# ANNUAL INFECTION PREVENTION AND CONTROL REPORT

April 2022 – March 2023

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# Contents

# Section 1

# Introduction

Infection prevention and control has continued to be at the forefront of activities within the Sheffield Teaching Hospitals NHS Foundation Trust, being a key quality issue in all areas of care.

Throughout this document several abbreviations or shortenings are commonly used.

- Trust-wide annual Infection Prevention & Control Report - Report.
- Sheffield Teaching Hospitals NHS Foundation Trust – STHFT or the Trust
- Royal Hallamshire Hospital - RHH
- Northern General Hospital - NGH
- Meticillin resistant *Staphylococcus aureus* – MRSA
- Meticillin sensitive *Staphylococcus aureus* – MSSA
- *Clostridioides difficile – C.difficile*
- *Clostridioides difficile* toxin associated diarrhoea - CDD
- Infection Prevention & Control, relating to a team, group, programme, title etc. - IPC
- Department of Health – DH
- Director of Infection Prevention and Control – DIPC
- Health Care Associated Infection – HCAI
- ICB - Integrated Care Board
- Care Quality Commission (CQC)
- UK Health Security Agency (UKHSA) – formerly Public Health England (PHE)

Several Department of Health, UK Health Security Agency, NICE and professional body documents are referred to throughout this Report; references are given here:


1. Health and Social Care Act 2008: Code of Practice for the Prevention and Control of Infections and related Guidance
2. Care Quality Commission Registration Standards
3. Infection Prevention Society/NHS Improvement: High Impact Interventions, Care Processes to Prevent Infection; 4th edition of Saving Lives
4. Saving Lives: A delivery programme to reduce Healthcare Associated Infection (HAI) including MRSA. http://webarchive.nationalarchives.gov.uk/20120118164404/http://hcai.dh.gov.uk/
5. NICE (2017) Infection Prevention and Control of healthcare-associated infections in primary and community care
6. NICE (2014): Infection Prevention and Control
7. NICE (2016): Prevention and Control of healthcare-associated Infections - organisational aspects
8. EPIC 3 National evidence based guidelines for preventing HCAIs
9. NICE Guidance – Clostridioides difficile infection: antimicrobial prescribing
10. NHS England » Minimising Clostridioides difficile and Gram-negative Bloodstream Infections
11. DH MRSA updated screening guidance
12. English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1118310/ESPAUR-report-2021-to-2022.pdf
13. Annual epidemiological commentary: Gram-negative bacteraemia, MRSA bacteraemia, MSSA bacteraemia and *C. difficile* infections, up to and including financial year Apr 2021 to Mar 2022 https://www.gov.uk/government/statistics/mrsa-mssa-and-e-coli-bacteraemia-and-c-difficile-infection-annual-epidemiological-commentary/annual-epidemiological-commentary-gram-negative-mrsa-mssa-bacteraemia-and-c-difficile-infections-up-to-and-including-financial-year-2021-to-2022
14. Detection, management and control of carbapenemase-producing Enterobacteriacaea
15. NHS England Commissioning for Quality and Innovation scheme
16. UKHSA guidance on Norovirus
17. UKHSA guidance on Ebola
18. Duty of Candour information
19. Advisory Committee on Antimicrobial Resistance and Healthcare Associated Infection (ARHAI).
20. Clostridioides difficile Infection: How to Deal with the Problem
21. Safe Water in Healthcare premises (HTM 04-01)
22. NHS England - NHS Contract

23. NHS England IPC Board Assurance Framework
24. UKHSA guidance on Covid-19
25. NICE guidance on Covid-19
26. NHSI guidance on Covid-19
27. National Infection Prevention and Control Manual
28. National Standards of Healthcare Cleanliness 2021
29. UKHSA Good Infection Prevention Practice: Using Ultrasound Gel – May 2022 update
30. UKHSA HCAI DCS Mandatory Surveillance website
31. UKHSA guidance on Staphylococcus capitis in neonatal units: Briefing Notes regarding the 'Increased detection of Staphylococcus capitis in samples from hospitalised infants'
32. UKHSA Good Practice for the Cleaning and Handling of Incubators and other Equipment in Neonatal Units
33. UKHSA Fingertips database: AMR local indicators - produced by the UKHSA - OHID (phe.org.uk)
34. Quarterly epidemiological commentary: Mandatory Gram-negative bacteraemia, MRSA, MSSA and C. difficile infections (data up to October to December 2022) Updated 6 April 2023
35. NHS England » Patient Safety Incident Response Framework

This Report covers a wide range of topics including the STHFT performance against a variety of national standards. Progress in relation to the IPC Programme forms a large part of this Report and Key Indicator results are reported. This Report pertains to the year 1st April 2022 to 31st March 2023. However, where appropriate, data/ information have been included from April 2023 onwards although the majority of this will be reported in the 2023/24 IPC Report. I would like to thank all my colleagues who have contributed to this Report, which like the IPC Service as a whole, is a multi-disciplinary team effort. In particular, I would like to acknowledge and thank Dave Emmett, Patty Hempshall, Katie Bramhall, Gayti Morris, Gemma Wheldon, Cariad Evans, Mohammed Raza, Karen Tweed, Chris Lynch and Dave Partridge for providing the information and data incorporated in various sections of this Report.

**Dr C J Bates**
**Director of Infection Prevention and Control**
**August 2023**

# Executive Summary

## Section 2: Infection Prevention and Control Service

Infection prevention and control continues to be a key health care priority for the Department of Health (DH), patients and the public.

A summary of the key roles and responsibilities within the Trust Infection Prevention and Control (IPC) Service is included in Section 2 and a diagram showing the current structure can be found in Appendix G of this Report. In addition to the roles and responsibilities of the specialist IPC Team, those of the Surgical Site Infection Surveillance Team, Antimicrobial Therapy Team, Communications Team and the Board of Directors are also described.

The overall responsibility for infection prevention and control within each Group lies with the Clinical Directors (CDs), although this is generally a delegated duty to the Nurse Directors (NDs). The structure for infection prevention and control information flow and accountability within each Group includes all professional groups not just the nursing staff. The NDs liaise with other key staff e.g. Clinical Directors (CDs), Matrons and Medical IPC Leads to make this a reality. The NDs and CDs continue to be encouraged to use the Healthcare Governance arrangements within their areas as conduits for communicating, implementing and reviewing infection prevention and control advice, guidance and information including surveillance data.

The 2022/23 annual IPC Programme was written in a similar format to previous years. Each Group or Department completed an assessment form in July 2022 and April 2023, declaring their position against the objectives within the Programme and returned this to the DIPC for review. The results of these reviews were reported to the IPC Committee and Quality Committee; see Section 3 of this Report.

## Section 3: Report on the Infection Prevention & Control Programme 2022/23

The main focus this year continued to be the prevention and control of Covid-19. However, the IPC Accreditation Scheme continued to be a key means by which infection prevention and control practice was standardised, improved and assessed across the Trust. Most of the other activities in the Programme relate to this Scheme by either being an integral part of it or via audit, ownership etc. The following were also key issues: optimising antimicrobial stewardship and respiratory personal protective equipment (PPE) for staff. Progress in respect of the Programme is detailed in this Section of the Report.

The Programme is divided into the following sections: 'IPC Accreditation', 'NICE guidance[5-7]/EPIC 3[6], 'Health and Social Care Act[1]/CQC[2]', 'Audit and Review', 'Ownership at Group, Directorate and Ward level', 'Decontamination of Medical Devices', 'Surveillance', 'MRSA', 'MSSA', '*C.difficile'*, 'Gram negative organisms', 'Covid-19, Influenza and other Respiratory Viruses', ' Norovirus', 'Novel & High Consequence pathogens e.g. Ebola', 'Antimicrobial Stewardship', 'Hand Hygiene', 'Management of Invasive Devices', 'Environmental, Cleaning, Waste, Water & Ventilation Issues', 'Education, Training and Personal Protective Equipment (PPE)', 'Communication and Information Technology' and ' Research/Studies'.

Progress in respect of the IPC Programme was assessed near the beginning, and at the end, of the financial year i.e. July 2022 and April 2023. These assessments were reviewed by the Director of Infection Prevention and Control (DIPC) and each area coded Red, Amber, Yellow, Green, Blue or Purple depending on progress made,

In summary:

- All areas completed the majority of the Programme
- All areas coded as Purple, Blue, Green or Yellow at the end of the year.
- The main reasons Groups/Directorates were not coded as Purple at the end of the year were a) newly identified departments needing to Accredit for the first time, b) areas behind with respect to their Reaccreditation schedule, c) failure of wards to make antibiotic audit returns on a regular basis or c) directorates being unable to regularly provide compliance data in respect of mandatory training
- The Trust-wide and IPC Team work programmes are particularly challenging, with a number of elements that are expected to require more than one year to complete; the coding in Table 1 reflects this.

In addition to the majority of the Programme that rolls over year to year, the following initiatives were undertaken during 2022/23:

During 2022/23 the National Infection Prevention and Control Manual[27] was published by NHSE. Trusts are required to ensure local policies, guidelines and protocols etc. are consistent with those within the Manual. The deadline for complying in respect to the first two modules is March 2024. The IPC Team are in the process of reviewing local policies, practices etc. against the Manual and changes will be made locally where necessary. Few if any changes are anticipated. As this Manual is constantly being updated, the Team will review it on an on-going basis and compliance against it will be a standing item on the IPC Committee agenda.

The Trust has continued to use the NHSE Infection Prevention and Control Board Assurance Framework (BAF)[23] at both Board and IPC Committee level to evaluate the Trust's performance and actions in respect to infection prevention and control. The initial national BAF concentrated on Covid-19 and the Trust had adapted the document for in-house use in assessing the wider infection prevention and control agenda, rather than just Covid-19. During 2022/23, the national BAF was updated to reflect the wider agenda and the Trust has therefore reverted to using the national document.

The in-house induction and annual refresher IPC e-learning packages, initially written over a decade ago, can no longer be supported by the Trust IT and Learning and Development departments and therefore, alternative means of providing this material have been investigated during 2022/23. It is anticipated that the Trust will move to a national on-line package during 2023/24

During 2022/23, updated national infection prevention and control advice[27] was published, including PPE use, which in summary was a move to a more generic risk-assessment based model, similar to pre-pandemic practice. The Trust has followed this updated national advice. Staff will still require appropriate PPE for patients with respiratory infections but overall this change results in less PPE being used and the cessation of universal mask wearing in clinical areas.

The amount of single-use PPE has obviously increased enormously over recent years and, amongst other reasons, is of concern in respect to the 'sustainability' agenda. During 2022/23, a multi-disciplinary group, including staff from Infection Prevention and Control, Facilities, Decontamination, Sustainability and Operating Services departments, has worked on options for switching from single-use to re-usable items of PPE, where this is appropriate. The group worked with the NHSE group heading up this work nationally. Work included options for re-usable masks, hats and gowns. The Trust has invested in a pilot scheme to install a clean room within the laundry on the NGH site to allow in-house processing of certain items of

non-sterile PPE. The pilot is planned to commence in 2023/24. Lessons learnt from this pilot will be used to hopefully widen the scope of this work.

A number of infection prevention and control issues were raised by the Care Quality Commission following their inspections of the Trust over the past two years. These have been taken forwards during 2022/23 as part of the wider Trust response to the CQC report as part of the Fundamentals of Care Initiative. This will continue into 2023/24 and appropriate actions are also included within the 2023/24 IPC Programme.

In summary the issues raised related to

- Clarity and visibility of audit methodology and results within the IPC Accreditation Programme; these issues have been addressed by updating and amending the IPC Accreditation programme; see section 3.8
- Management of ward curtains; this issue is being taken forwards by the Facilities department and includes determining the best methodology for curtain labelling
- Consistent compliance with PPE and 'bare below the elbow' (BBTE) in some areas; an invigorated PPE and BBTE campaign is planned for 2023/24
- Labelling of clinical equipment following cleaning; a protocol to optimise labelling has been produced and distributed across the Trust and monitored via the IPC Accreditation programme.

During 2022/23, the IPC Team began to review the Patient Safety Incidents Response Framework (PSIRF) and determine the implications for infection prevention and control. An agreed way forwards in respect to the methodology for incident sampling and review will be finalised in 2023/24, in time for September 2023 deadline when the new PSIRF process needs to be in place and implemented.

## Section 4: Key Indicators

The following key indicators have been used to monitor the quality of the IPC Service for 2022/23:

- Progress in respect of the Trust IPC Programme - See Section 3 of this Report
- Total number of new meticillin resistant *Staphylococcus aureus* (MRSA) cases detected by the Trust laboratories – See sections 5.3 to 5.5 of this Report.
- Number of C*lostridioides difficile* toxin associated diarrhoea (CDD) episodes within the Trust – See sections 6.2 to 6.3 of this Report
- Glycopeptide resistant enterococcal bacteraemia – the number of episodes detected during 2022/23 was 24. The number of episodes of GRE bacteraemia has gradually increased since the autumn of 2015, although numbers were slightly less during the Covid pandemic but have rebounded as the pandemic has waned; see sections 4.6 to 4.8 for details.

- Results of the mandatory DH surveillance schemes
  - MRSA bacteraemia - See sections 5.6 to 5.11 of this Report
  - MSSA bacteraemia – see sections 5.12 to 5.18 of this Report
  - CDD infections - See sections 6.4 to 7.11 of this Report
  - Gram negative bacteraemia a) *Escherichia coli,* b ) *Klebsiella species* and c) *Pseudomonas aeruginosa* – see sections 7.1 to 7.42 of this Report
- Comparison with other similar Trusts – STH performed 9$^{th}$ out of 16 similar trusts when combining data from the six DH mandatory HCAI surveillance schemes

- Surveillance of surgical site infection (SSI) – orthopaedic, cranial and breast implant surgery:
    - For 2022/23 the Trust elected to undertake continuous surveillance of both hip and knee arthroplasty (otherwise known as hip or knee replacement. For knee arthroplasty the STH infection rate was 0.2% against a national average of 0.5%. For hip arthroplasty the STH infection rate was 1.0% against a national average of 0.6%. Given that the complexity of the patient population operated on within the Trust is much higher locally than amongst other trusts participating in the surveillance scheme these results are extremely pleasing. The Musculoskeletal Group continue to develop and implement action plans to reduce infection rates further.
    - For 2022/23 the Trust also elected to undertake continuous surveillance of cranial procedures. The STH infection rate was 2.5% against a national average of 1.6%. The IPC Team continue to work with the Neurosurgery Directorate to investigate cases of infection and possible interventions that may reduce this rate.
    - In addition to the ongoing arthroplasty and craniotomy surveillance, the SSI Team commenced surgical site surveillance of colorectal surgery. The rate for 2022/23 was 12.7% against a national average of 8.6%. The IPC Team continue to work with the Colorectal Department to investigate cases of infection and possible interventions that may reduce this rate.

## Section 5: *Staphylococcus aureus*

Meticillin resistant *Staphylococcus aureus* (MRSA)

The number of new cases of MRSA infection or colonisation, detected by the STH laboratory, continues on a downward trend. The percentage of patients screened for MRSA that are positive has also remained at a historically low level. The majority of new cases detected are detected on admission. The number of hospital acquired episodes remains low, although the number of cases in 2022/23 increased compared to the past two years covering the pandemic. However, the number of cases is lower than the year preceding the pandemic, which reflects the overall downward trend.

The number of episodes of Hospital Onset MRSA bacteraemia during 2022/23 was two. It is pleasing to note that the Trust once again has a low MRSA bacteraemia rate compared to other similar trusts. In addition, the average rate of MRSA bacteraemia episodes per 100,000 bed-days across all trusts within England was 0.8 compared to the Trust rate of 0.4.

Since 2013/14, acute trusts and CCGs/ICBs have taken a zero-tolerance approach to MRSA bacteraemia. Each episode is reviewed to determine if there have been any lapses in care within the Trust, community or primary care settings; learning points are shared with appropriate parties.

Historically, the percentage of *S.aureus* isolates that are MRSA from all sources has mirrored that from blood cultures alone and has generally stabilised at a low level over recent years. However, from 2020/21 onwards this figure increased, see Table 5, and has remained higher than previous years again in 2022/23. Given the low numbers for newly detected MRSA both generally, see Table 4, and for STH acquired cases, see Chart 2, this rise has been unexpected. Investigating the data shows that this is mainly due to a lower number of MSSA isolates being detected, thereby reducing the denominator.

A great deal of work has taken place over the past few years designed to reduce the likelihood of patients experiencing MRSA generally and bacteraemia in particular. This work has been detailed in previous Reports and continues to be implemented and reiterated during the current year.

Meticillin sensitive *Staphylococcus aureus* (MSSA)

Since January 2011, it has been mandatory to report MSSA bacteraemia to the DH. Chart 3 shows data for all STH MSSA bacteraemia episodes reported to the DH healthcare surveillance database over the past few years.

Since 2013/14, there appears to be a general trend towards increasing cases of MSSA bacteraemia detected by the STH laboratories, although rates have fallen since a peak in 2020/21: rate of 25.1/100,000 bed days in 2013/14, rising to 51.6 in 2020/21 and falling to 37.9 in 2022/23[33]. A similar trend has been observed nationally[33]. The total number within the STH (185) in 2022-23 reduced by 2% compared to 2021-22 (189).

Within this overall trend there is variation in the number and rate of Hospital Onset* and Community Onset-Healthcare Associated# MSSA bacteraemias, that appears to fluctuate from year to year. Similar to the overall trend, the rate of Hospital Onset cases has increased in recent years, peaking in 2020/21 at 16.8/100,000 bed days and falling slightly over the past two years; 2022/23 rate of 15.2/1000 bed days).

Similarly, the number of Community Onset-Healthcare Associated cases has fallen with only 13 such episodes being detected in 2022-23. This is much lower compared to the past two years (31 and 27); the reasons for this are not immediately apparent, see also Chart 3 below.

These trends will continue to be monitored and where possible themes and possible actions identified to reduce all types of episodes in the future.

The review of the 2022/23 cases has determined that the numbers for each ward and Directorate are small and can vary year on year. Although root-cause analysis of all cases is not mandatory, directorates are encouraged to undertake them.

Where reviews have occurred, these have not shown areas of consistently poor practice. However, 24% (18/74) and 12% (9/74) of Hospital Onset* bacteraemias are most likely secondary to cannula site or other intravascular access device (IAD) infections. Therefore, one issue where intervention may be beneficial across the whole Trust is in the insertion, ongoing management and documentation of IADs, including peripheral, central, arterial and peripherally inserted central catheters (PICC) devices. The IPC Team is working with the Informatics Team to develop electronic care plans to optimise the care pathway for all IADs. In addition, the Team are developing a Trust-wide approach to improving peripheral cannula care.

## Section 6: *Clostridioides difficile* toxin associated diarrhoea (CDD)

Overall, comparing 2022/23 with 2021/2022 there has been a 4% increase in the number of CDD episodes detected in patients within the Trust. The numbers do fluctuate from year to year and current levels are similar to those seen in preceding years, see Table 13. These data relate to all episodes detected in patients within the Trust and include both ‘Hospital Onset’ and ‘Community Onset’ cases, where the samples originated from within the Trust.

The number of ‘Hospital Onset’ CDD episodes detected in 2022/23 was 117. This is a slight decrease compared to last year.

Since 2019/20, the DH has set a combined annual reduction target for 'Hospital Onset – Healthcare Associated (HOHA)' and 'Community-Onset-Healthcare Associated (COHA)' cases of CDD. For 2022/23 the STH target for was 149. The Trust detected 169 cases and therefore did not achieve this objective. The increase in cases detected in 2022/23 was mainly due to a rise in COHA episodes; the number of HOHA cases remaining stable. The reason for the rise in COHA cases is unclear but, the IPC Team will discuss this situation with the local ICB IPC team to determine if there are any lessons to be learnt from these cases. Details of the STHFT targets are given below in Table 14.

In recent years, the Trust has performed less well compared to other similar trusts in relation to HOHA cases of CDD; see Table 16. The Trust performance in 2022/23 improved, coming 10th out of 16 similar trusts which was pleasing. The aim will be to improve this position further in the coming years; see Table 3.

Since April 2014, cases of 'HOHA' *C.difficile* have been subject to an assessment to determine whether any 'lapse in care' has been identified which may have contributed to the case; these cases are known as 'potentially avoidable' cases (a summary of the definitions and process involved in this assessment have been reported in previous years' Reports). Although these cases are labelled as 'potentially avoidable', the 'lapses in care' identified may or may not have directly contributed to the specific case.

Of the 117 'Hospital Onset' episodes detected during 2022/23, a possible 'lapse in care' was only identified in thirteen instances (i.e. 11.1% of cases). This builds on the improvement seen in recent years (2021/22 8.4%, 2020/21 – 10.2%, 2019/20 - 9.2%, 2018/19 - 17.6%) and compares favourably with previous years where the figure was approximately 30%. The STH will continue to use this information as one of a number of parameters to monitor in-house progress in relation to *C.difficile* year on year. Comparison with other trusts is not meaningful given the variant nature of how these assessments are undertaken. Most of the 2022/23 cases where a possible 'lapse in care' was noted, were associated with clusters of infection where ribotyping indicated that spread had occurred on the ward. This emphasises the need for early deep cleans where possible clusters are detected.

The rolling deep clean of wards and departments will continue for the foreseeable future. During 2022/23 every effort was made to continue the deep clean programme throughout the year. However, the proactive deep clean programme became increasingly difficult to sustain during the Covid-19 pandemic and the majority of cleans which took place over the past few years, were undertaken in response to clinical cases or clusters/outbreaks of infection plus opportunities taken as services reconfigured, ceased, or were re-instated. However, as operational pressures have eased slightly, decant facilities have become available and allowed the proactive deep clean programme to be reinvigorated. Since February 2023, the programme has been actively pursued and this will continue into 2023/24.

The challenge faced by the Trust going forward is to maintain optimal infection prevention and control practice, cleanliness standards and antimicrobial prescribing, despite caring for an increasingly elderly and frail population. Previous year's Reports have detailed the action plans undertaken since 2011; see sections 6.12 to 19 for actions relating to 2022/23.

## Section 7: Gram Negative Bacilli

Nationally the number of bacteraemia episodes caused by Gram negative bacilli has been rising over the past decade and addressing this is a DH priority. The DH has an aspiration to reduce Gram negative bacteraemia by 50% by 2024/25.

The reasons why Gram-negative bacteraemia occurs are many and varied. At the present time, there is little evidence as to whether there are any interventions that will consistently reduce the number of such episodes. *E.coli* causes the most episodes and carriage of this species in the gastrointestinal tract is universal and the majority of infections are therefore caused by the patient's own body flora.

Nationally, and locally, the majority of episodes are detected on admission to hospital and therefore, this issue requires a whole healthcare system approach, including community care and public health, rather than just concentrating on the care provided by acute trusts. As such, projects such as a) an enhanced Root Cause Analysis review collecting pre admission information and data and b) reviewing STH prophylaxis for hepato-biliary procedures were commenced in 2022/23 and will continue into 2023/24. Any lessons learnt from these projects will be updated in next year's Report.

Since 2017/18, a Sheffield *E.coli* Steering Group has met, comprising STH and CCG colleagues, to gather information, identify trends, risk factors etc. and propose possible action plans based on the information gathered. Addressing these issues is complex and will require co-operation from multiple parties over the long-term and appropriate resourcing. This has been recognised nationally and, from 2019/20, the Integrated Care Systems (ICS) have been tasked with overseeing this issue

The regional ICB convened two meetings during 2019/20 to discuss this issue and to start developing an action plan. Infection prevention and control, pharmacy and microbiology staff from STH attended these meetings and provided data of the STH experience to aid the discussion. Progress in developing and implementing an action plan was hindered by the Covid-19 pandemic. The STH *E.coli* Steering Group has since reconvened and members will continue to liaise with the ICB in 2023/24, as appropriate.

The source of the bacteraemia i.e. the part of the body from which the organism probably entered the blood stream, is a key issue, as knowledge of this can help guide possible preventative actions. In addition, information as to the clinical speciality can also help guide prioritisation of action plan implementation. This data has been collected for each episode of *E.coli*, *Klebsiella species* and *Pseudomonas aeruginosa* bacteraemia detected between 2017/18 and 2022/23 and is presented in this Section. Sections 7.10 to 7.18 summarise the actions undertaken during 2022/23.

### *Escherichia coli* bacteraemia

Overall, the number of episodes detected by the STH laboratories in 2022/2023 has risen by 14% compared to the previous year. However, when comparing the pre-pandemic *E.coli* bacteraemia levels (2019/20) with 2022/23, there has been a 6.5% decrease in the total number of cases detected. As noted in last year's Report, the number of *E.coli* bacteraemia's fell during the Covid-19 pandemic, with possible factors being fewer patients seeking medical advice and less elective hospital work being undertaken.

Following on from the rise in the total number of episodes detected, unsurprisingly, the numbers of Hospital Onset* and Healthcare Associated# cases have also risen this year compared to 2021-22.

- Hospital onset: There has been a 32.8% increase this year compared to a 20% decrease last year. Compared to the pre-pandemic levels in 2019/20, there has been a 3% reduction in the number of bacteraemias.
- Healthcare associated: There has been a 29% increase this year compared to a 10% reduction last year. Comparing this year's figures with the 2019/20 pre-pandemic levels there has been an 8% decrease in the number of bacteraemias.
- Community cases: There has been a 7.7% increase this year, following on from a 4.8% increase the previous year. This is likely to reflect a gradual returning to pre-pandemic level. Comparing this year's figures with the 2019/20 pre-pandemic levels, there has been a 10.8% decrease in the number of community onset cases.

The STH performance during 2022/23 has remained similar to previous years, coming 12th out of 16 this year and 11th and 13th in the previous two years respectively; see Table 3. There are small fluctuations each year.

Overall this year, 7.5% of strains were ESBL producers. This is an increase compared to last year (5.6%), but not an outlier compared to the rates over the past six years (5.6% to 10.6%). The percentage of local isolates that were ESBL producers from Community Acquired cases was 7.2%, compared to 5% last year, Healthcare Associated cases 6.9%, down from 10% last year and Hospital Onset cases 7%, up from 5% last year. There appears to be year on year variation in these data. Nationally in 2021[12], the rate of blood culture isolates of *E.coli* which were resistant to third generation cephalosporins was approximately 14%. Although this parameter is not a strict comparison, it is a useful proxy measure.

Given that exposure to antibiotics increases the likelihood of organisms developing or acquiring resistance, wise antibiotic use is imperative to keep the level of resistance as low as possible. Microbiology, pharmacy and IPC teams across the health care community within Sheffield are continuing to address this issue and a range of objectives and initiatives are included in the 2023/24 IPC Programme to continue this work; see also Section 8.

The Directorates where *E.coli* bacteraemia episodes occur reflect the most common sources for these infections i.e. urinary and gastrointestinal tracts. There has not been any significant change in this distribution between 2017/18 and 2022/23 with. Geriatric and Stroke, General Surgery and Haematology being the three Directorates with the highest number of cases.

<u>*Klebsiella species* bacteraemia</u>

Overall the number of episodes detected by the STH laboratories in 2022/23 (224) is higher compared to last year 2021/22 (193) and shows a continued increase from the previous year 2020/21 (169). There have been increases across the board i.e. Hospital Onset (88 from 78), Healthcare Associated (37 from 23) and Community Acquired (99 from 92) cases, all of which are higher than pre-pandemic levels. STH is not alone in observing this increase. The UKHSA Quarterly report for Jan-March 2023 also reflects this trend, reporting that *Klebsiella spp.* bacteraemia increased by 6.3% nationally, compared to the same time period in 2022, with an increase in incidence, from 19.1 to 20.3 cases per 100,000 population. This is most notable in Hospital Onset cases. The report notes that these rates have exceeded pre-

pandemic levels and are continuing an upward trajectory, being at the highest levels since the surveillance commenced.

In respect to Klebsiella Hospital Onset bacteraemia rates, the STH came 11th out of 16 similar trusts. This was a decrease from 9th the previous year and 5th the year before that, see Table 3.

There is some variation in the percentage of each type of source for Hospital Onset, Healthcare Associated and Community Acquired cases but the there is no clear pattern of change for any of the categories between the years 2017/18 to 2022/23.

The Directorates where *Klebsiella species* bacteraemia episodes occur reflect the most common sources for these infections i.e., urinary and gastrointestinal tracts and central intravenous lines; see Chart 19. Compared to last year, there has been an increase in the number of infections within the Geriatric and Stroke directorate; up to 21 from 8 in 2021/22. The number of infections in other areas has remained similar. Monitoring of these data will continue into 2023/24.

As with *E.coli* isolates, Klebsiella species are also capable of developing antibiotic resistance with mechanisms such as extended spectrum beta-lactamases (ESBL's). Like *E.coli*, exposure to antibiotics will play a part in this.

Overall this year, 6.7% of strains were ESBL producers. This is a decrease compared to last year (8.7%) and similar to the 7% ESBL rate observed for *E.coli* bacteraemia isolates.

- 3% of Community Acquired cases were due to ESBL producers
- 5.4% of Healthcare Associated cases were due to ESBL producers
- 11.3% of Hospital Onset cases were due to ESBL producers

Reflecting the overall decrease in the number of ESBL producing *Klebsiella spp*. isolated, there has been a sustained decrease in the number of Community Acquired isolates, down from 4.3% last year and 5% the previous year, to 3% this year. Similarly, there has been a decrease in the number of Hospital Onset cases; 11.3% this year, down from 14.1% last year and Healthcare Associated cases; 5.4% this year down from 8.7% last year.

Compared to *E.coli*, Community Acquired *Klebsiella spp.* cases have lower rates of resistance at 3% compared to 7.2%. Similarly, rates for Healthcare Associated cases are lower for *Klebsiella spp.*at 5.4% compared to 16.9% for *E.coli*. In contrast, Hospital Onset *Klebsiella spp.* have a higher rate of resistance than *E.coli*, 11.3% compared to 7%. Locally, monitoring of ESBL's amongst *Klebsiella spp.* only commenced in 2021/22, and will continue to be monitored over in the year ahead.

*Pseudomonas aeruginosa* bacteraemia

Overall the number of episodes detected by the STH laboratories in 2022/23, fell compared to the previous year (51 compared to 64). This represents a continuing downward trend as these numbers are lower than pre-pandemic levels. The number of Hospital Onset cases also fell this year with 18 compared to 28 last year. This is the lowest level since 2017/18 when 17 episodes were reported. Conversely, there has been a rise in the number of Healthcare Associated cases this year with 13 compared to 6 being reported last year. However, these numbers are lower than pre pandemic levels. The number of Community Acquired cases has fallen in 2022/23, with 20 cases seen compared to 30 cases in 2021/22. The 2021/22 figures may be an outlier. It should be noted that, deducing trends from relatively small numbers is problematic, and monitoring of these data will continue into 2023/24

In respect to Hospital Onset *Pseudomonas aeruginosa* bacteraemia, the STH came 2nd out of 16 similar trusts; see Table 3 above. This is an improvement from 7th last year. This position has varied over the past few years, coming 4th in 2020/21 and 2nd in 2019/20.

There is some variation in the percentage of each type of source for Hospital Onset, Healthcare Associated and Community Acquired cases and, due to the small numbers, determining clear patterns of change for any of the categories between the years 2017/18 to 2022/23 is problematic; see Charts 22 to 25.

Small numbers of cases occur within many Directorates although cases associated with the haematology pathway are particularly common. A further complicating factor is that, in many cases, the cause is less than clear particularly in haematology patients who have multiple co-existing risk factors.

Carbapenemase Producing *Enterobacteriaceae (CPEs)*

To date, CPEs are relatively uncommon locally and Sheffield is not classed as a high-risk area. The table below contains information as to the number of cases detected by the laboratories in Sheffield. The IPC Team also try and determine where a patient may have acquired the organism. This is not always possible and unless the source is clearly elsewhere, e.g. when a patient is transferred from abroad, the source is allocated to the STH. It should be noted that the patient may have been carrying the organism on admission and the STH may not have been the source but, in the absence of information to this effect, allocation remains with the Trust.

CPE information 2013/14 to 2022/23
Number of patients identified by the STH Laboratories as being infected with or carrying CPE organisms

| | Total detected | Trust Attributable and Trust Associated[#] |
|---|---|---|
| 2013/14 | 10 | 4 |
| 2014/15 | 16 | 12 |
| 2015/16 | 8 | 5 |
| 2016/17 | 19 | 9 |
| 2017/18 | 20 | 14 |
| 2018/19 | 11 | 2 |
| 2019/20 | 9 | 3 |
| 2020/21 | 14 | 5 |
| 2021/22 | 24 | 13 |
| 2022/23 | 38 | 18 |

# Trust Attributable - detected in samples taken >48 hours after admission
Trust Associated – detected in samples taken < 48 hours after admission but the patient has been an STH in-patient within the past 28 days.

Patients who have had healthcare in areas where the incidence of CPE organisms is high have an increased risk of carrying such organisms. Therefore, patients who fulfil the following criteria are screened for CPE on admission to enable early detection, optimise any antibiotic therapy they may require and reduce the risk of transfer to other patients.

- Household or bay contacts of patients with known CPE colonisation
- Patients who have been an inpatient in hospitals outside of South Yorkshire, Bassetlaw and Chesterfield in the past 12 months
- Patients who have been an inpatient in hospitals outside the UK in the past 12 months
- Patients admitted to Critical Care, Haematology and Osborn wards

Although the actual number of cases detected locally is small, numbers do appear to be increasing over recent years. This is unsurprising given the national and international rise in such isolates. However, increased screening may also be a contributory factor.

## Section 8: Antibiotic Resistance and Stewardship

Local antibiotic resistance rates generally compare well to those seen nationally. However, resistant *Staphylococcus aureus*, *Enterococcus spp. a*nd multi-resistant Gram-negative organisms, including those known as extended spectrum beta-lactamase producers, are present and measures need to continue to ensure the incidence of these organisms is kept to a minimum.

The local data allows clinicians to continue to prescribe traditional antibiotics with confidence in the majority of situations. It should be noted that the data in this section relates to all isolates investigated within the Sheffield laboratories including those from samples submitted from the community.

Although resistance rates locally are generally low relative to the national position, the need to use antimicrobial agents wisely remains a priority. A range of activities have been undertaken over the past decade to optimise prescribing led by the Antimicrobial Stewardship (AMS) Team.

The charts within this section show the trend in antimicrobial prescribing within STH over time and compares this to other similar trusts. The data show that the trust performs well with either average or below average levels of prescribing for total antimicrobial use and various individual key agents.

