Infection Prevention and Control Annual Report 2020/2021

Contents

1. Purpose

1.1 The Director of Infection Prevention and Control (DIPC) Annual Report reports on infection prevention and control activities within Great Ormond Street Hospital NHS Foundation Trust for April 2020 to March 2021. The publication of the IPC Annual Report is a requirement to demonstrate good governance, adherence to Trust values and public accountability.

1.2 A zero tolerance approach continues to be taken by the Trust towards all avoidable Healthcare associated infections (HCAIs).

1.3 The Infection Prevention Control Committee (IPCC) reports to Patient Safety Outcomes Committee (PSOC) which reports to the Trust Board.

1.4 Committees reporting to the IPCC are:

- Genetically Modified Organism Safety Committee (GMOSC)
- Water Safety Group (WSG)
- Antimicrobial stewardship committee (AMS)
- Sepsis steering group

1.5 Regular reports to IPCC include:

- PHE

2. Infection Prevention and Control Staffing

2.1 Director of Infection Prevention and Control (DIPC)

Dr John Hartley, consultant Medical Microbiologist. DIPC since August 2009- May 2020. (0.3 wte for IPC - 0.1 wte allocated as DIPC. 0.2 as Infection Control Doctor).

Helen Dunn, Consultant Nurse IPC since May 2020- present

Executive lead for IPC

The Chief Nurse is the Executive lead for IPC; supported for medical issues by the Deputy medical director. Alison Robertson took over this role in April 2018. The DIPC meet bi-weekly with her. A highlight report of all acute significant IPC issues are presented weekly to the Safety Team.

2.2 The Infection Prevention and Control Team (IPCT) during 2020/21

Nursing and clinical scientist establishment:

- Lead Nurse for IP&C/Consultant Nurse IPC - Helen Dunn
- Deputy Lead Nurse in IP&C - Barbara Brekle
- Lead Practice Educator IP&C- Kate Harkus (started Aug 2020)
- IPC Nurse – Helen Saraqi
- IPC Nurse- Alyson Prince (0.4 WTE)
- Principal Clinical Scientist in IPC (0.6 NIHR fellowship until June 2019; currently with some backfill undertaking scientific IPC activity. Elaine is also the Trust Healthcare Clinical Scientist lead).
- Infectious Diseases CNSs lead on Tuberculosis control as required

Medical Staff:

- Dr John Hartley - Consultant Microbiologist, Infection Control Doctor and DIPC
- Dr Garth Dixon - Consultant Microbiologist, Lead Clinician for the Department of Microbiology, Virology and Infection Control: 1PA for IPC
- Dr James Soothill - Consultant Microbiologist: 2 PAs for IPC (1 for AMS)
- Dr James Hatcher – Consultant Microbiologist: 1 PA AMS,
- Professor Judy Breuer – Consultant Virologist (advisory)

Working with:

- Dr Alasdair Bamford - Consultant in Infectious Diseases, lead for Antimicrobial Stewardship for most of year.
- Professor Nigel Klein – Professor of Infectious Diseases and Microbiology
- Dr Delane Shingadia – Consultant in Infectious Diseases
- Dr Louis Grandjean New consultant started June 2018
- Dr Karen Moshal – Consultant in Infectious Diseases, Lead for Sepsis Programme- 0.5 PA; supported by ID CNS.

Antimicrobial stewardship (AMS) -
One WTE pharmacist
Paediatric infectious disease consultant AMS time – Chair of AMS committee
Antimicrobial Policy Group Chair - consultant microbiologist 1 PA (IPC time)
Consultants in microbiology and PID contribute.

Administrative support
Administrator IPC Team – 0.6 WTE

IPC Data management
A new data analyst started in March 2018 and will cover transition to the new IPC Data management system (RL Solutions) which will be implemented in parallel to EPIC and the new lab systems (Beaker). Transfer to new systems underway. In March 2020 this became a permanent role with support provided across the laboratory but with a focus on IPC activity and data.

2.3 Development of IPC Team
In recognition of the ever growing demands for IPC services (including antimicrobial stewardship, expansion of services with PICB opening and work with DPS on new and existing developments) the team has expanded, but not as quickly as hoped.
The new fixed term IPC data analyst (started in March 2018) continues and is now a permanent post
Funding was agreed to employ a band 7 IPC nurse to support the Built Environment team. This role has been appointed to but there was a delayed start into post due to covid-19.

2.4 Quality Improvement Team
Continues to provide invaluable central support for audit and surveillance data display.

2.5 Divisional Responsibility – change to new Directorates
Under the terms of the Trust IPC Strategy set out previously each Division developed a local Divisional group / structure to drive local planning and implementation of IPC actions.

2.6 The structure had changed with the divisional structure changes in 2016/7 with Divisional IPC meetings for J M Barrie, Charles West and International and Private Patients.
After the restructuring, only the IPP Meetings continues. A new Directorate system started in Aug 2019.The trust now functions under 9 directorates:

- Body, Bones & Bones
- Brain
- Research & Innovation
- Blood, Cells & Cancer
- IPP
- Sight & Sound
- Operations & Images
- Heart & Lung
- Medicines, Tests and Therapies

2.7 The Infection Prevention and Control Committee (IPCC)
The Terms of Reference were updated in 2020 to reflect the Trust re-structure and developments in IPC.

This committee is chaired by the DIPC and meets monthly 10 times a year. Regular reports are submitted to PSOC & Trust Board. IPCC continues to be held over zoom due to social distancing restrictions as a result of the COVID-19 pandemic.

Membership by role:

- Consultant Nurse Infection Control & Director of Infection Prevention and Control – currently the Chair (Deputy Director of infection Prevention and Control)
- Executive lead for infection control – currently the Chief Nurse
- Medical Director team (TBC)
- IPC Team
- Infection Control Doctor
- Consultant Microbiologist(s)
- Paediatric ID consultant
- Director of Estates & Facilities (or Head of Estates and Head of Facilities as representatives)
- Head of Staff Health & Wellbeing (or representative)
- Representation from each clinical directorate (role not specified)
- Pharmacy/AMS
- Member of Risk team
- Representation from Academic Paediatric Infectious Diseases, ICH
- Public Health England representative
- Additional members may be invited to attend the IPCC as appropriate.

Administrative support: provided by IPC Administrator

2.8 Trust wide risks identified/reviewed by the IPCC
The IPCC reviews all risks which relate to IPC across the trust. They ensure appropriate mitigations are in place by the clinical team. Within the last year the risks reviewed and recommended for action are below:

Risk	Actions/Mitigation
Increased acquisition of adenovirus on Robin and Fox ward	A business plan has been submitted and now approved for the ongoing whole genome sequencing (WGS) of samples from patients to help determine if transmission is occurring. The business plan also includes regular screening of the environment. Action plans are in

	place to reduce loads in communal areas but this work is ongoing and often repetitive as it is labour intensive for staff and parents but crucial to load reduction.
Risk of service disruption and patient harm due to quality of water on haemodialysis unit	A business case for a new water plant has been approved and the plant has been installed.
Lack of authorised persons on site	Lack of authorised persons on site has led to lack of assurance and increased risk associated with water and ventilation. The ventilation verification programme fell behind and there was also a lack of assurance around planned preventative maintenance taking place with regard to water outlets including lack of documentation. This remains a risk to the organisation.
Some staff cannot work clinically as there are not FFP masks available which fit them	A business case was submitted and approved to make fit testing a substantive service. These roles are now recruited with staff and mask supply of FFP has stabilised for now. Fit testing is overseen by IPC. In addition powered respirators have been purchased and are available in clinical areas for staff to use who are unable to be fit tested or have failed all masks.

2.9 Work streams completed in the previous year included:

- The completion of action plans and electronic data in dashboards at ward/department level following the audit days
- Review and update of mandatory IPC training at level 1 & 2
- Design and approval of a new accredited paediatric IPC module
- Draft on a new ward manual (currently being rolled out)
- All ongoing projects including audit days, mandatory reporting and covid response was maintained.

2.10 KPMG Infection Control Audit internal audit 2020-21
No internal audit was undertaken this year.

3. Organisms Subject to Mandatory Reporting

3.1 The following organisms are subject to mandatory reporting. These are MRSA & MSSA bloodstream infections, *Clostridiodes difficile* and Gram negative blood stream infections (*Escherichia coli, Klebsiella species, Pseudomonas aeruginosa*).

3.2 The table below shows numbers of bloodstream infections over the past ten years.

3.3 No targets were officially issued for the majority of mandatory reporting in the year 20/21. This is likely to be due to the pandemic and the effect on the NHS. MRSA bacteraemia remain with a target of zero avoidable infections and Cdiff targets were less than 5, the same as the previous year.

	ECOLI			Klebsiella			MRSA			MSSA			Pseudomonas			Total
Year	Total	HAI	CAI	Total	HAI	CAI	Total	HAI	CAI	Total	HAI	CAI	Total	HAI	CAI	
10/11	25	0	0	19	0	0	3	0	0	31	0	0	13	0	0	91
11/12	14	0	0	30	0	0	3	0	0	15	0	0	8	0	0	70
12/13	15	0	0	23	0	0	3	0	0	25	0	0	14	0	0	80
13/14	20	0	0	21	0	0	1	0	0	30	0	0	10	0	0	82
14/15	14	0	0	13	0	0	0	0	0	24	0	0	8	0	0	59
15/16	14	0	0	17	0	0	2	0	0	19	0	0	9	0	0	61
16/17	20	0	0	19	0	0	3	0	0	26	0	0	11	0	0	79
17/18	18	0	0	17	0	0	3	0	0	15	0	0	13	0	0	66
18/19	20	0	0	15	0	0	2	0	0	26	0	0	16	1	0	79
19/20	10	7	3	26	15	11	1	0	1	23	13	10	19	9	10	79
20/21	19	14	5	14	10	4	2	2	0	20	9	11	15	9	6	70
Grand Total	**189**	**21**	**8**	**214**	**25**	**15**	**23**	**2**	**1**	**254**	**22**	**21**	**136**	**19**	**16**	**816**

Methicillin-resistant Staphylococcus aureus (MRSA Bacteraemia)

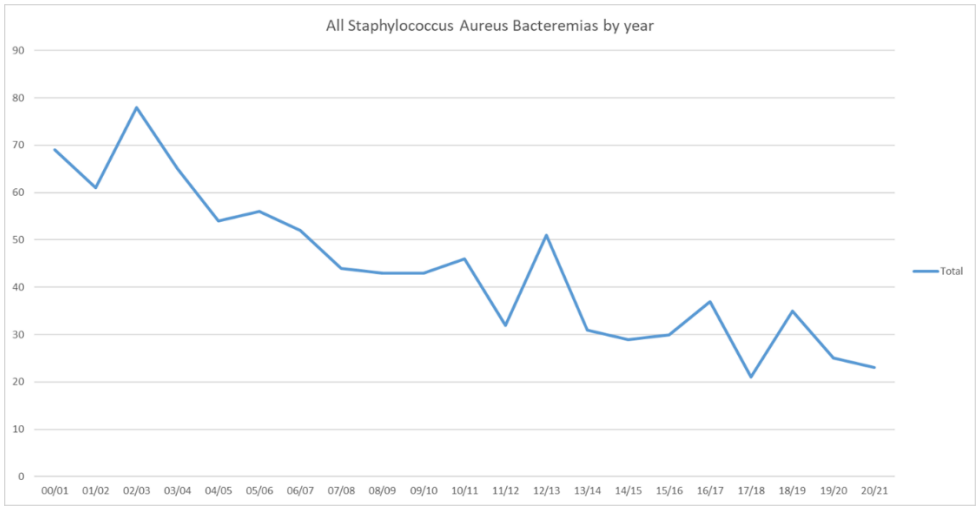
3.4 In 2020/21 financial year 2 children had an MRSA bacteraemia. These were both Trust attributable. A full RCA was conducted into both cases showing they were unavoidable.

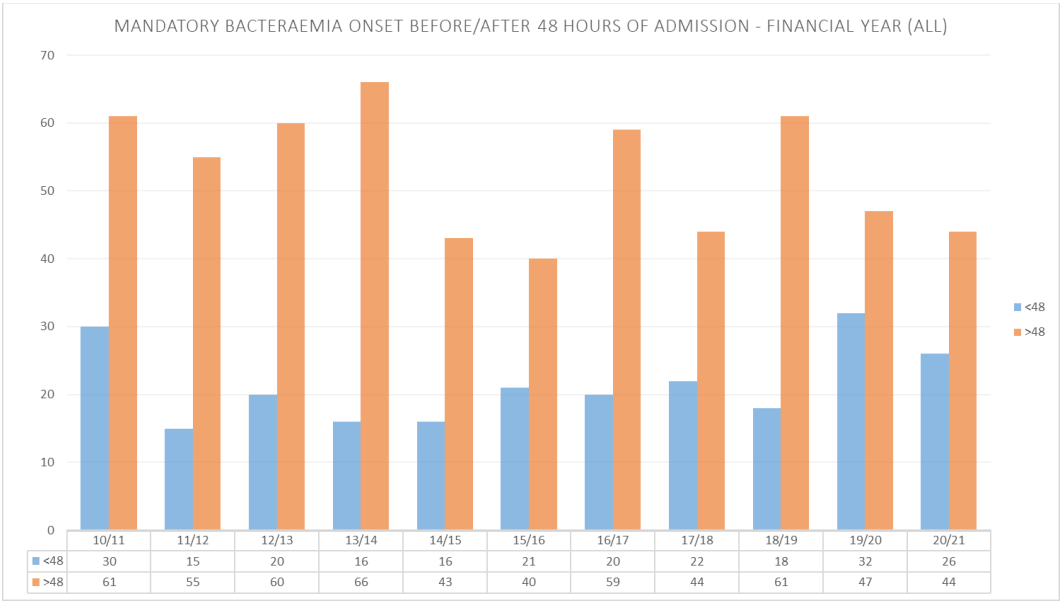
Methicillin- sensitive Staphylococcus aureus (MSSA Bacteraemia) (Hospital onset)

3.5 In 2020/21 financial year 20 children had an MSSA bacteraemia, 9 were Trust attributable.

Analysis of all S. aureus bacteraemias

3.6 The following graphs showing number of S. aureus bacteraemias (all and MRSA alone) by financial year. These graphs demonstrate a downward trend over the years but do demonstrate some normal variance across the small numbers.

