile 1 living in the most deprived areas and those in quintile

5 living in the least deprived areas. The SIMD identifies deprived areas, not deprived individuals and is unadjusted for age and sex. Further details are provided in SIMD 2020.

Urban/Rural classification:

The Scottish Government Urban Rural Classification is a measure that provides a consistent way of defining urban and rural areas across Scotland which may impact how patients access healthcare. Patients living in remote small towns (UR4) and remote rural areas (UR6) are classified as Remote, and patients living in accessible rural areas (UR5) and remote rural areas (UR6) are classified as Rural. The proportion of the Scottish population living in each of the 6-fold Urban Rural classification area categories are based on estimates from 2024. Accessible areas are defined as those areas that are within a 30 minute drive time from the centre of a settlement with a population of 10,000 or more. Remote areas have a drive time which is greater than 30 minutes. Further details are provided in Scottish Government Urban Rural Classification 2022.

Seasonality: Seasonality was assessed across 10 years of quarterly data for CDI and SAB, and 9 years of quarterly data for ECB bacteraemia, when mandatory national enhanced surveillance of ECB began.

Estimated marginal mean incidence rates were calculated for each quarter using generalised linear models. Effect contrasts were used to compare the average incidence rate in each quarter with the overall average incidence rate across all quarters. This approach assessed whether incidence rates in each quarter were consistently higher or lower than the overall average, thereby providing a measure of overall seasonality.

Mortality and case fatality: CDI, SAB and ECB: Any death occurring within 30 days of the first positive specimen date within each infection episode was used to calculate 30 day all-cause case fatality and 30 day all-cause mortality rate. Therefore, the data include deaths where CDI, SAB or ECB may not have been the underlying or contributory cause of death. All-cause case fatality and mortality depend solely on the number of deaths identified and are not subject to bias that may be introduced due to inaccuracies in completion of the death certificate or coding of the cause of death. All-cause mortality is calculated as a rate out of the total Scottish population and is therefore influenced by changes in incidence rates. If more than one episode occurs in the 30 days prior to death, only the latest episode will be counted as resulting in a death. Some cases may not be able to be linked to NRS death data due to missing or invalid Community Health Index (CHI) numbers.

Confidence intervals for 30 day all-cause fatality and 30 day all-cause mortality rate were calculated using Byar's method.

Origin of Infection: CDI, SAB and ECB: Cases are presented by origin of infection, where definitions are applied as per each surveillance protocol to classify cases as hospital acquired, healthcare associated, community associated or unknown. Please see the individual surveillance protocols for CDI and SAB / ECB for full details.

Funnel plots: Funnel plot analyses are used to determine if any NHS board's rate is significantly higher or lower than the NHS Scotland average rate. The incidence rates for each NHS board are plotted against NHS board size / hospital activity, with 95% confidence intervals calculated from the NHS Scotland average. Any NHS board above the 95% confidence interval are

deemed to be exceptions, and any NHS board below the 95% confidence interval are reported as lower than the NHS Scotland average rate. Funnel plots are generated on a quarterly basis in the quarterly epidemiological reports; in this report the funnel plots incorporate the full year's data for 2025, and therefore as a result, some NHS boards may be above the 95% confidence interval upper limit in the annual funnel plot who may not have exceeded the quarterly funnel plots limits.

***Clostridioides difficile* infection:** Toxin positive *C. difficile* results are reported by local diagnostic laboratories to the national database which holds test results, the Electronic Communication of Surveillance in Scotland (ECOSS). Local infection prevention and control (IPC) teams validate the results sent to ECOSS identifying clinically relevant cases of *C. difficile* infection. Confirmed cases are assigned an origin of infection based on national epidemiological surveillance definitions outlined within the protocol by a combination of local IPC teams and through data linkage with the Scottish Morbidity Records (SMR).

Further details are provided in surveillance protocol and quarterly publication.