This section includes a report from the AMS Team summarising their work and achievements and challenges during 2022/23. These include:

- CQUIN indicators for antimicrobial stewardship
- Antibiotic Usage Graphs
- Antimicrobial stewardship education and awareness
- Governance issues
- Multidisciplinary AMS Team
- New and high-cost antimicrobial agents
- Antimicrobial Guidelines and Polices
- Antimicrobial usage and prescribing reports
- Challenges for the AMS Team

## Section 9: Influenza

Influenza infections are a hallmark of the winter season when environmental conditions are optimal for its rapid spread. Whilst most of these infections in the community are self-limiting and remain uncomplicated, a proportion of these require a healthcare episode. Increased consultations at primary care facilities and

emergency departments lead to increased numbers requiring admission either with a complicated infection or with exacerbation of chronic illnesses

Graph 1 demonstrates the dramatic change in influenza activity observed in 2022/23 following the effects of the pandemic and removal of non-pharmaceutical interventions e.g. social distancing, masks, school closures and other control measures used for Covid-19. The 2022/23 season started approximately two months earlier than generally seen pre the pandemic. This had been predicated, following the influenza activity observed in the southern hemisphere.

In anticipation of early influenza activity, Trust teams prepared to deploy point of care testing (POCT) at the start of October 2022 and the staff vaccination programme was commenced as early as possible given vaccine availability. During the season, the patient admission pathways ran smoothly across the Infectious Diseases, Frailty and Respiratory units.

Overall, the 2022/23 influenza season was the largest seen, in terms of peak numbers, since local recording of cases begun. However, the duration of the season was short. The predominate strains were Influenza A H1N1 and H3N2, with very little Influenza B detected.

The Outbreak and Systems Resilience Group (OSRG) continue to oversee the prevention and management of influenza within the Trust, with key issues being a) promoting and administering staff influenza vaccination , b) planning patient pathways, c) ensuring staff are educated in the infection prevention and control plus clinical management of influenza patients and d) managing the influenza POCT programme which is offered on every admission pathway in parallel to Covid for all symptomatic admissions.

## Section 10: Covid-19

Covid-19 continued to dominate the infection prevention and control focus for 2022/23.

Section 10 of the 2019/20, 2020/21 and 2021/22 Reports included the various structures and groups set up to manage the pandemic and the main infection prevention and control related issues and topics addressed. The majority of the aforementioned work remains in place and continues to be the bedrock for managing the on-going pandemic. Where possible, the Trust continues to follow national guidelines regarding managing Covid-19, which are predominantly provided by NHSE/I and UKHSA. Within the STH, interpretation of these guidelines are now made by the OSRG Expert Group (OSRG-EG) and local amendments made if required and in response to local prevalence.

Throughout 2022/23, the waves of Omicron subvariants were managed in a relatively standardised manner compared to previous waves. Infection prevention and control guidance remained the same regardless of the Covid prevalence, apart from changes to when and where mask wearing was advised. The Trust testing strategy moved towards a symptomatic approach, with asymptomatic testing gradually being phased out, as per national guidance. The staff Test and Trace Team and the staff Drive Through Testing Service have therefore been stood down. Overall, therefore, testing for Covid-19 has been aligned to that of other respiratory pathogens.

The graph in this section depicts how the number of cases has stabilised towards the end of 2022 and start of 2023, with less significant peaks with each subsequent wave.

The main infection prevention and control challenges for 2022/23 included:

a) Detecting and managing cases and clusters of nosocomial infection. Nosocomial infection is problematic due to asymptomatic infection in staff and patients plus reduction in community testing.
b) Staff absence often at short notice, due to lateral flow test (LFT) testing, increasing community social contact etc.
c) Removal of LFT for the public, from April 2022, and ensuring patients and staff still engaged with testing practices.
d) Increase in other infections as community contact increases e.g. norovirus, RSV and influenza
e) Staff morale affected by months of dealing with Covid-19
f) Managing infection prevention and control related expectations within healthcare when measures are being relaxed in the wider community
g) Changes to patient admission testing, removal of asymptomatic testing pathways and a move to symptomatic identification and management.

Some lessons from the pandemic, including point of care testing (POCT) and PPE/masking, continue to provide large benefits across the organisation. Other respiratory viruses are becoming more prevalent with altered seasonality and in large numbers; see also section 9 above. This is due to reduced host immunity caused by reduced exposure over recent years due to Covid control measures. In addition, PPE and mask wearing has become embedded and established for the management of patients with a variety of respiratory viruses.

## Section 11: Norovirus

The norovirus activity seen within the Trust varies year by year and generally reflects activity in the community. Norovirus activity within the Trust during 2022/23 was higher than in recent years. This reflects the increase in infection seen within the community following the pandemic.

## Section 12: Outbreaks, Major Incidents and Complaints

There have been numerous occasions during the year when the IPC Team have either detected, or been called for advice regarding, a potential outbreak. Some of these situations proved to be false alarms, whilst others could be handled swiftly and any outbreak ‘nipped in the bud’. The IPC Team always aims to control an outbreak by causing as little disruption as possible to the running of the ward or department concerned. However, there are occasions when this is not possible and patient and staff screening and/or bed closures may be necessary.

During 2022/23, Covid-19 continued to be a significant infection prevention and control issue but other organisms, particularly norovirus and influenza, increased in incidence again as the pandemic waned and social control measures reduced.

Clusters/outbreaks/incidents of Covid-19 continued to occur during 2022/23 with 187 clusters/outbreaks/incidents being detected, involving 1185 patients and 292 members of staff resulting in 3425 bed-days lost. These figures reflect the immense impact Covid-19 continued to have during 2022/23 on staff, patients and Trust services.

Of note is the *Candida auris* cluster which was the first identification of this organism within the Trust. Following the identification of the index case, screening of patient contacts was undertaken and four further cases detected over a number of weeks. All patients had colonisation with this organism rather than infection. Enhanced

surveillance within the wards concerned was undertaken for several months; this has now ceased as no further cases have been detected.

Other incidents with infection prevention and control implications are summarised in this Section.

The IPC Team received a number of complaints this year. Most of them were not solely related to infection prevention and control but contain a number of complaints regarding the general care received by patients. The infection prevention and control related complaints and incidents are summarised below (one such complaint received unless stated otherwise):

The infection prevention and control related complaints are summarised below:

- Management of, exposure to, or nosocomial acquisition of, Covid-19 (seven)

The STHFT takes seriously any infection prevention and control complaint. Appropriate lessons learnt from the investigations into these cases are taken on board.

To date most of these complaints have been settled by local resolution although it is likely that more formal proceedings will be initiated in a number of cases. In some instances the complaint was due to a misunderstanding rather than STHFT providing poor care, but some complaints were justified, and measures have been taken to improve care and practices within the Trust. Ownership at ward level by all groups of staff is a prerequisite for improvement in this area.

## Section 13: Conclusion

This Report highlights both the progress made during the past year in relation to infection prevention and control and also the challenges that lie ahead. However, a great deal of hard work has taken place and much has been achieved.

For a trust the size and complexity of STHFT the Trust, the specialist infection prevention and control personnel and staff working both on the wards and behind the scenes have much to be proud of.

Preventing and controlling infection is an on-going issue for any healthcare establishment and STHFT is no exception in this respect. Infection prevention and control is obviously a key component of managing the on-going Covid-19 pandemic and this will be the top infection prevention and control priority for the coming year.

## Appendices A to H

Appendices A to D:
These sections contain infection prevention and control reports from the Trust Decontamination Manager, the Trust Water Safety Steering Group, the Trust Ventilation Safety Group and Trust Waste Manager in relation to decontamination, water, ventilation and waste safety, respectively.

Appendices E to H
These sections contain information regarding the infection prevention and control structure within the Trust, infection prevention and control related policies and the membership of the IPC Team and IPC Committee

# Section 2

# Infection Prevention and Control Service

2.1 2022/23 has once again been a busy year for the STHFT Infection Prevention and Control (IPC) Service with challenges and opportunities occurring throughout the year.

2.2 Unsurprisingly, the biggest challenge this year has continued to be Covid-19 with direct and indirect impacts felt across all areas of the Trust. Returning Trust services to 'business as usual' and dealing with the back-log of work put on hold during the pandemic, continues to be a challenge across the board.

2.3 Infection prevention and control is a key quality issue. There are numerous documents, pieces of guidance, bulletins, statements, performance indicators etc. emanating from the Department of Health, professional bodies, assessment bodies etc. which are designed to aid trusts in addressing this issue and assessing progress.

2.4 Links to the major IPC standards and key documents can be found in Section 1 of this Report[1- 32].

Structure of the STHFT IPC Service

2.5 The current Trust IPC Service structure can be found in Appendix G.

2.6 The Executive Lead for infection prevention and control continues to be the Chief Nurse, Chris Morley.

The role of Director of Infection Prevention and Control (DIPC) continues to be undertaken by the Lead IPC Doctor, Christine Bates.

2.7 All the microbiology consultants undertake operational IPC Doctor duties across the Trust, including community-based services. Rob Townsend provides strategic microbiology and antibiotic therapy advice to primary care and the Care Trust. Christine Bates, Chris Lynch and Rob Townsend lead on wound infection surveillance. Dave Partridge leads on the microbiological aspects of Water Safety, Christine Bates on Decontamination and CJD and Helena Parsons leads the Trust Antimicrobial Stewardship Team. Rob Townsend and Chris Lynch lead on microbiological and infection prevention and control issues relating to operating theatres, ventilation and other estates related topics. Mohammed Raza continues as the consultant virologist with responsibility for virological aspects of infection prevention and control across the Trust.

2.8 Patty Hempshall has continued as the Lead IPC Nurse Specialist with a team of 8.69 Whole Time Equivalent (WTE) IPC Nurse Specialists, including Band 7's, 5.28 WTE IPC Assistant Practitioners, 0.85 WTE IPC Systems Manager and 1.06 WTE Support Secretaries. With exceptions for colleagues briefly medically suspended due to Covid-19, and the IPC Systems Manager, the IPC Nurse Specialists and Assistant Practitioners have always maintained an on-site presence to meet clinical demands.

Comparison of staffing figures for 2022/23 with those for 2021/22 shows that:

- Band 4 IPC Assistant Practitioner staffing reduced by 0.3 WTE on average due to maternity leave/leaving for another post-recruitment for a replacement is in progress
- SSI Surveillance staffing was lower in 2021/22 due to internal secondments to the wider IPC Team, reflected to a lesser extent in 2022/23 as internal secondments ended and the surveillance workload increased
- Band 6 nurse staffing was 0.75 WTE lower on average when comparing the two periods, to be addressed by recruitment in 2023/24
- Band 7 and Band 8a staffing has been stable across both periods as has Admin/Clerical Band 3 and Band 6 staffing

The Acting Band 7 opportunities offered during 2020/21 strengthened Band 7 leadership at each main campus and became substantive appointments for Angela Kelleher and Sally Nyinza from June 2022. These Site Lead posts, and the individuals in them, are invaluable to support leadership of the IPC Team a) operationally to deliver the IPC Programme as fully as possible and b) in some of the more strategic projects such as preparation for the move to Oracle Cerner in 2024.

IPC Team cover across all areas of the Trust has been maintained in 2022/23 though with reduced IPC Nurse Specialist cover at times for Community Services and at Central Campus. Staffing has continued to be challenged due to the significant demands placed on the IPC Team by the pandemic. Staffing was supplemented by internal secondments from the SSI Surveillance Team which continued until the end of October 2022, with further details below. Staffing and skill mix across sites continues to be adjusted following retirement of two very experienced and valued colleagues, Kim Tomlin and Jackie Anderson in October 2022 and March 2023 respectively. With the recruitment of newer colleagues into vacancies comes a shift in skill mix and a need for mentorship and support from established colleagues, which continues to be provided. Covid related and other outbreaks have been managed by IPC Nurse Specialists alongside working to address the impact of the CQC feedback, re-establishing preventive and proactive work with the return to business as usual, and building assurance provided by our systems, including supporting the IPC Accreditation Programme. As part of its range of commitments, the IPC Team has continued to re-establish education for the IPC Link Workers, including quarterly Update events, and has made progress with policy review work.

The Surgical Site Infection (SSI) Surveillance Team currently comprises 4.25 WTE nurse specialists and during 2022/23 has been led by Patty Hempshall. SSI Surveillance colleagues have continued to take opportunities offered by the pandemic to provide support across sites, both in and out of hours. A programme of secondments to the IPC Team was offered in 2021/22 which continued into 2022/23 to provide further support during the pandemic and as development opportunities for SSI Surveillance colleagues. Debbie Adams worked very successfully in a 12 month secondment until March 2022 before returning to her substantive role in the SSI Surveillance Team from April 2022. Short term secondments were offered to SSI Surveillance Team colleagues due to the impact of Covid-19 on the elective arthroplasty categories that have formed a central, and previously substantial, component of the SSI surveillance programme for several years. Appendix E shows the details of the final secondments, for Debbie Carr and Samantha Willow, which

continued into 2022/23. Sarah Egginton continued in her SSI Surveillance role to provide continuity, whilst also a valuable asset to the work of the IPC Team on a more informal, ad-hoc basis rather than formal secondment. Without exception, these secondments proved very successful for the individuals involved in terms of a greater understanding of the IPC Team's other work, closer cohesion across IPC Team, and for their invaluable support.

In addition to supporting colleagues, covering at different sites has enabled individuals to widen their experience of the differing specialities within the Trust, take account of the changing workload due to reconfiguration of clinical services and to promote standardised practice within the Team across both campuses. The closure of the Hadfield Wing from November 2018 to June 2021, led to an increased workload for the IPC Team on the Central Campus as two busy Geriatric and Stroke Medicine areas from NGH were transferred to the Central Campus. The impact in terms of the number and frequency of patient reviews, *C. difficile* alerts and Covid-19 outbreaks was sustained until one of these areas returned to NGH in October 2022.

The IPC Team has continued to blend Acute and Community expertise successfully since 2015/16 to promote integration of Acute and Community IPC services and support development of IPC services for community-based settings. A further change in Community IPC Team staffing was implemented in December 2022 with Sue Hillis joining Bev Wade following Kim Tomlin's retirement. The IPC Team continues to work collaboratively with Sheffield Integrated Care Board, retaining a focus at all times on service improvement, collaboration, support of colleagues and services and Teamwork.

2.9 The IPC Assistant Practitioners also have a central role in delivering the IPC agenda. With other members of the Team, these individuals continue to contribute hugely to the prevention and control of infections due to alert organisms including MRSA, CDD, CPE, GRE and Covid-19. Their activities include regular patient reviews, IPC reviews in clinical areas, audit of infection prevention and control practice e.g. standard precautions, hand hygiene and commode cleaning, whether in response to *C. difficile* alerts or more proactively, working with colleagues to support IPC Accreditation. Their workload continues to include support for areas towards achievement of IPC Accreditation, support for planning of environmental cleaning and decontamination by Domestic Services, including the use of hydrogen peroxide vapour and UVC technology and optimising decolonisation regimens for patients with MRSA.

2.10 Glenn Radford continues as the IPC Systems Manager. His role spans a range of key functions including to work with the IPC Team to develop information systems and optimise the reporting of data to staff, patients and the public. His support remains invaluable, with significant progress made once again this year, including refinements to a number of reporting functions within the IPC SSI Surveillance database, and Outbreak database, which has continued to transform outbreak reporting by the IPC Nursing Team across STH. Glenn's support has also been involved in escalating disruptive access issues due to use of RDS for the SSI Surveillance database and an intermittent lack of connectivity affecting several members of IPC Team at NGH.

2.11 The antimicrobial pharmacy team, (funded establishment 2.0 WTE Band 8a and 1.0 WTE permanent Band 7 pharmacists, 1.0 WTE permanent Band 7

nurse and 1.0 WTE Band 5 pharmacy technician) continue to work with the IPC, Microbiology and OPAT Teams as part of the Antimicrobial Stewardship (AMS) Team. However, the team did not have the total funded establishment available to them throughout the year, with some individuals seconded to other roles and posts left vacant or backfilled with staff of a lower banding. The team undertakes a range of activities aimed at optimising antibiotic stewardship across the Trust. Section 8 contains a report by the AMS Team, which summarises the key antimicrobial stewardship issues addressed, and work carried out, during 2022/23.

2.12 The Communications Team, led by Julie Phelan, continues to add value to the IPC Service. Their key role is to help raise awareness amongst staff, patients and visitors of the many and varied issues involved in preventing and controlling infection.

2.13 Finally, the ongoing commitment of the Board of Directors has been key in ensuring that this element of healthcare remains a priority and that appropriate financial, material and moral support has been available to enable plans and initiatives to become a reality.

Ownership of infection prevention and control at a clinical level

2.14 The overall responsibility for infection prevention and control within each Group lies with the Clinical Directors (CDs), although this is generally a delegated duty to the Nurse Directors (NDs). The structure for infection prevention and control information flow and accountability within each Group includes all professional groups not just the nursing staff. The NDs liaise with other key staff e.g. Clinical Directors (CDs), Matrons and Medical IPC Leads to make this a reality. The NDs and CDs continue to be encouraged to use the Healthcare Governance arrangements within their areas as conduits for communicating, implementing and reviewing infection prevention and control advice, guidance and information including surveillance data.

2.15 Infection prevention and control continues to be embedded into the Trust Healthcare Governance system with the IPC Accreditation scheme linking up with the Trust Clinical Assurance Toolkit. Participation in the IPC Accreditation Scheme includes all in-patient, out-patient and community-based wards and departments.

2.16 The 2022/23 annual IPC Programme was written in a similar format to previous years. Each Group or Department completed an assessment form in July 2022 and April 2023 declaring their position against the objectives within the Programme and returned this to the DIPC for review. The results of these reviews were reported to the IPC Committee and Quality Committee; see Section 3 of this Report.

# Section 3

## Report on the Infection Prevention & Control Programme April 2022 - March 2023

3.1 The Infection Prevention & Control (IPC) Programme describes the infection prevention and control activities that the Trust planned to focus on during the year. All areas continued to follow existing infection prevention and control activities, policies, protocols, procedures and guidelines unless specifically updated or superseded. The trust-wide IPC Programme outlines the issues to be addressed each year. Each Group or Department is free to produce their own Programme/Action Plan detailing how the requirements in the trust-wide Programme will actually be undertaken at a local level.

3.2 The main areas focused on during 2022/23 were**:**

- Prevention and Control of Covid-19
- Optimising staff personal protective equipment (PPE)
- Antimicrobial Stewardship

The topics covered by the Programme continued to be.

- IPC Accreditation
- High Impact Interventions[3]/Saving Lives[4]/NICE Guidance[5-7]/ EPIC3[8]
- Health and Social Care Act[1]/CQC[2]
- Ownership at Group, Directorate/ Ward/Department/Service level
- Audit and Review
- Surveillance
- *Staphylococcus aureus*: Meticillin resistant (MRSA) & sensitive (MSSA)
- *Clostridioides difficile* (*C.difficile*)
- Gram negative organisms
- Covid-19, Influenza & Respiratory Viruses
- Norovirus
- Antimicrobial Stewardship
- Hand Hygiene
- Novel & High Consequence Pathogens
- Decontamination of Medical Devices & Patient Shared Equipment
- Management of Invasive Devices: Peripheral and Central intravenous cannulae & Urinary catheters
- Environmental, Cleaning, Waste, Water and Ventilation Issues
- Education, Training and Personal Protective Equipment (PPE) issues
- Communication. Information & Information Technology
- Research, Service Evaluations, Studies and Assessments

3.3 Progress in respect of the IPC Programme was assessed near the beginning, and at the end, of the financial year i.e. July 2022 and April 2023 by those responsible for infection prevention and control in each Group/Department. These assessments were reviewed by the Director of Infection Prevention and Control (DIPC) and each area coded Red, Amber, Yellow, Green, Blue or Purple depending on progress made, see section 3.4 and Table 1 below. The full IPC Programme, including the assessment forms, can be found on the Infection Control webpage on the Trust intranet. The main body of the Programme can also be found on the Trust internet site.

# Table 1
# Infection Prevention & Control Programme Progress Assessment: 2022-23

| | Initial Assessment | End of year Assessment |
|---|---|---|
| South Yorkshire regional Services<br>• Renal<br>• Cardiac<br>• Vascular | | |
| Combined Community and Acute Services<br>• Integrated Community Care<br>• Integrated Geriatric & Stroke medicine<br>• Therapeutic and Palliative Care | | |
| Medicine and Pharmacy Services<br>• Diabetes and Endocrinology (A/B & Decon)<br>• Respiratory (A/B)<br>• Gastroenterology | | |
| Acute and Emergency Care | | |
| Head & Neck Services | | |
| Specialised Medicine & Rehabilitation<br>• Communicable Diseases and Specialised Medicine (Infectious Diseases, GUM, Haematology inpatient and day case, Coagulation and Haemophilia, Dermatology, Immunology)<br>• Specialised Rehabilitation<br>• Cancer Services (Inpatient, Outpatient, Radiotherapy, Cancer Trials Centre) | | |
| MSK - Orthopaedics, Rheumatology, Physioworks/ Physioplus, Podiatric surgery, Hospital MSK Occupational Therapy & Physiotherapy, Metabolic Bone & Pain Services, Hand Unit | | |
| OG&N<br>• Obstetrics<br>• Gynaecology/Andrology<br>• Neonatology | | |
| OSCCA - Operating Service, Critical Care & Anaesthesia | | |
| Surgical Services - General Surgery, Plastics & Urology | | |
| Discharge Lounge NGH | | |
| Clinical Research Facility/Research Dept | | |
| Occupational Health | | |
| Pharmacy | | |
| Medical Imaging & BME | | |
| Laboratory Medicine | | |
| Estates | | |
| Facilities<br>• Waste<br>• Security<br>• Domestic Services<br>• Portering/Transport<br>• Catering<br>• Laundry | | |
| Infection Prevention and Control Team | # *<br># * | # *<br># * |
| Trust-wide/DIPC objectives | # *<br># * | # *<br># * |
| Total Trust | | |

* - taking into account actions expected to be completed in year
# - considering ongoing actions requiring a longer time frame

| Colour | Description for overall coding |
|---|---|
| | |
| Purple (Fully) | All sections 'Fully' met or one 'Nearly' met* |
| Blue (Nearly) | Unless qualify as Purple - One or more sections 'Nearly' or 'Mostly' met (if >one 'Mostly' – coded Green) |
| Green (Mostly) | One or more sections 'Nearly', 'Mostly' or 'Moderately' met (if > one 'Moderate' - coded Yellow) |
| Yellow (Moderately) | One or more sections 'Nearly', 'Mostly', 'Moderately', 'Poorly' (if > one 'Poorly' coded Amber) |
| Amber (Poorly) | One or more sections 'Nearly', 'Mostly', 'Moderately', 'Poorly', 'Minimally' met (if > one 'Minimally' coded Pink) |
| Pink (Minimally) | One or more sections 'Nearly', 'Mostly', 'Moderately', 'Poorly', 'Minimally', 'Not' met (if > one 'Not' coded Red) |
| Red (Not) | Greater than one section 'Not' met |
| N/A | Not applicable and therefore not taken into account when coding |

3.4 In summary:

- All areas completed the majority of the Programme
- All areas coded Purple, Blue, Green or Yellow at the end of the year.
- The main reasons Groups/Directorates were not coded as Purple at the end of the year were a) newly identified departments needing to accredit for the first time, b) areas behind with respect to their Reaccreditation schedule, c) failure of wards to make antibiotic audit returns on a regular basis or c) directorates being unable to regularly provide compliance data in respect of mandatory training
- The Trust-wide and IPC Team work programmes are particularly challenging, with a number of elements that are expected to require more than one year to complete; the coding in Table 1 reflects this.

A summary of progress made in relation to a number of key sub-sections within the Programme can be found below. Reports on the remaining sub-sections can be found in various chapters elsewhere in this Report.

Infection Prevention and Control Accreditation

3.5 The Accreditation scheme continues to be the main means by which infection prevention and control practice is standardised, improved and assessed across the Trust.

3.6 Details of progress in respect of initial Accreditation and annual Re-accreditation are reviewed quarterly by the IPC Committee. All established acute and community services Accredit annually and newly configured areas are working towards Accreditation for the first time. Details are available from the IPC Team.

3.7 During the pandemic, allowance was made for the fact that some areas were not able to complete all the Accreditation Programme audits, due to Covid related demands. However, to the great credit of Trust staff, the majority of areas did continue to undertake the audits and to achieve Accreditation despite the extra workload necessitated by Covid-19. Despite the ongoing workload issues resulting from the need to respond to the back-log of work caused by the pandemic, the Accreditation Programme is now running at full pace. All concerned, including the IPC Team who review all the Accreditation evidence, should be congratulated.

3.8 The Accreditation Programme was updated during 2022/23. Peer review audits have been introduced, the audit tool scoring system reviewed and the modules are in the process of being transferring onto the QUEST platform. This is a large and complicated piece of work and all those involved should be commended.

Audit and Review

3.9 The majority of the infection prevention and control related audit programme takes place via the IPC Accreditation Scheme. See sections 3.5 to 3.8 of this Report. Full audit results can be obtained from the matrons and ward managers of the various areas taking part in the Scheme.

3.10 Progress in respect of the IPC Programme is outlined in section 3.3 to 3.4

3.11 The IPC Team has continued the rolling programme of review of infection prevention and control related policies. Progress in this respect has been reviewed at the bi-monthly IPC Team and quarterly IPC Committee meetings. The list of policies that the IPC Team has primary responsibility for producing and reviewing, can be found in Appendix H.

During 2022/23 the National Infection Prevention and Control Manual[27] was published by NHSE. This currently has two sections but it is anticipated that further modules will be published in the coming months and years. Trusts are required to ensure local policies, guidelines and protocols etc. are consistent with those within the Manual. The deadline for complying in respect to the first two modules is March 2024. The IPC Team are in the process of reviewing local policies, practices etc. against the Manual and changes will be made locally where necessary. Few if any changes are anticipated. As this Manual is constantly being updated, the Team will review it on an on-going basis and compliance against it will be a standing item on the IPC Committee agenda.

3.12 The Trust has continued to use the NHSE Infection Prevention and Control Board Assurance Framework (BAF)[23] at both Board and IPC Committee level to evaluate the Trust's performance and actions in respect to infection prevention and control. The initial national BAF concentrated on Covid-19 and the Trust had adapted the document for in-house use in assessing the wider infection prevention and control agenda, rather than just Covid-19. During 2022/23, the national BAF was updated to reflect the wider agenda and the Trust has therefore reverted to using the national document.

Surveillance

3.13 The Trust continues to participate in the DH mandatory surveillance schemes; see Sections 4, 5, 6 and 7.

3.14 Surveillance of surgical site infections (SSI) has been part of the IPC Team's activities for many years. During 2022/23 SSI surveillance has been undertaken on a continuing basis for the following procedures: hip and knee arthroplasty and neurosurgical procedures. Surveillance of colorectal surgery also commenced; see sections 4.9 to 4.21 of this Report for details.

The SSI Team continue to work with clinical colleagues to review the data collected and investigate and implement options for improving practice, as appropriate. The structure and function of the SSI Surveillance Team continues to be reviewed. Longer term expansion of surveillance to other types of procedure and surgical specialities continues to be the aim.

3.15 The IPC Team are working with the various critical care departments across the Trust to determine the optimal infection related data to be collected from within these units and the methodologies for doing so. The IPC Committee reviews progress in this regard quarterly.

Hand Hygiene

3.16 The Trust has continued to promote best practice, including auditing of compliance, in respect of hand hygiene via the IPC Accreditation Scheme.

3.17 Unsurprisingly optimal hand hygiene was a key element in responding to Covid-19 and formed part of the education, training and communications provided to staff, patients and visitors. This advice and material will continue to be promoted in the post-pandemic era.

3.18 Wards and departments are required to provide patients with access to hand hygiene facilities, not only in the toilet areas but also at the bed side especially if the patient has to use a commode.

3.19 The Supplies and Occupational Health Departments continue work with the IPC Team to optimise the hand hygiene products available to staff and patients.

3.20 The Trust Dress Code for all staff includes the requirement to dress in a manner that will allow optimal hand hygiene. The Dress Code is kept under review; infection prevention and control issues being key elements considered.

Decontamination of Medical Devices, Environmental, Cleaning and Waste Issues

3.21 Appendices A and D contain reports by the Trust Deputy General Manager with responsibility for Decontamination and Trust Waste Manager respectively, which summarise the key decontamination and waste issues addressed, and work carried out, during 2022/23.

Appendices B and C contain reports from the Trust Water Safety Committee and Trust Ventilation Safety Group respectively, which summarise the key water and ventilation quality issues addressed, and work carried out, during 2022/23.

3.22 Audit of the ward environment and the standard of cleanliness forms part of the IPC Accreditation scheme.

3.23 The Patient Experience Committee oversees the refurbishment and cleanliness agenda. The Trust continues to review the domestic services provision and how it is delivered and has reviewed its position against the National Standards of Healthcare Cleanliness (NCS)[28], published in 2021. The Trust is compliant with, and in some areas exceeds, the 2021 NCS. The displaying of star ratings and the implementation of the efficacy audits has been progressed during 2022/23.

3.24 The ward upgrade programme continued during the year, taking into account work required due to service reconfiguration. This programme is multi-disciplinary, involving members of the Estates Department, Domestic Services Department and the IPC Team. Where possible this work continued during the Covid-19 pandemic, although some disruption was inevitable.

Education, Training and Personal Protective Equipment (PPE)

3.25 The Trust policy is that all staff should receive infection prevention and control training at induction and appropriate refresher updates thereafter. This policy forms part of the IPC Programme and Directorates do provide appropriate education programmes and sessions. Documentation of infection prevention and control education is via the Personal Achievement and Learning Management System (PALMS).

3.26 The in-house induction IPC e-learning packages, initially written over a decade ago, can no longer be supported by the Trust IT and Learning and Development departments and therefore, alternative means of providing this material have been investigated during 2022/23. It is anticipated that the Trust will move to a national on-line package during 2023/24

3.27 As for the IPC induction e-learning material mentioned in section 3.26, the in-house Trust IPC refresher e-learning packages can no longer be supported. This material will be replaced by a national on-line package in 2023/24.

3.28 In addition to the above e-learning packages, infection prevention and control is a key element of the centralised Trust induction sessions, which were mainly provided on-line via PALMS during the pandemic. These have moved back to face to face session during 2022/23.

3.29 Infection prevention and control mandatory training continues to be reviewed as part of the overall Trust review of such topics.

3.30 Staff are used to wearing PPE as part of their clinical roles; this generally being gloves and aprons when exposed to body fluids and other items in specific circumstances. During the pandemic staff were required to wear some elements of PPE for a longer period of time than usual and, in many cases, additional items were also required e.g. gloves, gowns, masks, eye protection. During 2022/23, updated national infection prevention and control advice[27] was published, including PPE use, which in summary was a move to a more generic risk- assessment based model, similar to pre-pandemic practice. The Trust has followed this updated national advice. Staff will still require appropriate PPE for patients with respiratory infections but overall this change results in less PPE being used and the cessation of universal mask wearing in clinical areas.

3.31 Local implementation and optimisation of the use of FFP3 masks continued throughout 2022/23, including an on-going programme of staff fit-testing.

3.32 The amount of single-use PPE has obviously increased enormously over recent years and, amongst other reasons, is of concern in respect to the ‘sustainability’ agenda.

During 2022/23, a multi-disciplinary group, including staff from Infection Prevention and Control, Facilities, Decontamination, Sustainability and Operating Services departments, has worked on options for switching from single-use to re-usable items of PPE, where this is appropriate. The group worked with the NHSE group heading up this work nationally. Work included options for re-usable masks, hats and gowns. The Trust has invested in a pilot scheme to install a clean room within the laundry on the NGH site to allow in-house processing of certain items of non-sterile PPE. The pilot is planned to commence in 2023/24. Lessons learnt from this pilot will be used to hopefully widen the scope of this work.

Communication and Information

3.33 The IPCT have continued to work with those planning, developing and implementing the Trust's information technology programme to ensure that, where possible, these developments will facilitate the infection prevention and control agenda

3.34 Specific issues that have been identified to date include:

- Evaluating the recently developed electronic peripheral cannula care form within the electronic Nursing Care Plan
- Ongoing participation in the development and promotion of the electronic Patient Care plans to replace Nursing Care Guidelines
- Options for Digitalising the IPC Programme and compliance returns

Progress towards these aims has been variable and will continue into 2023/24.

Research, Service Evaluations, Studies and Assessments

3.35 The IPC Team, Microbiology, Virology and various clinical staff across the Trust participate in a range of infection prevention and control related research, service evaluations, studies and assessments during the year.

Response to IPC issues raised by the Care Quality Commission (CQC)

3.36 A number of infection prevention and control issues were raised by the Care Quality Commission following their inspections of the Trust over the past two years. These have been taken forwards during 2022/23 as part of the wider Trust response to the CQC report as part of the Fundamentals of Care Initiative. This will continue into 2023/24 and appropriate actions are also included within the 2023/24 IPC Programme.

In summary the issues raised related to

- Clarity and visibility of audit methodology and results within the IPC Accreditation Programme; these issues have been addressed by updating and amending the IPC Accreditation programme; see section 3.8 above
- Management of ward curtains; this issue is being taken forwards by the Facilities department and includes determining the best methodology for curtain labelling
- Consistent compliance with PPE and 'bare below the elbow' (BBTE) in some areas; an invigorated PPE and BBTE campaign is planned for 2023/24
- Labelling of clinical equipment following cleaning; a protocol to optimise labelling has been produced and distributed across the Trust and monitored via the IPC Accreditation programme.

Patient Safety Incidents response Framework[35]

3.36 During 2022/23, the IPC Team began to review the Patient Safety Incidents Response Framework (PSIRF) and determine the implications for infection prevention and control. An agreed way forwards in respect to the methodology for incident sampling and review will be finalised in 2023/24, in time for September 2023 deadline when the new PSIRF process needs to be in place and implemented.

# Section 4

# Key Indicators

4.1 The following key indicators are used to monitor the quality of the Infection Prevention and Control (IPC) Service

- Progress in respect of the trust-wide IPC Programme
- Total number of new meticillin resistant *Staphylococcus aureus* (MRSA) cases detected by the Trust laboratories (includes cases of colonisation and infection at all body sites)
- Number of *Clostridioides difficile* toxin associated diarrhoea (CDD) episodes within the Trust
- Results of the mandatory Department of Health surveillance schemes
- Glycopeptide resistant enterococci (GRE) bacteraemia
- Performance compared to other Acute Teaching Hospitals in relation to the mandatory surveillance schemes

Progress in respect of the trust-wide IPC Programme

4.2 This is addressed in detail in Section 3 of this Report

Number of new MRSA cases

4.3 See sections 5.3 to 5.5 of this Report.

Number of CDD episodes

4.4 See sections 6.2 to 6.3 of this Report

Results of mandatory Department of Health surveillance modules

4.5 The mandatory surveillance scheme includes the following modules:

- MRSA bacteraemia - see sections 5. 6 to 5.11 of this Report
- MSSA bacteraemia – see sections 5.12 to 5.18 of this Report
- CDD – see sections 6.4 to 6.11 of this Report
- Gram negative bacteraemia a) *Escherichia coli,* b) *Klebsiella species* and c) *Pseudomonas aeruginosa* – see sections 7.1 to 7.42 of this Report
- Surveillance of surgical site infection - orthopaedic surgery – see sections 4.12 to 4.15 of this Report

Glycopeptide resistant enterococcal (GRE) bacteraemia

4.6 The mandatory surveillance scheme for GRE bacteraemia commenced in October 2003 and finished in 2014. Despite the national scheme finishing, the STH IPC Team continue to collect data to aid local surveillance of these organisms. Data are expressed as crude numbers. Due to the small numbers involved, the significance of the results can be difficult to determine. GRE isolates would be expected to occur in units where glycopeptide antibiotic use is necessarily high. This is most likely in haematology and renal units and therefore a number of cases would be expected in the STHFT.