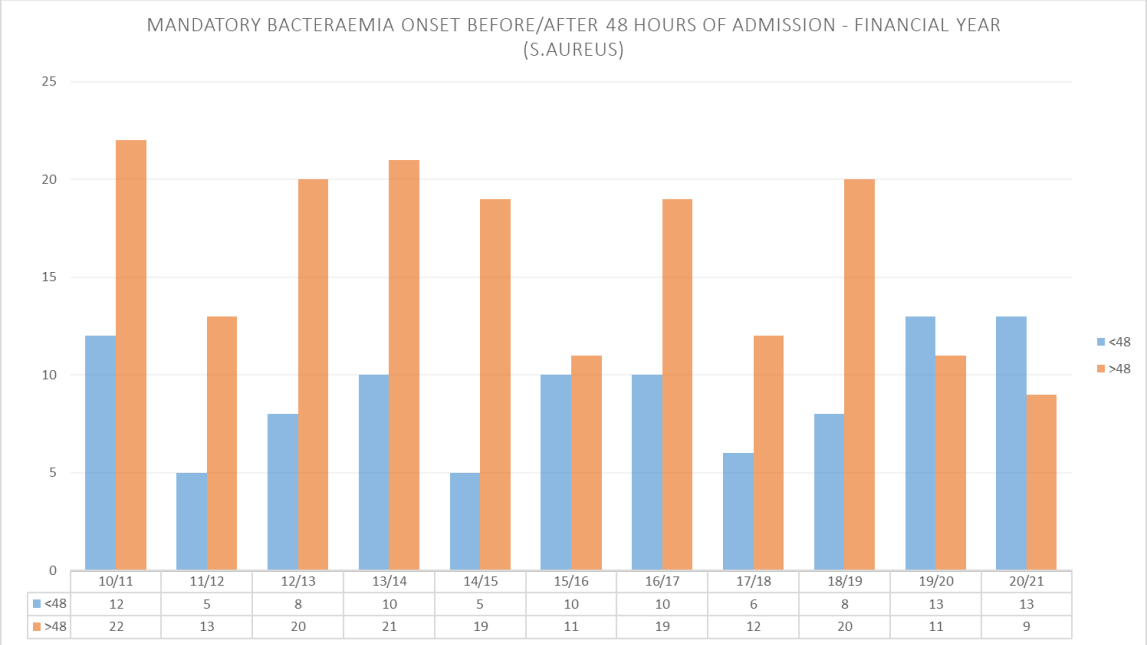




	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
<48	30	15	20	16	16	21	20	22	18	32	26
>48	61	55	60	66	43	40	59	44	61	47	44

Root cause analysis of all S. aureus bacteraemias (MRSA and MSSA)

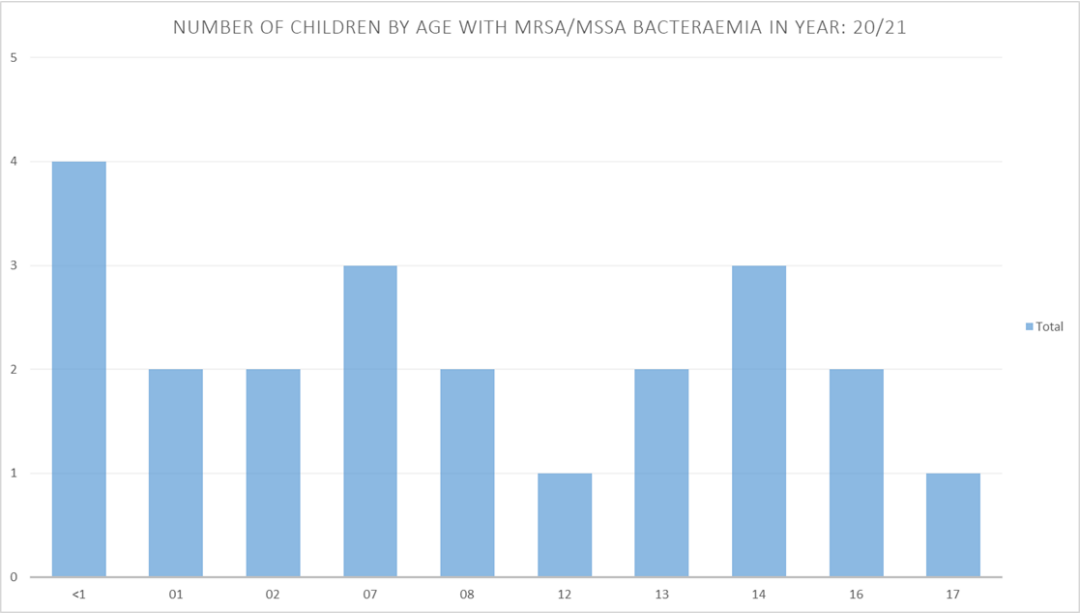
As shown above a lower number of the bacteraemias occurred after 48 hours. All S. aureus bacteraemias are reviewed by IPC team and full or mini-RCAs requested for all S. aureus bacteraemias developing after 48 hours of admission and not incubating before admission and those occurring in prior GOSH patients.



	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
<48	12	5	8	10	5	10	10	6	8	13	13
>48	22	13	20	21	19	11	19	12	20	11	9

3.7 RCA completion by clinical teams was not complete for the year, however clinical review was undertaken by IPC team and shows a range of potential sources beyond the lines.

3.8 Previous years data showed the highest proportion of children with MRSA/MSSA bacteraemia coming from <1 year olds. Whilst this is still true there is a much more even distribution over the age groups for this financial year. This may be due to a change in population as a result of the COVID-19 pandemic.



Clostridiodes difficile

3.9 In line with previous agreement with NHS England, while we test extensively for toxigenic C difficile colonisation and infection, we continue to report all children aged 2 and over who have C difficile toxin in the faeces and diarrhoea with no other cause, or other possible cause but treated. The table below shows testing and reporting over the past 4 years.

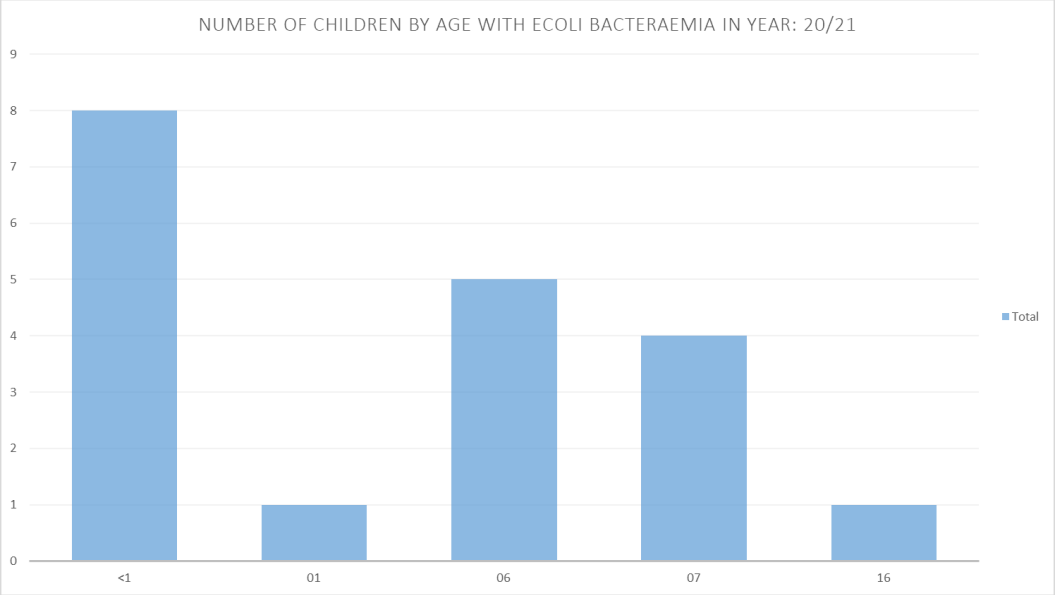
	17/18	18/19	19/20	20/21
C. difficile 1st toxin new detections ALL ages and any duration of admission	108	57	47	48
CDI notified on HCAI website (total numbers)	18	7	7	13
Number 'trust apportioned cases' (aged above 1 year and in for > 3 days when tested and reported as possible CDI on HCAI site)	12	7	2	10
Objective (number below which we aim to keep apportioned cases.	14	14	5	5
Possible lapse in care	3	0	0	0

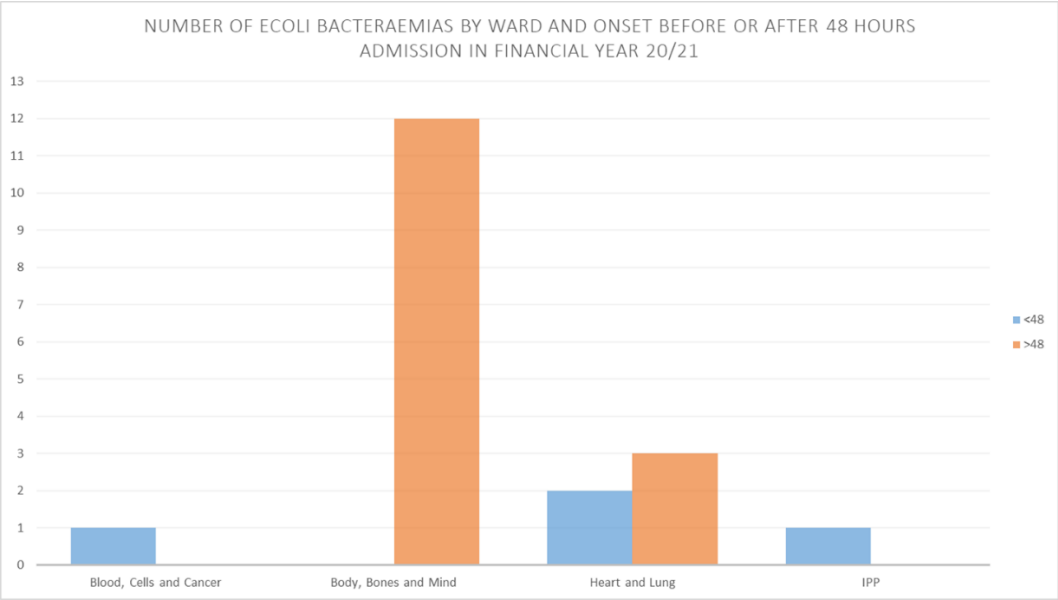
3.10 Analysis of every case is undertaken to assess the likelihood of true disease, and any avoidable risk factors or lapses in control measures.

The number of cases reported in 20/21 was higher than previous years. Following analysis a number of these children were displaced from UCLH cancer services which were housed in GOSH for the pandemic. This led to an increase in children hitting the case definition for reporting. No obvious ward clustering was observed.

3.11 E.coli bacteraemia

The number of children with E-coli bacteraemia reported rose in 20/21 to 19 with 14 of these being hospital acquired. This is much more in keeping with the figures reported year on year. Whilst appropriate RCA tools are being developed for these children a graph demonstrating age breakdown of cases suggests the majority of focused prevention is needed in <1 year olds. The majority of cases occur within Body, Bones and Mind directorate.

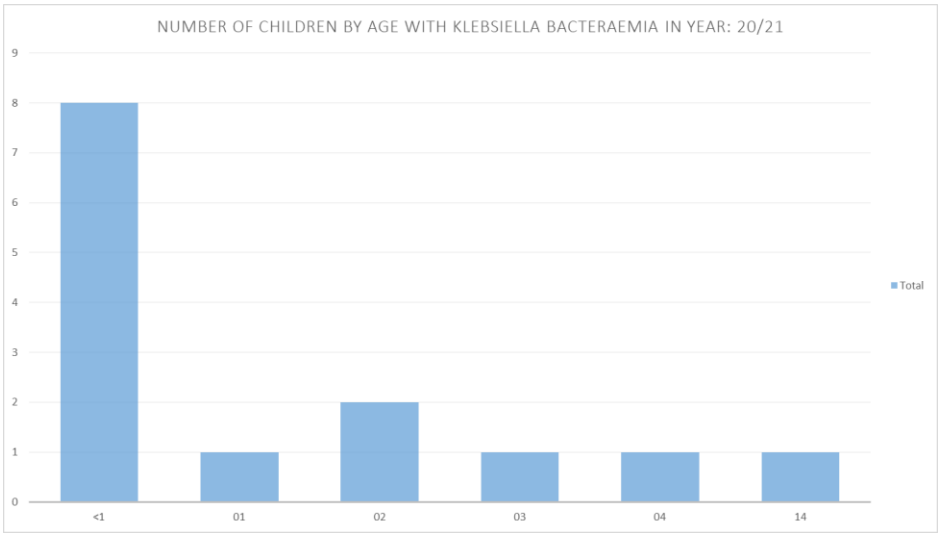


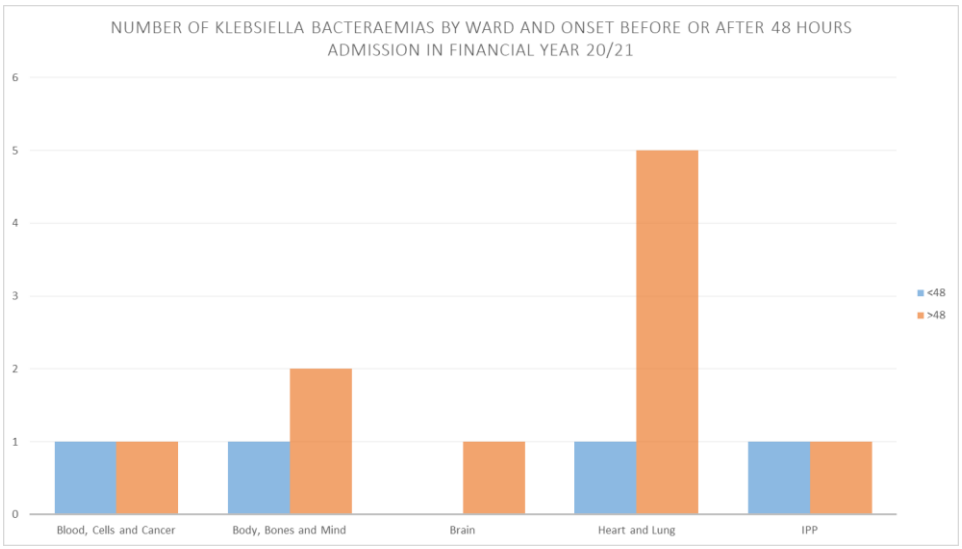


Klebsiella spp. Bacteraemia

3.12 The number of klebsiella sp. Bacteraemia decreased in 20/21.

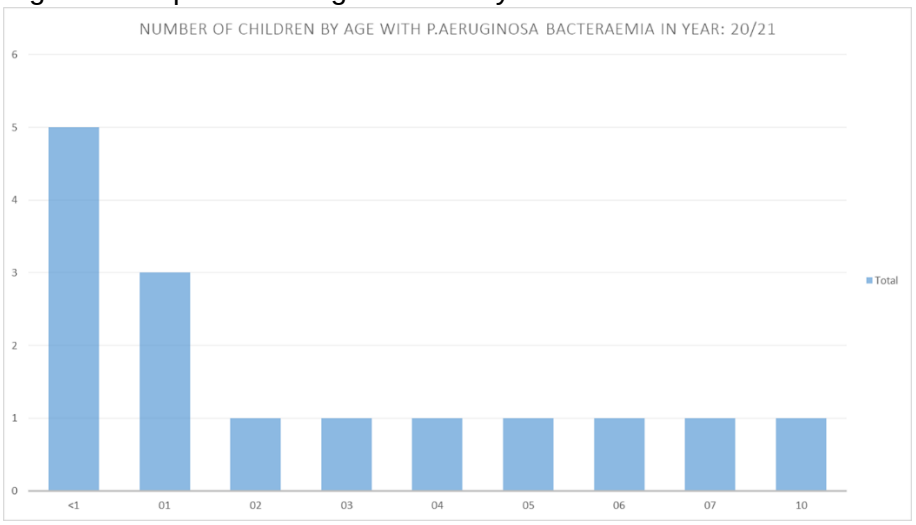
3.13 Cases of Klebsiella sp are displayed in the graph below. It is important to note that cases seem well controlled within Blood, cells and cancer and IPP with the majority of cases occurring in surgical wards (Body, Bones and Mind) and the ICU's (Heart & Lung). This is also where the majority of the <1 are placed. Focused RCA tools for the reasons behind these cases are being developed in 21/22.