***Clostridioides difficile* infection ribotyping**: A subset of CDI cases are sent for ribotyping according to the snapshot and clinical ribotyping schemes. Some specimens sent for ribotyping may not be included in the finalised case list following validation. Further details on the snapshot and clinical ribotyping schemes are provided in the protocol.

***Staphylococcus aureus* bacteraemia:** Blood specimens positive for *S. aureus* are reported by local diagnostic laboratories to ECOSS and are then included in the enhanced *S. aureus* bacteraemia web tool. Local IPC teams are asked to validate any result within the webtool following multidisciplinary team review, remove any case which does not meet the national epidemiological surveillance definitions, provide hospital admission details, assign an origin of infection to each confirmed case and provide the primary source (entry point) or other SAB related risk factors outlined within the protocol. Following validation by the NHS boards these case numbers are published quarterly and annually.

Further details are provided in surveillance protocol and quarterly publication.

***Escherichia coli* bacteraemia**: Blood specimens positive for *E. coli* are reported by local diagnostic laboratories to ECOSS and are then included in the enhanced *E. coli* bacteraemia web tool. Local IPC teams are asked to validate any result in the webtool following review by multidisciplinary clinical team, remove any case which does not meet the national epidemiological surveillance definitions, provide hospital admission details, assign an origin of infection to each confirmed case and provide the primary source or other ECB related risk factors outlined within the protocol. Following validation by the NHS boards these case numbers are published quarterly and annually. Further details provided in surveillance protocol and quarterly publication and the SONAAR Annual Report.

Primary Source of Infection: The most common primary sources of infection as determined by clinical teams are reported as per the individual surveillance protocol for SAB and ECB. The primary source of SAB is defined as the entry point of bacteraemia, and the primary source of ECB as the specific source, where definitions are applied as per the surveillance protocol.

Multi-drug resistant organism admission screening: Screening for MDRO on admission to hospital is a key intervention for early identification and management of patients who are colonised or infected, reducing the risk of introduction of MDRO into healthcare settings.

MRSA and CPE CRA screening policies are in place for all acute hospitals in Scotland. The two-stage screening process includes a CRA to identify patients at high risk of colonisation or infection with either MRSA or CPE, followed by microbiological testing as indicated by the CRA.

Uptake of the MRSA CRA has been a level 3 HCAI Key Performance Indicator (KPI) since 2013. The MRSA screening uptake monitoring tool was extended in 2018 to include assessment of CPE CRA uptake for the same patients included in the MRSA KPI audits.

Carbapenemase-producing Enterobacterales: CPE are bacteria that produce enzymes that inactivate carbapenems and other classes of antibiotics. Infections caused by CPE are difficult to treat and are associated with increased mortality.
A case of CPE is defined as one isolate per patient per enzyme and organism combination per year as confirmed by the Scottish Microbiology Reference Laboratory. Further details provided in the SONAAR Annual Report.

Incidents and Outbreaks: Healthcare infection incidents and outbreaks reported to ARHAI Scotland, as defined within Chapter 3 of the National Infection Prevention and Control Manual.

Incidents and outbreaks of COVID-19, influenza and Respiratory Syncytial Virus (RSV), are reported to ARHAI Scotland in line with Chapter 3 of the National Infection Prevention and Control Manual. During 2024 and 2025, NHS boards have been using the Respiratory Short Form minimum dataset to report incidents/outbreaks from key respiratory viruses (COVID-19, influenza and RSV only), where IPC measures align with checklist and NIPCM and ARHAI support was not requested. The respiratory short form was established as an alternative to the Healthcare Infection Incident and Outbreak Reporting Template (HIIORT). This contains fewer fields than the HIIORT form and was deemed especially useful in the winter months where healthcare delivery experiences additional pressures. The respiratory short forms were only used when it was appropriate to do so i.e. where infection prevention and control (IPC) measures were aligned with the IPC checklist and where ARHAI Scotland support was not requested by local IPC teams. Incidents which require additional support continue to be reported via the HIIORT form similarly to non-respiratory incidents and outbreaks.