4.7 The numbers detected each year are small and fluctuations are seen year on year. No trends or clusters of infection were detected in previous years. The

historical national data shows that the Trust performed well in regard to this parameter compared to other similar trusts.

The number of episodes of GRE bacteraemia has gradually increased since the autumn of 2015, although numbers were slightly less during the Covid pandemic but have rebounded as the pandemic has waned.

Historically, the majority of cases were associated with the Haematology Directorate but over recent years an increasing number have been detected in various specialities at the NGH. Review of these cases indicates that these infections are most likely endogenous i.e. arising from the patient's own body flora and reflect the increase in GRE gut carriage in the general population.

As part of the on-going programme to prevent and control GRE within the haematology setting, the screening of certain patient groups within Haematology continues.

4.8 The consultant Microbiologists continue to discuss the fluctuating number of GRE isolates seen locally with colleagues in other trusts and the UK Health Security Agency (UKHSA). It appears the numbers seen within Sheffield reflects a national picture.

Table 2
Details of GRE bacteraemia detected by the Trust laboratories

| | 2006/7 | 2007/8 | 2008/9 | 2009/10 | 2010/11 |
|---|---|---|---|---|---|
| Number of episodes | 5 | 6 | 3 | 7 | 3 |

| | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 |
|---|---|---|---|---|---|
| Number of episodes | 7 | 8 | 7 | 14 | 16 |

| | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|
| Number of episodes | 17 | 15 | 24 | 16 | 9 |

| | 2021/22 | 2022/23 | | | |
|---|---|---|---|---|---|
| Number of episodes | 14 | 24 | | | |

Surveillance of surgical site infection

4.9 The surgical site infection (SSI) scheme differs from the other mandatory surveillance schemes in that it collects data on wound infections based on clinical as well as microbiological data. This is a more comprehensive means of detecting infections but requires a trained member of staff to review the patient, patient records and laboratory data. It is therefore considerably more labour intensive and time consuming. Trusts are required to collect data on at least one type of orthopaedic procedure for at least three months of the year. Surveillance for more than one quarter a year and of other types of infection is voluntary.

4.10 For 2022/23 the Trust elected to undertake continuous surveillance of both hip and knee arthroplasty (otherwise known as hip or knee replacement) for the whole of the year. Procedures were undertaken at the NGH and RHH. In addition, surveillance of craniotomy procedures within neurosurgery was undertaken for the whole of 2022/23. These modules are undertaken as part of a national UKHSA scheme.

4.11 In addition to the ongoing arthroplasty and craniotomy surveillance, the SSI Team commenced SSI surveillance of colorectal surgery in July 2022.

**Orthopaedics**

4.12 For knee arthroplasty the STH infection rate for 2022/23 was 0.2% against a national average of 0.5%.

4.13 For hip arthroplasty the STH infection rate for 2022/23 was 1.0% against a national average of 0.6%.

4.14 The infection rates for both hip and knee arthroplasty remain below or nearing the national average. Given that the complexity of the patient population operated on within the Trust is much higher locally than amongst other trusts participating in the surveillance scheme these results are extremely pleasing. The Musculoskeletal Group continue to develop and implement action plans to reduce infection rates further. The slight upward trend seen locally in hip infection rates, has anecdotally been noted by other trusts. Investigations are ongoing, including the role that deep vein thrombosis (DVT) prophylaxis may play in this regard.

4.15 Surveillance of both knee and hip arthroplasty will continue into 2023/24

**Neurosurgery**

4.16 For craniotomy surgery the STH infection rate for 2022/23 was 2.5% against a national average of 1.6%.

4.17 The IPC Team continue to work with the Neurosurgery Directorate to investigate cases of infection and possible interventions that may reduce this rate. The Neurosurgical Directorate have convened a Surgical Site Infection Group who are developing a process to undertake root cause analysis of infections and lead on responding to any lessons learnt from these investigations.

4.18 Surveillance of craniotomy surgery will continue into 2023/24

**Colorectal surgery**

4.19 For colorectal surgery the STH infection rate for 2022/23 was 12.7% against a national average of 8.6%.

4.20 The IPC Team continue to work with the Colorectal Department to investigate cases of infection and possible interventions that may reduce this rate.

4.21 Surveillance of colorectal surgery will continue into 2023/24

<u>Mandatory surveillance data – position relative to other large acute teaching trusts</u>

4.22 Sections 6.4 to 6.11, 5.7 to 5.12, 5.13 to 5.19 and 7.1 to 7.42 of this Report provide information relating to the Trust's performance in respect of *Clostridioides difficile* toxin associated diarrhoea (CDD) and bacteraemia caused by MRSA, MSSA, *E.coli*, *Klebsiella spp*. and *Pseudomonas aeruginosa,* respectively, as measured by the DH mandatory HCAI surveillance scheme.

4.23 In summary the Trust position against the nationally set objectives for Hospital Onset plus Community Onset/Healthcare Associated cases for the various organisms is as follows:

C.*difficile* diarrhoea:
2022/23 outturn = 169 - 2022/23 objective 149 – objective not achieved

*E.coli* bacteraemia
2022/23 outturn = 260 - 2022/23 objective = 222 – objective not achieved

*Klebsiella species* bacteraemia
2022/23 outturn = 125 - 2022/23 objective = 94 – objective not achieved

*Pseudomonas aeruginosa* bacteraemia
2022/23 outturn = 31 - 2022/23 objective = 33 – objective achieved

MRSA bacteraemia
2022/23 outturn = 2 - 2022/23 objective = 0 – objective not achieved

MSSA bacteraemia (NB Hospital Onset only)
2022/23 outturn = 74 - 2022/23 local objective = 63 – objective not achieved

4.24 The information from these six modules can be combined to provide an overall picture of the Trust's performance in relation to other similar organisations, see Table 3. As from 2017-18, the trusts chosen for comparison comprise the Shelford Group of trusts plus six other large regional acute teaching hospital organisations[##].

The Trust performance in relation to other organisations has remained fairly static over recent years with the Trust being mid-table as regards overall performance.

Addressing *C.difficile* diarrhoea, MSSA and *E.coli* bacteraemia in particular will continue to be a key part of the 2023/24 IPC Programme.

Table 3
STH performance in relation to the sixteen other large acute teaching hospital trusts[##]
(Based on Hospital Onset rates for the various modules[#])

| Module | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 |
|---|---|---|---|---|---|---|
| | | | | | | |
| *C.difficile* | 6th | 9th | 14th | 14th | 13th | 10th |
| MSSA | 12th | 12th | 13th | 11th | 12th | 14th |
| MRSA | 7th | 2nd | 7th | 7th | 1st | 2nd |
| *E.coli* | 13th | 9th | 10th | 13th | 11th | 12th |
| *Klebsiella* | 7th | 5th | 7th | 5th | 9th | 11th |
| *Ps*eudomonas | 1st | 6th | 2nd | 4th | 7th | 2nd |
| | | | | | | |
| All six modules combined | 7th | 5th | 9th | 8th | 8th | 9th |

* 1st has lowest rate

\# Up to and including 2019/20, data was obtained from the UKHSA HCAI database. From 2020/21 onwards, data and the Trust positions in relation to other trusts, have been recalculated using the UKHSA Fingertips database.

## List of trusts compared

Names as listed within the UKHSA Fingertips database[33]

Shelford Trusts

Cambridge University Hospitals
Guy's & St Thomas'
Imperial College Healthcare
King's College Hospital
Manchester University NHS Foundation Trust
Oxford University Hospitals
Sheffield Teaching Hospitals
The Newcastle upon Tyne Hospitals
University College London Hospitals
University Hospitals Birmingham

Other large acute teaching hospital trusts:

Leeds Teaching Hospitals
Nottingham University Hospitals
Liverpool University Hospitals
University Hospitals Bristol and Weston
University Hospitals of Leicester
Southampton University Hospitals

# Section 5

## *Staphylococcus aureus*

### Meticillin Resistant *Staphylococcus aureus* (MRSA)

5.1 The Trust has determined that the following key indicators will be used to monitor the situation as regards meticillin resistant *Staphylococcus aureus* (MRSA) within the STHFT.

- MRSA screening and follow up
- Number of new MRSA cases
- Data from the Department of Health (DH) mandatory MRSA bacteraemia surveillance scheme

MRSA screening

5.2 Since 2005, the Trust has developed an increasingly comprehensive MRSA screening programme which has been a key element in preventing and controlling MRSA in both acute and community healthcare sectors. This programme exceeds the DH MRSA screening requirements[11]. Over the past two years, screening requirements for some very low risk non-inpatient areas have been reduced, in line with the national guidelines.

Number of new MRSA cases

5.3 Overall, the number of new cases of MRSA infection or colonisation has fallen slightly compared to last year, see Table 4 below. As noted in last year's Report, the 2020/21 figure may have been affected by fewer patients accessing healthcare during the height of the pandemic. The 2021/22 and 2022/23 figures are lower than the pre-Covid data and reflect the continuing overall downward trend. The percentage of patients screened for MRSA that are positive, see Chart 1 below, has remained low. The majority of new cases detected are detected on admission. These data support the decision to continue with the current MRSA screening strategy despite this exceeding the national requirements; see section 5.2

Table 4
Number of new cases of MRSA infection or colonisation, detected by the Trust laboratories

| 2001/2 | 2002/3 | 2003/4 | 2004/5 | 2005/6 | 2006/7 | 2007/8 | 2008/9 |
|---|---|---|---|---|---|---|---|
| 1002 | 1142 | 1389 | 1433 | 1769 | 1796 | 1583 | 1256 |

| 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 |
|---|---|---|---|---|---|---|---|
| 1038 | 954 | 802 | 586 | 621 | 858 | 775 | 863 |

| 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | | |
|---|---|---|---|---|---|---|---|
| 737 | 718 | 708 | 454 | 553 | 539 | | |

5.4 In addition to monitoring the overall number of MRSA cases, the Infection Prevention and Control (IPC) Team particularly concentrates on those cases deemed to be hospital acquired. The definition for this is any new positive infection or colonisation detected in samples taken greater than 48 hours after admission plus any other cases detected where the patient had been under STHFT care recently. The number of hospital acquired episodes remains low,

although the number of cases in 2022/23 increased compared to the past two years covering the pandemic. However, the number of cases is lower than the year preceding the pandemic, which reflects the overall downward trend, see Chart 2 below.

Chart 1
Percentage of samples and patients screened for MRSA that are positive

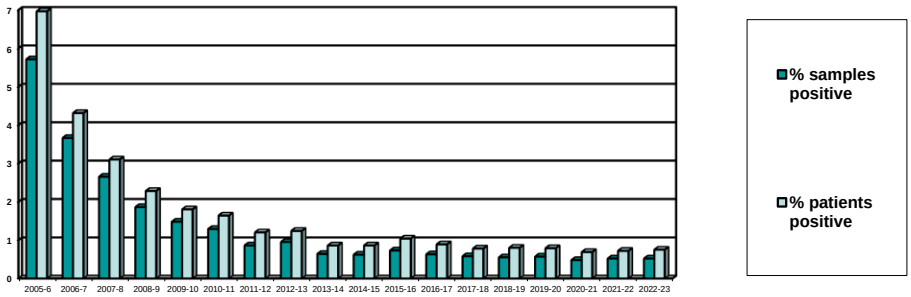
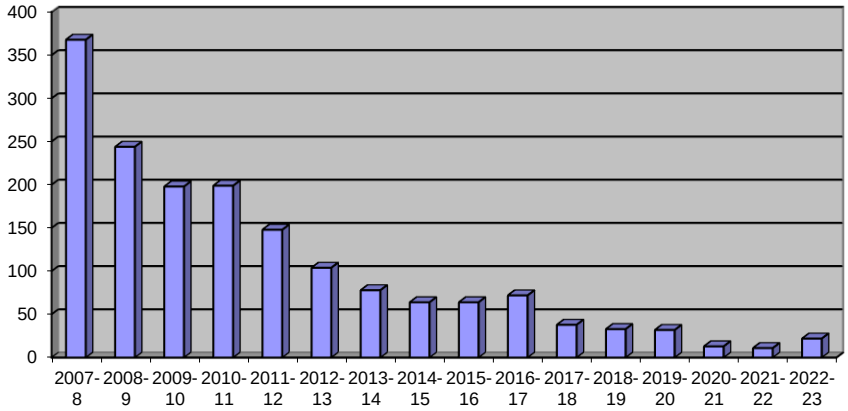



Chart 2
Annual number of new STH acquired MRSA infections and colonisations detected




5.5 Another useful parameter is the percentage of new *Staphylococcus aureus* (*S.aureus*) isolates that are MRSA.

For 2022/23, the STHFT figure for blood culture isolates was 2.7%; see Table 6 below. In the April 2022 to March 2023 financial year, UKHSA national data[30] reports 5.7% of S. aureus bacteraemia were caused by MRSA. Therefore, locally the proportion of MRSA from *S.aureus* bacteraemia, is significantly lower than the national dataset. At STHFT the majority of S. aureus infections can be treated with traditional antimicrobial agents associated with less cost and adverse events compared to anti-MRSA agents.

Previously, the percentage of isolates from all sources has mirrored that from blood cultures alone and has generally stabilised at a low level over recent years. However, from 2020/21 onwards this figure increased; see Table 5 below and has remained higher than previous years again in 2022/23. Given the low numbers for newly detected MRSA both generally and for STH acquired cases, this rise has been unexpected. Investigating the data shows that this is mainly due to a lower number of MSSA isolates being detected, thereby reducing the denominator.

Table 5
Percentage of new *S.aureus* isolates, from all sources and body sites, that are MRSA, for samples submitted to the Trust laboratories

| | % | | % |
|---|---|---|---|
| 2003/2004 | 23.9 | 2013/2014 | 3.9 |
| 2004/2005 | 20.3 | 2014/2015 | 8.9 |
| 2005/2006 | 26.0 | 2015/2016 | 3.7 |
| 2006/2007 | 16.8 | 2016/2017 | 4.0 |
| 2007/2008 | 10.2 | 2017/2018 | 3.5 |
| 2008/2009 | 9.2 | 2018/2019 | 3.8 |
| 2009/2010 | 7.7 | 2019/2020 | 4.0 |
| 2010/2011 | 6.5 | 2020/2021 | 9.4 |
| 2011/2012 | 5.0 | 2021/2022 | 8.4 |
| 2012/2013 | 3.1 | 2022/2023 | 9.4 |

Table 6
Details of *S.aureus* bacteraemia episodes detected by the Trust laboratories

| | MSSA (No.) | MRSA (No.) | Total (No.) | MRSA/ Total (%) |
|---|---|---|---|---|
| 2004/2005 | 237 | 101 | 338 | 30 |
| 2005/2006 | 240 | 79 | 319 | 25 |
| 2006/2007 | 218 | 59 | 277 | 21 |
| 2007/2008 | 217 | 36 | 253 | 14 |
| 2008/2009 | 209 | 24 | 233 | 10 |
| 2009/2010 | 190 | 16 | 206 | 7.8 |
| 2010/2011 | 196 | 16 | 212 | 7.5 |
| 2011/2012 | 158 | 14 | 172 | 8.1 |
| 2012/2013 | 176 | 6 | 182 | 3.3 |
| 2013/2014 | 145 | 7 | 152 | 4.6 |
| 2014/2015 | 146 | 8 | 154 | 5.2 |
| 2015/2016 | 182 | 3 | 185 | 1.6 |
| 2016/2017 | 182 | 6 | 188 | 3.2 |
| 2017/2018 | 175 | 3 | 178 | 1.7 |
| 2018/2019 | 182 | 5 | 187 | 2.7 |
| 2019/2020 | 197 | 7 | 204 | 3.4 |
| 2020/2021 | 199 | 8 | 207 | 3.9 |
| 2021/2022 | 189 | 1 | 190 | 0.5 |
| 2022/2023 | 185 | 5 | 190 | 2.7 |

MSSA – Meticillin sensitive *Staphylococcus aureus*
MRSA – Meticillin resistant *Staphylococcus aureus*

Mandatory MRSA bacteraemia surveillance scheme

5.6 Since 2001 it has been mandatory for trusts to report MRSA bacteraemia figures to the DH. The results are published and the MRSA bacteraemia rate per 100,000 occupied beds is used as a performance indicator.

Episode assignment has varied over the years; details can be found in previous IPC Reports.

Since 2013/14, acute trusts and CCGs/ICBs have taken a zero-tolerance approach to MRSA bacteraemia. Each episode is reviewed to determine if there have been any lapses in care within the Trust, community or primary care settings; learning points are shared with appropriate parties.

5.7 A summary of the STHFT results is given in Tables 7 and 8.

For 2022/23 there were three Community Onset and two Hospital Onset MRSA bacteraemias respectively, compared to only one Community Onset bacteraemia in 2021/22. This aligns with most recent national data where an increase was seen in the count and rate of all reported cases of MRSA bacteraemia comparing Oct-Dec 2022 for the same period in 2021. It has been suggested that trends are returning to pre COVID-19 levels in hospital onset counts and rated[34].

The Trust Hospital Onset MRSA bacteraemia rate was therefore 0.4 per 100,000 bed-days[33], lower than national rate for 2022/23 of 0.8[33]. However, the Trust is not complacent in this regard as this standard needs to be maintained and where possible the number and rate kept to a minimum over the long term. The two Hospital Onset MRSA bacteraemia cases have been investigated as per section 5.9 and found to '3rd party associated', indicating no lapse in care from STH or primary care.

5.8 The objective for 2023/24 will continue to be as few Hospital Onset episodes as possible and to take a 'zero tolerance' approach to cases of avoidable MRSA bacteraemia.

Table 7
Episodes of Hospital Onset (2008/9 to date) plus Trust-assigned (2013/14 to 2017/18 only) MRSA bacteraemia rate per 100,000 bed-days (number)

| Time period | Rate (Number) |
|---|---|
| | |
| 01/04/08-31/03/09 | 2.1 (14) |
| 01/04/09-31/03/10 | 1.4 (9) |
| 01/04/10-31/03/11 | 1.4 (9) |
| 01/04/11-31/03/12 | 0.3 (2) |
| 01/04/12-31/03/13 | 0.5 (3) |
| 01/04/13-31/03/14 | 0.7 (4) |
| 01/04/14-31/03/15 | 0.7 (4) |
| 01/04/15-31/03/16 | 0.0 (0) |
| 01/04/16-31/03/17 | 0.4 (2) |
| 01/04/17-31/03/18 | 0.6 (3) |
| 01/04/18-31/03/19 | 0.4 (2) |
| 01/04/19-31/03/20 | 0.6 (3) |
| 01/04/20-31/03/21 | 0.6 (3) |
| 01/04/21-31/03/22 | 0.0 (0) |
| 01/04/22-31/03/23 | 0.4 (2) |

Table 8
MRSA bacteraemia episodes by speciality

| | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medicine | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 1 |
| Surgery | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| GITU/HDU | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| SCBU | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Specialised Rehabilitation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Orthopaedics, Plastics | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Renal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cardiac | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Neurosciences | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Communicable Diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Haematology | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Obstetrics and Gynaecology | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Weston Park | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Admissions units/A&E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | |
| Total Hospital Onset | 02 | 03 | 04 | 02 | 00 | 02 | 03 | 02 | 03 | 03 | 00 | 02 |
| Total Trust Assigned | N/A | N/A | 00 | 02 | 00 | 00 | 00 | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| Community Onset/ Trust Assigned | 12 | 03 | 03 | 04 | 03 | 04 | 00 | 03 | 04 | 05 | 01 | 03 |
| | | | | | | | | | | | | |
| Total | 14 | 06 | 07 | 08 | 03 | 06 | 03 | 05 | 07 | 08 | 01 | 05 |

*Hospital Onset = episodes detected in blood cultures taken on Day 2 onwards after admission, where day of admission is Day 0*
*Community Onset/Trust Assigned = episodes detected from samples taken on Day 0 to Day 1 but where the care provided by the trust is deemed to have been contributory to the episode (only applicable for 2013/14 to 2017/18)*

Surveillance, follow up and action in respect of MRSA cases

5.9 All cases of MRSA bacteraemia are taken extremely seriously. A meeting is held between the IPC Team and the patient's clinical team to determine the series of events that lead to the bacteraemia. The DH Post Infection Review (PIR) tool is used to identify any actions required to improve practice and action plans made to implement these. The results of these meetings are copied to Sheffield CCG who monitor the Trust's performance in this regard. Where cases arise within 48 hours of admission, Sheffield CCG take the lead in undertaking the PIR review, but an assessment is made as to any recent care provided by the STHFT and Trust staff participate in these reviews as appropriate. Where appropriate, a summary of key learning points from these meetings is distributed to Nurse and Clinical Directors so that any necessary changes can be implemented throughout the Trust.

5.10 The IPC Team continues to produce data on a monthly basis detailing the number of new MRSA cases detected and the number of probably hospital acquired MRSA infections or colonisations. This data includes the ward on which the infection/colonisation most likely occurred. This information is sent to ward managers, matrons and senior sisters so that appropriate action can be taken locally. These data are also discussed at the Directorate Healthcare Governance meetings.

5.11 A great deal of work has taken place over the past few years designed to reduce the likelihood of patients experiencing MRSA generally and bacteraemia in particular. This work has been detailed in previous Reports and continues to be implemented and reiterated during the current year.

In summary these are

- MRSA screening and follow up detailed above,
- Antimicrobial prescribing; rolling review of antimicrobial prescribing policies, and restriction of certain agents which seem to be associated with better control of MRSA e.g. quinolones
- Insertion and on-going management of peripheral intravenous cannulae; range of initiatives to improve documentation and on-going management of these devices including switching to a chlorhexidine based skin wipe for skin preparation prior to insertion of the device and on-going audit of the use of cannula charts.
- Liaison with primary care colleagues; referral of patients deemed to be at higher than average risk of developing MRSA bacteraemia in the community, to community colleagues and protocols for treatment agreed
- The 'universal *Staphylococcus aureus* decolonisation/suppression' treatment initiative mentioned in section 5.19 below. Although not primarily instigated to reduce MRSA, applying this treatment will affect both MSSA and MRSA should the patient be colonised with these organisms.

**Meticillin Sensitive *Staphylococcus aureus* (MSSA)**

5.12 Much attention is given to meticillin resistant *Staphylococcus aureus* (MRSA) but meticillin sensitive *Staphylococcus aureus* (MSSA) is a far more common pathogen both in the community and within hospitals. MSSA naturally colonises approximately one third of the population at any one time. When people get an infection with this organism it is often caused by the organism they are already carrying, although cross infection may also be a cause. It is generally not possible to ascertain where patients actually acquire the organism causing their infection, but infections can be reduced by optimal infection prevention and control practice.

5.13 Since January 2011, it has been mandatory to report MSSA bacteraemia to the DH. Chart 3 shows data for all STH MSSA bacteraemia episodes reported to the DH healthcare surveillance database over the past few years.

Since 2013/14, there appears to be a general trend towards increasing cases of MSSA bacteraemia detected by the STH laboratories, although rates have fallen since a peak in 2020/21: rate of 25.1/100,000 bed days in 2013/14, rising to 51.6 in 2020/21 and falling to 37.9 in 2022/23[33]. A similar trend has been observed nationally[33]. The total number within the STH (185) in 2022-23 reduced by 2% compared to 2021-22 (189).

Within this overall trend there is variation in the number and rate of Hospital Onset* and Community Onset-Healthcare Associated# MSSA bacteraemias, that appears to fluctuate from year to year. Similar to the overall trend, the rate of Hospital Onset cases has increased in recent years, peaking in 2020/21 at 16.8/100,000 bed days and falling slightly over the past two years; 2022/23 rate of 15.2/1000 bed days).

Similarly, the number of Community Onset-Healthcare Associated cases has fallen with only 13 such episodes being detected in 2022-23. This is much lower compared to the past two years (31 and 27); the reasons for this are not immediately apparent, see also Chart 3 below.

These trends will continue to be monitored and where possible themes and possible actions identified to reduce all types of episodes in the future.

5.14 The data published by the DH has also revealed that the number of cases of MSSA bacteraemia detected by individual trusts can vary considerably from year to year. The fluctuating numbers seen locally may reflect this normal variation. However, work is ongoing to investigate the cases seen within Sheffield in recent years and determine any actions that can be taken to reduce the number of Hospital Onset* and Community Associated-Healthcare Associated# cases in the future; see sections 5.17 to 5.19 below.

5.15 MSSA is carried by approximately 30% of the population and most infections are due to organisms already carried by the patient, although cross infection from other patients and staff can also occur. Preventing infection with MSSA therefore requires a variety of interventions.

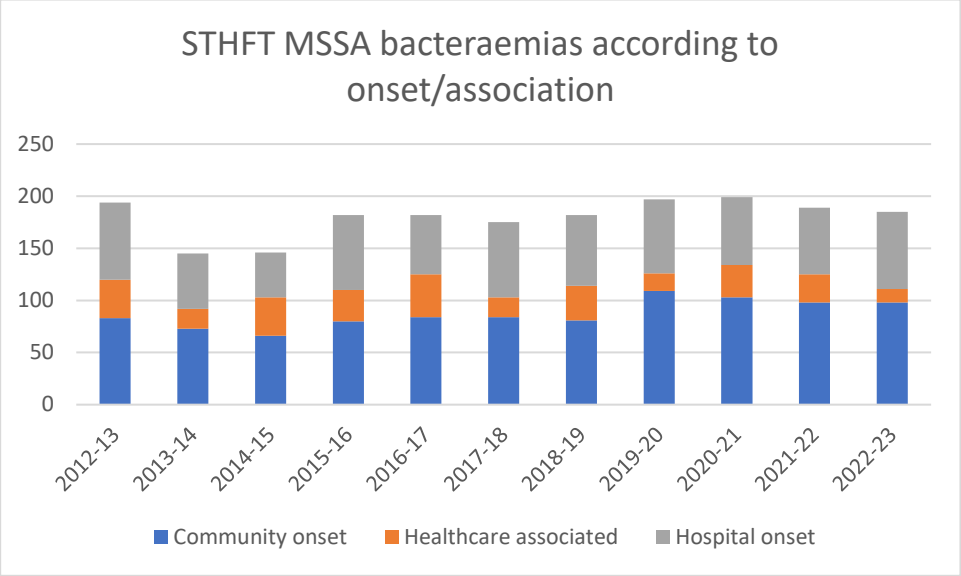
Details of the actions commenced during previous years and that will be continued into the coming year can be found in the 2023/24 IPC Programme.

5.16 A clinical review is undertaken of all inpatients with MSSA bacteraemia. The data collected includes the most likely source for the bacteraemia and the Directorate where the infection occurred; see Tables 9 to 12 below. This information helps to determine which interventions are likely to be most effective in reducing the number of Hospital Onset* and Healthcare Associated# episodes.

5.17 The review of the 2022/23 cases has determined that the numbers for each ward and Directorate are small and can vary year on year. Although root-cause analysis of all cases is not mandatory, directorates are encouraged to undertake them.

Where reviews have occurred, these have not shown areas of consistently poor practice. However, 24% (18/74) and 12% (9/74) of Hospital Onset* bacteraemias are most likely secondary to cannula site or other intravascular access device (IAD) infections. Therefore, one issue where intervention may be beneficial across the whole Trust is in the insertion, ongoing management and documentation of IADs, including peripheral, central, arterial and peripherally inserted central catheters (PICC) devices. The IPC Team is working with the Informatics Team to develop electronic care plans to optimise the care pathway for all IADs. In addition, the Team are developing a Trust-wide approach to improving peripheral cannula care.

Chart 3




*~ Community Onset = cases detected in blood cultures taken on Day 0 or Day 1, where the day of admission is Day 0, and the patient has not been an STH in-patient within the past 28 days or review has determined that in-patient contact with the Trust within the last 28 days did not contribute to the bacteraemia (coincidental)*
*# Healthcare Associated = cases detected in blood cultures taken on Day 0 or Day 1, where day of admission is Day 0, but the patient had been an STH inpatient within the past 28 days*
** Hospital Onset = episodes detected in blood cultures taken on Day 2 onwards after admission, where day of admission is Day 0*
*MRSA = Meticillin resistant Staphylococcus aureus*
*MSSA = Meticillin sensitive Staphylococcus aureus*

5.18 The areas where most cases of MSSA bacteraemia are detected appear to be the medical wards. The source of bacteraemia for patients on these wards is multifactorial. Following discussions with colleagues in other trusts with low MSSA bacteraemia rates, the IPC Team undertook a pilot study in 2018, investigating the pros and cons of introducing 'universal *Staphylococcus aureus* decolonisation/suppression' treatment for patients during their stay in hospital. This involves patients receiving topical antiseptics (body washes) for the duration of their stay, with the aim of reducing the risk of any *S. aureus* they may be carrying on their skin and mucosal surfaces, invading their body tissues or tracking down IADs and causing infection. The pilot study showed that this approach was acceptable to patients and staff and this initiative was rolled out for dependant patients on the Trust medical wards in 2019/20. Review of this initiative was performed in 2021 and did not demonstrate a discernible impact on the number of hospital onset MSSA bacteraemia in the wards undertaking universal decolonisation. However, it would not be possible to detect a significant change (due to the low absolute number of bacteraemia episodes) and there was also the effect of COVID pandemic on staff, ward use, admissions and patient population. A decision was made to continue the washes during the 2022/23 as there has been some positive feedback regarding the use of the washes and having a single product promotes consistency whilst possibly offering a yet undetected benefit.

A similar approach was introduced within the Musculoskeletal Directorate for patients having elective surgery. Patients are provided with topical antiseptic (body washes) in the period prior to and after their surgery, with the aim of reducing, not only bacteraemia caused by their own body flora but also surgical wound infection rates.

Table 9
Number of Hospital Onset* MSSA bacteraemia episodes by Directorate

| Directorate | 2012 /13 | 2013 /14 | 2014 /15 | 2015 /16 | 2016 /17 | 2017 /18 | 2018 /19 | 2019 /20 | 2020 /21 | 2021 /22 | 2022 /23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emergency Medicine | 0 | 1 | 0 | 3 | 2 | 2 | 2 | 1 | 0 | 1 | 0 |
| Respiratory Medicine | 6 | 4 | 6 | 2 | 6 | 6 | 7 | 5 | 2 | 9 | 9 |
| Diabetes & Endocrine | 3 | 6 | 3 | 8 | 6 | 7 | 5 | 4 | 4 | 1 | 5 |
| Geriatric/Stroke Medicine | 6 | 3 | 5 | 9 | 8 | 9 | 16 | 8 | 2 | 12 | 10 |
| Gastroenterology | 1 | 2 | 6 | 5 | 4 | 5 | 4 | 9 | 4 | 7 | 12 |
| General Surgery | 6 | 6 | 5 | 6 | 4 | 6 | 5 | 7 | 5 | 2 | 2 |
| Plastic Surgery | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| Urology | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Orthopaedics | 4 | 4 | 3 | 4 | 2 | 5 | 2 | 3 | 2 | 0 | 4 |
| Cardiac | 17 | 7 | 2 | 7 | 5 | 5 | 7 | 5 | 7 | 7 | 8 |
| Renal | 2 | 3 | 2 | 4 | 1 | 2 | 5 | 3 | 6 | 4 | 3 |
| Vascular | 2 | 2 | 0 | 1 | 0 | 4 | 2 | 0 | 1 | 3 | 2 |
| Haematology | 6 | 2 | 0 | 3 | 5 | 4 | 1 | 5 | 5 | 2 | 4 |
| Cancer Services | 2 | 0 | 0 | 2 | 3 | 1 | 4 | 2 | 4 | 4 | 5 |
| Specialised Rehabilitation | 0 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| Communicable Diseases | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 3 | 0 |
| Specialised Medicine (remainder) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| Neurosciences | 4 | 5 | 4 | 7 | 5 | 3 | 2 | 6 | 6 | 1 | 2 |
| ENT | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Ophthalmology | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oral & Dental Services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Obs/Gynae | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 |
| Neonatology | 6 | 2 | 3 | 5 | 1 | 7 | 2 | 4 | 3 | 2 | 1 |
| OSCCA | 4 | 0 | 1 | 3 | 2 | 3 | 2 | 2 | 9 | 4 | 3 |
| Total | 74 | 53 | 43 | 72 | 57 | 72 | 68 | 71 | 65 | 64 | 74 |

Table 10
Number of Community Onset - Healthcare Associated[#] MSSA bacteraemia episodes by Directorate

| Directorate | 2012 /13 | 2013 /14 | 2014 /15 | 2015 /16 | 2016 /17 | 2017 /18 | 2018 /19 | 2019 /20 | 2020 /21 | 2021 /22 | 2022 /23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Emergency Medicine | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 |
| Respiratory Medicine | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 1 | 3 |
| Diabetes & Endocrine | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 3 | 1 | 0 |
| Geriatric/Stroke Medicine | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 3 | 3 | 2 |
| Gastroenterology | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 2 | 2 |
| General Surgery | 2 | 2 | 2 | 0 | 2 | 0 | 1 | 1 | 0 | 2 | 0 |
| Plastic Surgery | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Urology | 0 | 1 | 2 | 0 | 3 | 0 | 2 | 0 | 3 | 1 | 0 |
| Orthopaedics | 3 | 1 | 2 | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 1 |
| Cardiac | 7 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 1 | 0 |
| Renal | 19 | 6 | 11 | 11 | 9 | 7 | 9 | 6 | 4 | 8 | 0 |
| Vascular | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Haematology | 3 | 4 | 8 | 6 | 8 | 4 | 7 | 3 | 3 | 1 | 1 |
| Cancer Services | 1 | 3 | 2 | 4 | 3 | 3 | 5 | 1 | 2 | 4 | 3 |
| Specialised Rehabilitation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Communicable Diseases | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| Specialised Medicine (remainder) | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Neurosciences | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 0 |
| ENT | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ophthalmology | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oral & Dental Services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Obs/Gynae | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| Neonatology | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OSCCA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Total | 37 | 19 | 37 | 30 | 41 | 19 | 33 | 17 | 31 | 27 | 13 |

Table 11
Number of Hospital Onset* MSSA bacteraemia episodes by Most Likely Source

| Most Likely Source | 2012/ 13 | 2013/ 14 | 2014/ 15 | 2015/ 16 | 2016/ 17 | 2017/ 18 | 2018/ 19 | 2019/ 20 | 2020/ 21 | 2021/ 22 | 2022/ 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Peripheral line | 11 | 10 | 6 | 9 | 9 | 8 | 14 | 17 | 11 | 13 | 18 |
| Central line | 14 | 7 | 6 | 6 | 5 | 8 | 7 | 8 | 8 | 6 | 1 |
| Other intravenous line | 5 | 4 | 8 | 7 | 7 | 3 | 6 | 5 | 10 | 6 | 8 |
| Person who injects drugs (PWID) | - | - | - | - | - | - | - | - | - | - | 2 |
| Post–operative wound | 7 | 3 | 3 | 7 | 3 | 5 | 3 | 2 | 4 | 3 | 0 |
| Soft tissue or bone | 18 | 12 | 7 | 10 | 11 | 19 | 20 | 15 | 11 | 12 | 18 |
| Respiratory tract | 6 | 4 | 8 | 13 | 9 | 10 | 5 | 7 | 6 | 3 | 5 |
| Urinary tract | 1 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 1 |
| SCBU unknown source | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| Other | 7 | 6 | 2 | 7 | 5 | 6 | 1 | 2 | 4 | 2 | 7 |
| Unknown/ including Contaminant until 2021/22) | 5 | 7 | 2 | 12 | 6 | 12 | 10 | 14 | 9 | 17 | 12 |
| Contaminant (2022/23 onwards) | - | - | - | - | - | - | - | - | - | - | 2 |
| Total | 74 | 53 | 43 | 72 | 57 | 72 | 68 | 71 | 65 | 64 | 74 |

Table 12
Number of Community Onset - Healthcare Associated[#] MSSA bacteraemia episodes by Likely Source

| Most Likely Source | 2012/ 13 | 2013/ 14 | 2014/ 15 | 2015/ 16 | 2016/ 17 | 2017/ 18 | 2018/ 19 | 2019/ 20 | 2020/ 21 | 2021/ 22 | 2022/ 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Peripheral line | 0 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 1 | 1 | 0 |
| Central line | 12 | 8 | 12 | 13 | 10 | 9 | 6 | 4 | 6 | 7 | 0 |
| Other intravenous line | 4 | 1 | 3 | 4 | 8 | 4 | 10 | 0 | 2 | 2 | 2 |
| Person who injects drugs (PWID) | - | - | - | - | - | - | - | - | - | - | 1 |
| Post–operative wound | 6 | 2 | 3 | 2 | 2 | 1 | 2 | 0 | 0 | 0 | 0 |
| Soft tissue or bone | 11 | 4 | 8 | 4 | 10 | 2 | 8 | 7 | 8 | 8 | 3 |
| Respiratory tract | 0 | 1 | 3 | 4 | 3 | 0 | 0 | 2 | 3 | 3 | 1 |
| Urinary tract | 0 | 0 | 3 | 1 | 3 | 0 | 1 | 1 | 4 | 0 | 2 |
| SCBU unknown source | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 4 | 2 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 3 |
| Unknown/ including Contaminant until 2021/22) | 0 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 7 | 3 | 1 |
| Contaminant (2022/23 onwards) | - | - | - | - | - | - | - | - | - | - | 0 |
| Total | 37 | 19 | 37 | 30 | 41 | 19 | 33 | 17 | 31 | 27 | 13 |

# Section 6

## *Clostridioides difficile* toxin associated diarrhoea

6.1 The Trust has determined that the following key indicators be used to monitor the situation as regards *Clostridioides difficile* toxin associated diarrhoea (CDD) within STHFT.