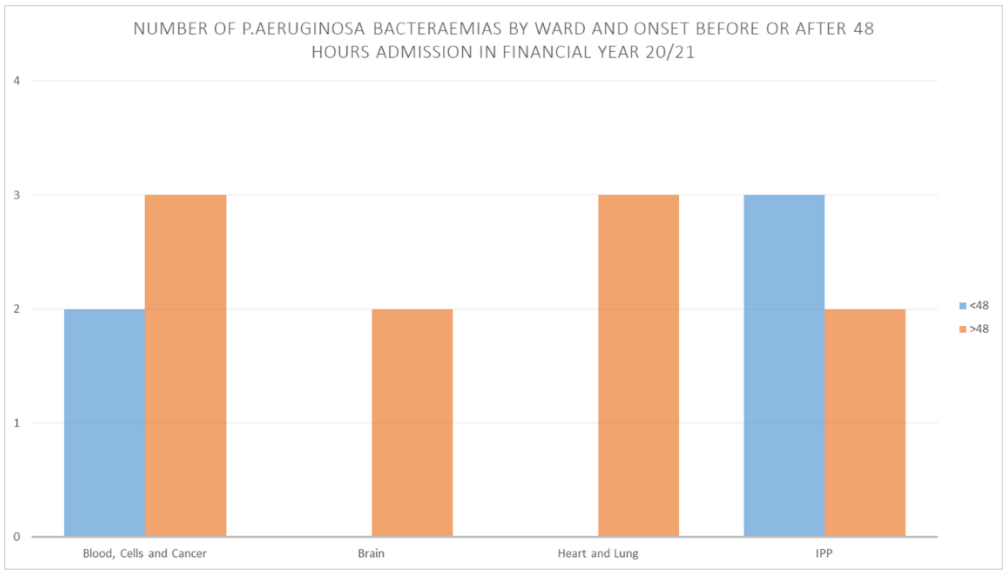




Pseudomonas aeruginosa bacteraemia

3.14 Pseudomonas aeruginosa age ranges are displayed below with hospital locations below. It is observed that age ranges are spread more evenly with a higher proportion of these cases in Blood, cells and cancer unlike the other gram negative organisms reported through mandatory surveillance.





Mandatory Surveillance of Glycopeptide Resistant Enterococcal bacteraemia (GRE) 2020/21

3.14 The number of children experiencing VRE bacteraemias is static

Year	Number of GRE bacteraemias
2015/16	2*
2016/17	2
2017/18	6* (3 children; 4 in one child)
2018/19	9 (3 children: 7 in one child as above)
2019/20	2 (2 episodes in 1 patient)
2020/21	7* (3 children: 5 episodes in one child)

4. Screening for MRSA and Multiple 'Resistant' Gram Negative Organisms

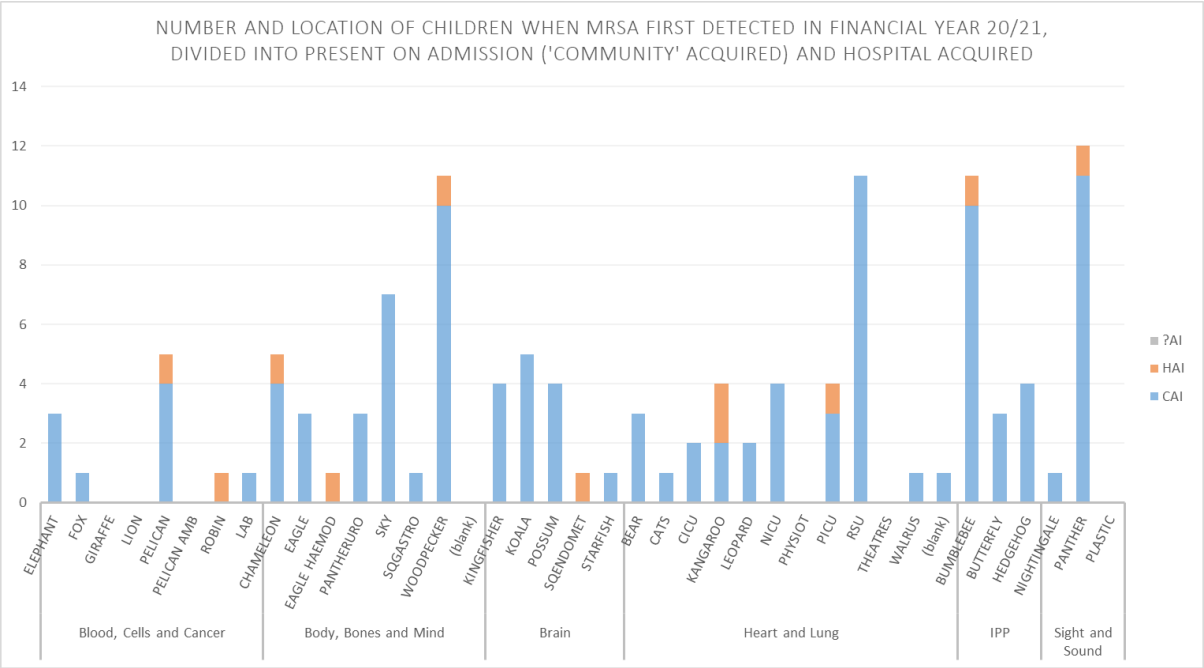
MRSA colonisation by financial year:

4.1 All patients are screened on admission or prior to admission at Great Ormond Street Hospital. Details of newly detected MRSA carriage is shown in the table below.

	CAI	HAI	?AI	Total
10/11	154	16	0	170
11/12	162	8	1	171
12/13	129	8	0	137
13/14	171	21	0	192

14/15	169	12	1	182
15/16	161	27	3	190
16/17	206	16	5	226
17/18	195	9	3	207
18/19	199	23	9	224
19/20	202	16	3	221
20/21	153	11	1	165
Grand Total	**1901**	**167**	**26**	**2085**

4.2 The table below shows the ward location of where both community and hospital first detections were isolated.

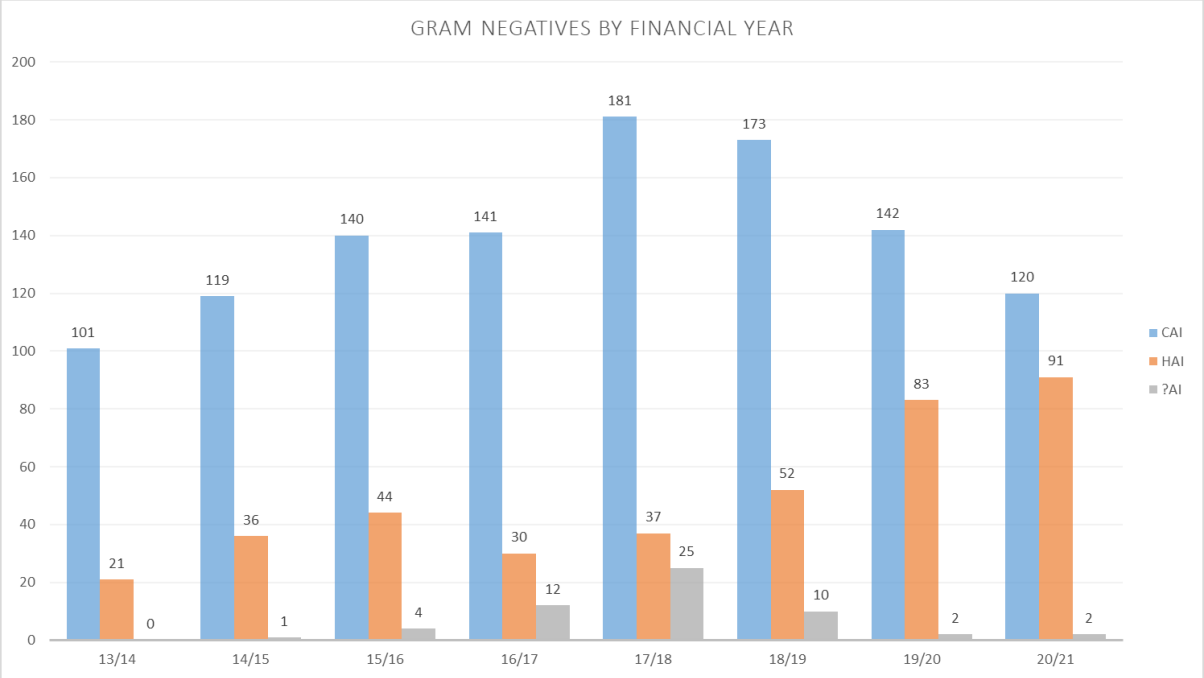


4.3 Every apparent GOSH acquired case is investigated. Long term colonised patients are always present and represent ongoing risk.

4.4 In previous years there has been a disproportionately high rate of carriage in IPP where the unique situation of parents and families probably leads to higher transmission. During 19/20 an outbreak on MRSA colonisation was noted in the cardiac services.

<u>Multiple resistant 'gram negative' organisms, including transmissible carbapenemase producing organisms</u>

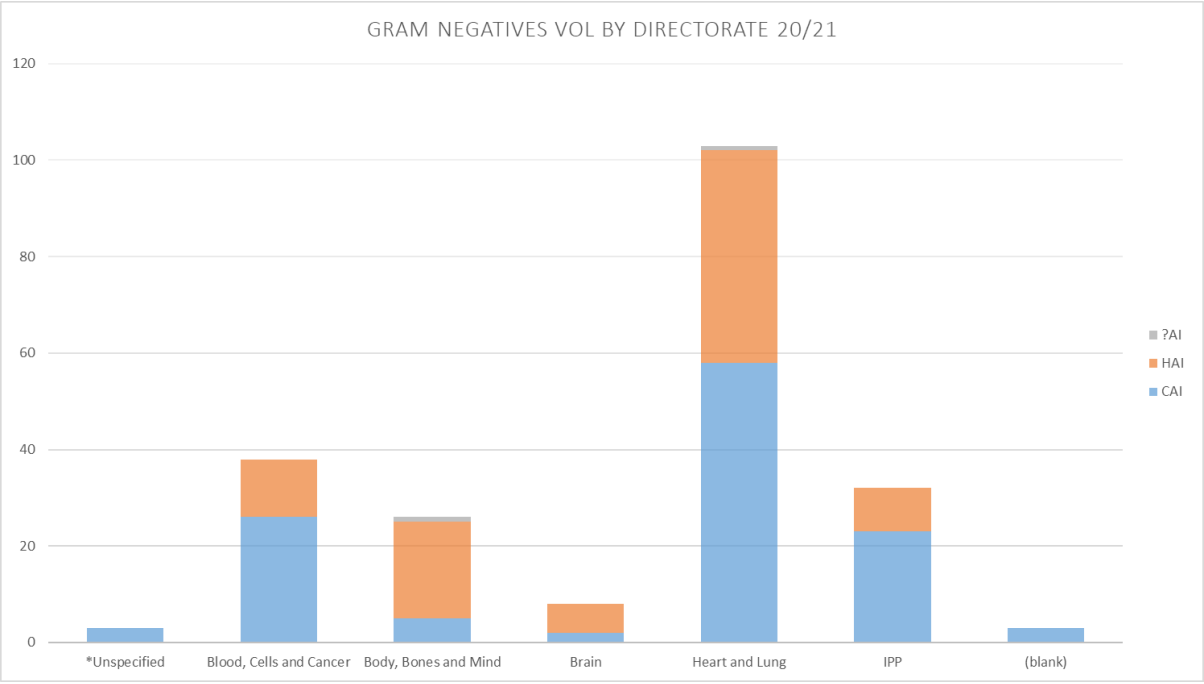
4.5 All patients should have a stool sample sent for screening for resistant gram negative organisms on admission. The chart below shows yhe number of children with newly detected colonisation with multidrug resistant gram negative organisms (as defined in GOSH Admission screening policy) by financial year.



CAI = those colonised on admission
HAI = those acquiring colonisation in hospital

4.6 This high level is due to the continuing national and international increase in antimicrobial resistant organisms but was also due to cross infection. In addition stool screening compliance figures are not as high as we would like them to be meaning, meaning children may be allocated as HAI when they arrived with the resistant organism or there may be cases of cross-infection which go unnoticed due to transmission based precautions not being implemented.

4.7 The chart below shows the location of children when first detected as colonised with multidrug resistant gram negative organisms in financial year 2020-21



4.8 Potential acquisitions occur throughout the year and not all isolates can be investigated through detailed typing, so complete analysis of source is not possible. Where the initial epidemiological analysis strongly suggests cross infection further typing is undertaken and linked cases were confirmed in a number of wards. Undetected cross infection will be occurring. Detailed research is underway to answer help understand the epidemiology of these isolates.