All incidents and outbreaks are provided with a Healthcare Incident Impact Assessment Tool (HIIAT) score of red, amber or green. This is a measure of the risk associated with the severity of the illness, the impact on healthcare service, risk of transmission and public anxiety surrounding the incident or outbreak. Those which are green are lowest risk and red at highest risk.

Antimicrobial Use and Antimicrobial Resistance: N/A

Relevance and key uses of the statistics

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow: Figures provided are used to describe the wider hospital system and support interpretation of epidemiological intelligence.

***Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia**:

National surveillance data: Through the routine collection, analysis and interpretation of data on healthcare and community associated infections, national surveillance aims to promote patient safety by reducing risk of harm from potentially preventable infections. This can be achieved by: providing a consistent and standardised surveillance approach to allow monitoring and benchmarking of HCAI incidence; undertaking epidemiological analyses to identify those at risk of developing specific HCAIs; identifying and monitoring emerging novel strains and their epidemiology, providing intelligence to inform targeted quality improvement plans and HCAI reduction strategies; evaluate the effectiveness of interventions and policy; supporting IPC decision-making; informing national policy and guidance development.

The collection of this data supports the UK antimicrobial resistance national action plan.

Further details for the relevance and key uses of CDI, SAB and ECB data are provided in the quarterly publication.

Health inequalities: Please see data source for any relevant information.

Multi-drug resistant organism admission screening: These audit data measure uptake of the two-stage admission screening process of CRA followed by microbiological testing of those considered to be at risk of carrying MRSA or CPE based on CRA response, in NHS Scotland as per policies. These audit data are collected to support the assurance element of quality improvement processes and gather intelligence to inform and target local interventions where CRA screening uptake is suboptimal. ARHAI Scotland provide enhanced feedback to NHS boards on a quarterly basis.

Carbapenemase-producing Enterobacterales: Details provided in the SONAAR Annual Report.

Incidents and Outbreaks: To describe the organisms, types of infection, procedures, patient mix, or clinical specialties 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.

Antimicrobial Use and Antimicrobial Resistance: Details provided in the SONAAR Annual Report.

Accuracy

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow: Details available as per each data source.

***Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia**:

Clostridioides difficile infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia case data are extracted from the Electronic Communication of Surveillance in Scotland (ECOSS) database and are therefore subject to the limitations of this national dataset.

Each case of CDI, SAB and ECB is validated by local Infection Prevention and Control (IPC) teams. Teams are asked to ensure that each case meets the national epidemiological surveillance definitions outlined in the respective protocols.

Assignment of the origin of infection of CDI, SAB and ECB cases is dependent on the interpretation of the national epidemiological surveillance definitions of the local teams. The origin of infection reported for each CDI case is further impacted by the availability of hospital discharge information from the Scottish Morbidity Records. As more data becomes available the origin of infection may be updated retrospectively for a small number of cases.

The reported rates of infection are impacted by the denominators used. Rates of healthcare associated infection are dependent on the total occupied bed days (TOBDs) recorded from ISD(S)1. These bed days are susceptible to reporting lag, may not capture all bed days from all wards or accurately represent those in unconventional settings (i.e. temporary beds, corridor care etc). To minimise the impact of this, ARHAI Scotland are in close contact with Public Health Scotland who manage this national data set.

***Clostridioides difficile* infection ribotyping:**

The snapshot programme aims to obtain a representative sample of isolates from CDI cases across all NHS boards in Scotland, however not all NHS boards are able to submit the required number of isolates as specified by the Snapshot protocol therefore the data should be interpreted with caution.

The clinical typing scheme aims to provide data from severe CDI cases and/or suspected outbreaks. These data are based on the specimens and information received by the reference laboratory and are not validated by individual NHS boards, therefore, the data should be interpreted with caution.

Health inequalities: Please see data source for any relevant information relating to SIMD and Scottish Government Urban/Rural Classification.