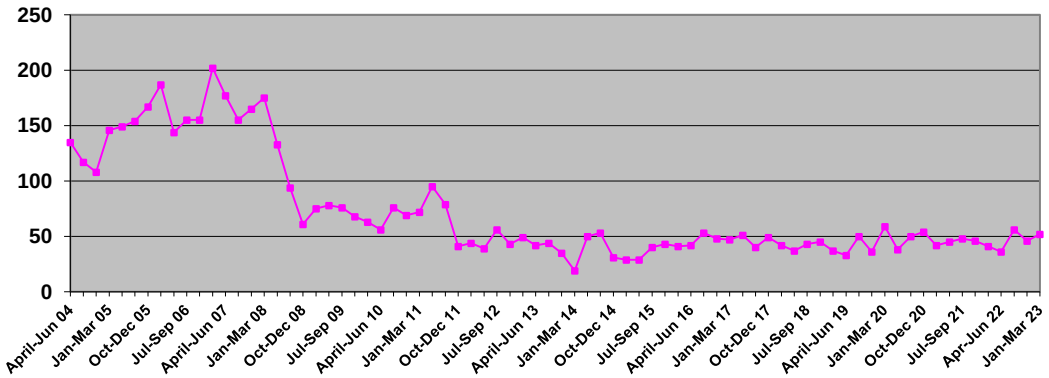
- Total number of CDD episodes detected in patients within the Trust
- Number of Hospital Onset CDD episodes/Data from the Department of Health (DH) mandatory CDD surveillance scheme

Number of CDD episodes detected in patients within the Trust

6.2 Overall, comparing 2022/23 with 2021/22 there has been a 4% increase in the number of CDD episodes detected in patients within the Trust. The numbers do fluctuate from year to year and current levels are similar to those seen over the preceding years, see Table 13. These data relate to all episodes detected in patients within the Trust and include both 'Hospital Onset' and 'Community Onset' cases, where the samples originated from within the Trust. Data relating to all episodes is included in this Report to indicate the continued burden of CDD on Trust facilities and staff, regardless of whether the episode was deemed to be attributable to the Trust or not.

6.3 Chart 4 shows the figures for CDD episodes detected in patients within the Trust by quarter. Table 13 shows where these cases occurred within the various Directorates within the Trust.

Chart 4
CDD data for episodes detected within the Trust by quarter
(includes episodes detected within 48 hours of admission
i.e. not all episodes are 'Hospital Onset')




Mandatory CDD surveillance scheme

6.4 Since 2004 it has been mandatory for trusts to report CDD figures to the DH. The results are published and the CDD rate per 100,000 occupied bed days is used as a performance indicator.

6.5 Episode assignment has varied over the years; details can be found in previous Infection Prevention and Control (IPC) Reports. For 2019/20 onwards, the definitions used for Hospital Onset episodes changed to include

more episodes than in previous years. This partly, although not totally, explains the increase in Hospital Onset cases noted from 2019/20 onwards compared to previous years.

6.6 For 2019/20 onwards, the definitions used for episodes of CDD are as detailed below:

- Hospital Onset - Healthcare Associated (HOHA) = episodes detected from samples taken on Day 2 onwards (where Day 0 is the day of admission); in previous Reports these episodes were described as 'Trust Attributable'
- Community Onset - Healthcare Associated (COHA) = episodes detected from samples taken in a community or out-patient setting or on Day 0 or Day 1 (where the day of admission is Day 0) but the patient has been an inpatient within the Trust within the last 28 days
- Community Onset - Indeterminate Association (COIA) = episodes detected from samples taken in a community or out-patient setting or on Day 0 or Day 1 (where the day of admission is Day 0) but the patient has been an inpatient within the Trust within the last 29 to 84 days
- Community Onset - Community Associated (COCA) = episodes detected from samples taken in a community or out-patient setting or on Day 0 or Day 1 (where the day of admission is Day 0) but the patient has not been an inpatient within the Trust within the last 84 days

6.7 Tables 15 and 16 summarise the CDD data for 'Hospital Onset cases' (HOHA), 'Community Onset – Healthcare Associated' (COHA) cases and the combined data.

The number of 'Hospital Onset' CDD episodes detected in 2022/23 was 117. This is a slight decrease compared to last year.

The challenge faced by the Trust going forward is to maintain optimal infection prevention and control practice, cleanliness standards and antimicrobial prescribing, despite caring for an increasingly elderly and frail population. Whether this is possible is still uncertain given that 5-20% of people carry *C.difficile* in their gastrointestinal tracts and carriage increases with age. These people will be at risk of disease regardless of infection prevention and control measures being optimised within the Trust.

6.8 Between 2008/9 and 2018/19 the DH set annual reduction targets for 'HOHA' cases of CDD. This altered for 2019/20 onwards in that the objective now, not only relates to 'HOHA' cases, but also incorporates 'COHA' cases – see 6.6 above.

6.9 The STH target for 2022/23 was 149. The Trust detected 169 cases and therefore did not achieve this objective. The increase in cases detected in 2022/23 was mainly due to a rise in COHA episodes; the number of HOHA cases remaining stable. The reason for the rise in COHA cases is unclear but, the IPC Team will discuss this situation with the local ICB IPC team to determine if there are any lessons to be learnt from these cases. Details of the STHFT targets are given below in Table 14.

Table 13
CDD data for episodes detected within the Trust

| | 2011 /12 | 2012 /13 | 2013 /14 | 2014 /15 | 2015 /16 | 2016 /17 | 2017 /18 | 2018 /19 | 2019 /20 | 2020 /21 | 2021 /22 | 2022 /23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medicine - Total | 78 | 42 | 40 | 42 | 36 | 52 | 41 | 39 | 46 | 45 | 56 | 57 |
| Medicine – Respiratory | 12 | 7 | 8 | 6 | 6 | 14 | 9 | 5 | 11 | 8 | 9 | 15 |
| Medicine – Diabetes & Endocrinology | 9 | 2 | 3 | 1 | 0 | 5 | 4 | 6 | 2 | 9 | 5 | 8 |
| Medicine – Geriatrics & Stroke | 45 | 26 | 25 | 24 | 27 | 24 | 23 | 25 | 19 | 19 | 23 | 25 |
| Medicine - Gastroenterology | 9 | 4 | 3 | 4 | 3 | 5 | 4 | 2 | 6 | 7 | 15 | 5 |
| Medicine – Emergency Care | 3 | 3 | 1 | 7 | 0 | 4 | 1 | 1 | 7 | 2 | 4 | 4 |
| Surgery - Total | 40 | 24 | 16 | 8 | 7 | 15 | 12 | 11 | 18 | 14 | 14 | 14 |
| Surgery – General | 28 | 10 | 9 | 2 | 7 | 6 | 10 | 4 | 11 | 11 | 12 | 4 |
| Surgery - Vascular | 9 | 8 | 3 | 3 | 0 | 4 | 0 | 1 | 3 | 1 | 2 | 4 |
| Surgery - Urology | 3 | 4 | 2 | 1 | 0 | 3 | 1 | 3 | 1 | 2 | 0 | 6 |
| Surgery - Other | 0 | 2 | 2 | 2 | 0 | 2 | 1 | 3 | 3 | 0 | 0 | 0 |
| Orthopaedic and Plastics | 8 | 3 | 1 | 9 | 9 | 5 | 5 | 7 | 7 | 4 | 3 | 1 |
| GITU/HDU | 7 | 1 | 3 | 4 | 2 | 5 | 2 | 6 | 15 | 6 | 9 | 8 |
| Renal | 8 | 5 | 4 | 5 | 5 | 6 | 1 | 2 | 6 | 7 | 9 | 7 |
| Cardiac | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 7 | 1 | 2 | 3 |
| Neurosciences | 6 | 8 | 3 | 5 | 1 | 7 | 3 | 4 | 3 | 4 | 7 | 7 |
| Communicable Diseases & Dermatology | 0 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 5 | 3 | 5 |
| Haematology | 8 | 3 | 0 | 6 | 2 | 1 | 5 | 2 | 4 | 4 | 3 | 4 |
| Specialised Rehabilitation | 1 | 5 | 5 | 4 | 2 | 3 | 5 | 5 | 2 | 4 | 3 | 6 |
| Palliative Care | 5 | 1 | 1 | 0 | 3 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| Obstetrics and Gynaecology | 1 | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| Weston Park | 7 | 4 | 2 | 5 | 5 | 11 | 2 | 3 | 6 | 10 | 8 | 4 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hospital Onset cases – Total | 178 | 104 | 80 | 93 | 78 | 110 | 83 | 84 | 115 | 105 | 119 | 117 |
| Community Onset cases detected within the STH | 81 | 83 | 63 | 70 | 75 | 80 | 99 | 78 | 63 | 79 | 61 | 71 |
| Total | 259 | 187 | 143 | 163 | 153 | 190 | 182 | 162 | 178 | 184 | 180 | 188 |

6.10 In recent years, the Trust has performed less well compared to other similar trusts in relation to Hospital Onset CDD; see Table 16. The Trust performance in 2022/23 improved, coming 10th out of 16 similar trusts which was pleasing. The aim will be to improve this position further in the coming years; see Table 3 above.

Table 14
STHFT reduction targets for 2008/9-2022/23
Hospital Onset cases only up to and including 2018/19, Hospital Onset and Community Onset-Healthcare Associated cases 2019/20 onwards

| | 2008/9 | 2009/10 | 2010/11 | 2011/12 | 2012/13 |
|---|---|---|---|---|---|
| STHFT reduction targets | 446 | 375 | 304 | 134 | 134 |
| STHFT actual number detected | 267 | 202 | 184 | 178 | 104 |

| | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 |
|---|---|---|---|---|---|
| STHFT reduction targets | 77 | 94 | 87 | 87 | 87 |
| STHFT actual number detected | 80 | 93 | 78 | 110 | 83 |

| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 |
|---|---|---|---|---|---|
| STHFT reduction targets | 86 | 166 | 156* | 136 | 149 |
| STHFT actual number detected | 84 | 154 | 149 | 155 | 169 |

* in-house objective

6.11 Since April 2014, cases of 'Hospital Onset' *C.difficile* have been subject to an assessment to determine whether any 'lapse in care' has been identified which may have contributed to the case; these cases are known as 'potentially avoidable' cases (a summary of the definitions and process involved in this assessment have been reported in previous years' Reports). Although these cases are labelled as 'potentially avoidable', the 'lapses in care' identified may or may not have directly contributed to the specific case.

Of the 117 'Hospital Onset' episodes detected during 2022/23, a possible 'lapse in care' was only identified in thirteen instances (i.e. 11.1% of cases). This builds on the improvement seen in recent years (2021/22 8.4%, 2020/21 – 10.2%, 2019/20 - 9.2%, 2018/19 - 17.6%) and compares favourably with previous years where the figure was approximately 30%. The STH will continue to use this information as one of a number of parameters to monitor in-house progress in relation to *C.difficile* year on year. Comparison with other trusts is not meaningful given the variant nature of how these assessments are undertaken. Most of the 2022/23 cases where a possible 'lapse in care' was noted, were associated with clusters of infection where ribotyping indicated that spread had occurred on the ward. This emphasises the need for early deep cleans where possible clusters are detected.

Surveillance, follow up and action in respect of CDD cases

6.12 All cases of CDD are taken extremely seriously. Details of how cases are followed up were given in previous years' IPC Reports (e.g. sections 7.16 to 7.20 of the 2015/16 Report). Most aspects of follow up have not changed and will therefore not be repeated in this year's Report. The project aimed at streamlining the process for undertaking RCAs for Hospital Onset cases of CDD, was piloted in early 2020 and has been implemented since mid-2021.

6.13 As mentioned above, the on-going challenge faced by the Trust is to maintain optimal infection prevention and control practice, cleanliness standards and antimicrobial prescribing, despite caring for an increasingly elderly and frail population.

Table 15
STHFT 2022/23 Mandatory Surveillance CDD data for patients
1st April - 31st March

| Month | Monthly Total HOHA* cases | Monthly Total COHA* cases | Monthly Combined HOHA* & COHA* cases | Cumulative Total | National Target cumulative Total | Cumulative variance from national target |
|---|---|---|---|---|---|---|
| April | 5 | 4 | 9 | 9 | 12 (12) | -3 |
| May | 6 | 6 | 12 | 21 | 24 (12) | -3 |
| June | 10 | 8 | 18 | 39 | 37 (13) | +2 |
| July | 12 | 1 | 13 | 52 | 49 (12) | +3 |
| August | 8 | 6 | 14 | 66 | 61 (12) | +5 |
| September | 14 | 5 | 19 | 85 | 74 (13) | +11 |
| October | 13 | 5 | 18 | 103 | 86 (12) | +17 |
| November | 5 | 5 | 10 | 113 | 98 (12) | +15 |
| December | 6 | 3 | 9 | 122 | 111 (13) | +11 |
| January | 11 | 3 | 14 | 136 | 123 (12) | +13 |
| February | 12 | 2 | 14 | 150 | 135 (12) | +15 |
| March | 15 | 4 | 19 | 169 | 149 (14) | +20 |
| Total | 117 | 52 | 169 | 169 | 149 | +20 |

*see section 6.6 for definitions

Table 16
STHFT 'Hospital Onset' CDD data for patients
1st April - 31st March

| Time period Apr-Mar | Number of episodes | Rate per 100,000 bed days | Ranking within Comparable Hospitals*# |
|---|---|---|---|
| 2007/8 | 517 | 81.6 | 7th* |
| 2008/9 | 267 | 42.9 | 8th* |
| 2009/10 | 202 | 33.0 | 7th* |
| 2010/11 | 184 | 30.1 | 9th* |
| 2011/12 | 178 | 30.0 | 20th* |
| 2012/13 | 104 | 17.8 | 8th* |
| 2013/14 | 80 | 13.7 | 8th* |
| 2014/15 | 93 | 16.2 | 10th* |
| 2015/16 | 78 | 14.4 | 10th* |
| 2016/17 | 110 | 20.5 | 29th* |
| 2017/18 | 83 | 15.5 | 6th* |
| 2018/19 | 84 | 15.4 | 9th |
| NB: new Hospital Onset definition for 2019/20 onwards | | | |
| 2019/20 | 115 | 22.9~ | 14th |
| 2020/21 | 105 | 27.2~ | 14th |
| 2021/22 | 119 | 26.8~ | 13th |
| 2022/23 | 117 | 24 | 10th |

* 1st has lowest rate

\# Acute Teaching Hospitals Group of 25 trusts (2008/09 to 2012/13), 27 trusts 2013/14 to 2014/15, 28 trusts 2015/16, 32 trusts 2016/17, 16 large acute teaching hospitals 2017/18 onwards

~ rates updated from those published in previous Reports, based on the UKHSA Fingertips database in June 2023 following the Trust updating the declared denominator bed-day data

6.14 Previous year's Reports have detailed the action plans undertaken since 2011. These actions will continue into 2023/24 but will be increasingly challenging to implement in the current healthcare environment. Actions are reviewed regularly and changes made as appropriate

6.15 The action plan can be summarised under the following headings:

- Reducing environmental contamination of wards and departments
- Optimising infection prevention and control practice
- Optimising antibiotic prescribing
- *C.difficile* case follow up and action
- Raising the profile of infection prevention and control
- Ongoing real time monitoring on cases

Details of the actions taken over the past few years were presented in the *C.difficile* sections of previous years' IPC Reports and will not be repeated here, apart from a few key issues noted below.

6.16 The Infection Prevention and Control Operational Group continues to meet bi-monthly to ensure the action plan is implemented and that the benefits are sustained. The Group has representation from Central Nursing, the DIPC, the IPC Team, Estates Department, Facilities and Antimicrobial Pharmacists.

6.17 The rolling deep clean of wards and departments will continue for the foreseeable future. During 2022/23 every effort was made to continue the deep clean programme throughout the year. However, the proactive deep clean programme became increasingly difficult to sustain during the Covid-19 pandemic and the majority of cleans which took place over the past few years, were undertaken in response to clinical cases or clusters/outbreaks of infection plus opportunities taken as services reconfigured, ceased, or were re-instated. However, as operational pressures have eased slightly, decant facilities have become available and allowed the proactive deep clean programme to be reinvigorated. Since February 2023, the programme has been actively pursued and this will continue into 2023/24.

6.18 The IPC Team and Decontamination Manager continue to optimise decontamination of the environment and investigate innovative solutions, see Appendix A. Areas at 'high-risk' of on-going contamination with *C.difficile* spores (due to patients carrying the organism), are cleaned with a disinfectant with enhanced activity against *C.difficile.*

6.19 The financial investment required to continue to implement the action plan is considerable and is in excess of £1 million. Much of this needs to be recurrent funding for key elements to be continued into the future.

# Section 7

# Gram Negative Bacilli

'Gram negative bacilli' is a term that covers a wide range of bacterial species and refers to the appearance of these organisms when viewed under the microscope. Essentially these organisms are long and thin in shape and appear pink when a series of chemical dyes, known as 'Gram staining' are applied. Although this term includes many species, it is useful in that the organisms involved have many aspects in common, including their natural reservoir, the diseases they cause in humans and the antibiotics that can be used to treat them.

The species considered below are those that cause the most human disease, in community, outpatient and in-patient settings and those of particular importance due to their resistance to certain antibiotics.

- *Escherichia coli (E.coli)*
- *Klebsiella species*
- *Pseudomonas aeruginosa*
- Carbapenemase Producing Enterobacterales

The NHS Long Term Plan supports a 50% reduction in Gram-negative bloodstream infections (GNBSIs) by 2024/25

## ***Escherichia coli (E.coli)*** **bacteraemia**

7.1 *E.coli* causes a range of infections in hospital, outpatient and community settings. It is on a par with *S.aureus* as to the number of infections it causes. The normal reservoir for this organism is the human gut and almost all people will carry the organism throughout their life. Infections occur when the organism enters other body cavities e.g., urinary tract infections (UTIs), peritonitis and blood stream infections; the most common of these being the urogenital tract. Generally it can be treated with standard antibiotics but resistance to these agents has begun to appear, even in patients in the community who have not had significant exposure to hospitals.

Mandatory Surveillance

7.2 Surveillance of *E.coli* bacteraemia has been part of the DH national mandatory surveillance scheme since June 2011. Previously, the data released included all episodes detected and did not take into account whether the episode was associated with care provided by the trust or not. Therefore it was not useful to compare local data from this scheme with that observed elsewhere. As from 2017/18, the *E.coli* bacteraemia data has been published detailing both the overall rates and rates for those episodes considered to be Hospital Onset cases.

7.3 From 2018/19, the terminology used for episodes of *E.coli* bacteraemia previously deemed to be 'Trust Attributable*, has been changed nationally to 'Hospital Onset'. Therefore, the term 'Hospital Onset' is used in this Report to reflect the change in terminology. The definition of such episodes is otherwise unchanged.

7.4 Chart 5 shows data for all *E.coli* bacteraemia episodes detected within the Trust laboratories over recent years. Overall, the number of episodes detected by the STH laboratories in 2022/2023 has risen by 14% compared to

the previous year, 2021/22. However, when comparing the pre-pandemic *E.coli* bacteraemia levels (2019/20) with 2022/23, there has been a 6.5% decrease in the total number of cases detected. As noted in past year's Report, the number of *E.coli* bacteraemia's fell during the Covid-19 pandemic, with possible factors being fewer patients seeking medical advice and less elective hospital work being undertaken.

7.5 Following on from the rise in the total number of episodes detected, unsurprisingly, the numbers of Hospital Onset* and Healthcare Associated# cases have also risen this year compared to 2021-22.

- Hospital onset: There has been a 32.8% increase this year compared to a 20% decrease last year. Compared to the pre-pandemic levels in 2019/20, there has been a 3% reduction in the number of bacteraemias.
- Healthcare associated: There has been a 29% increase this year compared to a 10% reduction last year. Comparing this year's figures with the 2019/20 pre-pandemic levels there has been an 8% decrease in the number of bacteraemias.
- Community cases: There has been a 7.7% increase this year, following on from a 4.8% increase the previous year. This is likely to reflect a gradual returning to pre-pandemic level. Comparing this year's figures with the 2019/20 pre-pandemic levels, there has been a 10.8% decrease in the number of community onset cases.

These data continue to reflect the fact that over 50% of *E.coli* bacteraemia episodes occur in patients with no recent contact with acute healthcare; see Chart 5.

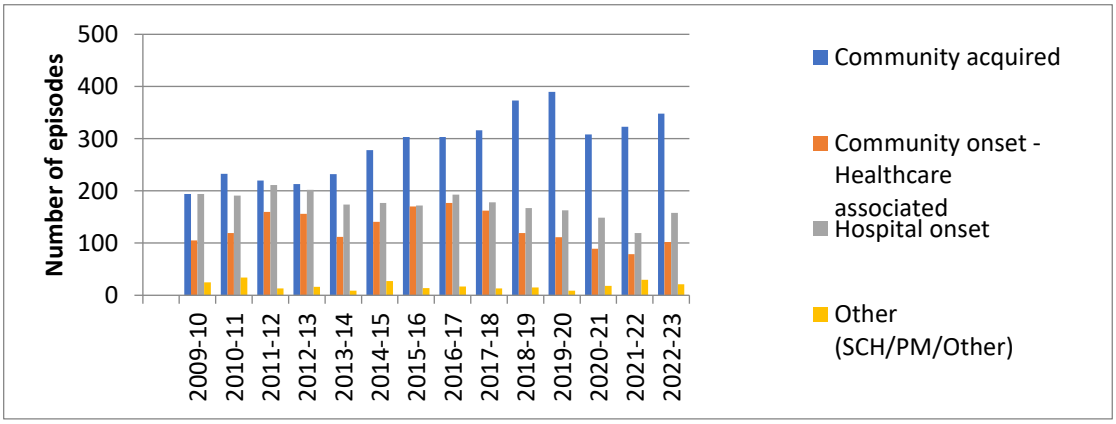
7.6 The STH performance during 2022/23 has remained similar to previous years, coming 12th out of 16 this year and 11th and 13th in the previous two years respectively; see Table 3 above. There are small fluctuations each year. The IPC Team will continue to monitor this over the coming year.

7.7 One issue that will affect the Trust's position compared to other trusts is patient case-mix and the specialities provided. Gram negative bacteraemia is more likely to occur in haematology, oncology, gastroenterology and hepatobiliary (HPB) medicine and surgery. The STH has large specialist services for all of these areas. However, it is unlikely that this alone will explain the difference in infection rates and work is on-going to optimise practice wherever possible.

Chart 5

Details of *E.coli* bacteraemia episodes detected by the Trust laboratories

(Number of episodes)



*~ Community Acquired = cases detected in blood cultures taken on Day 0 or Day 1, where the day of admission is Day 0, and the patient has not been an STH in-patient within the past 28 days*
*# Healthcare Associated = cases detected in blood cultures taken on Day 0 or Day 1, where day of admission is Day 0, but the patient had been an STH inpatient within the past 28 days*
** Hospital Onset = episodes detected in blood cultures taken on Day 2 onwards after admission, where day of admission is Day 0*

## Antibiotic resistance amongst *E.coli* bacteraemia isolates

7.8 There are a number of mechanisms by which *E.coli* can develop antibiotic resistance but the commonest is by acquiring one of a number of enzymes collectively known as extended spectrum beta-lactamases (ESBLs). The reasons why this occurs are not fully understood but exposure to antibiotics is a key factor.

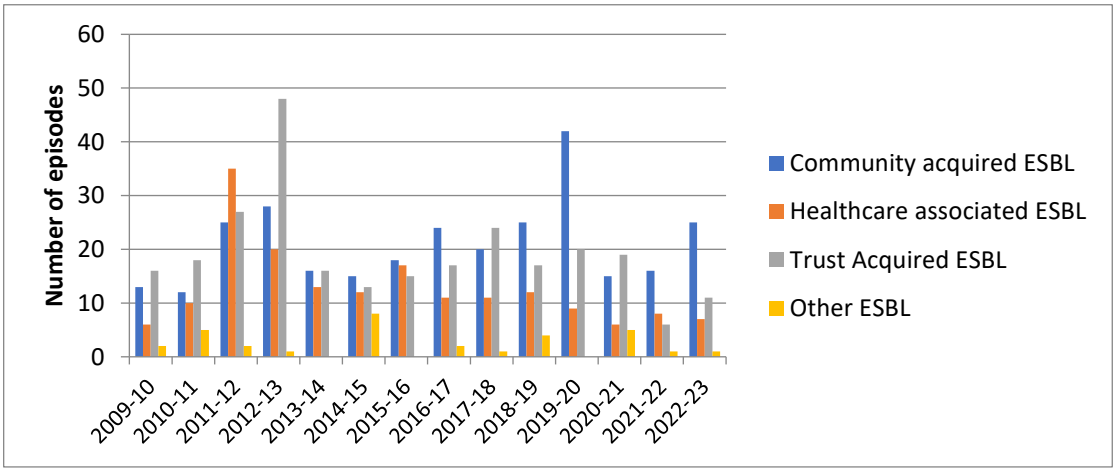
7.9 Overall this year, 7.5% of strains were ESBL producers. This is an increase compared to last year (5.6%), but not an outlier compared to the rates over the past six years (5.6% to 10.6%).

The percentage of local isolates that were ESBL producers from Community Acquired cases was 7.2%, compared to 5% last year, Healthcare Associated cases 6.9%, down from 10% last year and Hospital Onset cases 7%, up from 5% last year. There appears to be year on year variation in these data.

UKHSA report that, nationally in 2021[12], the rate of blood culture isolates of *E.coli* which were resistant to third generation cephalosporins was approximately 14%. Although this parameter is not a strict comparison, it is a useful proxy measure. There was concern nationally that the pandemic would result in higher empirical antibiotic use, thereby seeing higher rates of resistance; this has not been the case within STH.

Given that exposure to antibiotics increases the likelihood of organisms developing or acquiring resistance, wise and, where available, evidence based antibiotic use is therefore imperative to keep the level of resistance as low as possible. Microbiology, pharmacy and Infection Prevention and Control (IPC) teams across the health care community within Sheffield are continuing to address this issue and a range of objectives and initiatives are included in the 2023/24 IPC Programme to continue this work; see also Section 8.

Chart 6
Details of ESBL *E.coli* bacteraemia episodes detected by the Trust laboratories
(Number of episodes)



Action to reduce Gram negative bacteraemia including that caused by E.coli

7.10 Nationally the number of *E.coli* bacteraemia episodes has been rising year on year and addressing this is a DH priority. The DH has an aspiration to reduce Gram negative bacteraemia by 50% by 2024/25.

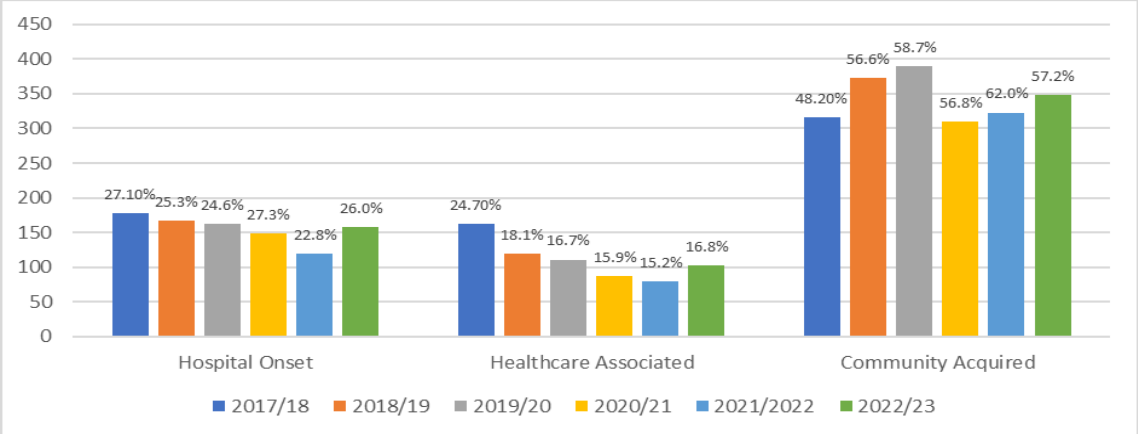
Nationally, and locally, most episodes are detected on admission to hospital and therefore, this issue requires a whole healthcare system approach, including community care and public health, rather than just concentrating on the care provided by acute trusts; see Chart 7 below for local data. As such, projects such as a) an enhanced Root Cause Analysis review collecting pre admission information and data and b) reviewing STH prophylaxis for hepato-biliary procedures were commenced in 2022/23 and will continue into 2023/24. Any lessons learnt from these projects will be updated in next year's Report.

The reasons why *E.coli* bacteraemia occurs are many and varied and, at the present time, there is little evidence as to whether there are any interventions that will consistently reduce the number of such episodes. *E.coli* carriage in the gastrointestinal tract is universal and the majority of infections are therefore caused by the patient's own body flora.

7.11 Since 2017/18, a Sheffield *E.coli* Steering Group has met, comprising STH and CCG colleagues, to gather information, identify trends, risk factors etc. and propose possible action plans based on the information gathered. Addressing these issues is complex and will require co-operation from multiple parties over the long-term and appropriate resourcing. This has been recognised nationally and, from 2019/20, the Integrated Care Boards (ICB) have been tasked with overseeing this issue.

The regional ICB convened two meetings during 2019/20 to discuss this issue and to start developing an action plan. Infection prevention and control, pharmacy and microbiology staff from STH attended these meetings and provided data of the STH experience to aid the discussion. Progress in developing and implementing an action plan was hindered by the Covid-19 pandemic. The STH *E.coli* Steering Group has since reconvened and members will continue to liaise with the ICB in 2023/24, as appropriate.

Chart 7
*E.coli* bacteraemia episodes detected in recent years by Trust laboratories by attribution
(Number of episodes and percentage of total)



7.12 The source of the bacteraemia i.e. the part of the body from which the organism probably entered the blood stream, is a key issue, as knowledge of this can help guide possible preventative actions. In this regard, data has been collected locally for 2017/18 to 2022/23; see Chart 8. STH data shows a similar picture to that seen nationally[13].

7.13 There is some variation in the percentage of each type of source for Hospital Onset, Healthcare Associated and Community Acquired cases but there is no clear pattern of change for any of the categories between the years 2017/18 to 2022/23; see Charts 8 to 11.

7.14 For Hospital Onset cases there has been an increase in UTI, catheter associated UTI's and HPB/Gastrointestinal (GI) infections compared to last year 2021/22. These tend to fluctuate each year. The number of bacteraemia's associated with HPB/GI infections is currently at its highest at 52, although there were 50 cases back in 2019/20 so this could just represent year on year variation. As mentioned previously, a project is currently underway looking at HPB prophylaxis. See Chart 9.

For Healthcare Associated cases, the numbers of UTI associated and catheter associated UTI infections have remained relatively static; 33 UTI associated cases this year compared to 32 last year and 14 this year compared to 12 last year, respectively. The downward trend in HPB/GI cases observed last year, has not been sustained and there has been an increase of 13, with 29 cases this year compared to 16 last year. See Chart 10.