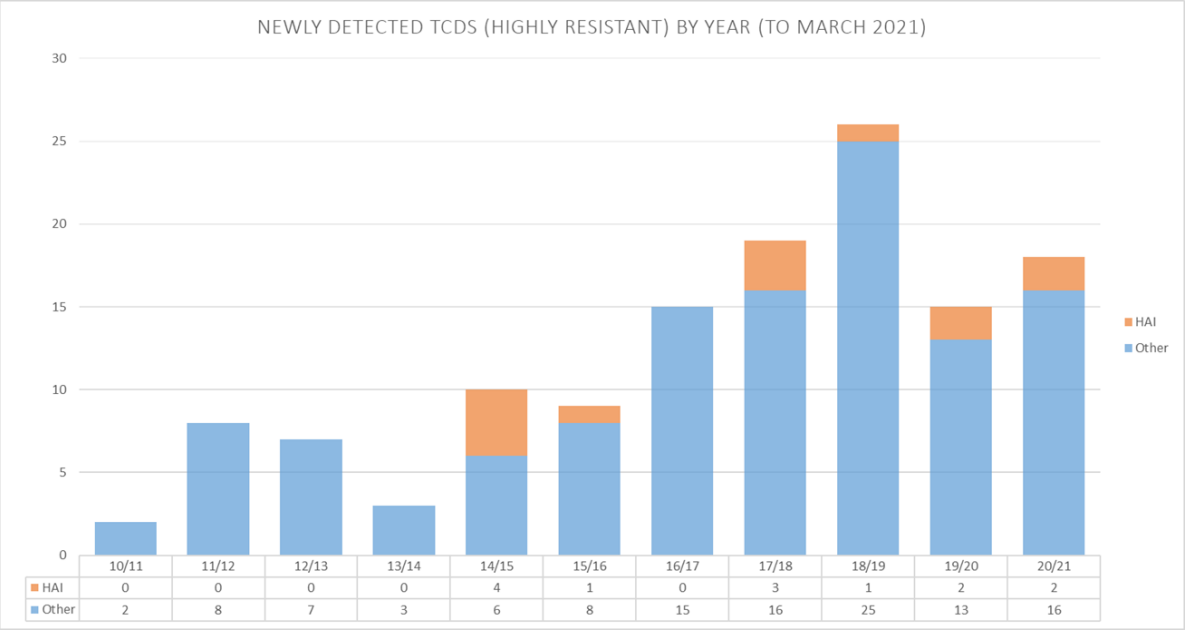
4.9 The organisation is stretched in its ability to apply controls mechanisms without adverse impact on other aspects of care provision; however, we feel it is essential to continue to do so.

Carbapenemase resistant gram negatives

4.10 The transmissible carbapenemase resistance determinants (TCDs; blaNDM, KPC, oxa48, VIM and IMI especially) represents the most serious threat to treatment yet. Organisms carrying this mechanism may become truly untreatable. They are becoming more prevalent in various countries and regions within UK and have been responsible for major outbreaks. We routinely screen for carriage and implement strict control mechanisms when found. There had been an increase in detection of children colonised with TCDs, plateauing in the calendar year chart shown below (but there were 21 in the financial year 2019/20).

4.11 Organisms are detected during routine screening and clinical samples.

4.12 Bar chart showing the number of children newly detected as colonised with significant **transmissible carbapenemase carrying organisms** (Enterobacteriaceae, Acinetobacter)

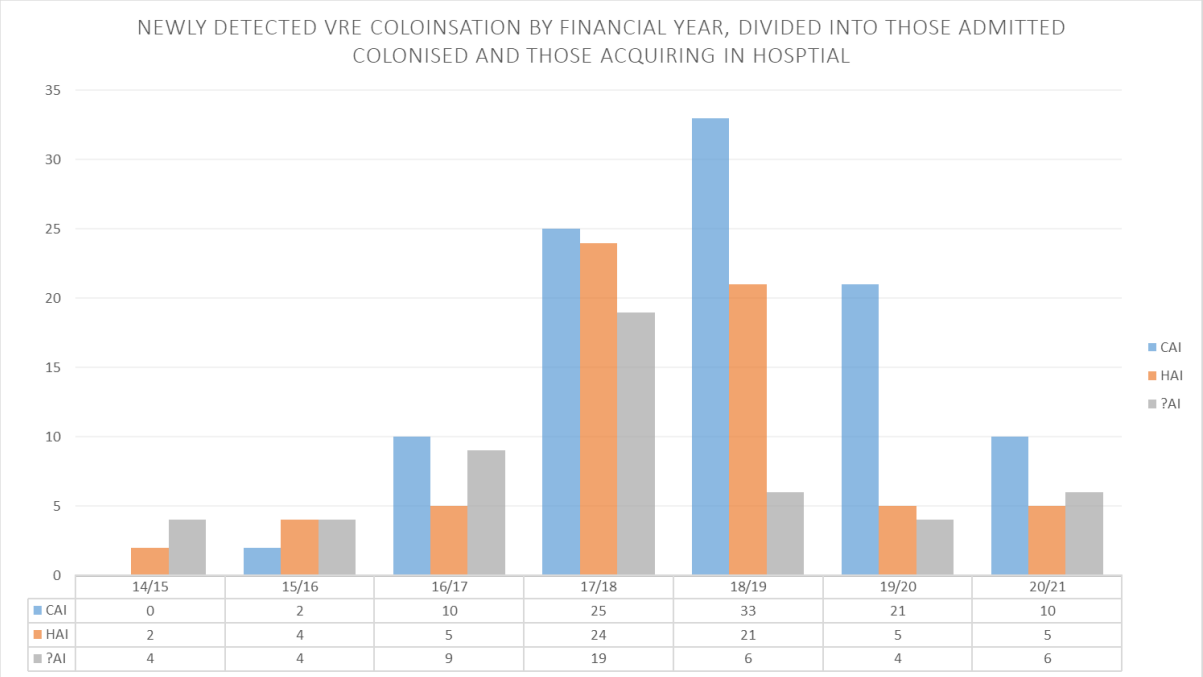


	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21
HAI	0	0	0	0	4	1	0	3	1	2	2
Other	2	8	7	3	6	8	15	16	25	13	16

4.13 The majority of cases found are detected on admission. The larger number of hospital acquired cases in 14/15 relates to an outbreak within Blood, Cells and Cancer. Lack of compliance with stool screening means that they may be cases which we do not know about which are a risk to the trust.

Vancomycin resistant enterococci (VRE)

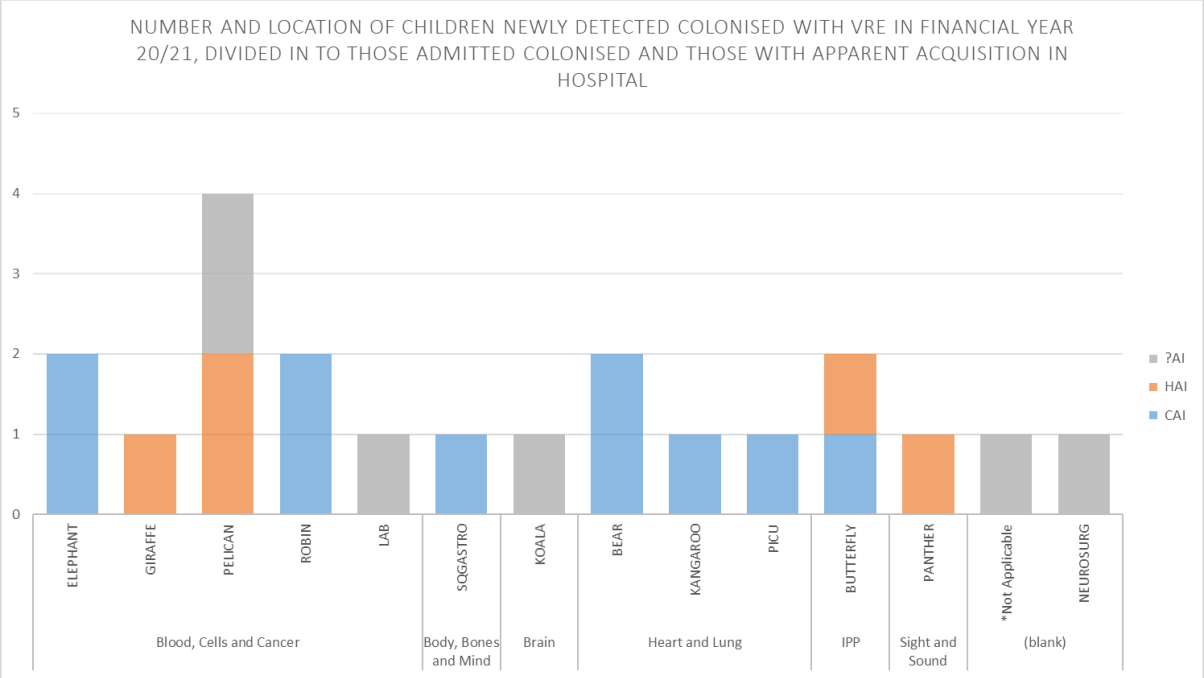
4.14 VRE colonisation, community and hospital acquired, is shown below. Children may be found in most clinical services. VRE bacteraemia was rare (except for recurrence in one child).



	14/15	15/16	16/17	17/18	18/19	19/20	20/21
CAI	0	2	10	25	33	21	10
HAI	2	4	5	24	21	5	5
?AI	4	4	9	19	6	4	6

4.15 As a result of the increase in cross transmission detected in 2017-18 we have increased terminal cleaning after room occupancy and, combined with actions on general cleaning, we hoped to reduce transmission. A small but sustained reduction was seen in hospital acquired cases.

4.16 The graph below shows community and hospital acquisitions for 20/21. There were no clusters noted.



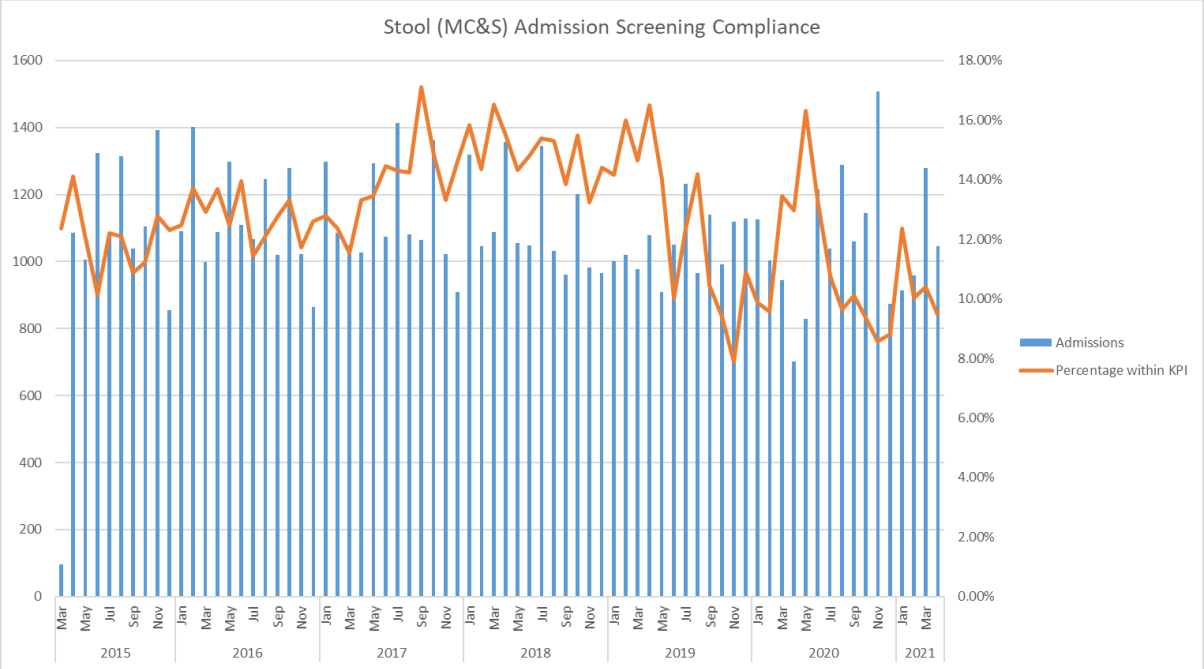
Screening compliance for multiple 'resistant' gram negative organisms

4.17 Routine admission faecal surveillance is performed to allow:

- instigation of isolation procedures in patients who are colonised with multiple antibiotic resistant organisms , including transmissible carbapenemase resistance ('ALERT' organisms as defined in the Admission screening policy) and
- to guide individual antibiotic choice of empirical treatment of serious sepsis.

We also detect colonised or infected children during processing of clinical samples and as part of routine stool screening on admission and after 30 days as an inpatient. In 19/20 weekly faecal screening of high risk inpatients (immunology and bone marrow transplant) was moved in line with the rest of the trust and is now undertaken every 30 days. Additional isolation procedures at instigated at considerable organisational, financial and individual cost.

4.18 Screening/testing shows a maintained number of colonised children detected on admission and an increase in those acquired in hospital.

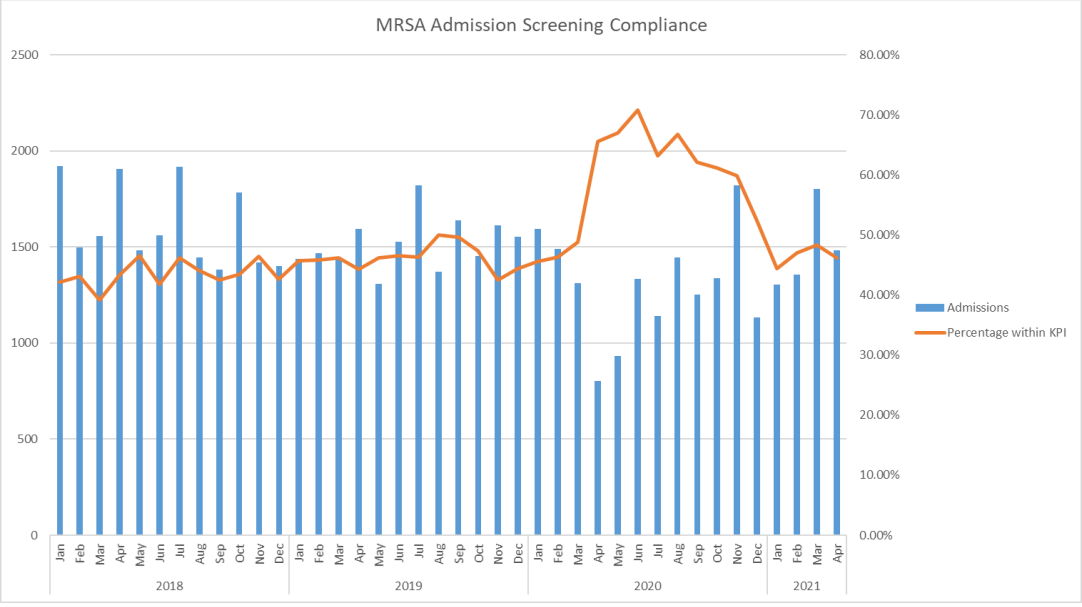


Screening compliance for MRSA

4.19 The Trust MRSA screening policy is universal admission screening (in the 30 days prior to admission (or sooner if admitted elsewhere in those 30 days) or within 24 hours of admission). We aim to achieve > 80% for all admissions, and near to 100% for the ICUs (except some situations it is not appropriate, so > 95% target).