Multi-drug resistant organism admission screening: While audit data does not present the same robust scientific data as surveillance, it provides a nationally representative measure of CRA screening uptake and is valuable for identification of areas for targeted implementation of quality improvement measures. A minimum of 3,500 patients are audited annually for NHS Scotland in order to measure uptake with sufficient precision, with each NHS board auditing a representative number of patients.

For each eligible patient admitted during the audit period, data are collected for the most recent opportunity for the CRA to have been undertaken. It is acknowledged that all patients are eligible for CPE CRA admission screening though not all areas are included in the screening audit. These areas will not be represented in these data. Patients are selected for audit based on the Protocol for CRA MRSA Screening National Rollout in Scotland, with the exception of NHS Golden Jubilee from which only CPE CRA screening uptake audits are submitted (as all patients are screened for MRSA). In order to maximise the representativeness of the national KPI measure whilst ensuring flexibility at a local level, NHS boards are asked that data collection throughout the year should be spread as much as possible across; hospital, wards, high/low impact specialties, medical/surgical specialties, elective and emergency admissions.

Carbapenemase-producing Enterobacterales: CPE case data are extracted from the ECOSS database and are therefore subject to the limitations of this national dataset. These results are reported from local teams, and not all may be submitted to ECOSS. Reporting to ECOSS may be further impacted by changes in screening practice, and laboratory information management systems which could affect how organisms are reported and potentially result in inaccurate counting of infections.

Furthermore, ECOSS has been subject to various quality improvement exercises. These exercises have ensured more accurate case capture, however, there are some challenges comparing data for certain non-blood specimen types between 2019 and mid-2022. ECOSS can also be susceptible to data lag, which may impact the accuracy of the data for a short time, it is rare that this would impact reporting within this publication as data are 10 months in arrears.

Further details provided in the SONAAR Annual Report.

Incidents and Outbreaks: ARHAI Scotland are aware that the HIIAT is subjective and there may be variation in how NHS Scotland boards assess and therefore report healthcare infection incidents. The extent of variation in assessment and unreported incidents has not been fully quantified.

Antimicrobial Use and Antimicrobial Resistance: N/A

Completeness

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow: Details available as per each data source.

***Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia**:

Details on completeness of data are provided in quarterly publication.

***Clostridioides difficile* infection:**

The rate of community associated CDI may be undercounted due to mild illness or GP criteria for testing. This may be minimised by improved awareness of CDI and any changes in the epidemiology. In hospitals, diarrhoeal specimens will likely be tested for C. difficile therefore higher completeness is expected. Validation of confirmed cases of CDI, ensures that case capture is as close to 100% as practicable.

Healthcare associated CDI may be undercounted when NHS boards are unaware of previous healthcare in other NHS boards. However, the chance of this is minimised by the data linkage of cases with hospital discharge information from the Scottish Morbidity Records.

One CDI case was found to have missing sex and therefore was removed from the age-sex pyramids produced throughout the report. This case was retained in any analysis not stratified by age or sex.

14 (1.2%) CDI cases in 2025 were excluded from calculations for health inequalities due to missing data or where postcodes could not be linked.
***Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia:** Most bacteraemia will be collected within hospital settings, and further validation of data which allows additional cases to be added means that coverage across Scotland is expected to be as close to 100% as practicable.

***Staphylococcus aureus* bacteraemia:** 68 (4.0%) SAB cases in 2025 were excluded from calculations for health inequalities due to missing data or where postcodes could not be linked.

***Escherichia coli* bacteraemia**: 87 (1.9%) ECB cases in 2025 were excluded from calculations for health inequalities due to missing data or where postcodes could not be linked.

Multi-drug resistant organism admission screening: A minimum of 3,500 patients are audited annually for NHS Scotland in order to measure uptake with sufficient precision, with each NHS board auditing a representative number of patients. All NHS boards submitted at least their required minimum number of patients audited and all completed audits submitted data for the reporting period have been included in the analysis.

Carbapenemase-producing Enterobacterales: Details provided in the SONAAR Annual Report.