For Community Acquired cases, in contrast to Hospital onset and Healthcare associated cases, there has been a decrease in HPB/GI sources of infection. Last year, we had seen a small increase in the number of HPB/GI cases from the community so as expected this appears to represent normal variation and is reassuring; see Chart 11. There have been small increases in the number of UTI and catheter associated UTI sources, but again these are small numbers and are likely to represent year on year variation. We will continue to monitor these over the coming years.

7.15 The Directorates where *E.coli* bacteraemia episodes occur reflect the most common sources for these infections i.e. urinary and gastrointestinal tracts; see Chart 12. There has not been any significant change in this distribution between 2017/18 and 2022/23; Geriatric and Stroke, General Surgery and Haematology being the three Directorates with the highest number of cases.

7.16 The majority of urinary source episodes are not related to catheters and the *E.coli* Steering Group continues to investigate actions that might address other factors implicated in the development of *E.coli* bacteraemia. Preliminary data and common sense indicate that dehydration, constipation, mobility and ability to undertake optimal personal hygiene are key issues; these often increase the risk of developing a UTI that can then progress to bacteraemia.

7.17 During 2022/23 work has been undertaken to investigate episodes where the source was thought to be the HPB or GI tract, to determine if there were any interventions that might reduce the likelihood of these episodes occurring. The project recommendations were to review antibiotic prophylaxis for patients undergoing ERCP procedures and to review overall resistance rates for "first line" antibiotics; Co-amoxiclav, Piperacillin-Tazobactam, Cefuroxime and Gentamicin in *E.coli* and *Klebsiella species*. As previously mentioned, a project is currently being undertaken looking at the Trust prophylaxis guidelines and will also incorporate the implications of local resistance rates.

Number of episodes of *E.coli* bacteraemia detected from 2017/18 to 2022/23 by Trust laboratories by probable source

Chart 8

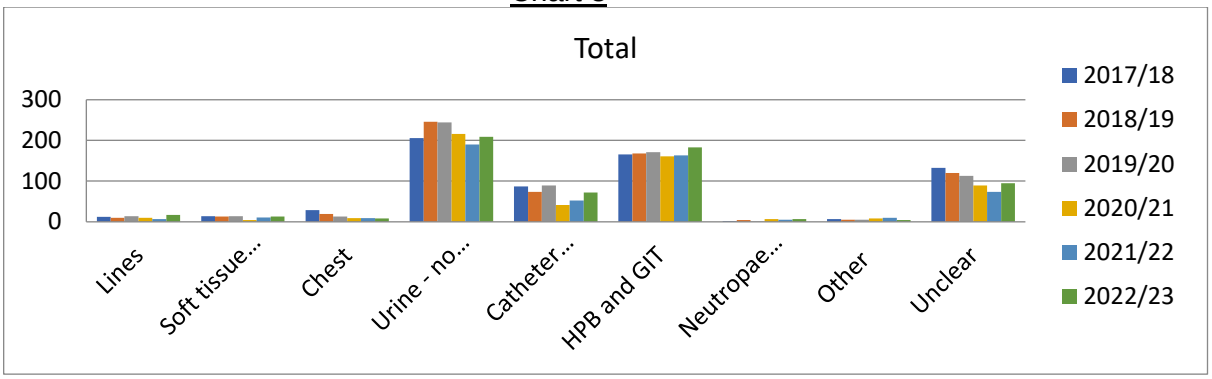



Chart 9

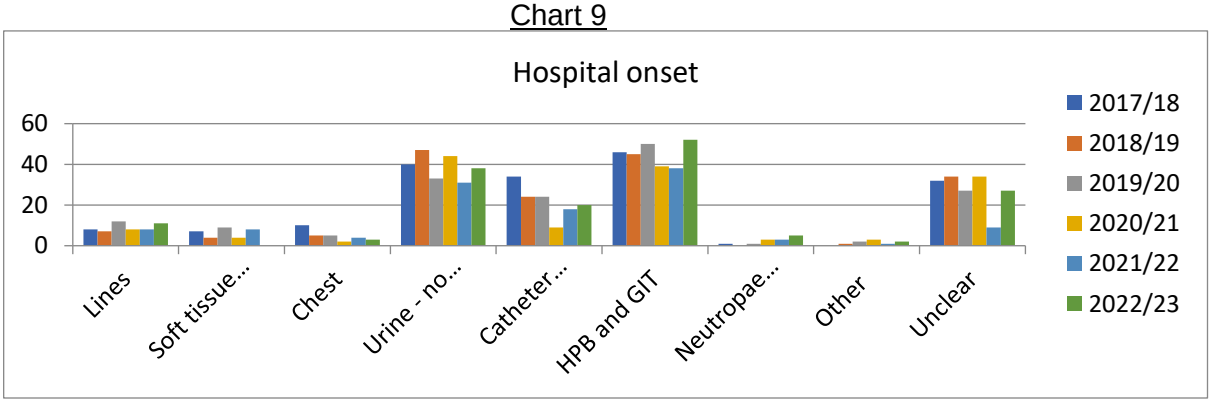



Chart 10

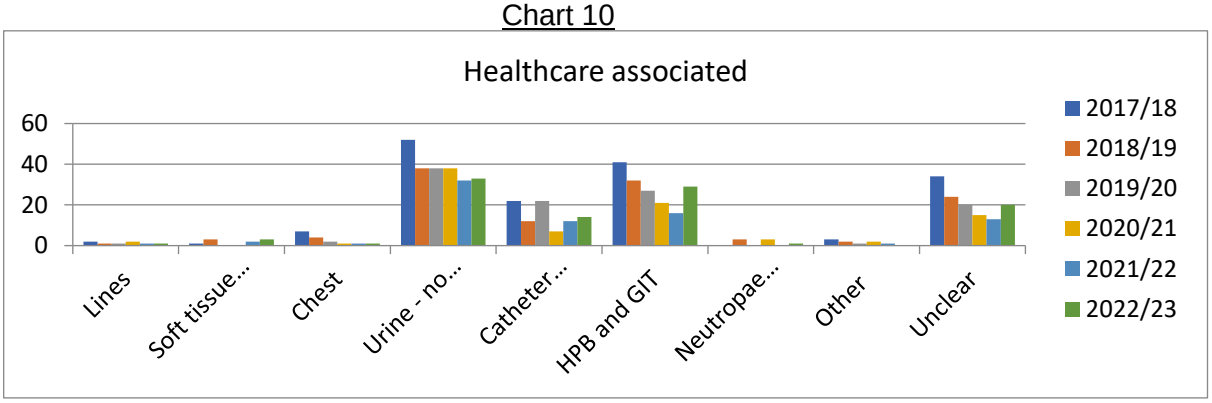



Chart 11

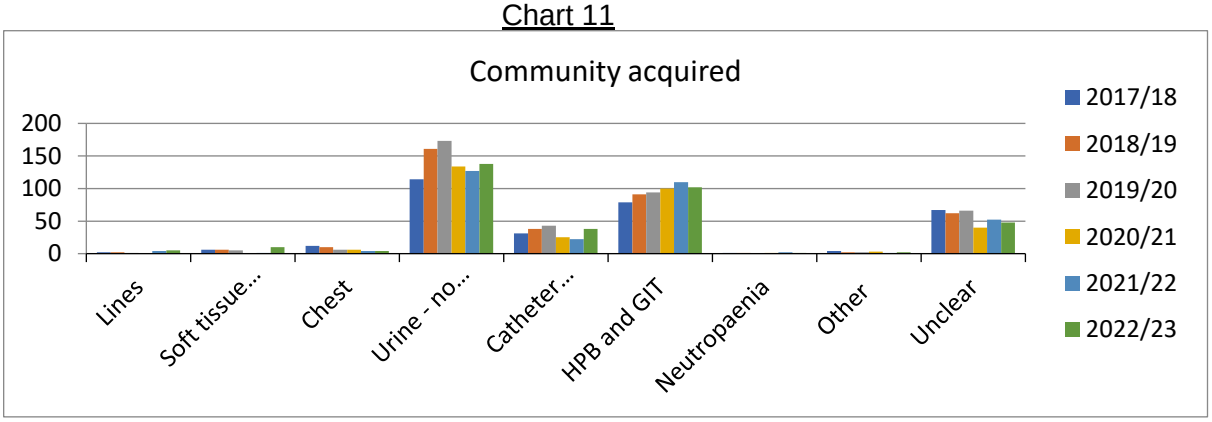
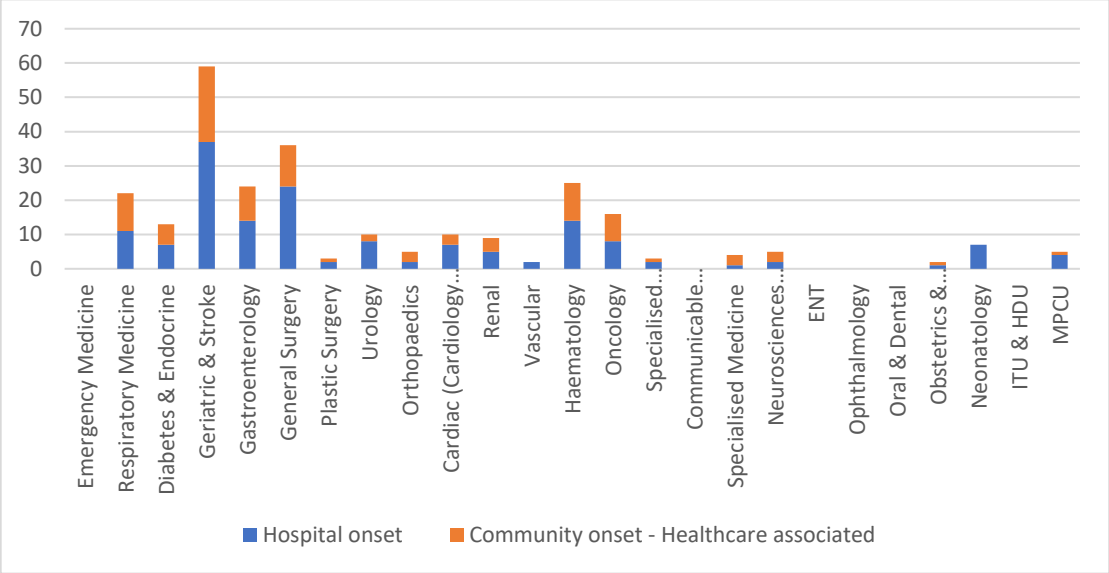


Chart 12
*E.coli* bacteraemia detected in 2022/23 by the Trust laboratories by Directorate
(Number of episodes)

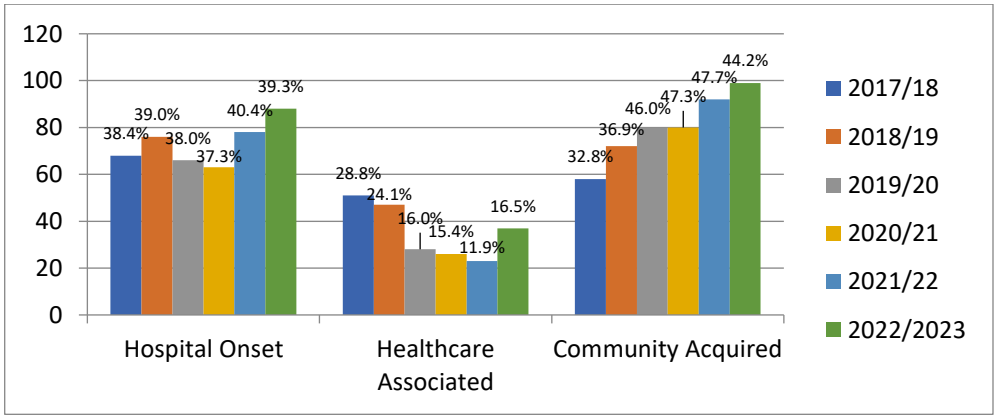



7.18 As stated in section 7.11 above, attempting to reduce Gram negative bacteraemia is not a straightforward issue and single, simple to implement options are not the solution. Going forwards, the Sheffield *E.coli* Steering Group will continue to work with the South Yorkshire ICB, as appropriate.

## ***Klebsiella species* bacteraemia**

7.19 *Klebsiella species* are very similar to *E.coli*, causing a similar range of infections in hospital, out-patient and community settings. The normal reservoir for this organism is the human gut and many people will carry the organism for much of their life. These species are the second most common cause of Gram-negative bacteraemia. Although the actual number of episodes is less than for *E.coli*, they are more likely to be associated with healthcare, although acquisition within the community is becoming more common; see Chart 13.

Chart 13
*Klebsiella species* bacteraemia episodes detected in recent years by the Trust laboratories by attribution 2022/23
(Number of episodes)



*~ Community Acquired = cases detected in blood cultures taken on Day 0 or Day 1, where the day of admission is Day 0, and the patient has not been an STH in-patient within the past 28 days*
*# Healthcare Associated = cases detected in blood cultures taken on Day 0 or Day 1, where day of admission is Day 0, but the patient had been an STH inpatient within the past 28 days*
** Hospital Onset = episodes detected in blood cultures taken on Day 2 onwards after admission, where day of admission is Day 0*

Mandatory Surveillance

7.20 Surveillance of *Klebsiella species* bacteraemia became part of the DH national mandatory surveillance scheme from April 2017 onwards. As from 2017/18, the *Klebsiella species* bacteraemia data has been published detailing both the overall rates and rates for those episodes considered to be Hospital Onset cases.

7.21 From 2018/19, the terminology used for episodes of *Klebsiella species* bacteraemia previously deemed to be 'Trust Attributable*, has been changed nationally to 'Hospital Onset'. Therefore, the term 'Hospital Onset' is used in this Report to reflect the change in terminology. The definition of such episodes is otherwise unchanged.

7.22 Overall the number of episodes detected by the STH laboratories in 2022/23 (224) is higher compared to last year 2021/22 (193) and shows a continued increase from the previous year 2020/21 (169). There have been increases across the board i.e. Hospital Onset (88 from 78), Healthcare Associated (37 from 23) and Community Acquired (99 from 92) cases, all of which are higher than pre-pandemic levels. STH is not alone in observing this increase. The UKHSA Quarterly report for Jan-March 2023 also reflects this trend, reporting that *Klebsiella spp.* bacteraemia increased by 6.3% nationally, compared to the same time period in 2022, with an increase in incidence, from 19.1 to 20.3 cases per 100,000 population. This is most notable in Hospital Onset cases. The report notes that these rates have exceeded pre-pandemic levels and are continuing an upward trajectory, being at the highest levels since the surveillance commenced.

7.23 In respect to Klebsiella Hospital Onset bacteraemia rates, the STH came 11th out of 16 similar trusts. This was a decrease from 9th the previous year and 5th the year before that, see Table 3 above. The IPC Team will continue to monitor this over the coming year.

Antibiotic resistance amongst *Klebsiella* species isolates

7.24 As with *E.coli* isolates, *Klebsiella spp*. are also capable of developing antibiotic resistance with mechanisms such as extended spectrum beta-lactamases (ESBLs) and exposure to antibiotics will play a part in this.

7.25 Overall this year, 6.7% of strains were ESBL producers. This is a decrease compared to last year (8.7%) and similar to the 7% ESBL rate observed for *E.coli* bacteraemia isolates.

- 3% of Community Acquired cases were due to ESBL producers
- 5.4% of Healthcare Associated cases were due to ESBL producers
- 11.3% of Hospital Onset cases were due to ESBL producers

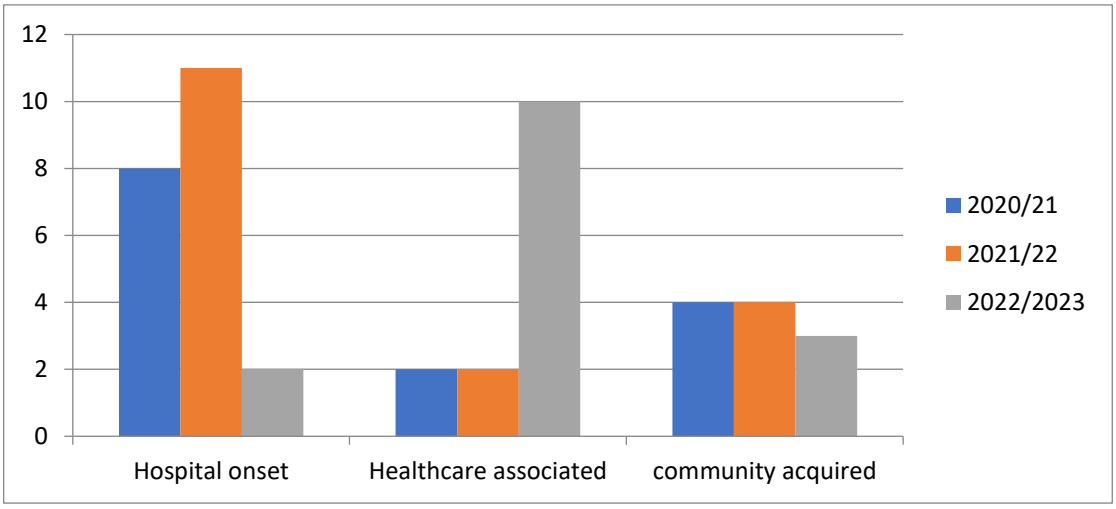
Reflecting the overall decrease in the number of ESBL producing *Klebsiella spp*. isolated, there has been a sustained decrease in the number of Community Acquired isolates, down from 4.3% last year and 5% the previous year, to 3% this year. Similarly, there has been a decrease in the number of

Hospital Onset cases; 11.3% this year, down from 14.1% last year and Healthcare Associated cases; 5.4% this year down from 8.7% last year.

Compared to *E.coli*, Community Acquired *Klebsiella spp.* cases have lower rates of resistance at 3% compared to 7.2%. Similarly, rates for Healthcare Associated cases are lower for *Klebsiella spp.*at 5.4% compared to 16.9% for *E.coli*. In contrast, Hospital Onset *Klebsiella spp.* have a higher rate of resistance than *E.coli*, 11.3% compared to 7%.

Locally, monitoring of ESBL's amongst *Klebsiella spp.* only commenced in 2021/22, and will continue to be monitored over in the year ahead.

Chart 14
Details of ESBL *Klebsiella* species bacteraemia episodes detected by Trust laboratories
(Number of episodes)




Action to reduce *Klebsiella species* bacteraemia

7.26 The source of the *Klebsiella species* bacteraemia i.e. the part of the body from which the organism probably entered the blood stream, is more varied than for *E.coli*., with 26% originating from the urinary tract followed by 23.7% having an HPB source; see Chart 15.

7.27 For Hospital Onset cases, there has been an increase in the number of infections caused by UTIs and catheter associated UTIs, from 7 in 2021/22 to 20 in 2022/23 and from 9 in 2021/22 to 14 in 2022/23, respectively. There has been a reduction in the number of line associated *Klebsiella spp.* bacteraemias; 9 detected in 2022/23 compared to 17 in 2021/22. This may reflect a return to pre-pandemic levels.

For Healthcare Associated cases, the number of line associated cases has remained low. Similar to Hospital Onset cases, a moderate increase in both UTI and Catheter associated UTI cases have been observed. In addition, there has also been a rise HPB/GI associated cases; 10 cases being reported in 2022/23 compared to 5 in 2021/22.

For Community Acquired cases, there has been little change compared to last year as regards the different probable sources. The main rise has been in the 'unclear' category, being at its highest level this year at 18 compared to 7 last

year. This was previously highest number was in 2018/19, when 16 cases were reported as 'unclear'.

7.28 For most sources the change in numbers reflects the increase or decrease in overall numbers for each category.

7.29 However, it is too early to draw any firm conclusions or determine whether the interventions noted in sections 7.10 to 7.18 above are having any long-term impact on numbers or sources, in any of the categories.

7.30 The actions described above, aimed at reducing *E.coli* bacteraemia, will also impact on infections caused by *Klebsiella species*. In particular, the actions highlighted from the thematic root cause analysis of Gram negative bacteraemias, mentioned in section 7.17 above, will be of interest going forwards into the coming year.

Number of episodes of *Klebsiella species* bacteraemia detected in 2017/18 to 2022/23 by the Trust laboratories by probable source

Chart 15

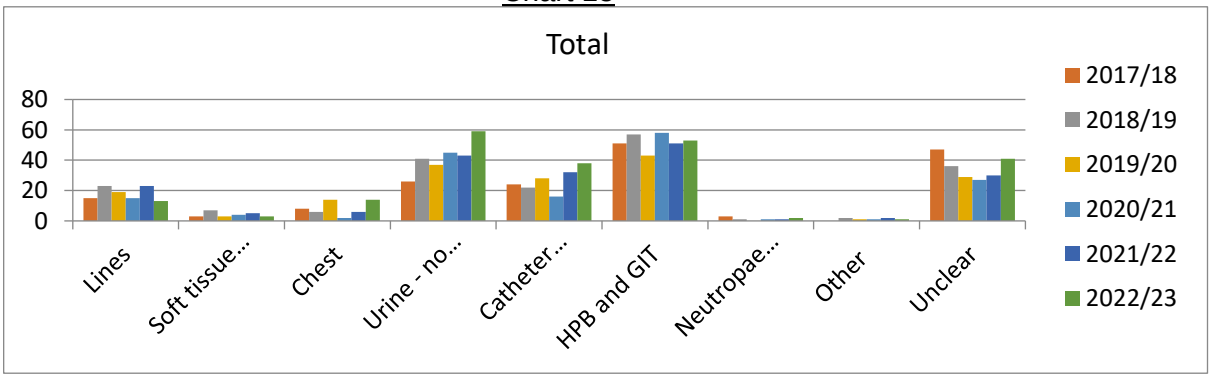



Chart 16

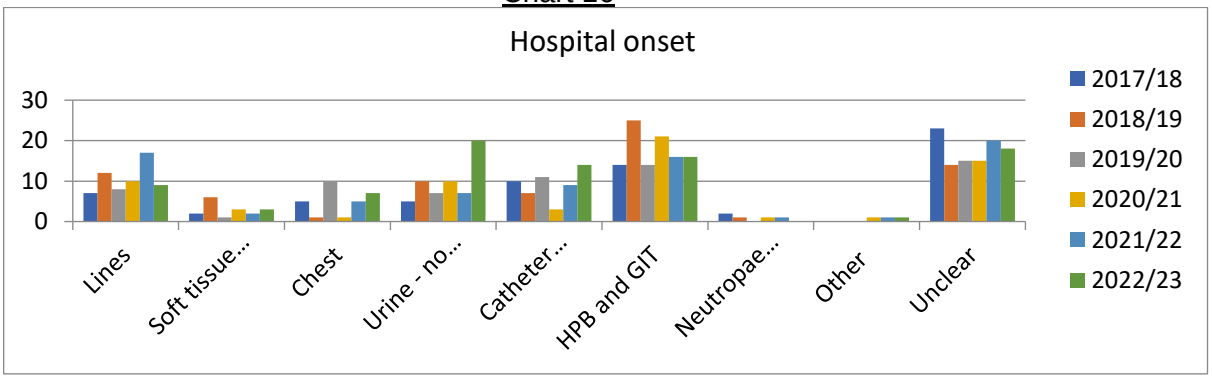


Chart 17

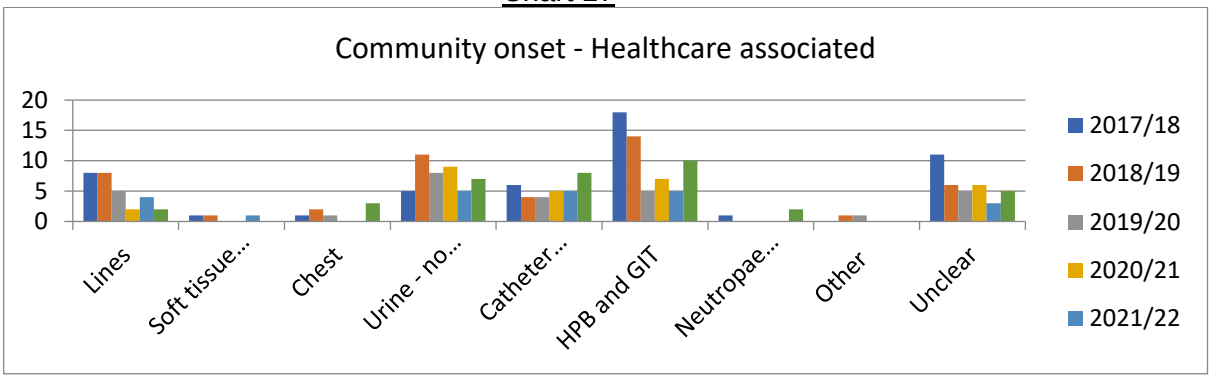
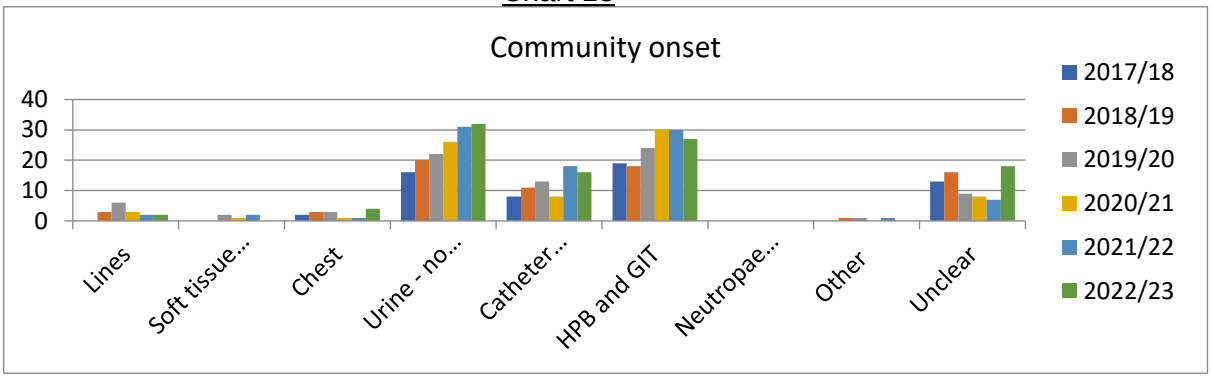
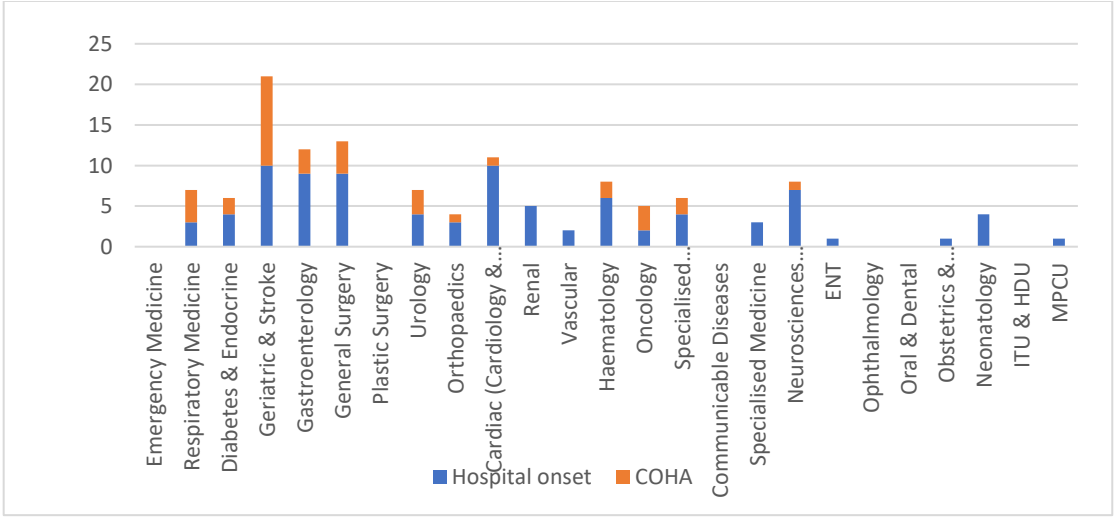



Chart 18




7.31 The Directorates where *Klebsiella species* bacteraemia episodes occur reflect the most common sources for these infections i.e., urinary and gastrointestinal tracts and central intravenous lines; see Chart 19. Compared to last year, there has been an increase in the number of infections within the Geriatric and Stroke directorate; up to 21 from 8 in 2021/22. The number of infections in other areas has remained similar. Monitoring of these data will continue into 2023/24.

Chart 19
*Klebsiella species* bacteraemia detected in 2022/23 by the Trust laboratories by Directorate
(Number of episodes)



## ***Pseudomonas aeruginosa* bacteraemia**

7.32 *Pseudomonas species* are Gram negative organisms but, unlike *E.coli* and *Klebsiella species,* these organisms are naturally colonisers of the environment, particularly water and damp areas, and less commonly found in the human gut. However, they are very capable of colonising damaged human tissues and causing superficial and deep infections, particularly in immunosuppressed individuals; the most common human pathogen is *Pseudomonas aeruginosa.*

The actual number of episodes is far fewer than for *E.coli* and *Klebsiella species.* Historically, *Pseudomonas aeruginosa* was thought to only cause infections in association with healthcare, particularly in the in-patient setting. However, this has changed with modern healthcare practices and quite a number of infections now appear to be Healthcare Associated or Community Acquired; see Chart 20.

Mandatory Surveillance

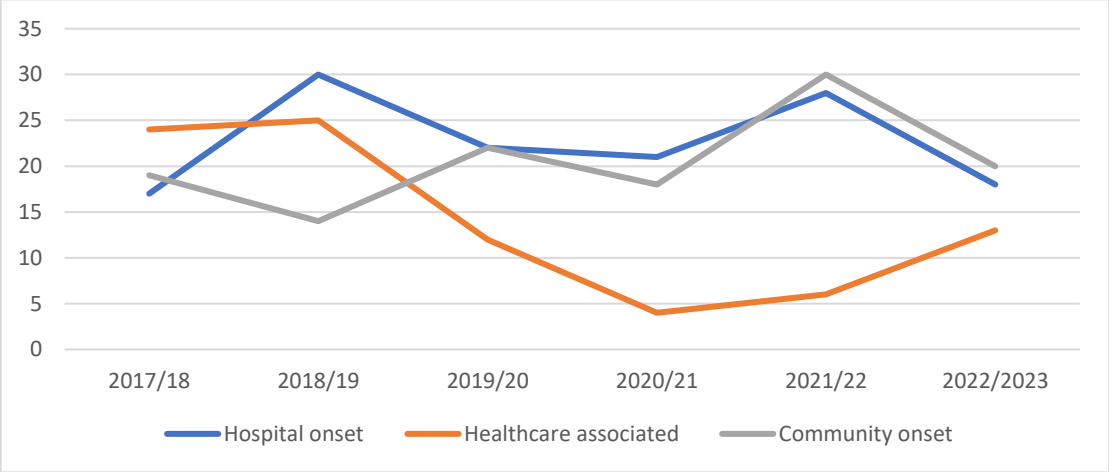
7.33 Surveillance of *Pseudomonas aeruginosa* bacteraemia became part of the DH national mandatory surveillance scheme from April 2017 onwards. As from 2017/18, the *Pseudomonas aeruginosa* bacteraemia data has been published detailing both the overall rates and rates for those episodes considered to be Hospital Onset.

7.34 From 2018/19, the terminology used for episodes of *Pseudomonas aeruginosa* bacteraemia previously deemed to be 'Trust Attributable*, has been changed nationally to 'Hospital Onset'. Therefore, the term 'Hospital Onset' is used in this Report to reflect the change in terminology. The definition of such episodes is otherwise unchanged.

7.35 Overall the number of episodes detected by the STH laboratories in 2022/23, fell compared to the previous year (51 compared to 64). This represents a continuing downward trend as these numbers are lower than pre-pandemic levels. The number of Hospital Onset cases also fell this year with 18 compared to 28 last year. This is the lowest level since 2017/18 when 17 episodes were reported. Conversely, there has been a rise in the number of Healthcare Associated cases this year with 13 compared to 6 being reported last year. However, these numbers are lower than pre pandemic levels. The number of Community Acquired cases has fallen in 2022/23, with 20 cases seen compared to 30 cases in 2021/22. The 2021/22 figures may be an outlier. It should be noted that, deducing trends from relatively small numbers is problematic, and monitoring of these data will continue into 2023/24.

7.36 In respect to Hospital Onset *Pseudomonas aeruginosa* bacteraemia, the STH came 2nd out of 16 similar trusts; see Table 3 above. This is an improvement from 7th last year. This position has varied over the past few years, coming 4th in 2020/21 and 2nd in 2019/20. The IPC Team will continue to monitor this over the coming year.

Chart 20
*Pseudomonas aeruginosa* bacteraemia episodes detected by the Trust Laboratories
(Number of episodes)




Action to reduce *Pseudomonas aeruginosa* bacteraemia

7.37 The source of the *Pseudomonas aeruginosa* bacteraemia i.e. the part of the body from which the organism probably entered the blood stream, is more varied than for other Gram-negative organisms; see Chart 22.

7.38 There is some variation in the percentage of each type of source for Hospital Onset, Healthcare Associated and Community Acquired cases and, due to the small numbers, determining clear patterns of change for any of the categories between the years 2017/18 to 2022/22 is problematic; see Charts 22 to 25.

Overall, there has been an increase in the number of cases associated with HPB/Gastrointestinal (GI) infections, but a fall in cases associated with lines, skin and soft tissue and bone infections plus no cases associated with UTI's without catheters.

There has been a rise in the number of cases associated with the Gastroenterology directorate, which would be consistent with the rise seen in HPB and GI tract infections, 7 this year, compared to 3 last year; see Chart 26. There has been a fall in the number of cases attributed to the Haematology department, with 2 cases this year compared to 5 cases last year. Obviously, these are small numbers and year on year variation is not unexpected. A further complicating factor is that, in many cases, the cause is less than clear particularly in haematology patients who have multiple co-existing risk factors.