4.20 Wards are provided continuous feedback on completion of screening through the Infection Control Screening Compliance Report located on the Nursing Care Quality Dashboard (which wards monitor daily).

4.21 The graph below shows compliance with MRSA screening over time. It is important to note that at times of reduced admissions screening compliance was highest.



5. Investigation of Infection prevention and control incidents and outbreaks

5.1 Serious Incidents: There were no SI's related to IPC in 20/21.
5.2 Major outbreaks: The table below shows the outbreaks and incidents the IPC team co-ordinated at GOSH or were involved in nationally over the year.

Date	Organism and issue	Ward/ Department	Outcome
April 2020	Staph capitis Patient cluster	NICU	London wide group met and discussed if an issue across NICUs in London. Isolates sent for sequencing. Wider issue across UK- PHE now leading a UK incident.
Sep 2020	COVID- 19 Staff outbreak	Ventilation Technician Department (Heart & Lung)	Reported externally
Sep 2020	COVID- 19 Staff outbreak	MRI sedation service (Operations & Images)	Reported externally
Oct 2020	COVID- 19 Staff outbreak	Blood Cells and Cancer services	Reported externally
Oct 2020	COVID- 19 Staff outbreak	Recovery (Operations & Images)	Reported externally
Jan 2021	COVID- 19 Staff outbreak	Estates department	Reported externally

5.3 In addition to the above mentioned outbreaks the IPC team provided expert advice for the risk assessment and was part of the steering group which managed the BD Infusion giving set contamination which the trust was affected by.

5.4 There were also no wards closed or on restricted admission due to enteric and respiratory viruses.

6. Management of Respiratory and Enteric Viral Infections

Surveillance of Respiratory virus infection

6.1 Respiratory viruses are common in children and often asymptomatic or only causing mild infection. However, in children with immunodeficiency or other severe illness, normally mild infections may be serious, with even the simplest 'common cold' leading to death. We are aware that children acquire infections while in hospital, with multiple sources among patients, visitors and siblings, staff and other adults. The prevention of cross infection requires good compliance with standard and transmission based infection prevention procedures, including assessment of risk and low threshold for testing, including in asymptomatic immunocompromised children who shed high loads for long periods.

6.2 First detections are called hospital acquired if the symptoms onset in hospital or if the first test was after 48 hours; some detections will have been incubating. Some children have 2 or 3 viruses so the total number of positive patients is less than the number of viruses.

6.3 Comparison of previous years, see below, and shows that the number of potential hospital acquired cases has decreased but the overall number of respiratory viral infections also decreased dramatically compared to previous years. This is likely to be a result of lockdown, social distancing and other IPC interventions.

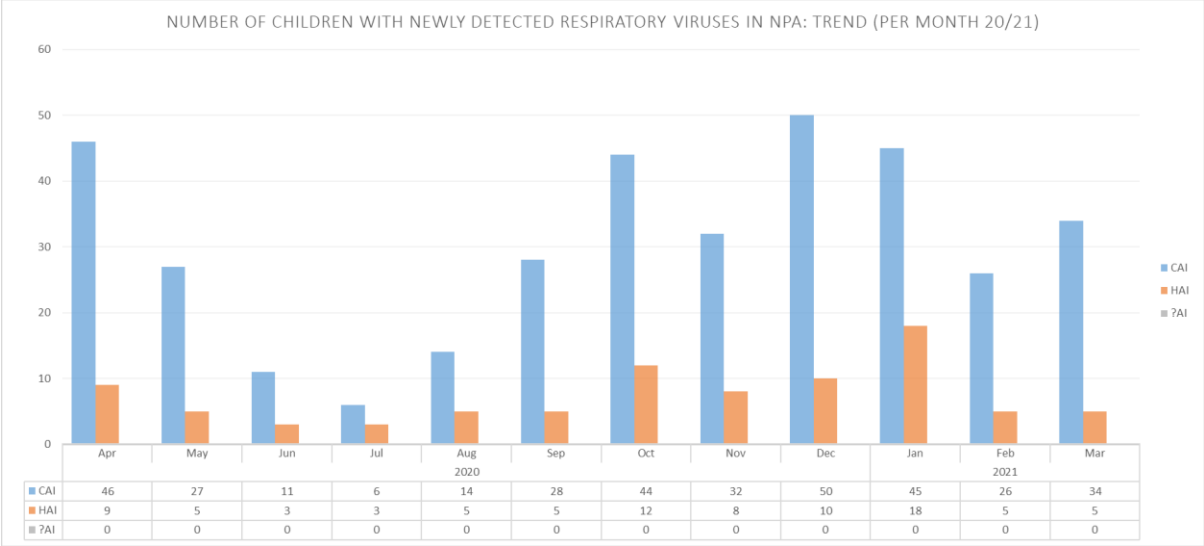
6.4 Adenovirus infection which had increased in the previous year and had stabilised has reduced slightly.

6.5 Increased cases of rhinovirus was sustained this year, likely to be due to the increased use of the diagcore platform.

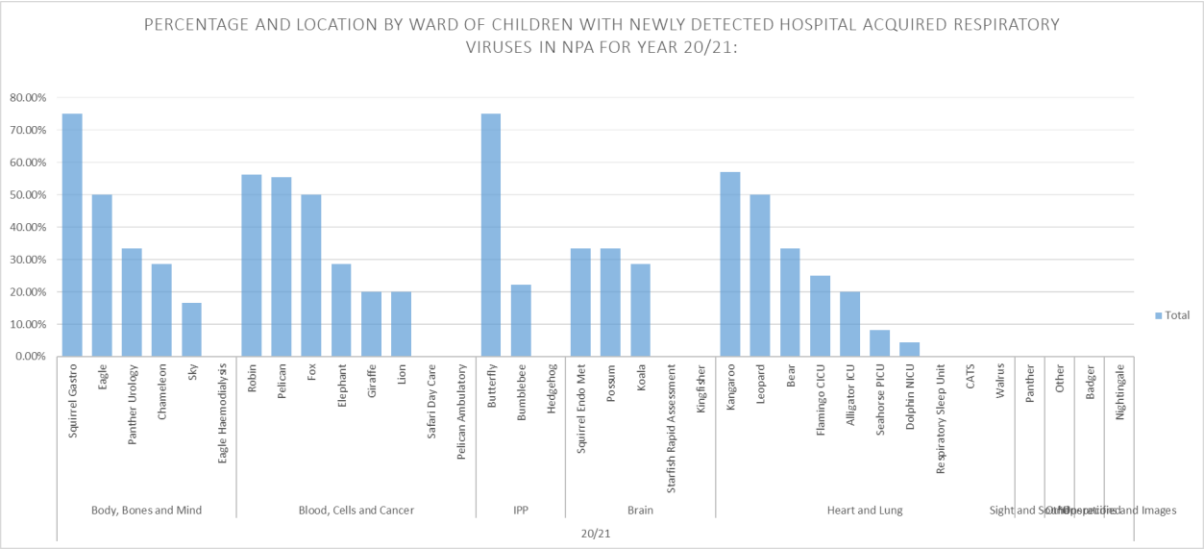
	17/18			18/19			19/20			20/21		
	CAI	HAI	?AI	CAI	HAI	?AI	CAI	HAI	?AI	CAI	HAI	?AI
Adenovirus	72	39	2	87	52	4	119	64	0	73	38	0
Bordetella pertussis	0	0	0	0	0	0	3	0	0	0	0	0
Coronavirus 229E	0	0	0	4	3	0	2	4	0	1	0	0
Coronavirus HKU1	0	0	0	2	2	0	6	3	0	5	1	0
Coronavirus NL63	0	4	0	3	3	0	14	3	0	6	0	0
Coronavirus OC43	0	2	2	2	4	0	5	9	0	1	0	0
Enterovirus	1	1	0	2	3	0	0	0	0	0	0	0
hMPV	34	9	0	23	7	1	40	6	0	1	0	0
Influenza A	24	2	0	24	9	1	39	6	0	2	0	0
Influenza A H1N1	9	1	0	12	7	0	9	2	0	0	0	0
Influenza A H3	0	0	0	1	0	0	6	0	0	0	0	0
Influenza B	33	9	1	1	0	0	10	0	0	0	0	0
Legionella Pneumononie	0	0	0	0	0	0	1	0	0	0	0	0
Mycoplasma pneumoniae	0	0	0	0	0	0	0	0	0	1	0	0
Parainfluenza 1	18	6	0	3	5	0	27	5	0	0	1	0
Parainfluenza 2	8	8	0	7	8	1	14	14	0	3	0	0
Parainfluenza 3	34	26	0	53	34	2	32	12	0	5	0	0

Parainfluenza 4	0	0	0	2	0	0	8	5	0	5	1	0
Rhinovirus	31	20	3	79	34	0	190	120	0	210	30	0
RSV A	50	18	2	40	13	0	60	54	0	4	5	0
RSV A/B	0	0	0	22	1	0	7	0	0	0	0	0
RSV B	40	10	1	50	14	1	14	3	0	0	1	0
SARS-CoV-2	0	0	0	0	0	0	4	1	0	67	11	0
Grand Total	**354**	**155**	**11**	**417**	**199**	**10**	**610**	**311**	**0**	**384**	**88**	**0**

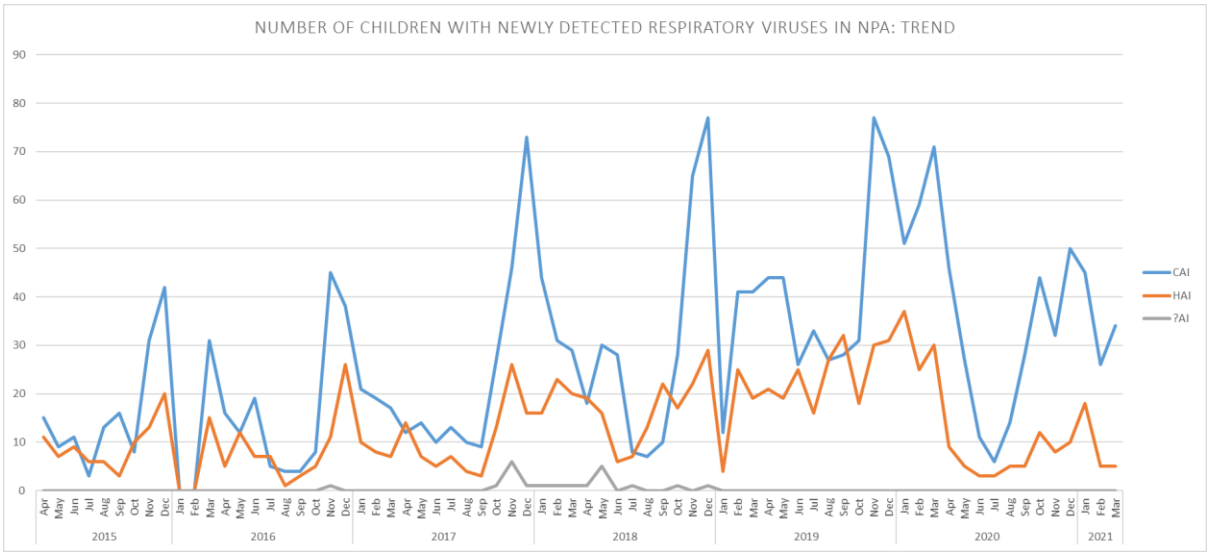
6.6 The chart below demonstrates that respiratory viruses transmit throughout the year but a higher rates during winter months.



6.7 The chart below demonstrates that hospital acquired respiratory viruses occur across the trust so intervention is needed in all areas to prevent transmission.



6.8 The trend graph below shows that the focus on the recognition of respiratory symptoms and preventative measures introduced as a result of covid-19 have reduced the number of hospital acquired respiratory viruses.



6.9 Data collected demonstrates for the first time this year that staff are more aware of respiratory viruses with the number of patients in isolation precautions at the time of test being taken overtaking thise not for the first time. Whilst there is still further work to be done this demonstrates a marked reduction in risk for unknown sources transmitting infection.

Surveillance of Viral Gastro-enteritis

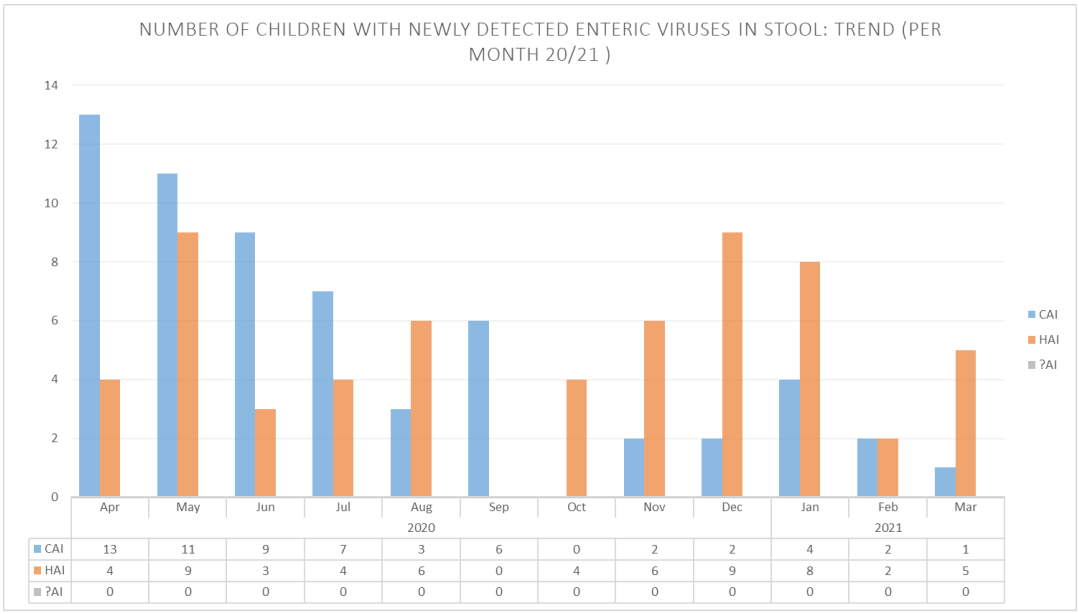
6.10 GOSH Trust outbreak and prevention guideline includes isolation of children with suspected viral gastro-enteritis with emphasis on recognition and early intervention.

6.11 As in respiratory infections, children, parents and staff frequently enter the Trust incubating these common infections and act as sources for localised outbreaks. Control of these explosive outbreaks may require closure or restriction of admission to units, along with additional environmental cleaning, as attack rates are high and secondary cases occur. Detailed investigation of these outbreaks and numbers of reported patients, staff or visitors affected are kept by the IPC team and the decision to close wards is based on risk assessment and epidemiological data.

6.12 As shown in the table below the number detected in 2020/21 has decreased significantly to 131 (from 341 in 2019/20), with 60 (down from 155) recorded as acquisitions.