Incidents and Outbreaks: ARHAI Scotland are aware that the HIIAT is subjective and there may be some variation in how NHS boards assess and therefore report healthcare infection incidents. The extent of variation in assessment and unreported incidents has not been fully quantified.

Antimicrobial Use and Antimicrobial Resistance: N/A

Comparability

Infection Prevention and Control Guidance: N/A

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

Infection Prevention and Control Workforce Development: N/A

Healthcare demand, capacity and flow: Details available as per each data source.

***Clostridioides difficile* infection, *Staphylococcus aureus* bacteraemia and *Escherichia coli* bacteraemia**: UKHSA report rates annually and per quarter (methods and definitions may differ).

Multi-drug resistant organism admission screening: There are no comparable data on CRA screening uptake.

Carbapenemase-producing Enterobacterales: Details provided in the SONAAR Annual Report.

Incidents and Outbreaks: Reporting of all HCAI outbreaks is not mandatory elsewhere in the UK and comparable data are not published.

Antimicrobial Use and Antimicrobial Resistance: N/A

Accessibility

It is the policy of PSD Scotland 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.

CDI, SAB and ECB data are reported to ARHAI according to their respective surveillance protocols.

Tables and charts of healthcare associated infection data stratified by quarter are available on the ARHAI Scotland website within supplementary data files and in open data.

Value type and unit of measurement

Total occupied bed days per year.

Count of emergency admissions per year.

Count of elective admissions per year.

Percentage of TOBD due to delayed discharges (%) = Number of bed days occupied by people aged 18 and over who were clinically ready for discharge (excluding NHS Golden Jubilee) / TOBD (excluding bed days from NHS Golden Jubilee and all paediatric specialties/children's hospitals) * 100.

Percentage of A&E attendances seen within 4-hour target (%) = Total number of patients seen within 4 hours in A&E / Total number of patients who attended A&E * 100.

Total cases and incidence rates (per 100,000 population) for CDI, SAB and ECB.

Total cases and incidence rates (per 100,000 population) for MRSA bacteraemia and meticillin sensitive S. aureus (MSSA) bacteraemia.

Healthcare associated and hospital acquired cases and incidence rates (per 100,000 total occupied bed days) for CDI, SAB and ECB.

Overall and community associated cases and incidence rates (per 100,000 population) for CDI, SAB and ECB.

Percentage for SIMD quintiles of CDI, SAB and ECB (%) = count of cases in SIMD Quintile / total number of cases where SIMD quintile assigned * 100. Those with missing or where postcodes could not be linked excluded from total.

Incidence rates (per 100,000 population) for CDI, SAB and ECB, by SIMD quintile.

Percentage for Urban/Rural status 6-fold classification status of CDI, SAB and ECB (%) = count of cases in Urban/Rural classification category / total number of cases where Urban/Rural 6-fold classification assigned * 100. Those with missing or where postcodes could not be linked excluded from total.

Percentage living in remote areas for CDI, SAB and ECB (%) = count of cases in remote small town classification + count of cases in remote rural area classification / total number of cases where Urban/Rural 6-fold classification assigned * 100. Those with missing or where postcodes could not be linked excluded from total.

Percentage living in rural areas for CDI, SAB and ECB (%) = count of cases in Accessible rural area classification + count of cases in Remote rural area classification / total number of cases where Urban/Rural 6-fold classification assigned * 100. Those with missing or where postcodes could not be linked excluded from total.

Percentage for demographics of CDI, SAB and ECB (%) = count of cases in age-sex subgroup / total number of cases *100.

Incidence rates (per 100,000 population) within age groups 15 to 64 years and 65 years and older for CDI, SAB and ECB, and incidence rates (per 100,000 population) within age group under 15 years for SAB and ECB.

Percentage for origin of infection category of CDI, SAB and ECB (%) = count of healthcare associated or community associated cases / total number of cases *100.
30 day all-cause case fatality rate for CDI, MRSA bacteraemia, MSSA bacteraemia, total SAB and ECB = count of cases with death occurring within 30 days of positive specimen date / total number of cases.