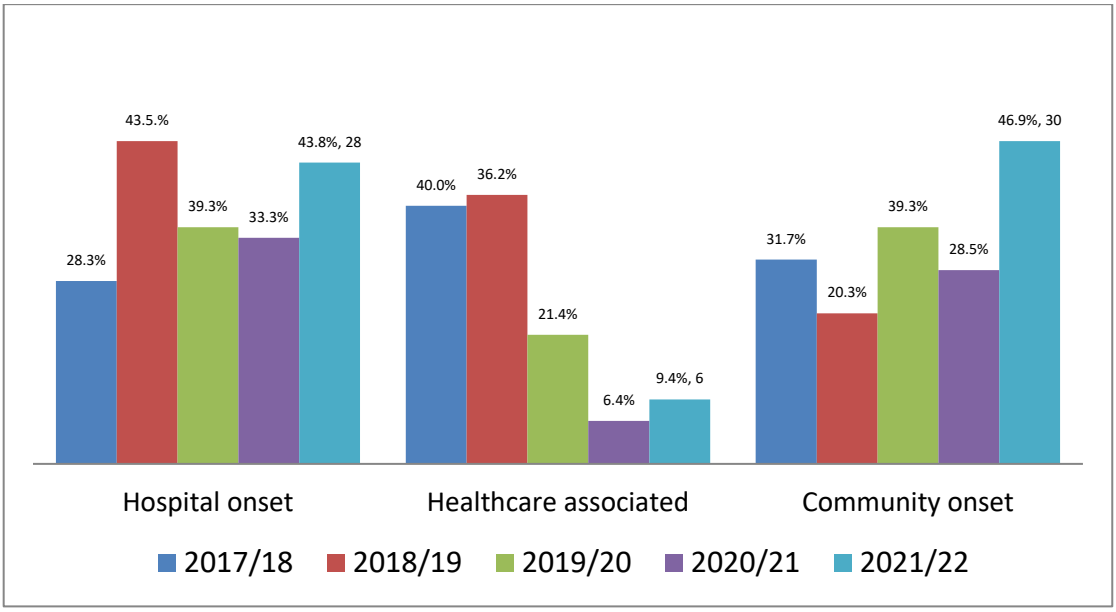
7.39 For Hospital Onset cases, there has been a fall in the number of bacteraemias associated with lines, chest, UTI (no catheter) sources. Compared to last year, a small rise in the number of HPB/GI tract infections has been observed, 6 this year compared to 4 last year. Similarly, there has been a small rise in the number of Catheter associated UTI cases, 6 this year compared to 4 last year, although these are still lower than levels seen in 2018/19.

7.40 For Healthcare Associated cases, there has been a rise in the number of Unclear (4 compared to 2 in the previous year) and Catheter associated UTI sources (3 compared to 1 in the previous year) but falls in Chest and UTI (no catheter sources. As previously noted, the actual numbers involved are small and drawing any meaningful conclusions from these figures is difficult.

7.41 For Community Acquired cases, there has been a fall in the numbers from all sources except Chest (increasing to 4 from 3) and HPB/GI tract (increasing to 6 from 2 last year). The previous rise observed in Catheter associated UTI source episodes in 2019/20, has slowly fallen over the recent years. The previous rise seen in UTI (not catheter associated) has not been sustained this year, with a fall to zero cases compared to 8 cases in 2021/22. An enhanced root cause analysis is ongoing reviewing episodes where the most likely source is thought to be the urinary tract.

7.42 The actions described above, aimed at reducing *E.coli* and *Klebsiella species* bacteraemia, will also impact on infections caused by *Pseudomonas aeruginosa*.

Chart 21
*Pseudomonas aeruginosa* bacteraemia episodes detected in recent years by the Trust laboratories by attribution
(Number of episodes and percentage of total)



Number of episodes of *Pseudomonas aeruginosa* bacteraemia detected in 2017/18 to 2022/23 by the Trust laboratories by probable source

Chart 22

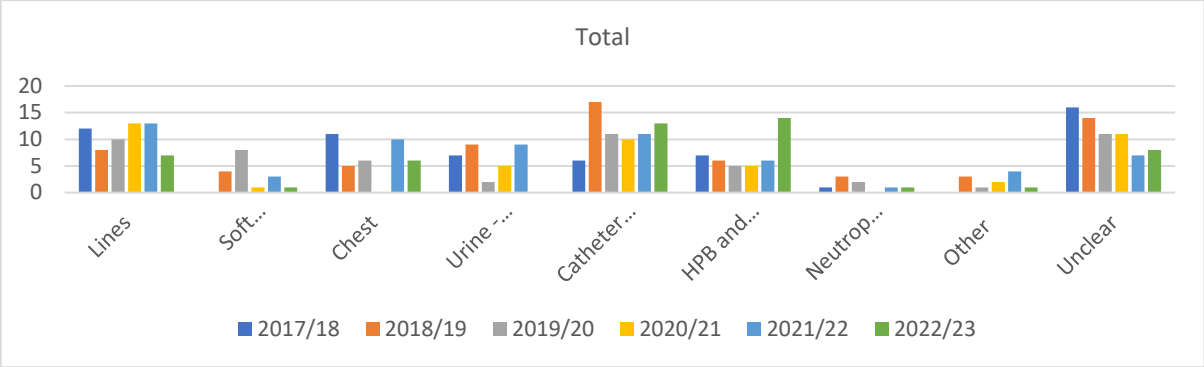



Chart 23

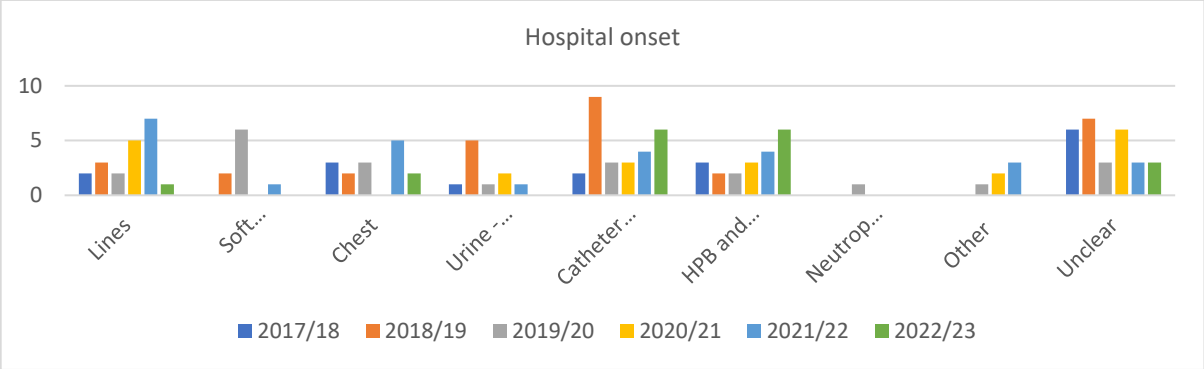



Chart 24

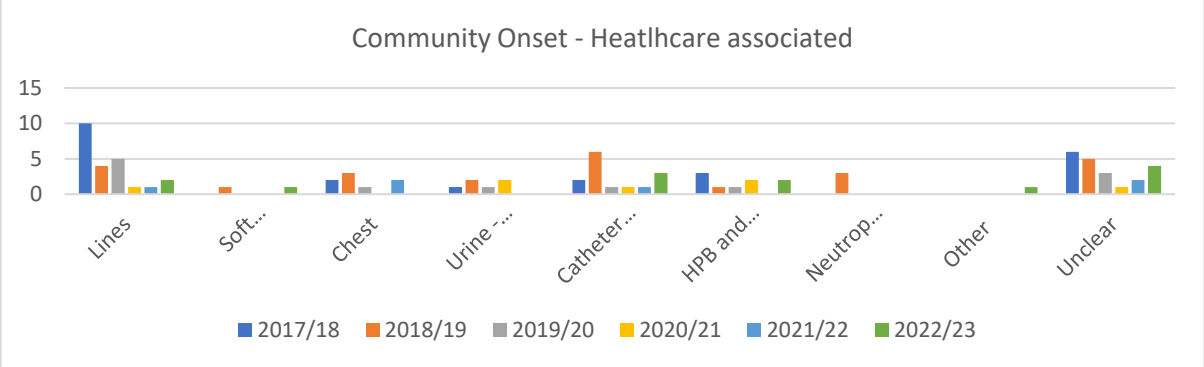



Chart 25

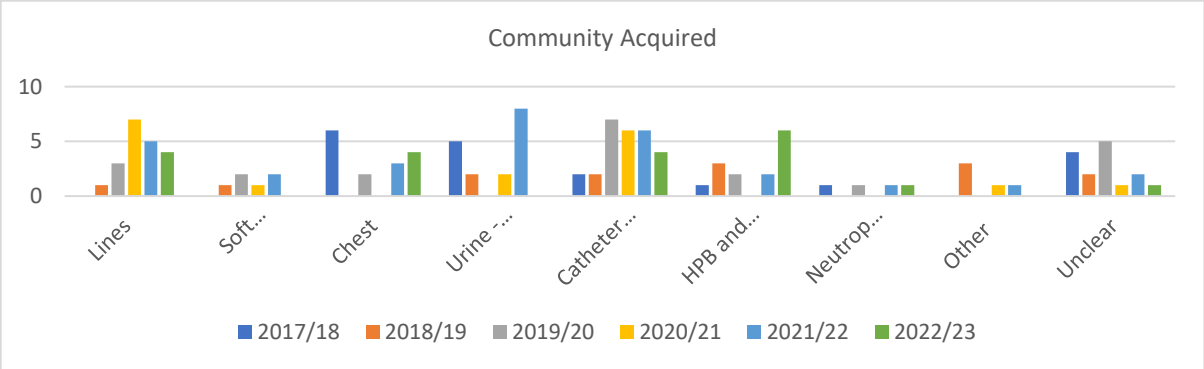
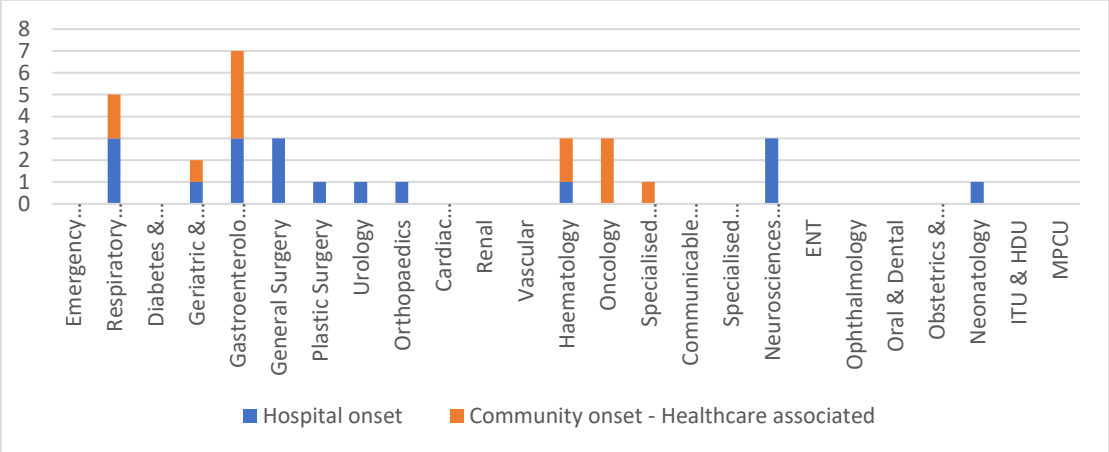


Chart 26
*Pseudomonas aeruginosa* bacteraemia detected in 2022/23 by the Trust laboratories by Directorate
(Number of episodes)




Carbapenemase Producing Enterobacterales

7.43 Over the past decade there has been increasing concern worldwide regarding the development of resistance to the carbapenem group of antibiotics. The reasons for this concern, the implications for patients and trusts and the local response to this threat have been detailed in previous years' IPC Reports. The STH local policy for CPEs is based on the UKHSA CPE guidance[14].

7.44 To date, CPEs are relatively uncommon locally and Sheffield is not classed as a high-risk area. Table 17 contains information as to the number of cases detected by the laboratories in Sheffield. The IPC Team also try and determine where a patient may have acquired the organism. This is not always possible and unless the source is clearly elsewhere e.g. when a patient is transferred from abroad, the source is allocated to the STH. It should be noted that the patient may have been carrying the organism on admission and the STH may not have been the source but, in the absence of information to this effect, allocation remains with the Trust.

7.45 Patients who have had healthcare in areas where the incidence of CPE organisms is high have an increased risk of carrying such organisms. Therefore, patients who fulfil the following criteria are screened for CPE on admission to enable early detection, optimise any antibiotic therapy they may require and reduce the risk of transfer to other patients.

- Household or bay contacts of patients with known CPE colonisation
- Patients who have been an inpatient in hospitals outside of South Yorkshire, Bassetlaw and Chesterfield in the past 12 months
- Patients who have been an inpatient in hospitals outside the UK in the past 12 months
- Patients admitted to Critical Care, Haematology and Osborn wards

7.46 Although the actual number of cases detected locally is small, numbers do appear to be increasing over recent years. This is unsurprising given the national and international rise in such isolates. However, increased screening may also be a contributory factor.

The IPC Team and clinical staff will continue to respond appropriately to each situation and endeavour to optimally manage each case and prevent spread wherever possible. However, as these organisms become more common across the UK, this will become an increasing challenge.

Table 17
CPE information 2013/14 to 2022/23
Number of patients identified by the STH Laboratories as being infected with or carrying CPE organisms

| | Total detected | Trust Attributable and Trust Associated[#] |
|---|---|---|
| 2013/14 | 10 | 4 |
| 2014/15 | 16 | 12 |
| 2015/16 | 8 | 5 |
| 2016/17 | 19 | 9 |
| 2017/18 | 20 | 14 |
| 2018/19 | 11 | 2 |
| 2019/20 | 9 | 3 |
| 2020/21 | 14 | 5 |
| 2021/22 | 24 | 13 |
| 2022/23 | 38 | 18 |

# Trust Attributable - detected in samples taken >48 hours after admission
Trust Associated – detected in samples taken < 48 hours after admission but the patient has been an STH in-patient within the past 28 days.

# Section 8

# Antibiotic Resistance and Stewardship

## Antibiotic Resistance

8.1 The data presented in Table 18 is the local incidence of antibiotic resistance amongst some of the major pathogens. This shows that:

- Amongst *Escherichia coli (E.coli)* the rate of extended spectrum beta-lactamase (ESBL) producing isolates has remained stable over recent years and below the national average.
- The percentage of *Staphylococcus aureus* isolates that are meticillin/ flucloxacillin resistant i.e. MRSA, has increased slightly compared to 2021/22 and remains higher than pre-Covid; this may be due to the case-mix of patients undergoing microbiological investigations during the pandemic, see also section 5.6.
- The rate of glycopeptide resistant *Enterococcus spp*. has risen compared to last year although remains below the national reported figure; see also sections 4.6 to 4.8.

Table 18

Selected Antibiotic Resistance Statistics: percentage resistance of local isolates

| | 2001/2 | 2002/3 | 2003/4 | 2004/5 | 2005/6 | 2006/7 | 2007/8 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ***E.coli*** | | | | | | | |
| ESBL producers* | | | | 7.4 | N/A | 6.6 | 3.6 |
| ***Staph. aureus*** | | | | | | | |
| Meticillin/Fluclox** | 21.0 | 24.0 | 23.9 | 20.3 | 26.0 | 16.8 | 10.2 |
| ***Enterococcus spp.*** | | | | | | | |
| Vancomycin# | 1.0 | 5.7 | 3.0 | 3.6 | 2.9 | 1.9 | 1.7 |

| | 2008/9 | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ***E.coli*** | | | | | | | |
| ESBL producers* | 4.0 | 4.6 | 4.1 | 4.9 | 5.6 | 5.0 | 4.8 |
| ***Staph. aureus*** | | | | | | | |
| Meticillin/Fluclox** | 9.2 | 7.7 | 6.5 | 5.0 | 3.1 | 3.9 | 8.9 |
| ***Enterococcus spp.*** | | | | | | | |
| Vancomycin# | 0.5 | 1.3 | 0.9 | 2.5 | 1.3 | 0.3 | 3.0 |

| | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ***E.coli*** | | | | | | | |
| ESBL producers* | 4.8 | 4.7 | 5.1 | 4.8 | 5.0 | 5.0 | 4.7 |
| ***Staph. aureus*** | | | | | | | |
| Meticillin/Fluclox* | 3.7 | 4.0 | 3.5 | 3.8 | 4.0 | 9.1 | 8.4 |
| ***Enterococcus spp.*** | | | | | | | |
| Vancomycin* | 5.0 | 6.6 | 9.6 | 10.5 | 10.2 | 8.8 | 9.8 |

| | 2022/23 | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ***E.coli*** | | | | | | | |
| ESBL producers* | 5.3 | | | | | | |
| ***Staph. aureus*** | | | | | | | |
| Meticillin/Fluclox* | 9.4 | | | | | | |
| ***Enterococcus spp.*** | | | | | | | |
| Vancomycin* | 12.3 | | | | | | |

Data from the UK Health Security Agency/Public Health England

* 2021 UK data for blood culture isolates estimates 14% resistance to third generation cephalosporins which, although not a strict comparison, is a useful proxy measure
2021 UK data for *Staphylococcus aureus* blood culture isolates shows 5.7% resistance
2021 UK data for *Enterococcus species* isolates shows 17.1% resistance
English Surveillance Programme for Antimicrobial Utilisation & Resistance (ESPAUR)

8.2 Generally these figures show that resistance rates in Sheffield are below the national average. It should be noted that, for some of the organisms, the national figures lag a year or so behind the local ones.

The local data allow clinicians to continue to prescribe traditional antibiotics with confidence in the majority of situations. It should be noted that the above data relate to all isolates investigated within the Sheffield laboratories including those from samples submitted from the community.

8.3 Although resistance rates locally are generally low relative to the national position, the need to use antimicrobial agents wisely remains a priority.

**Antibiotic Stewardship; the following sections have been written by Katie Bramhall on behalf of the Antimicrobial Stewardship team**

8.4 Within the STH, a range of activities have been undertaken over the past decade to optimise prescribing led by the STH Antimicrobial Stewardship (AMS) Team.

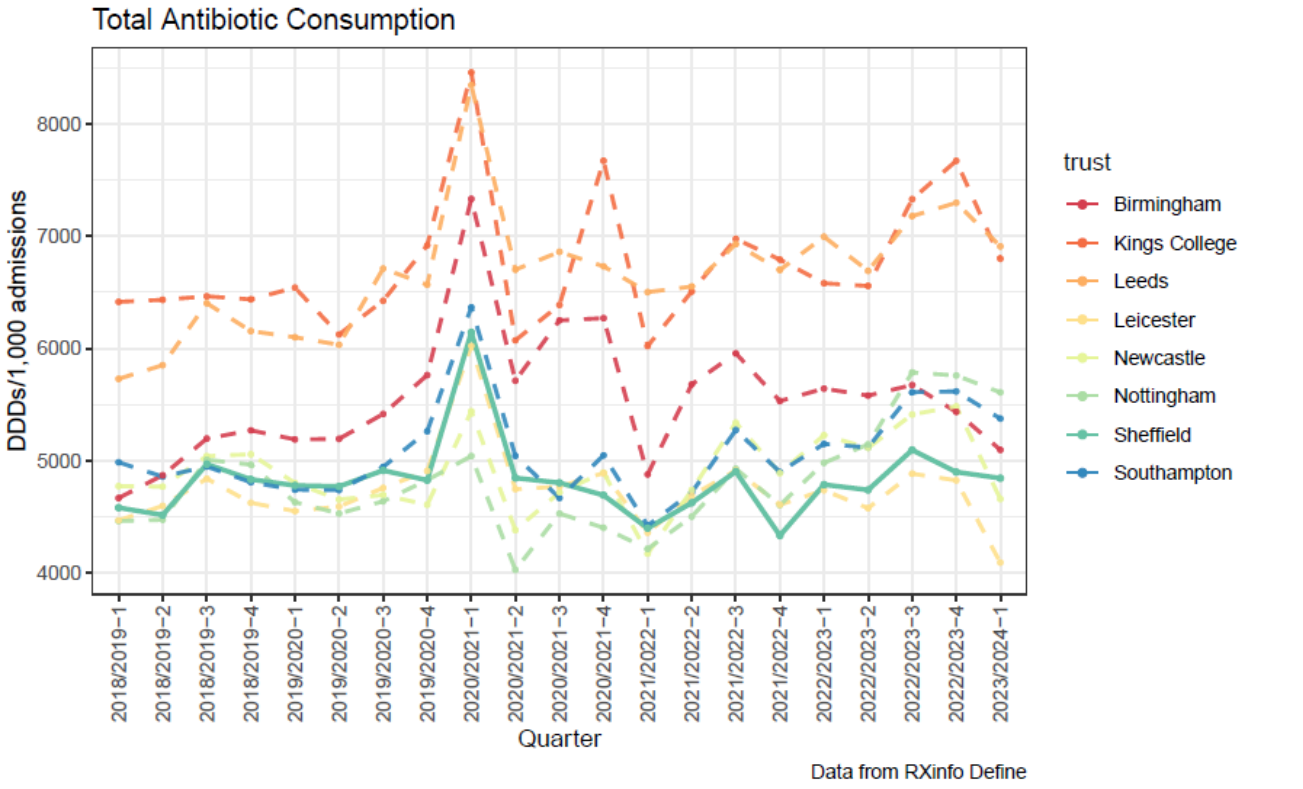
The following sections summarise the actions, achievements and challenges of the team in 2022/23.

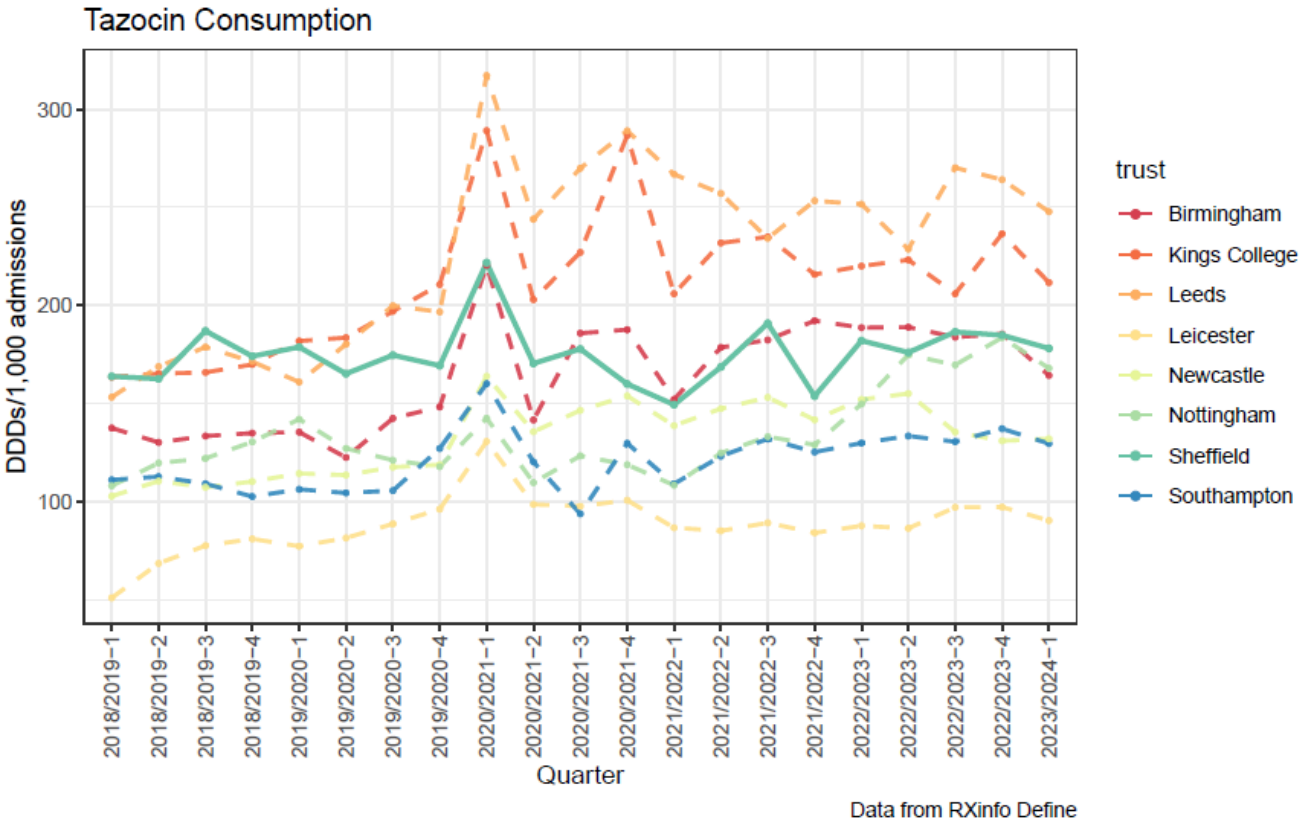
8.5 **CQUIN 2022/23: Antimicrobial related CQUINs**

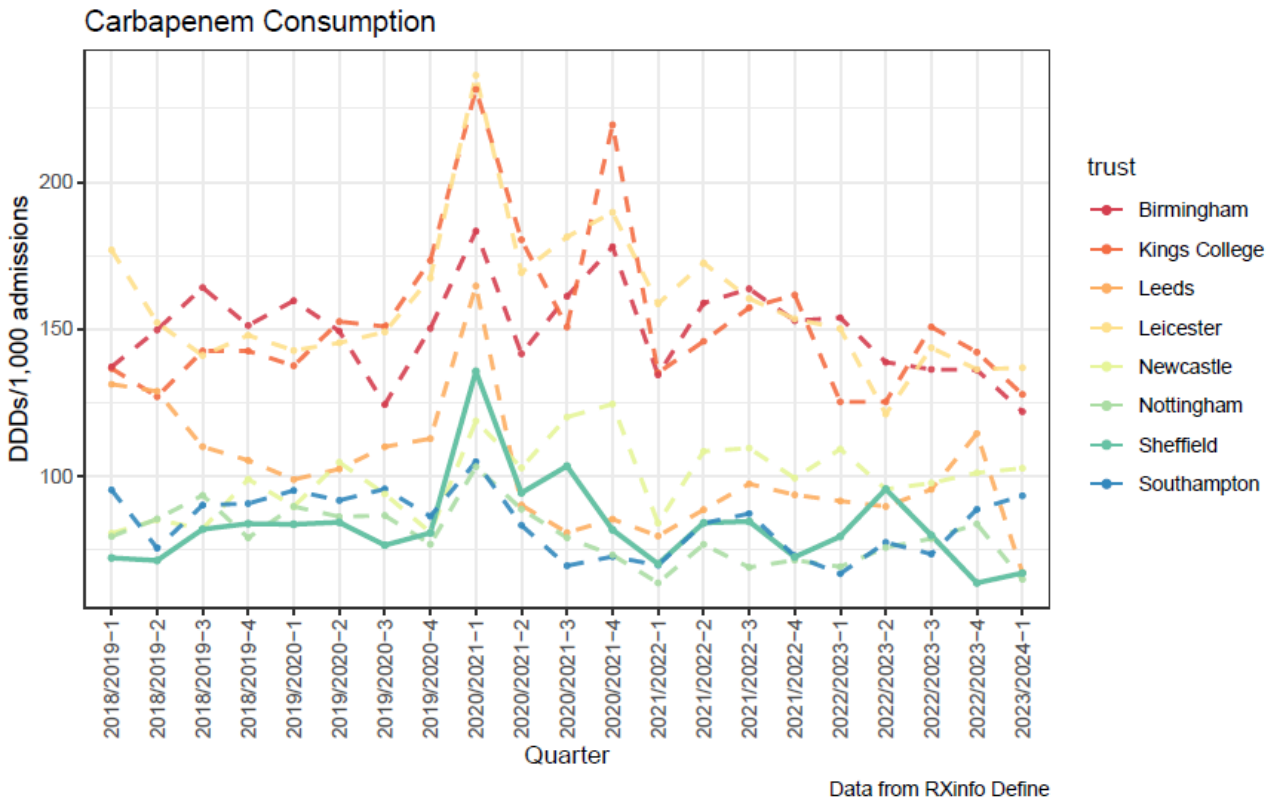
| **CQUIN CCG2: Appropriate antibiotic prescribing for UTI in adults aged 16+** | |
|---|---|
| **Target** | Achieve 60% of all antibiotic prescriptions for UTI in patients aged 16+ years that meet NICE guidance for diagnosis and treatment. |
| **Description of indicator** | 1. Documented diagnosis of UTI, which excludes the use of urine dipstick for 65+ years and in all catheter associated UTI (CAUTI).<br>2. Empirical antibiotics prescribed following NICE/local guidelines.<br>3. Urine sample sent to microbiology as per NICE requirement.<br>4. For CAUTI, review of urinary catheter is documented in clinical record. |
| **Comments** | • Partial payment for 40-60% adherence, full payment >60%, although the commissioners decided that this was not one of the '5 money' CQUINs that STH was to achieve.<br>• Still a requirement for data submission. Data was collected for quarters 2, 3 and 4, with an average score of 52% across these 3 quarters. Q2 overall score achieved was 60%, Q3 overall score 36%, Q4 overall score 59% |
| **NHS Standard Contract: Reduce WHO Watch and Reserve antibiotic usage** | |
| **Target** | • Reduction in WHO Watch and Reserve antibiotic groups usage by 4.5% (measured in Defined Daily Dose) per 1,000 admissions from 2018 baseline. |
| **Description of indicator** | • To target broad spectrum and last line antibiotic usage, to help reduce the risk of antibiotic resistance. |
| **Comments** | • STH achieved a 3.4% reduction. Although the 4.5% reduction was not achieved, the STH performed well compared to the 22 acute trusts within the ICB Region, where only eight achieved a reduction, the remainder reported an increase.<br>• Antimicrobial team proactively finding patients on watch antibiotics and reviewing these, to try to minimise inappropriate use.<br>• Reserve antibiotics already well monitored due to antimicrobial restricted policy in place at STH. |

## 8.6 Antibiotic usage graphs

The following charts show the trend in antimicrobial prescribing within STH over time and compares this to other similar trusts, up to April 2023. The data show that the trust performs well with either average or below average levels of prescribing for total antimicrobial use and various individual key agents.




Carbapenem Consumption
DDDs/1,000 admissions
200
150
100
2018/2019−1
2018/2019−2
2018/2019−3
2018/2019−4
2019/2020−1
2019/2020−2
2019/2020−3
2019/2020−4
2020/2021−1
2020/2021−2
2020/2021−3
2020/2021−4
2021/2022−1
2021/2022−2
2021/2022−3
2021/2022−4
2022/2023−1
2022/2023−2
2022/2023−3
2022/2023−4
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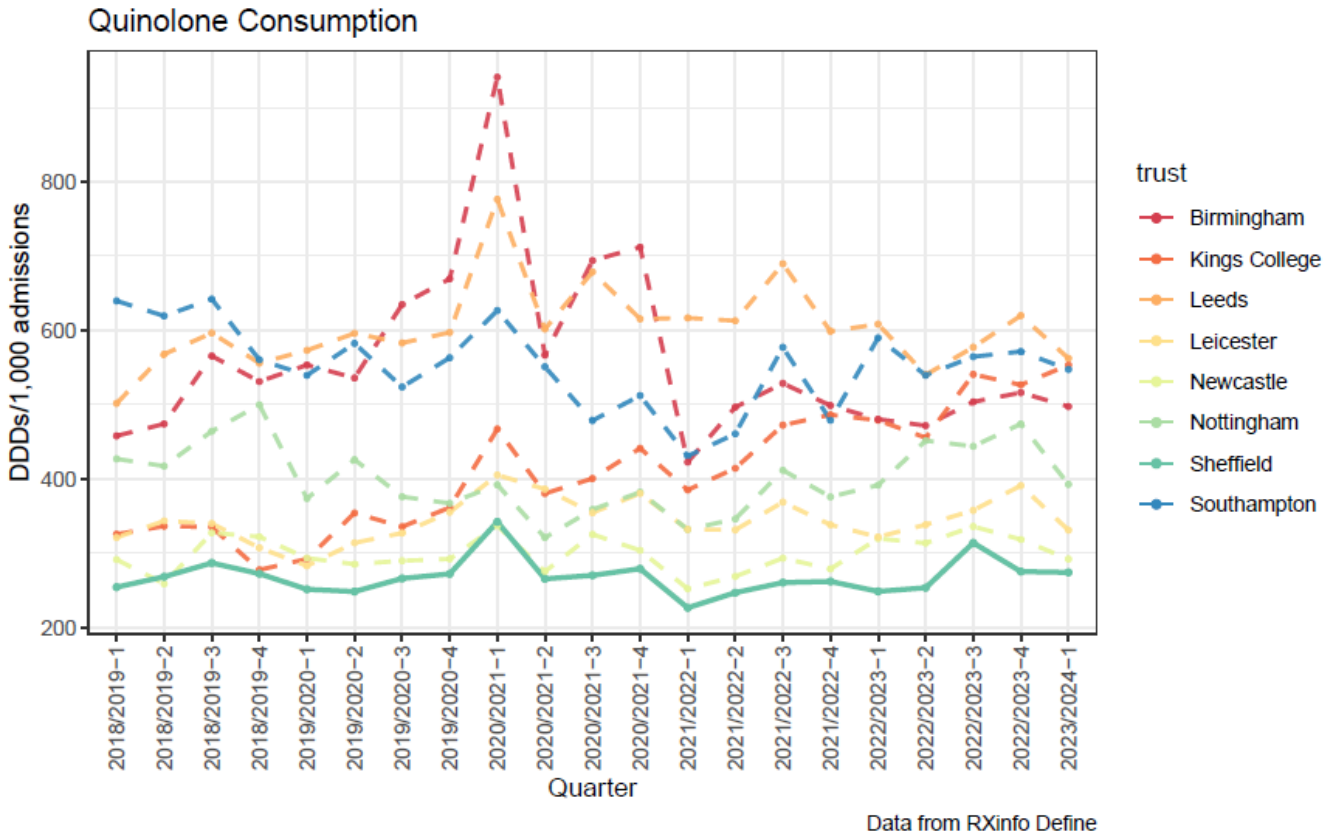
Quarter
Data from RXinfo Define
trust
Birmingham
Kings College
Leeds
Leicester
Newcastle
Nottingham
Sheffield
Southampton