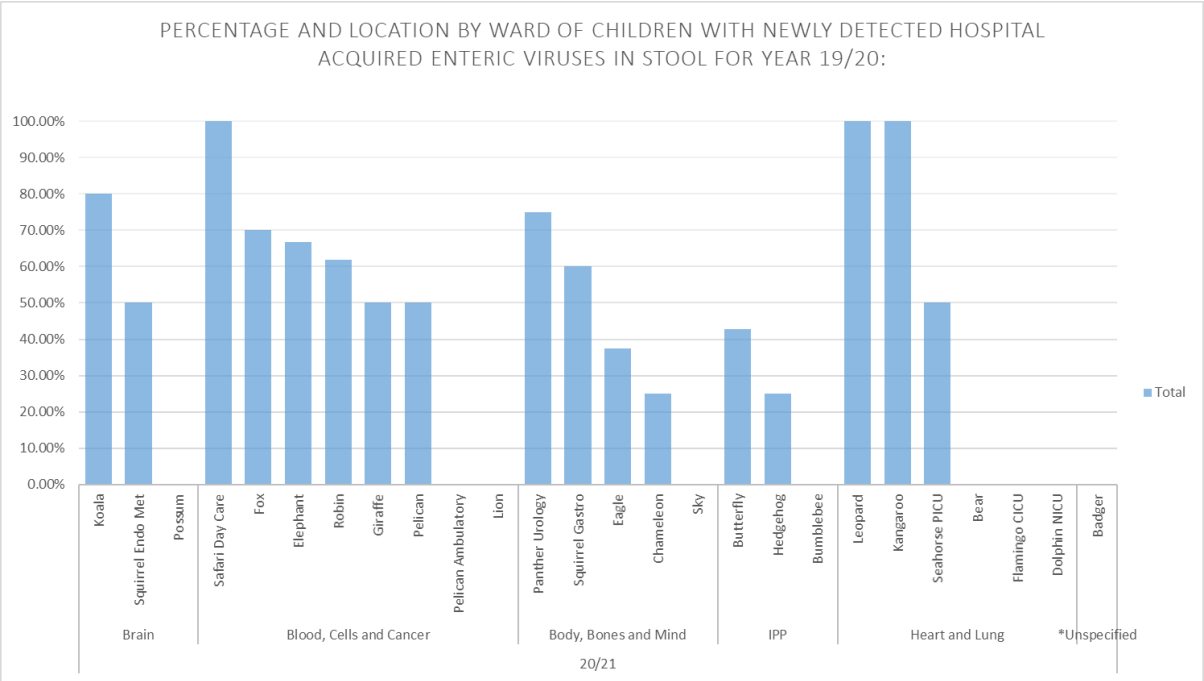
	17/18			18/19			19/20			20/21		
	CAI	HAI	?AI	CAI	HAI	?AI	CAI	HAI	?AI	CAI	HAI	?AI
Adenovirus	117	87	6	160	146	16	78	82	4	38	42	0
Astrovirus	25	34	2	18	21	0	15	8	0	0	0	0
Norovirus G1	6	5	0	14	9	0	10	4	0	3	0	0
Norovirus G2	61	49	0	54	52	2	40	28	1	4	1	0
Rotavirus	19	8	0	14	17	2	12	6	0	8	3	0
Sapovirus	44	43	1	51	44	2	31	27	0	18	14	0
Grand Total	**272**	**226**	**9**	**311**	**289**	**22**	**186**	**155**	**5**	**71**	**60**	**0**

6.13 Enteric viruses remain present throughout the year with more cases during the winter months. This winter there were a disproportionately high number of hospital acquired cases suggesting that staff are less aware of symptoms and isolation requirements during the covid-19 pandemic.

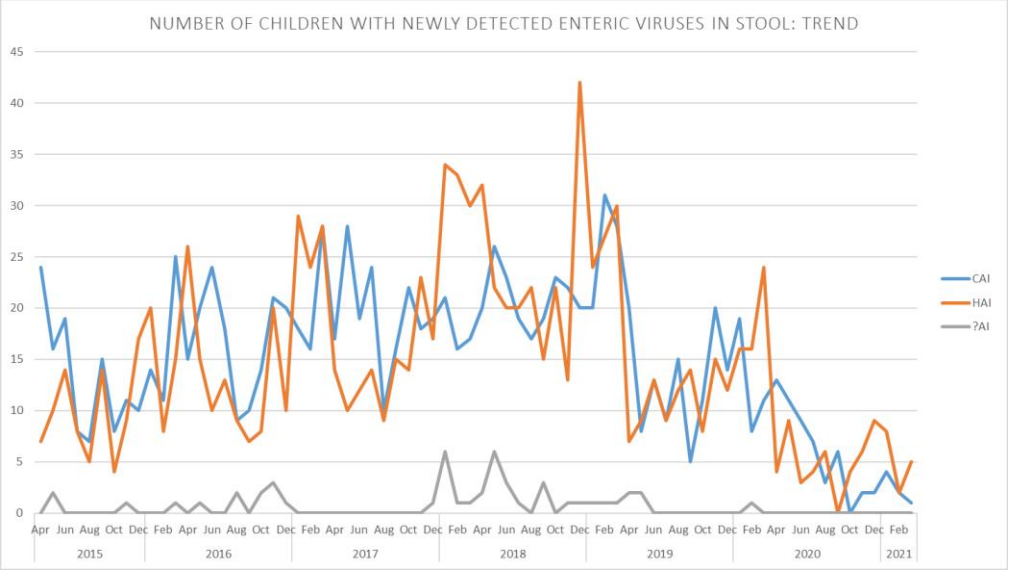


	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
	2020									2021		
CAI	13	11	9	7	3	6	0	2	2	4	2	1
HAI	4	9	3	4	6	0	4	6	9	8	2	5
?AI	0	0	0	0	0	0	0	0	0	0	0	0

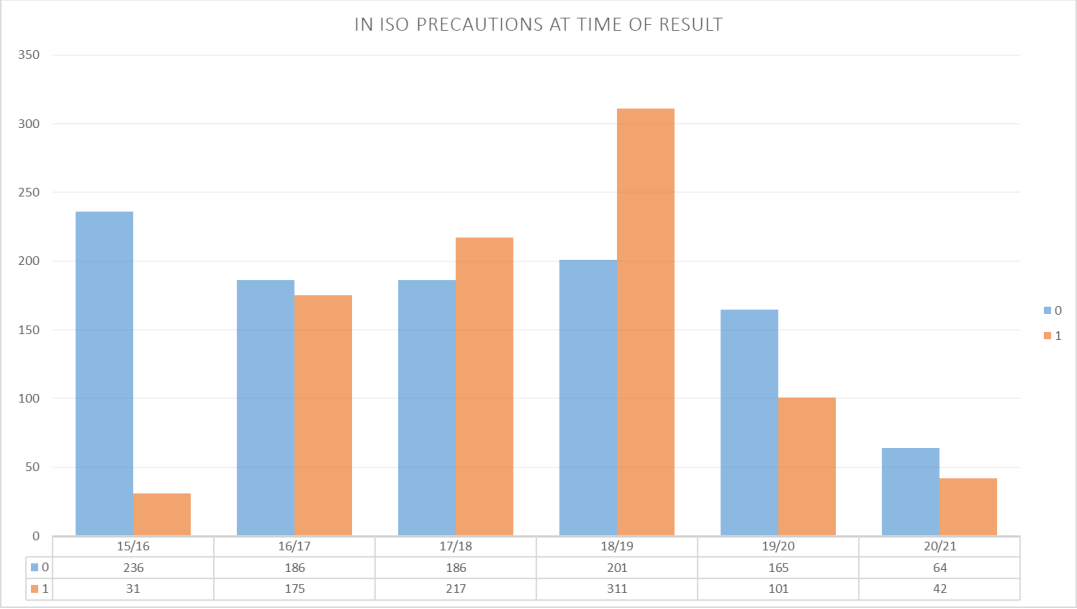
6.14 The graph below demonstrates as with respiratory viruses despite the smaller numbers of enteric viruses hospital acquired cases occur across the organisation meaning that improvement is required in all areas to detect symptoms and prevent transmission.



6.15 The trend analysis shows that while numbers are at their lowest numerical value the risk of acquiring a hospital acquired enteric virus has risen. This is a risk to patients.



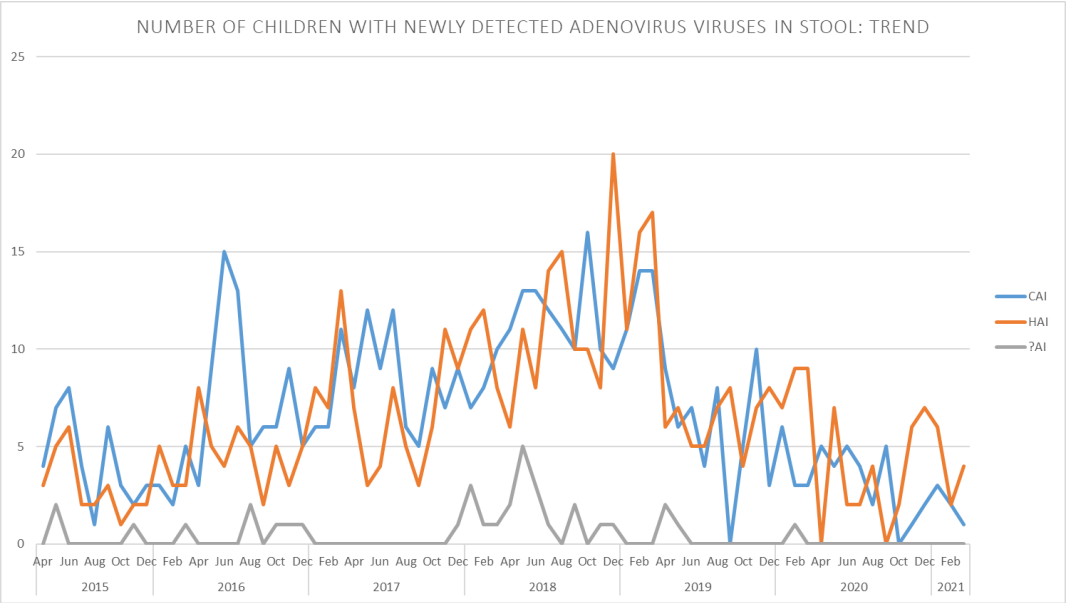
6.16 It is important to continue to message that symptom recognition and placing patients in isolation at the time of symptoms onset regardless of test result is important to prevent the spread of infection.



	15/16	16/17	17/18	18/19	19/20	20/21
0	236	186	186	201	165	64
1	31	175	217	311	101	42

6.17 Adenovirus continues to play an important risk factor for BMT patients so levels are monitored. Stool screening within this group has continued throughout the

pandemic. Adenovirus in stool samples is more common in hospital acquired cases compared to community onset as seen in previous years, albeit smaller numbers.



7. Audit and Compliance to Policy

7.1 The infection control Trust-wide audit plan is well embedded in the Trust's overall audit programme and registered with audit department. This plan is based on the internal and external infection control strategy which includes elements of High Impact Interventions from the "Saving Lives" programme. Care bundle audits are completed for the associated devices
- Peripheral line care bundle (insertion and maintenance)
- Urinary catheter care bundle (insertion and maintenance)
- Renal dialysis care bundle audited

7.2 Hand hygiene audits are also carried out looking at compliance with 'Bare below the elbows' and the '5 moments of hand hygiene'

7.3 Isolation precautions were audited annually prior to the pandemic but currently are monitored each quarter.

7.4 The infection control link personnel in the clinical areas take responsibility, with guidance from the IP&CT, for performing planned audits. All data is displayed, by the QI Team, on continuous dashboards, although this required modification with the audit process change and switch to EPIC.

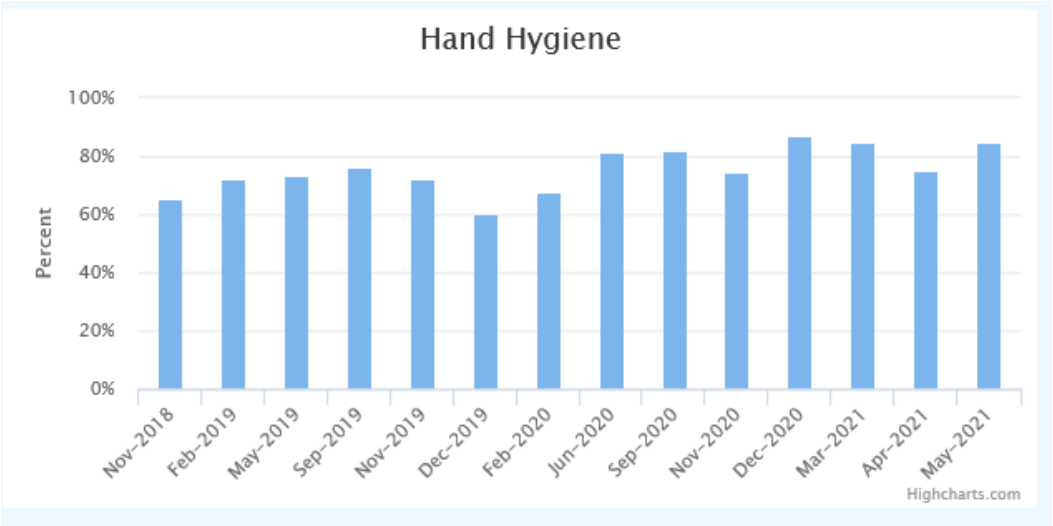
7.5 The infection control trust-wide audit plan undertook a major change in focus and direction in October 2018. In previous years and until the change monthly hand hygiene (including bare below the elbows) and high impact intervention audits were carried out on a monthly basis. Results from both these audits were in the mid to high 90 percentiles and had remained at this rate for many years.
7.6 In October 2018 with approval from the IPCC and the Trust board we moved to quarterly audit days where hand hygiene audits and updated high impact intervention audits would be carried out using point prevalence methods rather than a minimum

number of audits per month. In addition to completing the audits and collecting qualitative data as well as quantitative data we implemented the use of action plans to be completed each quarter on the findings from the audit days.

Hand Hygiene Results

7.7 The first trustwide audit day was held in November 2018. Hand hygiene rates have improved since the introduction in Nov 18. There was a slight reduction in compliance in Dec 2019 but this was due to a large number of areas not attending the audit day. This was highlighted and compliance again improved.

7.8 The graph and table below show the percentage rates and numerical count and percentage of hand hygiene compliance for the year.