30 day all-cause mortality rates per 100,000 population for CDI, SAB and ECB.

Percentage for most commonly reported primary source of healthcare associated SAB and ECB (%) = count of healthcare associated cases with given primary source / total number of healthcare associated cases with a known primary source * 100. Those with not known primary source were excluded from total.

Percentage for most commonly reported primary source of community associated SAB and ECB (%) = count of community associated cases with given primary source / total number of community associated cases with a known primary source * 100. Those with not known primary source were excluded from total.

Quarterly median incidence rates (per 100,000 population) for CDI, SAB and ECB with interquartile ranges and minimum and maximum values, by calendar quarter (January-March, April-June, July-September, October-December).

Percentage of C. difficile ribotypes (%) = count of each ribotype or ribotype group / total number of isolates submitted for typing.

MRSA Clinical Risk Assessment (CRA) Uptake (%) = number of patients where CRA undertaken / all patients in audit sample *100.

CPE CRA Uptake (%) = number of patients where CRA undertaken / all patients in audit sample *100.

Count of CPE per year. Incidence rate of CPE per 100,000 population per year. Total number of reported incidents and outbreaks.

Number of reported incidents and outbreaks by HIIAT category.

Number of reported incidents and outbreaks with one or more confirmed patient cases.

Number of reported incidents and outbreaks with a single patient case.

Number of reported incidents and outbreaks with one or more confirmed patient cases involving two or more organisms.

Number of reported decontamination, environmental or near miss incidents and outbreaks with no patient cases.

Distribution of organism categories for incidents and outbreaks with one or more confirmed patient cases and one or more reported organisms (%) = Number of reported incidents and outbreaks with one or more confirmed patient cases and one or more reported organisms involving organism category / Total number of reported incidents and outbreaks with one or more confirmed patient cases and one or more reported organisms * 100. Note: some incidents and outbreaks included multiple organisms so total percentages may not add up to 100%.

Number and percentage of incidents and outbreaks with one or more confirmed patient cases involving key MDRO reported to ARHAI Scotland (%) = Number of reported incidents and outbreaks with one or more confirmed patient cases involving key MDRO reported to ARHAI Scotland / Number of reported incidents and outbreaks with one or more confirmed patient cases and one or more reported organisms involving corresponding organism category * 100.

Number of reported incidents and outbreaks requesting ARHAI support in attending incident management team (IMT) as recorded in ORT submissions.

Total number of reported COVID-19, influenza and RSV healthcare infection incidents and outbreaks.

Number of reported COVID-19, influenza and RSV healthcare infection incidents and outbreaks by HIIAT category.

Number of reported COVID-19, influenza and RSV healthcare infection incidents and outbreaks by respiratory organism.

Number of reported COVID-19, influenza and RSV healthcare infection incidents and outbreaks by week in which the incident or outbreak was first reported.

Disclosure

The Public Health Scotland (PHS) Statistical Disclosure Protocol is followed.

Official statistics accreditation

Official statistics.

UK Statistics Authority Assessment

Not assessed

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Help email

NSS.ARHAIinfectioncontrol@nhs.scot

Data form completed

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Appendix 3 – Early Access Details

Pre-release access

Under terms of the 'Pre-Release Access to Official Statistics (Scotland) Order 2008', PSD Scotland are 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 4 – PSD Scotland and Official Statistics

About Public Services Delivery Scotland

ARHAI Scotland were formerly part of NHS National Services Scotland and are now part of Public Services Delivery Scotland. From 1 April 2026, NHS Education for Scotland and NHS National Services Scotland combined to form Public Services Delivery Scotland. Public Services Delivery Scotland works at the very heart of the health service across Scotland, delivering services critical to frontline patient care, supporting efficient and effective operation, and delivering training across NHS Scotland.

Official Statistics

Public Services Delivery Scotland has been created under the Common Services Agency which is already a producer of Official Statistics, so there will be no change to the designation of Official Statistics. 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'.

This document has been prepared by Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) team of NHS Scotland Assure, part of Public Services Delivery Scotland.

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