Quinolone Consumption
DDDs/1,000 admissions
800
600
400
200
2018/2019−1
2018/2019−2
2018/2019−3
2018/2019−4
2019/2020−1
2019/2020−2
2019/2020−3
2019/2020−4
2020/2021−1
2020/2021−2
2020/2021−3
2020/2021−4
2021/2022−1
2021/2022−2
2021/2022−3
2021/2022−4
2022/2023−1
2022/2023−2
2022/2023−3
2022/2023−4
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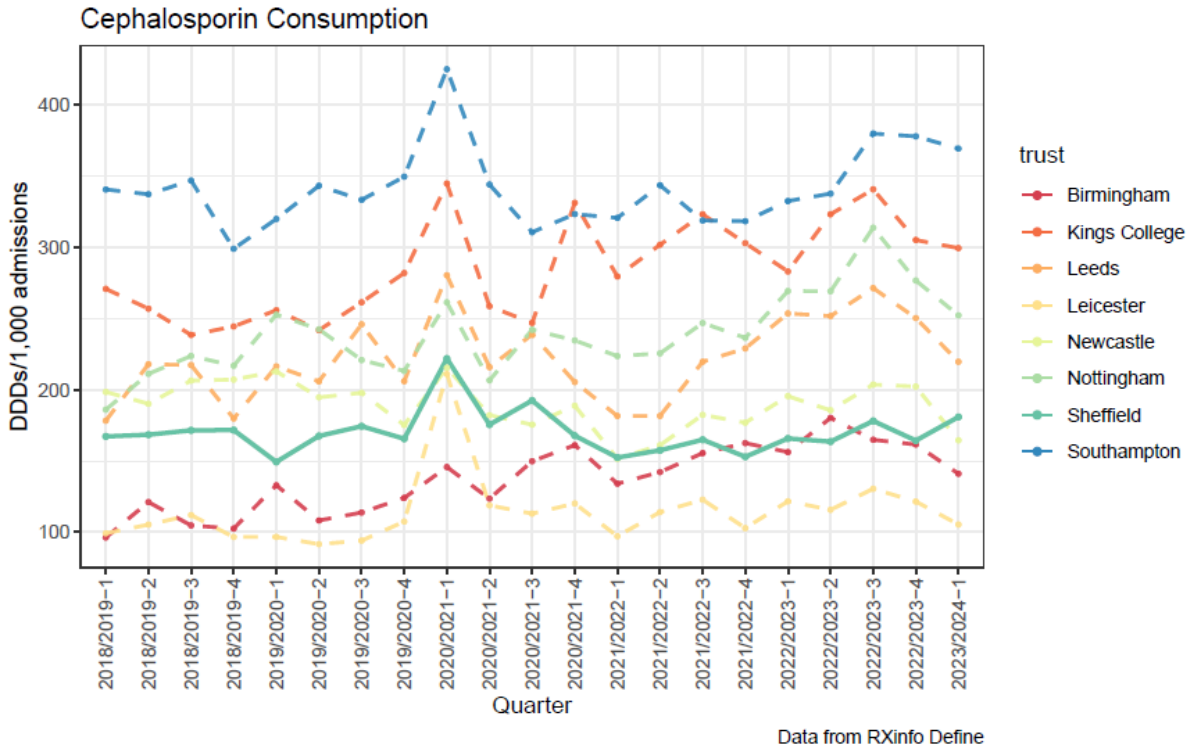
Data from RXinfo Define
trust
Birmingham
Kings College
Leeds
Leicester
Newcastle
Nottingham
Sheffield
Southampton


Cephalosporin Consumption
DDDs/1,000 admissions
400
300
200
100
2018/2019−1
2018/2019−2
2018/2019−3
2018/2019−4
2019/2020−1
2019/2020−2
2019/2020−3
2019/2020−4
2020/2021−1
2020/2021−2
2020/2021−3
2020/2021−4
2021/2022−1
2021/2022−2
2021/2022−3
2021/2022−4
2022/2023−1
2022/2023−2
2022/2023−3
2022/2023−4
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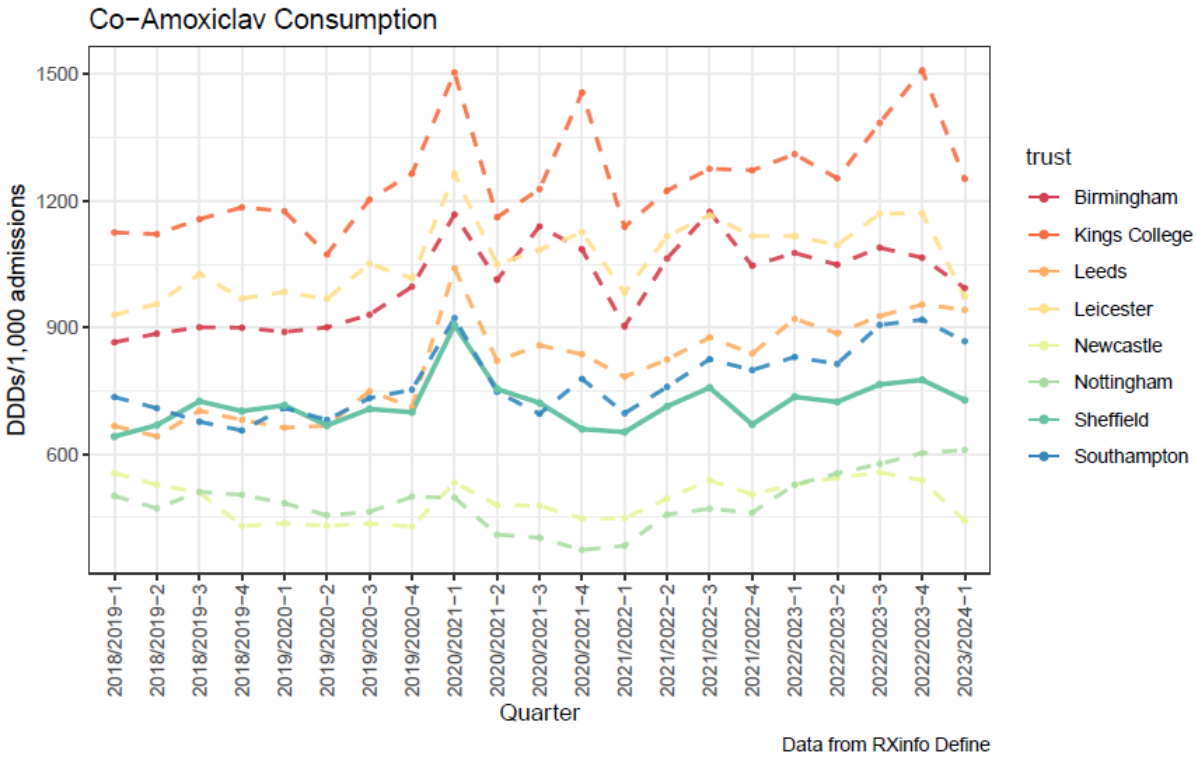
Data from RXinfo Define
trust
Birmingham
Kings College
Leeds
Leicester
Newcastle
Nottingham
Sheffield
Southampton


Co−Amoxiclav Consumption
DDDs/1,000 admissions
1500
1200
900
600
2018/2019−1
2018/2019−2
2018/2019−3
2018/2019−4
2019/2020−1
2019/2020−2
2019/2020−3
2019/2020−4
2020/2021−1
2020/2021−2
2020/2021−3
2020/2021−4
2021/2022−1
2021/2022−2
2021/2022−3
2021/2022−4
2022/2023−1
2022/2023−2
2022/2023−3
2022/2023−4
2023/2024−1
Quarter
Data from RXinfo Define
trust
Birmingham
Kings College
Leeds
Leicester
Newcastle
Nottingham
Sheffield
Southampton

**Actions taken to improve Antimicrobial Stewardship:**

**Antimicrobial Stewardship education and awareness**

8.7 The following activities took place in 2022/23.

- Microbiology medical staff conducted daily ward rounds within critical care areas, plus various weekly visits either in person or via MS Teams to general medical and surgical wards to review antimicrobial prescribing and offer education. AMS Team utilised EPMA to extract data for patients on antibiotics to help streamline ward rounds.
- Educational sessions on antimicrobial stewardship were conducted throughout the year by the AMS Team to doctors, pharmacy staff, nurses (including student nurses), healthcare assistants and community healthcare professionals.

**Clinical governance**

8.8 Clinical governance issues relating to antimicrobial stewardship

- Antimicrobial Datix reports were reviewed at AMS Team meetings and any necessary actions agreed.
- Antimicrobial pharmacists utilise EPMA to identify patients who had been prescribed intravenous vancomycin, amikacin and multiple daily dosed gentamicin throughout the trust and review these daily; aiming to avoid sub-therapeutic or toxic levels to improve patient safety. The antimicrobial pharmacists also review daily reports of serum levels of other antimicrobials needing therapeutic drug monitoring.
- AMS Team participated in the development and planning of a penicillin de-labelling pilot project launched in summer 2022. To date, 17 patients have been successfully de-labelled. This potentially avoids the use of more toxic agents or multiple antibiotic agents in these patients. The AMS pharmacy team have been involved in producing letters to send to the patient's GP following participation in de-labelling. It is anticipated that this will be undertaken by admin support in the future.
- The AMS Team previously conducted audits into the prescribing and monitoring of teicoplanin within the Trust, to evaluate any safety issues and put in place action plans to address any issues identified. As part of this, changes are currently being made to the EPMA system to include an order set for loading doses of teicoplanin.
- Following several incidents regarding prescribing and monitoring of linezolid (and patient counselling) a prompt was added to EPMA to indicate that additional monitoring and counselling is required when prescribing. A trainee pharmacist is undertaking an audit of this.

**Multidisciplinary AMS Team**

8.9 Developments within the AMS Team during 2022/23 were as follows:

- Continued networking and collaborative working with related STH groups and committees e.g. Microbiology and Infection Prevention and Control (IPC) colleagues. In addition, increased collaborative work was possible with groups outside of STH such as the regional antimicrobial pharmacist group and OPAT network group.

**New and high-cost antimicrobial agents**

8.10 New antimicrobial agents that have been added to the STH formulary by the AMS Team:

- New antimicrobial agents for Cytomegalovirus (CMV) and Human Immunodeficiency virus (HIV) have been added to the Trust's formulary by the AMS Team. These changes maximised antimicrobial treatment options for these conditions within the Trust in line with national guidance.
- Restrictions remained in place, with regular usage monitoring by the AMS Team, for high-cost antimicrobials e.g. dalbavancin, meropenem-vaborbactam.
- Increasing use has been made of continuous antibiotic infusers for OPAT: facilitating OPAT as a viable option for more patients, allowing earlier discharges, improving use of narrow spectrum antibiotics and reducing frequency of district nurse visits.

**Antimicrobial guidelines and policies**

8.11 Regarding antimicrobial related documents:

- The AMS Team have continued to ensure that the antimicrobial guidelines and policies under their approval are reviewed and updated. The issues considered when undertaking these reviews include:
  - changes in antibiotic resistance patterns
  - financial implications
  - current antimicrobial stock issues
  - changes in practice necessitated by the move to electronic prescribing (EPMA)
- Documents are ratified by the Medicines Management and Therapeutic Committee (MMTC), Trust Executive Group (TEG) or Medicines Safety Committee (MSC).
- The AMS Team continues to update the antimicrobial section on the Trust's Microguide app, improving accessibility and awareness of local antimicrobial guidelines and policies.

**Antimicrobial usage and prescribing reports:**

8.12 The following reports and audits were undertaken:

- The AMS Team regularly reviewed up to date trends in STH antibiotic usage through utilisation of DEFINE software. Abnormalities in antibiotic usage were reviewed and addressed by the AMS Team
- Quarterly prescribing audits were undertaken by medical staff in all directorates and reviewed by the AMS Team. Compliance with the process is linked to the IPC Accreditation scheme. This changed to an annual audit during 2022/23, with added emphasis on performance rather than merely whether the audit had been undertaken or not; the first data collection period is planned for spring 2023.
- Antibiotic prescribing audits were conducted by the AMS Team on wards where a red/amber *C.difficile* cluster alert has been highlighted, to identify if antibiotic prescribing could have contributed to the cases. The AMS Team utilised EPMA to extract data of patients on antibiotics, making the data collection process more efficient.

**Challenges for the AMS Team:**

8.13 The following issues were a challenge in 2022/23

- Multiple antimicrobial shortages: For a variety of manufacturing and logistical reasons, outside the control of the STH, a number of key antimicrobial agents have been unavailable or in short supply during 2022/23.
- Limited attendance and engagement of doctors, outside of Microbiology, in AMS Team meetings. Medical staff attendance which can result in conclusions made at the meetings lacking the benefit of a diverse representation and input from different directorates/specialities.
- Quarterly antibiotic prescribing audits were found to be time consuming for the AMS Team to produce, and engagement from some clinical teams was not always optimal. In addition, only participation with this audit counted towards ward IPC Accreditation, not the performance observed. It was therefore decided to move this to an annual audit from early 2023, with wards scoring <40% being given targeted interventions and an expectation to re-audit. Poorly performing wards will be flagged as 'engagement concern' and escalated to the Trust IPC Executive Committee.

**Antimicrobial Stewardship Team**

8.14 The following were members of the team during 2022/23:

| NAME | DESIGNATION |
|---|---|
| Dr Helena Parsons | Consultant Microbiologist |
| Mrs Avril Lynch | Antimicrobial Pharmacist |
| Mrs Katie Bramhall | Antimicrobial Pharmacist |
| Dr Alexander Basran | Consultant in Respiratory and General (Internal) Medicine |
| Mrs Debra Fowler | Antimicrobial Pharmacist |
| Mr Remon Keriakos | Obstetrics and Gynaecology Consultant |
| Mr Andrew Moore | Pharmacoeconomics Pharmacist |
| Dr Laura Prtak | Consultant Microbiologist |
| Dr Anne Tunbridge | Consultant in Infectious diseases and tropical medicine |
| Dr Cariad Evans | Consultant Virologist |
| Dr Gemma Wheldon | Consultant Microbiologist |
| Miss Kay Cawthron | Antimicrobial Nurse |
| Dr Emma Boldock | Consultant Microbiologist |

# Section 9

# Influenza

9.1 Influenza infections are a hallmark of the winter season when environmental conditions are optimal for its rapid spread. Whilst most of these infections in the community are self-limiting and remain uncomplicated, a proportion of these require a healthcare episode. Increased consultations at primary care facilities and emergency departments lead to increased numbers requiring admission either with a complicated infection or with exacerbation of chronic illnesses

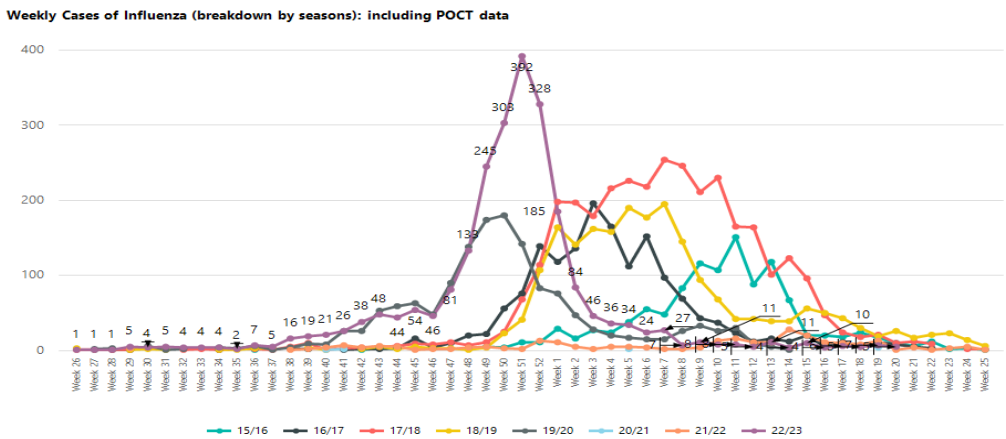
9.2 Graph 1 demonstrates the dramatic change in influenza activity observed in 2022/23 following the effects of the pandemic and removal of non-pharmaceutical interventions e.g. social distancing, masks, school closures and other control measures used for Covid-19. The 2022/23 season started approximately two months earlier than generally seen pre the pandemic. This had been predicated, following the influenza activity observed in the southern hemisphere.

9.3 In anticipation of early influenza activity, Trust teams prepared to deploy point of care testing (POCT) at the start of October 2022 and the staff vaccination programme was commenced as early as possible given vaccine availability. During the season, the patient admission pathways ran smoothly across the Infectious Diseases, Frailty and Respiratory units.

Overall, the 2022/23 influenza season was the largest seen, in terms of peak numbers, since local recording of cases begun. However, the duration of the season was short. The predominate strains were Influenza A H1N1 and H3N2, with very little Influenza B detected.

9.4 The Outbreak and Systems Resilience Group (OSRG) continue to oversee the prevention and management of influenza within the Trust, with key issues being a) promoting and administering staff influenza vaccination , b) planning patient pathways, c) ensuring staff are educated in the infection prevention and control plus clinical management of influenza patients and d) managing the influenza POCT programme which is offered on every admission pathway in parallel to Covid for all symptomatic admissions.

Graph 1



# Section 10

# Covid-19

10.1. Covid-19 continued to dominate the infection prevention and control focus for 2022/23.

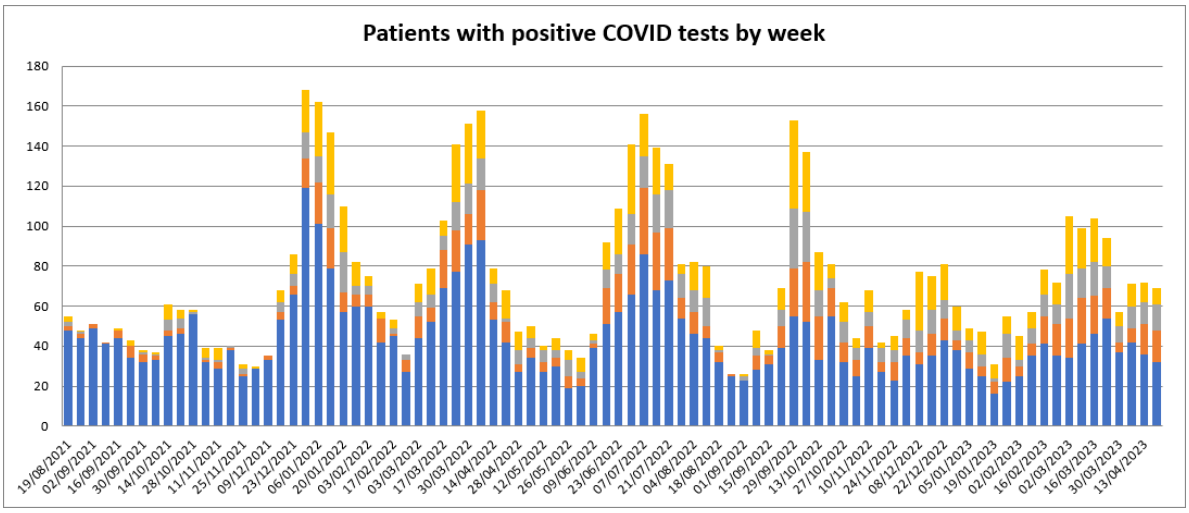
10.2 Section 10 of the 2019/20, 2020/21 and 2021/22 Reports included the various structures and groups set up to manage the pandemic and the main infection prevention and control related issues and topics addressed. The majority of the aforementioned work remains in place and continues to be the bedrock for managing the on-going pandemic.

10.3 Where possible, the Trust continues to follow national guidelines regarding managing Covid-19, which are predominantly provided by NHSE/I and UKHSA. Within the STH, interpretation of these guidelines are now made by the OSRG Expert Group (OSRG-EG) and local amendments made if required and in response to local prevalence.

10.4 Throughout 2022/23, the waves of Omicron subvariants were managed in a relatively standardised manner compared to previous waves. Infection prevention and control guidance remained the same regardless of the Covid prevalence, apart from changes to when and where mask wearing was advised. The Trust testing strategy moved towards a symptomatic approach, with asymptomatic testing gradually being phased out, as per national guidance. The staff Test and Trace Team and the staff Drive Through Testing Service have therefore been stood down. Overall, therefore, testing for Covid-19 has been aligned to that of other respiratory pathogens.

The graph below depicts how the number of cases has stabilised towards the end of 2022 and start of 2023, with less significant peaks with each subsequent wave.

Graph 2




| | Number of days in hospital when first tested positive for Covid |
|---|---|
| | 2 of fewer |
| | 3-7 |
| | 8-14 |
| | >14 |

10.5 The main infection prevention and control challenges for 2022/23 included:

h) Detecting and managing cases and clusters of nosocomial infection. Nosocomial infection is problematic due to asymptomatic infection in staff and patients plus reduction in community testing.
i) Staff absence often at short notice, due to lateral flow test (LFT) testing, increasing community social contact etc.
j) Removal of LFT for the public, from April 2022, and ensuring patients and staff still engaged with testing practices.
k) Increase in other infections as community contact increases e.g. norovirus, RSV and influenza
l) Staff morale affected by months of dealing with Covid-19
m) Managing infection prevention and control related expectations within healthcare when measures are being relaxed in the wider community
n) Changes to patient admission testing, removal of asymptomatic testing pathways and a move to symptomatic identification and management.

10.6 Some lessons from the pandemic, including point of care testing (POCT) and PPE/masking, continue to provide large benefits across the organisation. Other respiratory viruses are becoming more prevalent with altered seasonality and in large numbers; see also section 9 above. This is due to reduced host immunity caused by reduced exposure over recent years due to Covid control measures. In addition, PPE and mask wearing has become embedded and established for the management of patients with a variety of respiratory viruses.

# Section 11

# Norovirus

11.1 The illness caused by norovirus has historically been known as 'winter vomiting disease' due to its seasonality and typical symptoms. Sporadic cases occur throughout the year, but large outbreaks generally occur each year, mostly during the colder months, both in the community, hospitals and other ‘closed’ environments e.g. hotels, schools, cruise ships.

11.2 As in previous years, the Trust followed national UK Health Security Agency guidance[16] as to how to manage the situation. This recommends that, when cases of norovirus are suspected or confirmed, initial management should concentrate on bay by bay closure rather than early full ward closure.

11.3 The day to day management of cases and clusters was a multi-disciplinary task involving the Infection Prevention and Control (IPC) Team, Virology Department and Clinical Operations in addition to clinical staff within Accident & Emergency, the Admissions Units and the various wards across the Trust affected by this virus at various times during the season. Enhanced cleaning, including hydrogen peroxide vapour or ultraviolet light, has been undertaken wherever possible following clusters of norovirus infection.

11.4 Details of the 2022/23 norovirus data can be found in Table 19.

Table 19
Data for Norovirus clusters detected within the acute STHFT setting

| | Number of Incidents/Clusters | Number of Patients | Number of Staff | Number of Bed-days Lost* |
|---|---|---|---|---|
| 2010/11 | 64 | 672 | 102 | 1738 |
| 2011/12 | 109 | 923 | 85 | 1932 |
| 2012/13 | 107 | 913 | 70 | 1847 |
| 2013/14 | 82 | 430 | 49 | 650 |
| 2014/15 | 43 | 225 | 42 | 455 |
| 2015/16 | 76 | 469 | 74 | 925 |
| 2016/17 | 76 | 429 | 61 | 882 |
| 2017/18 | 35 | 178 | 18 | 385 |
| 2018/19 | 49 | 236 | 30 | 732 |
| 2019/20 | 52 | 336 | 24 | 1274 |
| 2020/21 | 22 | 28 | 0 | 118 |
| 2021/22 | 23 | 103 | 20 | 300 |
| 2022/23 | 68 | 394 | 72 | 1958 |

* A lost bed-day is counted when an unoccupied bed has to be kept empty in a bay affected by norovirus.

The norovirus activity seen within the Trust varies year by year and generally reflects activity in the community. Norovirus activity within the Trust during 2022/23 was higher than in recent years. This reflects the increase in infection seen within the community following the pandemic.

# Section 12

# Outbreaks, Major Incidents and Complaints

Outbreaks and Major Incidents

12.1 During 2022/23, Covid-19 continued to be a significant infection related issue but other organisms, particularly norovirus and influenza, increased in incidence again as the pandemic waned and social control measures reduced.

**Clusters/Outbreaks/Sporadic cases requiring IPC Team input**

12.2 There have been numerous occasions during the year when the Infection Prevention and Control (IPC) Team have either detected, or been called for advice regarding, a potential outbreak. Some of these situations proved to be false alarms, whilst others could be handled swiftly and any outbreak 'nipped in the bud'. A high index of suspicion on the part of clinical staff is important in this regard, and the IPC Team would ask staff to be continually vigilant. The IPC Team always aims to control an outbreak by causing as little disruption as possible to the running of the ward or department concerned. However, there are occasions when this is not possible and patient and staff screening and/or bed closures may be necessary.

12.3 A summary of clusters/outbreaks is given below and includes those detected in both acute and community services. It should be noted that the recording of the number of lost bed-days is not an exact science. The term 'bed-days lost' refers to empty beds. Patients with infections generally remain in hospital longer than those without infections and therefore, the effect of these clusters and outbreaks on patient throughput cannot reliably be estimated from the figures below.

12.4 *Diarrhoea/Gastro-enteritis:*

Norovirus

The norovirus activity seen within the Trust varies year by year and generally reflects activity in the community. Norovirus activity during 2022/23 was higher than in recent years reflecting the increase in infection seen following the pandemic. Please see Section 11 for a more detailed summary of norovirus activity and management during the year.

*Clostridioides difficile (C.difficile)*

- 54 clusters/outbreaks were detected involving 133 patients and 0 staff. This is similar to 2021/22. Investigation of the 54 clusters showed that, in most cases, the strains involved in individual clusters were different suggesting cross infection was not the cause of the infections. For a full report on *C.difficile*, see Section 6 of this Report.
- Two of the *C.difficile* clusters involved several patients on the same ward at the same time with the same strain. Following identification of these clusters, deep cleaning, auditing and enhanced infection prevention and control practices were instigated, which terminated the outbreaks.

Other gastrointestinal organisms or no organism detected

- 8 clusters/outbreaks were detected involving 38 patients and 5 members of staff. These figures are lower last year.

Antibiotic resistant Gram-negative bacteria (*E.coli*, *Klebsiella* etc.):

- 19 clusters/individual cases were detected involving 22 patients. This is similar to last year. Please see sections 7.43 to 7.46 for a summary of antibiotic resistant Gram-negative bacteria activity during the year.

Respiratory viruses (e.g. Influenza, Respiratory Syncytial Virus, Coronavirus, Parainfluenza, Human metapneumovirus)

- 12 clusters/outbreaks/sporadic cases of respiratory viral infections was detected involving 48 patients and 9 staff; these were due to influenza. This is an increase compared to during the pandemic but similar to pre-pandemic numbers.

Covid-19

- 187 clusters/outbreaks/incidents of Covid-19 infections were detected involving 1185 patients and 292 members of staff resulting in 3425 bed-days lost. These figures reflect the immense impact Covid-19 continued to have during 2022/23 on staff, patients and Trust services. Please see Section 10 for a more detailed summary of Covid-19 activity and management during the year.

Other clusters/outbreaks/single cases of infection prevention and control importance

- Six clusters/outbreaks/single cases of other organisms were detected in 2022/23. Three of these were due to glycopeptide resistant enterococci, one due to MRSA, one due to *Streptococcus pyogenes* and one due to *Candida auris*.
- The *C.auris* cluster was the first identification of this organism within the Trust. Following the identification of the index case, screening of patient contacts was undertaken and four further cases detected over a number of weeks. All patients had colonisation with this organism rather than infection. Enhanced surveillance within the wards concerned was undertaken for several months; this has now ceased as no further cases have been detected.

<u>Complaints, Incidents and Freedom of Information requests</u>

12.5 The IPC Team received seven complaints this year. Some of these were not solely related to infection prevention and control but contained a number of complaints regarding the general care received by patients. Complaints and incidents are generally handled by the clinicians caring for the patient with input as necessary from the IPC Team.

12.6 The infection prevention and control related complaints are summarised below (one such complaint received unless stated otherwise):

- Management of, exposure to, or nosocomial acquisition of, Covid-19 (seven)

The STHFT takes seriously any infection prevention and control complaint. Appropriate lessons learnt from the investigations into these cases are taken on board.

To date most of these complaints have been settled by local resolution although it is likely that more formal proceedings will be initiated in a number of cases. In some instances the complaint was due to a misunderstanding rather than STHFT providing poor care, but some complaints were justified and measures have been taken to improve care and practices within the Trust. Ownership at ward level by all groups of staff is a prerequisite for improvement in this area.

12.7 Incidents:

Blockage of pipe-work within the various buildings across the Trust can lead to sewage leaks and pest control issues which cause disruption to the areas concerned and the services provided by the staff in these areas. Dealing with these incidents, and the subsequent cleaning and decontamination, requires a multi-disciplinary team effort. Domestic Services, Estates, Pest Control and Infection Prevention and Control staff, as well as the staff in the area affected, need to react quickly often at the expense of their planned activities for that day. Two such incidents occurred during the year.

The ongoing management of the water system across the Trust results in the occasional necessity to interrupt the water supply to certain areas of the Trust whilst maintenance, repair or upgrade work takes place. In addition, where certain organisms are found to be colonising the supply e.g. legionella, pseudomonas etc. extra precautions, filters, cleaning and upgrade work are necessary until the situation is resolved. Sometimes this occurs as an emergency and sometimes in a planned manner. Estates and Infection Prevention and Control staff, as well as the staff in the area affected, need to ensure appropriate measures are in place during these times to maintain staff and patient safety and dignity e.g. hand hygiene, toilet facilities, equipment and environmental cleaning, hydration etc. Breakages of equipment and environmental fittings e.g. bed-pan washers, macerators, water pipework, showers, gas leaks etc., can necessitate the development of plans to ensure optimal infection prevention and control practice continues despite these events. Eight such incidents occurred during the year.

12.8 Freedom of Information requests:

Two infection prevention and control related Freedom of Information requests were received during the year. The IPC Team responded appropriately to these within the time frame required.

# Section 13

# Conclusion

13.1 This Report highlights both the progress made during the past year in relation to infection prevention and control and also the challenges that lie ahead. However, a great deal of hard work has taken place and much has been achieved. The Key Indicators show:

- All Groups/Departments completed a large percentage of the Infection Prevention and Control (IPC) Programme despite the Covid pandemic
- The total number of new meticillin resistant *Staphylococcus aureus* (MRSA) cases detected remains at a low level; the majority of cases were detected on admission to the Trust
- The MRSA bacteraemia rate has continued to be low; the total number of Hospital Onset episodes was two
- The number of Hospital Onset and Community Onset-Healthcare Associated *Clostridioides difficile* toxin associated diarrhoea episodes (CDD) was 169; therefore the Trust did not achieve the national objective of 149 or less. However, number of Hospital Onset cases remained stable.
- The number of Hospital Onset episodes of meticillin sensitive *Staphylococcus aureus* (MSSA) bacteraemia showed an increase compared to recent years. However, when expressed as a rate, a fall is observed; the rate peaking in 2020/21 at 16.8/100,000 bed days and falling slightly over the past two years to a rate of 15.2/1000 bed days in 2022/23.
- The number of Hospital Onset and Healthcare Associated episodes of *E.coli* bacteraemia increased this year compared to last year. However, the numbers remain lower than the pre-pandemic levels.
- The STH performed 9th out of 16 similar trusts when combining data from the six mandatory surveillance scheme modules
- The number of Carbapenemase Producing *Enterobacteriaceae (*CPEs) detected locally remains low
- The local rates of antibiotic resistance in relation to key organisms have remained stable and compare favourably to those reported nationally

13.2 Throughout this Report planned initiatives have been mentioned which are designed to improve the IPC Service further. These have been included in the 2023/24 IPC Programme and will have already begun by the time this Report is published.

13.3 This Report indicates the substantial progress made during the past year. For a trust the size and complexity of the STHFT, the ever changing and increasing expectations of health care establishments and the on-going fall-out from the Covid-19 pandemic, the Trust, the specialist infection prevention and control personnel and staff working both on the wards and behind the scenes have much to be proud of. Preventing and controlling infection is an on-going issue for any healthcare establishment and STHFT is no exception in this respect.

# Appendix A

## Decontamination of Medical Devices IPC Report 2022/23

**(Report provided by Karen Tweed – Trust Deputy Operations Director– Decontamination)**

**PURPOSE OF THE REPORT:**

This paper provides the IPC Committee with the assurance that the Trust is compliant with the required standards for the decontamination and sterilisation of re-usable medical devices and the decontamination of patient shared equipment.

**KEY POINTS:**

- The offsite Decontamination Provider service is continuously monitored contractually via the Decontamination Services Agreement (DSA).
- The Provider is accredited with the relevant notified body against the requirements of the Medical Device Directive and BS EN ISO13485 and is audited annually against this standard.
- In house provision of decontamination and disinfection services for flexible endoscopes are provided in two centralised compliant units, one on the Northern General Hospital (NGH) site and one on the Royal Hallamshire Hospital (RHH) site.
- The endoscopy decontamination units (EDU) have attained accreditation with BSi a notified body against the requirements of the Medical Device Directive and BS EN ISO13485 and is audited annually against this standard. The track and traceability of the scopes through the decontamination process to the patients is audited bi-annually in accordance with current guidance HTM 01-06 and recommendations.
- The Dental Practice Unit (DPU) has decontamination and sterilisation equipment used for student training purposes and currently for equipment used on STH patients.
- The STH Authorised Engineer decontamination (AEd) provides an external independent audit of the Trust decontamination facilities and the decontamination equipment maintenance and validation records.
- A review of the decontamination of surgical equipment used in the Medical Education Centre used for training purposes.
- The Decontamination Management Group (DMG) ensure that local decontamination of re-usable medical devices and patient shared equipment is now effectively managed and correct arrangements are in place for best practice. The group also ensure there are suitable policies, procedures and guidance available for all aspects of decontamination work.
- The Chemical Review Group a sub-group of the DMG ensure that the best disinfectant and cleaning products are used on all medical devices and patient shared equipment and also assess best value for money.

### 1. OUTLINE

This report is intended to provide the Trust with the current position, and therefore assurance on, decontamination and sterilisation of re-usable medical devices and the decontamination and cleaning of patient shared equipment.

This report outlines the policy and control around cleaning and disinfection of patient shared equipment including four areas of re-usable medical device decontamination:

- Reusable invasive medical devices, reprocessed at Steris IMS Healthcare, the offsite Decontamination Provider.
- Flexible endoscopes and Trans-oesophageal echo probe (TOE) scopes, reprocessed at STH.
- Benchtop decontamination and sterilisation equipment used in Weston Park Hospital (WPH) and the bench top decontamination and sterilisation equipment used in the Dental Practice Unit (DPU).
- Local decontamination of reusable medical devices and patient shared equipment in Clinical areas throughout STH.

The Care Quality Commission (CQC), Regulation 12, Standard Outcome 8 states that there must be maintenance of appropriate standards of cleanliness and hygiene in relation to:

- Premises occupied for the purpose of carrying out regulated activity.
- Equipment and re-usable medical devices used for the purpose of carrying out the regulated activity.
- Materials to be used in the treatment of service users where such materials are at risk of being contaminated with a heath care associated infection.

## 2. REPORT

STH decontamination service for re-useable surgical medical devices is continuously monitored via the Decontamination Service Agreement (DSA) which is the legal contract between STH and Steris IMS. The executive group who oversee the DSA is the Joint Management Board (JMB) and is made up of senior STH managers, SCH managers and representation from the Community service along with Steris IMS senior managers. The offsite decontamination provider is accredited with a notified body against the requirements of the Medical Device Directive 03/42/EEC and BS EN ISO 13485:2016.