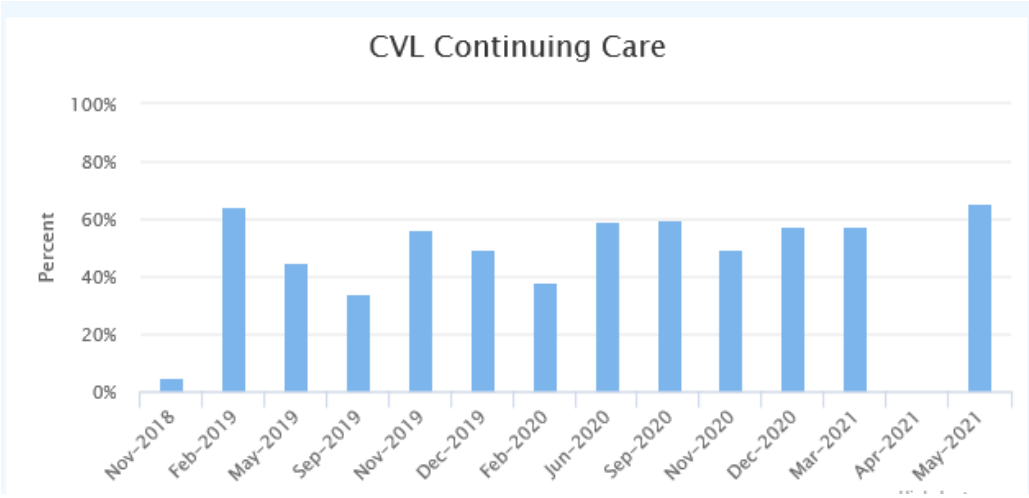
Feb-2020	600	405	68%
Jun-2020	616	499	81%
Sep-2020	483	396	82%
Nov-2020	340	253	74%
Dec-2020	324	282	87%
Mar-2021	686	580	85%

7.9 Action plans are live within the IPC dashboards and compliance is monitored through the directorate IPC meetings and the quarterly audit days.

Central Venous Line Ongoing Care

7.10 Audit of the Saving Lives HII CVL care bundle was performed monthly from all areas with frequent CVLs until Oct 2018. From Nov 2018 this was completed on a quarterly basis.

7.11 The graph and table below show the percentage compliance and numerical values for the past year(s).

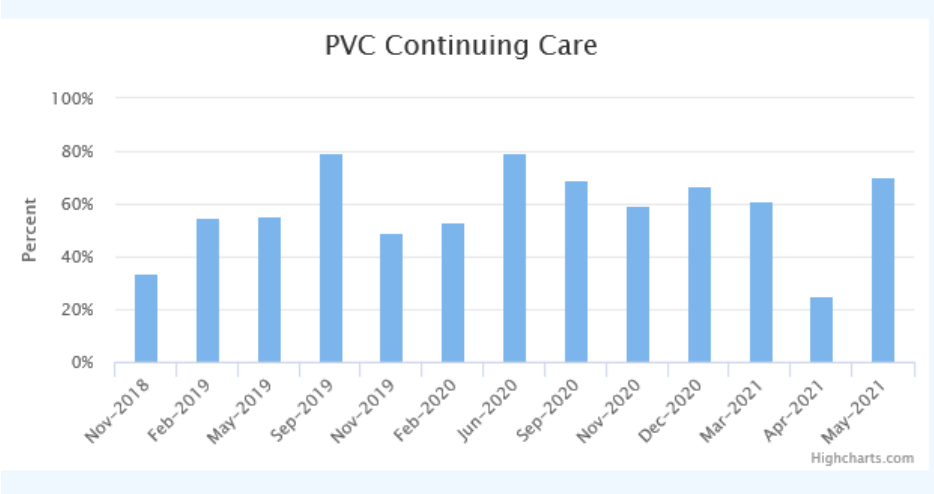


Jun-2020	104	62	60%
Sep-2020	95	57	60%
Nov-2020	50	25	50%
Dec-2020	45	26	58%
Mar-2021	104	60	58%

7.12 Compliance with this bundle has been poor since the introduction of the audit system but CVL line related infection remains static. Areas for improvement within the bundle lie mainly around the documentation of dressing changes and needle free connectors within Epic. Part of the work led by the IPC team in the IV working group will address the issues.

Peripheral Cannula Ongoing Care

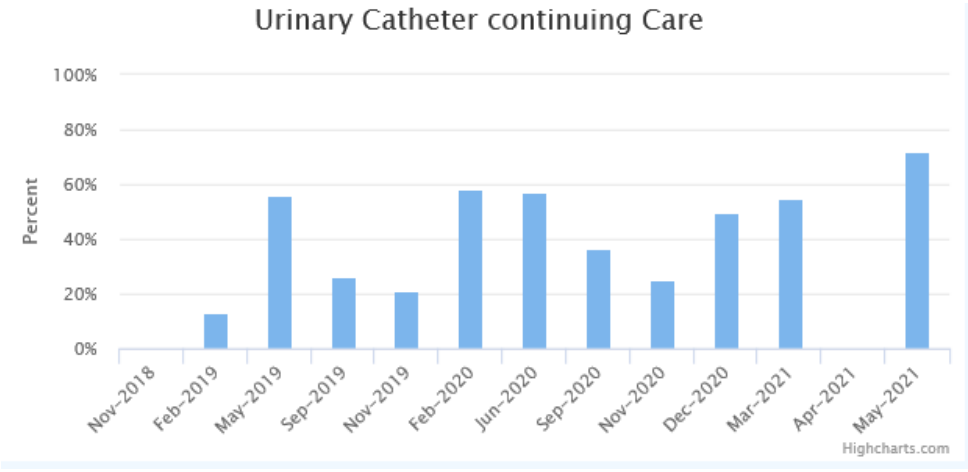
7.13 The graph and table below show compliance with the PVC continuing care bundle. Compliance has improved compared to 2019/20.



Jun-2020	49	39	80%
Sep-2020	49	34	69%
Nov-2020	47	28	60%
Dec-2020	30	20	67%
Mar-2021	69	42	61%

Urinary Catheter Ongoing Care

7.14 The graph and table below show compliance with the urinary catheter continuing care bundle. Compliance has improved compared to the previous year but work is still required. There is a high variance in compliance rates due to the small numbers of catheters.



Jun-2020	14	8	57%
Sep-2020	22	8	36%
Nov-2020	12	3	25%
Dec-2020	2	1	50%
Mar-2021	20	11	55%

Ventilator associated pneumonia / Ventilator associated events.
7.14 Care plans are in place in the ICUs for the reduction of risk of ventilator associated events but the ICUs do not undertake any systematic surveillance.

Surgical site surveillance
For the financial year 2020-21, spinal surgery has one full calendar year (2020) of data for all eligible identified procedures. All remaining surgical specialities will have no data and the reason is not having the system replacement project from the previous Surgical Site Surveillance System (S4)/PIMS to RLDatix/EPIC completed as initially expected by April 2019.

The data collected for the calendar year of 2020 is detailed below:

Spinal Surgery

Procedure	Lost to follow up	Parent Reported Infections	SSI			Annual total	Infection % **
			Superficial	Deep	Organ space		
All spines	0	0	3	1	0	107	3.7%
Posterior fusion	0	0	2	1	0	60	5%
Anterior fusion	0	0	0	0	0	3	0%
Hemi vertebrae/ decompression/ short fusion/ Kyphectomy	0	0	1	0	0	11	9%
Combined fusion	0	0	0	0	0	3	0%
Extension of fusion/revision	0	0	0	0	0	12	0%
Growth rod insertion:	0	0	0	0	0	3	0%

-traditional **-MAGEC** **-SHILLA**							
Growth rod lengthening: **-traditional**	0	0	0	0	0	5	0%
Growth rod revision: **-traditional** **-MAGEC** **-SHILLA**	0	0	0	0	0	10	0%

** It is important to highlight that the overall infection rate for the calendar year of 2020 includes all diagnosed SSIs (superficial, deep and organ-space) and all PRIs (Patient/Parent Reported Infection). PRIs are based on the answers given by the patient on the post-discharge questionnaire to assess either what the patient described and/or the treatment they were given was clear indicative of an SSI.

Please also note that -with the exemption of posterior spinal fusions- some infection rates for yearly reports could appear either considerably high or low due to small data sample size.

Cluster of infections in spinal implant surgery

The infection rate in spines for 2020 was 3.7%, this is an increase from 2019 (2.4%).

However, it is important to understand changes to the size of the population monitored in 2020 that might have slightly increased the overall infection rate compared to 2019. Due to the Coronavirus (COVID-19) pandemic outbreak during 2020, surgical lists had to be cancelled and/or reduced, causing a substantial decrease (35% constriction) in the total number of spinal patients operated (only 107 in 2020 compared to 165 in 2019). Therefore, infection rates for yearly reports could appear either considerably high or low due to abrupt data sample size changes.

In addition to this, the average infection rates for all spines 2019-2020 have been trending down when compared to the overall rate from previous years: 9.4% (2015), 7.4% (2016), 5.2% (2017), 7.5% (2018), 2.4% (2019) and 3.7% (2020). During the period 2015-2018, GOSH remained an outlier in comparison to other participating Hospitals through the PHE Surgical Site Surveillance programme.

Aims 2021-2022

- Monitor hypothermia and antibiotic prophylaxis
- To support further creation of Outcomes Hub SSI tabs

- To continue to work with the Infection & Prevention Control team, Epic and RLDatix teams during the duration of the Epic-RLDatix project to promote the replacement of the S4 system.

Neurosurgical surveillance

A total of **887** Neurosurgical procedures were performed within this period. The overall number of adverse events was **120** with an adverse event rate of **13.5%.**

The overall number of Infections was **29** and therefore infections make up **24.2%** of the adverse events. The overall Infection rate for Neurosurgical procedures during this time was **3.3%.** There have been no specific clusters of infections.

The sub-specialty breakdown of infections is as follows:

Craniofacial	7 events (in 5 patients)
Cranial Dysraphism	2 events
Epilepsy	2 events
Hydrocephalus	6 events
Neuro-Oncology	3 events
Spinal Dysraphism	7 events
Trauma / ICP	1 event
Vascular	1 event

We utilise a Grading system for reporting Complications in Neurosurgery and the number of infections as per this system is as follows:

Grade	**Superficial Incisional (SI)**	**Deep Incisional (DI)**	**Organ Space (Not GOSH Shunt)**	**CSF (Shunt)**
1 No increase in hospital stay or readmission	**4**			
2 Increase in hospital stay or readmission without neurological deficit	**9**	**5**	**7**	**3**
3 Reduction of GCS or neurological deficit			**1**	
4 Death				
Total	**13**	**5**	**8**	**3**

Service Developments

Oversight of SSI has been strengthened with regular meeting and input from IPC. A significant finding from an RCA prompted the stopping of using valve masks in neurosurgical theatres.

Plans for the coming year include:

- To continue with robust infection control data collection and continue with the RCA process
- To try and implement in neuro theatres, regular vigilance pertaining to timing of antibiotic administration in relation to the knife to skin
- To try and improve thermoregulation of patients in neuro theatres

Cardiac surgical site surveillance

As a specialty we undertook a total of 528 bypass and non- bypass cases in the past 12 months in patients 0-16 years of age. This is a slight reduction on the same age group the previous year (2019-2020= 578 cases), but is likely explained by the effects of COVID-19 on elective and emergency paediatric cardiac surgery. Last year's report included all surgical cases- not defined by age and was a total of 721 cases.

Surgical Site infection by type 2020-2021

	SII	DII	OS	SA
In Hospital	11	2	1	2
Out of Hospital	10	3	0	6
Total	21	5	1	8
Rate (N= 528) 0-16 years of age	4%	0.9%	0.18%	1.5%
2019-2020 Data	**SII**	**DII**	**OS**	**SA**
Combined total	5	4	1	7
Rate (n=721)	0.7%	0.55%	0.13%	1%

Classification of SSIs – surgical site infections according to PHE Criteria.
SSI – Superficial incisional infection; DII – Deep incisional infection; OS – organ space: PR – Patient (Parent) reported: SA – Stitch abscess (not a surgical site infection but also recorded).

The overall findings above would suggest a slight increase in 3 classification groups, most notably superficial surgical site infections. The reasons for infection are multifaceted and factors affecting this increase have been discussed in depth at the SSI meetings.

The SSI Officer post has not been filled for the past 18 months, limiting the collection of compliance data and systematic surveillance. There had been plans to recruit a new SSI officer into the vacant position at the beginning of 2020. However, due to COVID- 19, many resources and staff have been re- deployed both in and outside of GOSH, consequently this role remains vacant into this next year. As a result, the following compliance measure data has not been collected:

1. pre-operative wash
2. pre-operative antibiotics administered within defined knife to skin time
3. post-operative antibiotics according to protocol
4. MRSA swab result available before surgery – and taken within 30 days?
5. Follow up of 30 day surveillance calls

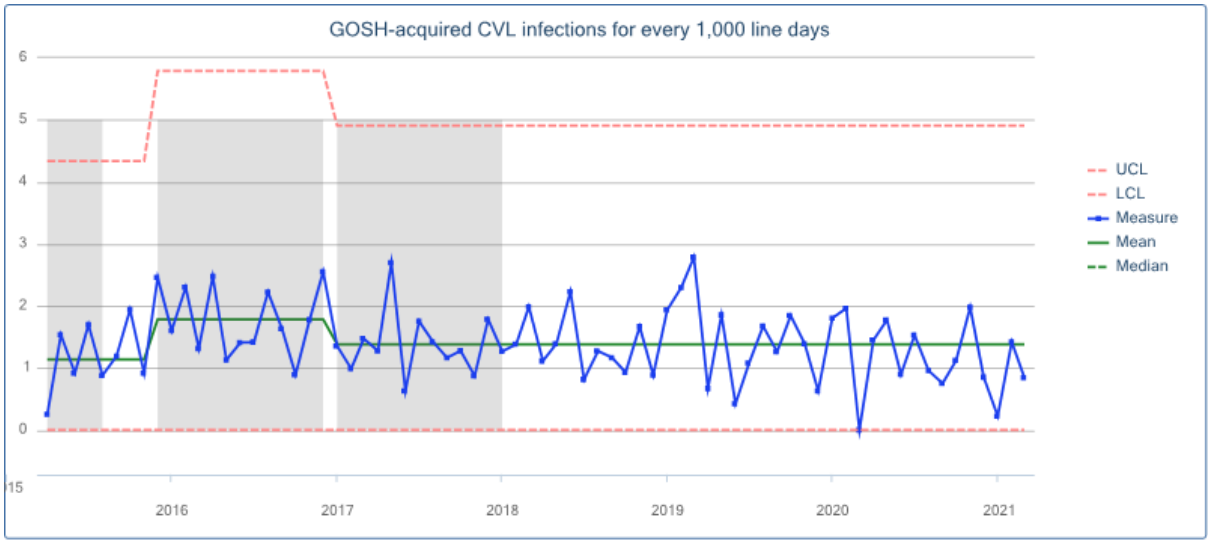
These measures are recognised factors in the reduction of surgical site infection, and with limited collection of this information we cannot assume that compliance is at desired levels.