In house provision of decontamination and disinfection services for flexible endoscopes is provided in two compliant units, one on the Northern General Hospital (NGH) site and one on the Royal Hallamshire Hospital (RHH) site. The endoscopy decontamination units are audited annually against British Society of Gastroenterologists (BSG) guidelines and the track and traceability of the scopes is audited biannually in accordance with current guidance and recommendations. The EDU's achieved accreditation 2016 by BSi a notified body against the standard BS EN ISO 13485:2016.

The STH has appointed an Authorised Person decontamination (APd) who provides advice and internal audit on the Trust decontamination equipment including maintenance and validation. The STH also contracts an Authorised Engineer decontamination (AEd) to provide an external independent audit of all the Trust decontamination facilities (excluding the off-site provider) and the decontamination equipment maintenance and validation records.

Service issues arising from the managed endoscopy decontamination service are discussed at the bi - monthly Endoscopy Decontamination User Group meeting who report to the STH Decontamination Management Group.

The Dental Practice Unit (DPU) has decontamination and sterilisation equipment which is used for dental equipment including small implant trials and student training purposes. The reprocessed equipment is used to treat STH patients who attend the DPU. This decontamination equipment is validated and maintained by the equipment manufacturer and is managed by the CCDH staff. This decontamination service is

under review to see if it would be feasible to move all equipment reprocessing to the off-site decontamination provider and to use the decontamination equipment just for the purpose of training dental students.

The benchtop little sister autoclave in WPH is used to sterilise radioactive eye shields which have to be processed by STH due to transportation and radiation handling issues. A decontamination area was provided for this activity to ensure the equipment is sited in a suitable area to reprocess radioactive materials, manage the risk to operatives and ensure the products are handled in an appropriate manner.

The Decontamination Management Group meet bi-monthly to ensure that robust processes are in place to oversee the organisation, management and quality assurance of all aspects regarding the local decontamination of re-usable medical devices and patient shared equipment in the STH.

## 3. STERIS IMS QUALITY ASSURANCE

In August 2012 STH completed their sterile service migration to Steris IMS, formerly Synergy Healthcare, the offsite decontamination service provider. The service required a considerable bedding in period but in December 2013 the unit reached steady state where the performance criteria were met. This state is continuously monitored via the Decontamination Service Agreement (DSA) which is the legal contract between STH and Steris IMS. The executive group who oversee the DSA is the Joint Management Board and is made up of senior STH managers and Steris IMS senior managers. The terms of reference for this group are set out in the DSA.

All DATIX reports, near miss incidents and cancelled procedures are fully investigated by Steris IMS to ensure corrective actions are instigated to prevent reoccurrence. In 2022 there were no cancelled procedures, but four near misses were recorded. Of the near misses, only one was a Steris liability and caused by confusion relating to bar code labels. All the near misses are fully investigated and agreed actions put in place. These reports are always investigated to check for trends even if there was no direct impact on patient care.

## 4. ENDOSCOPY DECONTAMINATION SERVICES QUALITY SYSTEM

Both NGH and RHH Endoscopy Decontamination Units (EDUs) have achieved accreditation against standard BS EN ISO 13485:2016 quality standard. Now the EDUs are accredited it is possible to sell the decontamination service of flexible scopes to other Healthcare providers. The NGH central endoscope decontamination unit had an endoscope washer disinfector (EWD) installed October 2014 which is being utilised for the reprocessing of Trans oesophageal echo probe (TOE) scopes in accordance with National Standards.

In 2015 independent monitoring was installed for all the EDU's decontamination equipment; this is to allow product (scope) release using an independent monitoring system, a requirement of the Medical Devices Directive.

JAG no longer includes the Endoscope Decontamination Units in their accreditation scheme but rely on the annual audits undertaken by the Trust Authorised Engineer decontamination (AEd). The AEd attended the STH once in 2021 to perform a JAG inspection; the audit of the decontamination test documents was done remotely.

During December 2021 to January 2022 the decontamination equipment on the NGH site was replaced which included a refurbishment of the unit. In January 2023, work started on the replacement of the RHH endoscope washer disinfectors and the part replacement of the reverse osmosis water system. The project also included a

refurbishment of the unit and the installation of compliant hand wash and equipment washing sinks. All works and commissioning are due for completion by June 2023.

## 5. COMMUNITY SERVICES

All Community areas that required reprocessed equipment packs are serviced by Steris IMS Sheffield. Issues arising from the service are addressed in local meetings with the Community Service users, Trust Deputy Operations Director (Decontamination) and Steris IMS Customer Manager; a representative from Community Services also sits on the JMB and there is representation at the bimonthly Service Review Group.

## 6. LOCAL DECONTAMINATION

The Decontamination Management Group (DMG) ensure that robust processes are in place to oversee the organisation, management and quality assurance of all aspects regarding the local decontamination of re-usable medical devices and patient shared equipment in the STH. The membership and business includes all stakeholders who manage decontamination of reusable medical devices and patient shared equipment; with respect to purchase, procedure, policy and training. The DMG also review MDA alerts to ensure actions are taken to enable the STH to declare compliance.

This group also oversees all STH areas which use decontamination reprocessing equipment for medical devices such as WPH and GI Physiology. The equipment reprocessed in these areas cannot be reprocessed in a centralised unit and the processes have been risk assessed to ensure patient safety.

The benchtop little sister autoclave in WPH is used to sterilise radioactive eye shields which have to be processed by STH due to transportation and radiation handling issues. A newly furbished decontamination area was provided for this activity to ensure the equipment is sited in a suitable area to reprocess radioactive materials, manage the risk to operatives and ensure the products are handled in an appropriate manner. The equipment has not yet been re-sited into this unit due to recommendations from the Counter Terrorism Team. A paper is due to be presented in 2022 to STH Capital Investment Team on the security measures required to move reprocessing to the new decontamination room.

2019 the DMG were asked to review the cleaning and decontamination process for surgical instruments used in the Medical Education Centre (MEC) for student practice and also in the mortuaries. A compliant washer / disinfector was purchased and installed 2021 along with a part refurbishment of a store to make a decontamination area with hand wash and equipment washing sink. This compliant washer / disinfector is tested annually to ensure it is safe and fit for purpose.

In 2015 a subgroup was formed from the DMG, the Chemical Review Group (CRG), the purpose of this group is to look at standardising cleaning and disinfectant products used throughout the STH. Their aim is to identify the most suitable product which is fit for purpose and is compatible with the device.

The CRG has reviewed and standardised the cleaning and disinfectant products used throughout the STH for environmental and patient shared equipment cleaning to one disinfectant chemical, Tristel FUSE/JET. The active agent within these products is chlorine dioxide which has been shown to have a broad spectrum of antimicrobial activity and is fully sporicidal. The roll out of these products commenced in 2017 and was completed 2018. All STH areas are now using this product as their standard

cleaning and disinfectant chemical. The CRG monitor the use of this product and all reports of device issues and sensitivity.

## 7. SUMMARY

STH is able to demonstrate compliance in most areas with Care Quality Commission Standards and the standards described in HTM 01-01 and the best practice requirements for the decontamination of reusable instrumentation and equipment.

The offsite decontamination provider is accredited with a notified body against the requirements of the Medical Device Directive. The annual audit by their notified body demonstrates to STH that Steris IMS are compliant to Medical Device Directive 03/42/EEC and BS EN ISO 13485:2016.

The decontamination and management of flexible endoscopes and TOE scopes are performed in compliant units in accordance with HTM 01-01, HTM 01-06 and the service is audited against BSG recommendations and standards; this is independently audited by the STH AEd.

The Decontamination Management Group ensure that robust processes are in place to oversee the organisation, management and quality assurance of all aspects regarding the decontamination of re-usable medical devices and patient shared equipment.

The DPU needs a review of practice to ensure that dental equipment used in this unit has full track and traceability from the decontamination process to the patient. If this cannot be achieved, then the re-usable medical devices must be reprocessed by the off-site decontamination provider and the decontamination equipment used for staff training purposes only.

**Decontamination Management Group Membership**

| MEMBER DESIGNATION | ROLE / INTEREST |
|---|---|
| Deputy Operations Director Decontamination | Chair |
| Trust Decontamination Manager | Deputy Chair |
| Director of Infection Prevention and Control | Microbiology IPC |
| Lead Infection Control Nurse | IPC |
| Senior Category Manager | Purchasing |
| Clinical Procurement Specialist | Chemicals |
| Governance Lead Critical Care and Operating Services | Risk |
| Senior Finance Manager | Finance |
| Clinical Educator / Trainer | Training |
| Clinical Engineering | Medical Devices |
| Estates Manager / Authorised Engineer | Decontamination Equipment |
| Head of Domestic Services | Decontamination |
| Occupational Safety Manager | Safety |
| Laundry and Linen Services Manager | Laundry |

- Standing invitation

| DESIGNATION |
|---|
| Supplies Manager |
| Estates Manager /Engineering Manager |
| Patient and Healthcare Safety Governance |
| Head of Sustainability |

# Appendix B

## Water Safety Steering Group Report 2022/23

**(report provided by Dave Partridge on behalf of the WSSG)**

**PURPOSE OF THE REPORT:**

- To report on the role and activities of the Water Safety Steering Group (WSSG) to the Trust Quality Committee in ensuring that statutory requirements in relation to Legionella control and water quality are maintained and that robust procedures are in place to prevent and manage infection control incidents that may arise from water related issues. The WSSG continues to meet quarterly in accordance with their terms of reference, and reports to the Safety and Risk Management Board via the Responsible Person for Water.

**KEY POINTS:**

- Discussions are to take place between Estates and Central Nursing to determine the optimal solution with respect to water usage assessment assurance as at present, there is limited potential for scrutiny of this and efforts to utilise the Quest system for this purpose have been impacted by capacity issues and the fact that it is primarily restricted to clinical areas.
- A Joint Water Safety Policy and Plan between the Trust, Veolia and Kajima has been agreed
- Pseudomonas is intermittently isolated from routine water samples on augmented care units. This is managed in accordance with the Pseudomonas Water Safety Plan.
- Legionella has been isolated in two separate incidents from outlets in clinical areas as detailed below. No associated clinical cases have been identified.
- No further cases of *Mycobacterium chimaera* infection have been recorded as being associated with cardiac heater-cooler units (HCUs) in the Trust in the past 12 months.

**Water quality related policies are subject to review as below:**

- The Control and Management of Water Quality Policy has been ratified and its next review is due in December 2024
- The Water Quality (Legionella) Control: Flushing Guidance has been ratified and its next review is due in November 2025
- The Policies for the Infection Prevention and Control Requirements for the Use of Ice Machines and Water Coolers have been reviewed and are awaiting Approval and Ratification.
- The Birthing Pool Infection Control Policy was issued on the intranet in March 2021 and is due for review in February 2024.
- The Hydrotherapy Pool Infection Control Policy was reviewed and Ratified in 2022 and is due for review in November 2025
- The Water Safety Steering Group Terms of Reference were updated in November 2021 and are due for review in November 2024

**Progress and changes implemented since the last report:**

- A new structure of the Estates leadership team for water safety has been agreed with Chris Norman assuming the role of Responsible Person (RP) and Deputy Responsible Persons (DRP) identified for each campus. Training has been undertaken by the DRPs consistent with the role. Formal appointment letters for these roles have been requested by the Authorising Engineer but there has been a delay in signing of these letters whilst training is completed.
- Progress with development of water assurance tools is awaiting Estates resource to assist in the alignment of outlet identifiers between plans and physical location The Quest system is not an option for non-clinical areas and Estates colleagues are in the process of reviewing other assurance systems including L8guard and Aqualog.
- A Joint Water Safety Policy and Plan for Hadfield wing between the Trust, Veolia and ProjectCo has been agreed but the Authorising Engineer has requested greater clarity with respect to responsibilities and their delineation.
- Water testing for Legionella and Pseudomonas continues to be performed by the STH microbiology laboratory (UKAS accredited). Verification of the Legionella PCR assay is still underway but will hopefully be complete later this year.
- Pseudomonas is intermittently isolated from routine water samples on augmented care units. This is managed in accordance with the Pseudomonas Water Safety Plan. There have been no clinical cases of Pseudomonas infection associated with the trust water supply.
- In the last 12 months, *Legionella* has been isolated from outlets located on:
    - Ward O1 has continued to have outlets contaminated by non-serogroup 1 *Legionella pneumophila*. Efforts continue to eradicate the organism, especially in light of the high-risk nature of the patients on the ward.
    - Non-serogroup 1 Legionella was isolated from a shower on the renal unit in low numbers in November 2022. Local outlet disinfection and flushing successfully cleared the outlet.
    - There have been no clinical cases of *Legionella* associated with the trust water supply.
- Water filters continue to be used on taps used for drinking water on the Haematology in-patient facilities (all patients on P3/4 and O1) and Renal Unit F. Patients at WPH undergoing total body irradiation are also being provided with sterile drinking water.
- No further cases of *Mycobacterium chimaera* infection associated with cardiac heater cooler units used by the Trust have been reported in the past 12 months. *Mycobacterium chimaera* is regularly isolated from the Macquet machines purchased in 2018. Risk to patients is mitigated by the design of the HCU as evidenced by the lack of cases associated with this model, a major reason for its selection at the time of purchase. Other trusts have ceased routine testing of these machines in view of the low risk of transmission although this is still recommended in national guidance and is, at present, continuing at STH.

# Appendix C

## Ventilation Safety Group Report 2022/23

**(report provided by Chris Lynch on behalf of the VSG)**

### Purpose of the report

To report on the role and activities of the Ventilation Safety Group (VSG) to the Trust Infection Prevention and Control Committee in ensuring that all aspects of ventilation integrity, safety and resilience are maintained for the safe development and operation of healthcare premises.

### Key Points

- VSG meetings continue to be held bi-monthly.
- Critical plant verification is on track for the year.
- Ventilation in many clinical areas remain below HTM standard, this risk is currently being mitigated with recirculating air filters.
- Work is ongoing to prioritise improvements across the Estate

### Ventilation related Policies are subject to review as below

- VSG terms of reference have been agreed (partially copied below – full document available form the Estates department)
- Policy for the Safe Control and Management of Ventilation Systems v3 reviewed and ratified 8/11/22

### Progress and changes implemented since the last report

- Critical plant verification is on track for the year.
- The risk register has been reviewed and rationalised ensuring risks related to ventilation are recorded correctly.
- The Estates Operations team are implementing good practice to provide greater assurance on the performance of ventilation plant and equipment. New systems are in place to limit access to the building management system preventing any unauthorised changes to commissioned settings.
- Non-critical ventilation plant across the organisation was surveyed due to COVID. This demonstrated that the majority of the Northern campus wards do not meet the HTM 03-01 standard of 6 air changes per hour (ACH). The central campus is in a significantly better position.
- Recirculating HEPA filters are in place to mitigate risks from reduced ventilation.
- A prioritised ventilation replacement/up-grade strategy is progressing. The delivery of this strategy requires significant capital investment. This work is awaiting an audit from the authorising engineer on the current state of the ventilation plant.
- A process for raising and agreeing capital scheme ventilation derogations has been agreed and is being utilised.
- Ventilation in existing non-clinical areas remains a lower priority than non-compliant clinical areas though will be reviewed as areas are refurbished or redeveloped.
- A process is ongoing to ensure that the commissioning and validation process is robust and provides assurance that systems are functioning as designed on handover.

## Ventilation Safety Group
## Terms of reference

**1. Purpose**

To assess all aspects of ventilation safety and resilience required for the safe development and operation of healthcare premises, to include:

- The design process for new healthcare premises.
- The design process for modifications to existing premises.
- The commissioning and validation process.
- Operational management and maintenance.
- Annual verification and performance testing.
- Prioritising the plant replacement programme.
- Decommissioning and removal of redundant equipment.

**2. Duties and responsibilities**

- The Ventilation Safety Group (VSG) will oversee all decisions affecting the resilience, safety and integrity of the ventilation systems and associated equipment and ensure that the appropriate expertise and competence is available when such decisions are made.
- Whenever significant building work is undertaken, the VSG will ensure processes are in place to consider:
  - its effects on the existing ventilation system air intakes to ensure safety of all occupants.
  - the need to identify any risks to construction personnel who may be working in the vicinity of extract air discharges.
- When construction or alteration work is undertaken inside an occupied building, its effects on the occupiers will need to be considered, the VSG should be consulted and approve such work.
- Gain assurance that risks relating to the operation of ventilation systems have been identified and have an oversight of the implementation and management of these risks.
- Scrutinise and agree any derogations or alternative design strategies from the standards set out in HTM 03-01, ensuring reasons for the derogation or alternative design strategy and limits to its application are recorded.
- Receive and critically analyse reports:
  - Summary of critical ventilation plant reports
  - Planned capital projects, including refurbishment
  - Maintenance report – outstanding or significant upcoming work
- Approve new/changes to policies, guidance and procedures relating to the management of the Trust ventilation systems.
- Ensure that the Ventilation Policy Document is up to date.
- Advise on whether a plant should be considered a critical ventilation system.
- Receive and oversee the implementation of new legislation, regulatory requirements and guidance/ reports from national or other bodies including NHS England, Health and Safety Executive, National Patient Safety Association, Care Quality Commission.
- Monitor relevant incidents to identify themes and trends to ensure that thorough investigation and implementation of learning is identified and shared across the Trust.

**3. Accountable to**

This group reports to the Infection Control Committee.

# Appendix D

## Waste Management Report 2022/23

**(report provided by Maria Mahon)**

### Waste Management Contracts

All healthcare (clinical and offensive) and domestic waste contracts now reside with Veolia. The net result being that over 90% of waste produced from STH sites (including community and outliers) is treated within the Sheffield boundary. This development equates to a significant reduction in our carbon emissions from transport miles.

In addition, all alternative treatment (orange stream) waste is treated directly through the Veolia energy recovery facility (ERF) in Sheffield, negating the need for pre-treatment elsewhere. This secondary development also significantly reduces our carbon emissions from waste treatment.

All orange and yellow-lidded Sharpsmart waste is sent through an alternative treatment process, significantly reducing our reliance on high temperature incineration as a waste treatment.

This practice contributes to the deliverables from NHSE detailed in the *NHS Clinical Waste Strategy* released earlier this year.

The main ask being for trust to achieve a **60:20:20** split in healthcare waste categorisation by 2026.

Current levels for main sites are detailed below (April 2022 – March 2023):

| **Healthcare waste – NHS Clinical Waste Strategy targets:** | | |
|---|---|---|
| *Offensive*<br><br>(Tiger bag stream) | *Clinical for alternative treatment*<br>(Orange stream) | *Clinical for high temperature incineration* – Medicinal, chemical, anatomical & Cytotoxic /cytostatic. |
| **60%** | **20%** | **20%** |

| **Current split @ main sites:** | | |
|---|---|---|
| NGH: **59.8%** | NGH: **34.6%** | NGH: **5.6%** |
| RHH incl. JW: **64%** | RHH incl. JW: **28.25%** | RHH incl. JW: **7.75%** |

### Audits

Ward audits demonstrate that in practice we have returned to a BAU situation with regard to waste disposal within clinical areas post-COVID, patterns of healthcare waste disposal remain.

The audit programme is ongoing, although performance requires significant improvement and additional support from the WMT in some areas to re-align good practice with pre-COVID performance (scores in table below). An increased number of areas appear to take a ‘blanket’ approach to local management of waste, which needs to be addressed to ensure compliance.

Most wards have too many large offensive waste bins which are used as a general waste bin, usually due to location adjacent to sinks (the average number of bins on a typical ward is in excess of 60).

A request has been made to the Estates Commissioning team to involve Waste Management at the planning stage, which will provide an opportunity to re-set existing practices and improve segregation with local managers.

In addition, updated postering and labelling for bin stock is also in preparation, which it is hoped will help users to improve segregation at source.

We anticipate the self-assessment audit programme records will be added to the QUEST system in the coming months. The project team are currently reviewing the format to ensure the parameters work for both the Waste Management Team and the QUEST system.

WMT Compliance Audits August 2022 – May 2023

| Year / Percentage / No. of wards | | Hospital | Date range | Number of Depart / Wards | Number of Areas Audited | BLUE | GREEN | AMBER | RED | Compliance |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | % |
| 95%+ | Example of best practice | NGH | 09/22 - 5/23 | 89 | 43 | 10 | 10 | 7 | 16 | 47% |
| 75 – 94.99% | Good compliance | RHH | 09/22 - 5/23 | 83 | 11 | 3 | 3 | 3 | 2 | 55% |
| 60-74.99% | Issues preventing compliance | CCDH | 09/22 - 5/23 | 16 | 11 | 7 | 4 | 0 | 0 | 100% |
| <60% | Action required | JW | 09/22 - 5/23 | 16 | 6 | 0 | 4 | 2 | 0 | 67% |
| | | WPH | 09/22 - 5/23 | 16 | 7 | 2 | 2 | 2 | 1 | 57% |
| Total number of areas reporting | | | | 220 | 78 | 22 | 23 | 14 | 19 | 58% |
| % of areas achieving acceptable scores | | | | | **45** | **22** | **23** | | | |

## Non-conformances

Most recent examples are around mixing of different waste types requiring different types of treatment in the same wheeled bin, which has been highlighted by our contractor on several occasions since contract commencement. Some incidents have required logging on the Datix system.

Consequence: Mixing of different types of hazardous waste (pictures 1, 2 and 3 taken at contractor's site) – legal compliance issue due to mixing and mis-categorisation of the waste. STH pays the higher disposal cost (for incineration). Picture 3 – anatomical waste (requires incineration) mixed with orange stream (requires alternative treatment). Picture 4, noted during internal waste audit.

Remedial actions include offer of additional training for staff in areas of high non-compliance and improved segregation postering in waste storage areas.
It has also come to light recently that clinical staff have been removing Sharpsmart bins from the main acute sites for use off site in community areas. This practice is unacceptable and further investigation is required.





***Segregation***

Segregation of waste in clinical areas remains an issue, with large amounts of household waste and recyclable materials being disposed of into the healthcare waste streams, adding to unsustainable practices in a large number of areas. Audits also demonstrate that the Clinismart system, which is embedded across the main Trust sites, is not being adhered to in its original format.This lack of correct practice has led to equal or greater numbers of healthcare waste bins being placed into patient bed-space areas.

With this in mind, a 'back to basics' trial on four volunteer wards is being planned. It is proposed that the Review team will incorporate an element of 'back to basics' with the Clinismart waste management system, with a view to reducing bin numbers and eliminating healthcare waste bins from multi-bedded areas. This will require some re-education for clinical staff and close monitoring of segregation during the trial period. Support for this initiative from the IPC Team will be key in progressing this.

***Training***

Work is on-going with training teams to refresh healthcare waste management training. Waste management training will become part of the IPC JSET training as a third module in the next two months. Information from Organisational Training and Development suggests this will be in the form of an add on to the new national IPC JSET training which is shortly to be released.

Recent intakes of Waste Champions have been extremely proactive on return to their own areas of work, with increase in recycling from clinical areas starting to become more evident.

***National Update***

Alongside the NHS Clinical Waste Strategy , the long-awaited, updated HTM 07-01 document (Safe and Sustainable Management of Healthcare Waste) was also released, with subsequent national webinars for interested parties. This document describes little change to current practices, with an extended focus on Sustainability.

# Appendix E

## Membership of the STHFT Infection Prevention & Control Executive Committee for 2022/23

| | |
|---|---|
| Executive Lead for Infection Prevention and Control | Chris Morley |
| Director of Infection Prevention and Control and Lead Infection Control Doctor | Christine Bates |
| Infection Control Doctors (Microbiology and Virology) | Sokolayam Atanze<br>Emma Boldock<br>Cariad Evans<br>Chris Lynch<br>Raza Mohammed<br>Helena Parsons<br>Dave Partridge<br>Ruth Payne<br>Laura Prtak<br>Gayti Morris<br>Rob Townsend<br>Gemma Wheldon |
| Infection Control Nurse Specialist | Patty Hempshall (Lead)<br>Angela Kelleher<br>Sally Nyinza |
| Deputy Chief Nurse | Karen Jessop (Apr 2022 to Jan 2023)<br>Gill Smith (Jan to Mar 2023) |
| Lead Nurse for Quality and Practice Development | Louise Bringloe |
| Deputy Medical Director | Rob Ghosh |
| Patient and Healthcare Governance | Caroline Drew |
| Occupational Health | Tracy Bennett<br>Prosenjit Giri<br>Rachel Henchley |
| Infectious Diseases Physician | Katharine Cartwright |
| Antibiotic Pharmacist | Katie Bramhall<br>Avril Lynch |
| Estates Department | Chris Norman |
| Sterile Services Manager | Karen Tweed |
| Domestic Services | Andrew Jones |
| Waste Manager | Maria Mahon |
| Senior Nurse Representatives | Lorraine Beacham<br>Nigel Coulson<br>Shane Lawson<br>Rebecca Matthews<br>Marie Partner<br>Jane Sendel |
| Consultant in Communicable Disease Control/ UK Health Security Agency Representative | Nachi Arunachalam |
| Integrated Care Board Representative | Nikki Littlewood |

# Appendix F

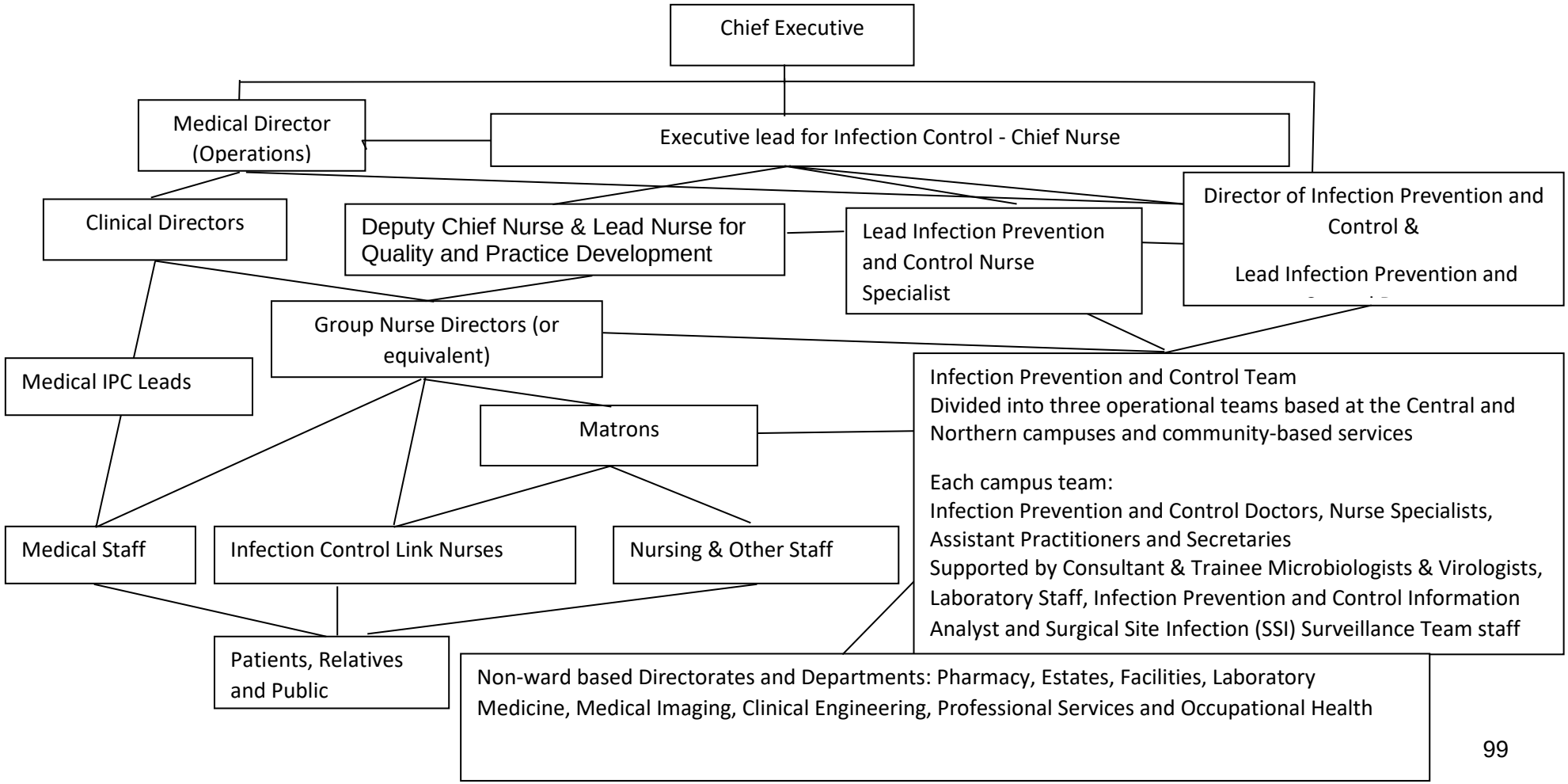
## STHFT Infection Prevention & Control Team and Attendees of the Trust-wide Infection Prevention & Control Team Meetings

| | |
|---|---|
| Infection Control Doctors | Sokolayam Atanze<br>Emma Boldock<br>Christine Bates<br>Chris Lynch<br>Helena Parsons<br>Dave Partridge<br>Ruth Payne<br>Laura Prtak<br>Gayti Morris<br>Rob Townsend<br>Gemma Wheldon |
| Infection Control Nurse Specialists | Patty Hempshall<br>Jackie Anderson<br>Jesse Beardmore (until Jan 2023)<br>Hollie Hanson<br>Sue Hillis (moved to CIPCT from 19/12/22)<br>Emily Hutchesson<br>Angela Kelleher (substantive Band 7 Site Lead from Jun 2022)<br>Natalie Kendall (from Dec 2022)<br>Sally Nyinza (substantive Band 7 Site Lead from Jun 2022)<br>Jaiz Shaji (from January 2023)<br>Kim Tomlin (until end October 2022)<br>Beverly Wade<br>Samantha Willow (substantive Band 6 post from Oct 2022) |
| SSI Surveillance Nurses | Debbie Adams<br>Debbie Carr (seconded to IPCT Feb - Jun 2022)<br>Debra Crossland<br>Sarah Egginton<br>Lyndsey Packham<br>Samantha Willow (seconded to IPCT from Jan 2022) |
| Infection Control Systems Manager | Glenn Radford |
| Infection Control Assistant Practitioners | Anna Green<br>Sharon Grindle<br>Wendy Ibbotson<br>Julie Taff<br>Karen Frost<br>Eric Moulds |
| Consultant Virologists | Mohammed Raza<br>Cariad Evans<br>Alison Cope<br>Mike Ankcorn |
| Lead Nurse for Quality and Practice Development | Louise Bringloe |
| Occupational Health | Tracy Bennett |
| Primary care representatives | Nikki Littlewood |
| Secretaries | Trish Brooks<br>Pat Ogle |

# Appendix G

## Line of operational accountability for Infection Prevention and Control

**(NB This diagram indicates the official channels of communication but, in reality, communication is not confined to these channels and any group can communicate to any other)**



# Appendix H

## List of Trust Infection Prevention and Control Related Policies and Guidelines

| General Infection Prevention and Control (IPC) documents |
|---|
| IPC Standard Precautions, Prevention of Sharps Injuries and Prevention of Exposure to Blood and Body Fluids |
| Hand Hygiene Policy |
| Aseptic Technique |
| Personal Protective Equipment (PPE) Levels |
| Care of the Deceased Patient |

| Patient Placement, Isolation Protocols, Ward Closure and Outbreak Management |
|---|
| Major Outbreaks of Communicable Infection - Outbreak Control Plan |
| Closure of Wards, Departments and Premises to New Admissions<br>a) Patient Placement Guidelines<br>b) Closure of Beds Due to Outbreak/IPC Concern |

| Equipment, Devices, Environment etc. related policies/guidance |
|---|
| Linen Policy |
| Waste Policy |
| Computer Keyboards & Equipment Cleaning Policy |
| Decontamination Policy for Medical Devices, Patient Shared Equipment, Non-medical Equipment and Environmental Fittings |

| Invasive Procedures |
|---|
| Bladder Management and Catheterisation Policy for Adults |
| IPC Policy for Central Venous Catheters (CVC) including PICC and long lines |
| IPC Policy for Peripheral cannula |
| Taking Blood Cultures Procedure |
| Ultrasound Gel Use – Good IPC Practice |

| Specific organism policies/guidance |
|---|

| Specific organisms |
|---|
| Meticillin-Resistant Staphylococcus aureus [MRSA] |
| Transmissible Spongiform Encephalopathies - Creutzfeldt-Jacob Disease [CJD] and Related Disorders |
| Glycopeptide Resistant Enterococci |
| Carbapenemase Resistant Gram-Negative bacteria |
| Multi drug resistant *Pseudomonas species* and other environmental Gram-negative bacteria |
| Tuberculosis, including MDRTB |
| Candida auris |
| High Consequence Infectious Diseases (HCID) Contact spread - Viral Haemorrhagic Fevers |
| High Consequence Infectious Diseases (HCID) Respiratory spread: (SARS Coronavirus, MERS Coronavirus, Human Cases of Avian Influenza and Severe Respiratory Infection suspected to be caused by a Novel Infective Agent |
| Respiratory Viruses e.g. Seasonal Influenza. RSV, Covid |
| Chickenpox |
| Anthrax |
| Smallpox |
| Scabies |
| Lice, Fleas and Bed Bugs |
| Control and Management of Pests and Infestations |

| Diarrhoea related policies/guidance |
|---|
| Suspected Infective Diarrhoea |
| Norovirus |
| Clostridioides difficile |
| Protocol for use of Faecal Transplant in the management of *Clostridioides difficile* disease |

| Antimicrobial Prescribing |
|---|
| Antibiotic Review Policy |
| Antibiotic Prescribing Guidelines |
| Restricted Antibiotic Policy |

| Occupational Health related policies/guidance |
|---|
| Management of Healthcare workers with Infections |
| Management of Occupational Exposure to Blood Borne Viruses [BBVs] and Post-Exposure Prophylaxis |

| Water Related policies/guidelines |
|---|
| Water Safety Policy |
| Regular flushing of taps |
| Birthing Pools |
| Hydrotherapy pools |
| Drinking Water Coolers |
| Ice Machines |

| Other IPC Related Policies and Guidelines |
|---|
| Completing Death Certificates in Respect of MRSA, *C. difficile* and Other HCAI |
| Animals and Pets in Hospital |
| Statutory Notification of Infectious Diseases and Reporting of Healthcare Associated Diseases and Infection Related Serious Untoward Incidents |

| IPC Service Documents |
|---|
| STH IPC Strategy |
| The Structure of the IPC Service for the STH |
| IPC Committee Terms of Reference |
| Procedure for the Production of the Trust-wide IPC Programme |
| DIPC Job Description |
| Infection Control Accreditation Scheme – acute based services |
| Infection Control Accreditation Scheme – community-based services |