In the next year, it is hoped that the RL SSI reporting software will be rolled out alongside the appointment of an SSI Officer and both will contribute to a reduction in surgical site infection. This is vital to the reliability and sustainability of SSI surveillance and for the service moving forward.

8. GOSACVCRB (GOS acquired CVC related bacteraemias ('Line infections')*

8.1 GOSH has been monitoring central line infection rates for a number of years, using a specific in house definition which dates back to pre- 'Matching Michigan'. Most recent year's data is shown below in table and SPC graph format and demonstrates a small reduction year on year.

Period	GOSACVCRB_No	Days Recorded	Rate	Rate_YtD
Year 15/16	75	51976	1.4	1.4
Year 16/17	87	52679	1.7	1.7
Year 17/18	82	50835	1.6	1.6
Year 18/19	82	52959	1.5	1.5
Year 19/20	73	56045	1.3	1.3
Year 20/21	63	53974	1.2	1.2



Ward location of children with a surveillance definition of a GOS acquired CVC RB:

8.2 Data in the table below splits the rate and numerical count of the line infections by ward. It also includes the number of line days collected by that ward which is now automated from the Electronic Patient Record (EPR).

Directorate	Ward	GOSACVC RB	Total LineDays 20/21	Rate 20/21
Blood, Cells and Cancer	ELEPHANT	3	3207	0.9
Blood, Cells and Cancer	FOX	2	2512	0.8
Blood, Cells and Cancer	GIRAFFE	1	1785	0.6
Blood, Cells and Cancer	HAEM CNTR			0
Blood, Cells and Cancer	LION	4	2739	1.5
Blood, Cells and Cancer	PELICAN	2	1677	1.2
Blood, Cells and Cancer	PELICAN AMB		63	0
Blood, Cells and Cancer	ROBIN	3	3472	0.9
Blood, Cells and Cancer	SAFARI		23	0
Body, Bones and Mind	CHAMELEON		2352	0
Body, Bones and Mind	EAGLE	1	1545	0.6
Body, Bones and Mind	EAGLE HAEMOD		432	0
Body, Bones and Mind	KINGFISHER			0
Body, Bones and Mind	MCU			0
Body, Bones and Mind	PANTHERURO		542	0
Body, Bones and Mind	SKY		751	0
Body, Bones and Mind	SQGASTRO	4	1936	2.1
Brain	KINGFISHER		90	0
Brain	KOALA	2	1560	1.3
Brain	POSSUM		177	0
Brain	SQENDOMET	1	1195	0.8

Heart and Lung	ALLIGATOR	6	2795	2.1
Heart and Lung	BEAR	5	3584	1.4
Heart and Lung	CATS		31	0
Heart and Lung	CICU	9	7091	1.3
Heart and Lung	KANGAROO	2	937	2.1
Heart and Lung	LEOPARD	2	2924	0.7
Heart and Lung	NICU		550	0
Heart and Lung	PICU	6	3342	1.8
Heart and Lung	RSU		37	0
International and Private Patients	BUMBLEBEE	3	1928	1.6
International and Private Patients	BUTTERFLY	4	4003	1
International and Private Patients	HEDGEHOG		65	0
Operations and Images	IR		1	0
Operations and Images	MSCB THEATRE			0
Operations and Images	NIGHTINGALE		1	0
Operations and Images	OBW THEATRE			0
Operations and Images	PICB THEATRE			0
Operations and Images	THEATRES		22	0
Operations and Images	VCB THEATRE		3	0
Sight and Sound	PANTHER	3	588	5.1

Organisms associated with GOSACVCRB

8.3 GOSH central line surveillance programme is important because it monitors over time the infection rates of those with central lines across the trust, not just in ICU's as some national programmes do.

8.4 In 2020/21 64 episodes have been called GOSACVCRB (compared with 86 in 2019/20).

8.5 The table below shows the breakdown of species cluster. The top 3 species clusters identified were Gram negative Rods of which klebsiella was the most frequently identified organism, Streptoccal genus of which enterococcus was the most frequently identified organism, and staphylococcus cluster of which staphylococcus were the most frequently identified organism.

Row Labels	2017/2018	2018/2019	2019/2020	2020/2021
ANO2	**1**		**2**	
Bacteroides	1			
Brevibacterium			1	
Clostridium			1	
FUNGI	**4**	**11**	**7**	**3**
Candida	4	9	7	3
Fungus		1		
Trichosporon		1		
GNC	**2**			
Moraxella	1			
Neisseria	1			
GNR	**16**	**19**	**27**	**27**
Acinetobacter			1	2
Citrobacter				4
Coliform	1			
Enterobacter	4	5	10	2
Escherichia	5	7	5	3
Gram		1		
Klebsiella	5	6	11	12
Morganella				2
Serratia	1			2
GPR	**2**	**4**	**5**	**1**
Bacillus	1	2	2	
Corynebacterium			1	
Lactobacillus			1	1
Microbacterium		2		
Rothia	1			
Tsukamurella			1	
PSEUDO	**6**	**7**	**7**	**14**
Achromobacter				1
Burkholderia				1
Pseudomonas	4	4	4	6
Stenotrophomonas	2	3	3	6
STAPH	**59**	**41**	**64**	**49**
Dermacoccus			1	
Gram				1
Kocuria			1	
Micrococcus				1
Staphylococcus	59	41	62	47
STREP	**18**	**21**	**18**	**19**
Abiotrophia		2		
Aerococcus				1
Enterococcus	11	13	14	14
Streptococcus	2	1		2
viridans	5	5	4	2
Grand Total	**108**	**103**	**130**	**113**

Other bacteraemia and sensitivity data.

8.5 Blood culture surveillance is complicated due to mixed cultures and difficulty defined clinical episodes. In the year 20/21 there were:

13 486 separate blood culture sets sent (11 516 in 19/20)
823 were positive (809 in 19/20)

8.6 Removing repeat isolates (same species within 14 days of initial) there were

548 new clinical episodes with (690 in 19/20)

8.7 Regular surveillance has been undertaken of crude bacteraemia episodes defined by any positive blood culture in a child.

GOSH CVC infection reduction programme.

8.8 The programme to reduce GOS acquired CVC related bacteraemias (GOSACVCRB; 'line infections') has used an improvement process based on the universal or focussed introduction of care components combined with continuous process and outcome audit. Initially the 'saving lives' standard care bundle was implemented across the entire trust and significant reduction in line infection rate was seen year on year. However, this did not reach zero.

8.9 The main control is implementation of the standard care bundle, which, despite continuous attention has not reached 100%.
Review of additional interventions was also undertaken and it was decided to introduce parafilm and biopatch in areas or situations associated with the greatest risk.

8.10 Compliance with good line care has decreased this year to 57% compliance from 72% in the previous year. A working group to create one IV guidleline for GOSH is underway, led by the IPC team. This project will also relaunch 'gloves off' in autumn 2021.

9. Wider Infection Prevention and Control Service

9.1 The services below all submitted full annual reports to the IPCC. Key achievements and areas of risk are identified and brought to attention within this annual report for review by the board.

Estates & Facilities (including Decontamination)

9.1 The report highlighted that water testing for legionella and pseudomonas aeruginosa did not take place for 6 months due to COVID. This is now re-established and a risk assessment is in place and under regular review to manage legionella within 2 clinical buildings and 1 non-clinical building.
9.2 The annual verification for specialist ventilation was not completed for all rooms that required air pressure testing and plating. An action plan is in place to rectify this.
9.3 Decontamination highlighted a new supplier had been tendered and awarded for the decontamination of theatre sets. MEDU & Endoscopy services had been brought in house as part of this tender, improving the service and providing a faster turnaround. The new MEDU unit also opened.
9.4 The cleaning service is being brought in house and a mobilisation project is underway to ensure risks around this process are minimised. PLACE did not occur due to the pandemic.

Antimicrobial Stewardship

9.5 Key achievements from the AMS team include the contribution to national pandemic response with development of national COVID-19 treatment guidelines.
Involvement in the COVID-19 Trust vaccination programme with development of vaccine governance structure and policy.
9.6 Switching to caspofungin as first line for antifungal for empirical treatment of suspected fungal infection in non-BMT patients with febrile neutropenia.
9.7 Completion of a laboratory based audit on detection of carbapenamases.

9.8 Key challenges and objectives include the development of a comprehensive antifungal treatment guideline and monthly fungal multidisciplinary team meeting.
9.9 Work towards automatic point prevalence data incorporated into directorate specific real time dashboards and ongoing audits on glycopeptide prescribing across the Trust.
9.10 The team continue working towards reduction of total antimicrobial consumption and evaluate the impact of COVID-19 on local prescribing

Sepsis

The sepsis programme in the trust was overseen by the Infectious Diseases Team for the time of this report. Issues remain with the reporting and management of sepsis within Epic, therefore a report was not able to be provided.

Occupational Health

The Occupational Health Service is an in house service. During 2020/21 OH screened 1,573 pre-placement forms and undertook 2,167 blood tests to ensure appropriate levels of immunity for new starters. A combined total of 163 employment required immunisations (excluding flu and Covid vaccines) were administered during 2020/21.

Influenza Vaccine

Final flu uptake figures for Healthcare Workers 2020/21 reached 71.6%.

Year	Percentage uptake of flu vaccinations for HCWs	Percentage increase/decrease
2015/16	48%	-
2016/17	62%	14% increase
2017/18	61%	1% decrease
2018/19	61%	0 change
2019/20	59%	1% decrease
2020/21	71.6%	12.6% increase

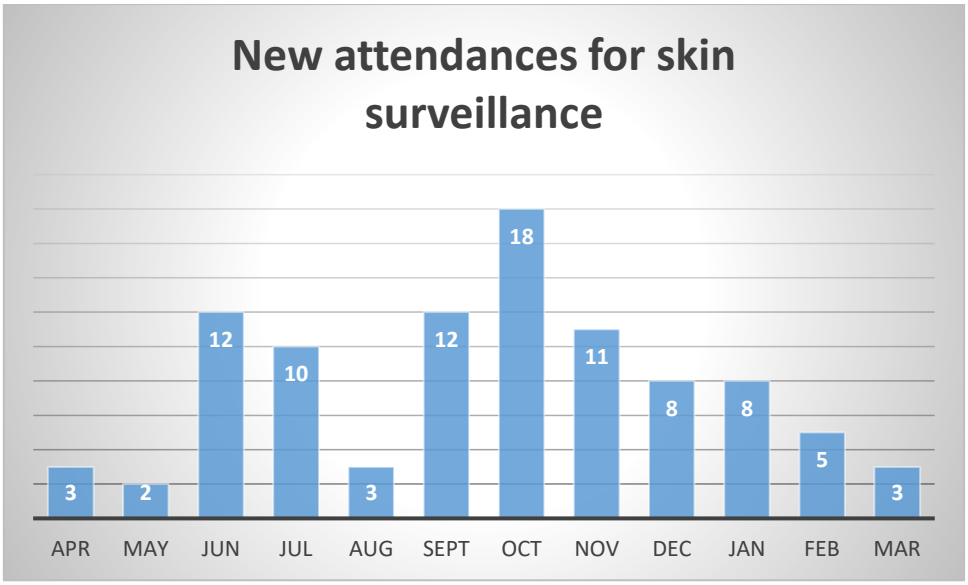
Exposure to Blood Borne Viruses

During 2020/21 there were 50 attendances at OH following a needlestick injury compared with 57 attendances for 2019/20, 65 attendances for 2018/19 and 91 attendances 2017/18.

The majority of incidents occur during disposal of the sharps. The number of needlestick injuries is continuing to reduce in line with the introduction of safer sharps within the Trust.

Skin Surveillance

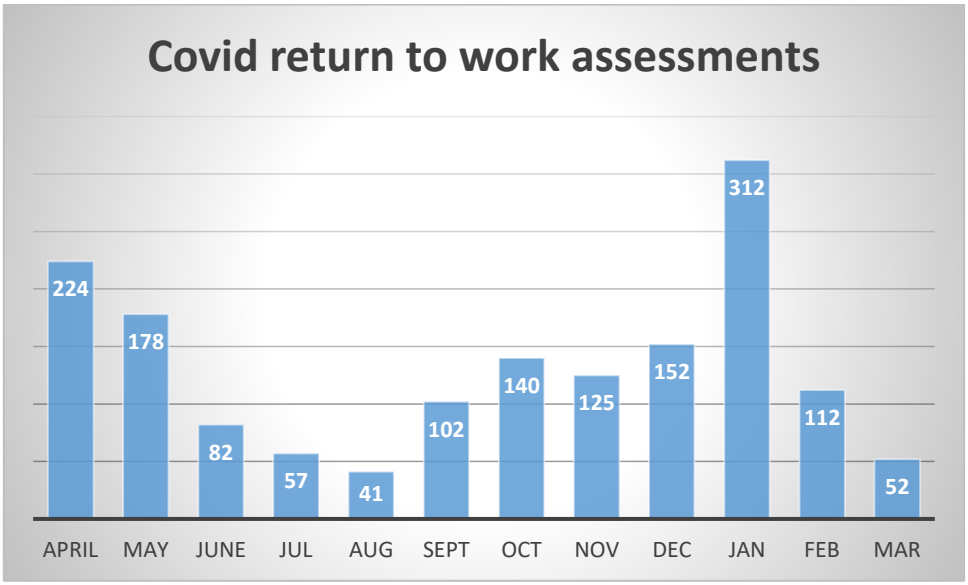
During the Pandemic, with the increased advice promoting frequent handwashing we had expected to see more staff referring themselves in to OH with sore hands; the introduction of wearing FRSM also led to OH appointments for staff who had a breakdown of skin associated to wearing masks and the impact that this warm moist environment had on skin integrity.



Covid 19

Post Covid return to work assessments:

Early on in the pandemic a return to work pathway was developed by IPC for those with symptoms or a positive PCR test. OH undertook return to work assessments for all employees who had been self-isolating with symptoms or a positive PCR. This process ensured that staff only returned once they were well enough to do so.



Covid Vaccinations:

October 2020 saw the announcement that a Covid Vaccine roll out would commence in December. The Trust responded by setting up a Covid Vaccination planning group to oversee the planning and implementation of clinics to deliver the vaccine to all the staff that wished to be vaccinated.

Alternative routes to the vaccination have been set up for staff still requiring their second vaccines and new starters yet to be vaccinated.

10. COVID-19 response and Board assurance Framework (BAF)

Effective infection, prevention and control is fundamental to our efforts to respond to the COVID-19 pandemic. The purpose of this report is to provide assurance that Infection Prevention and Control (IPC) Measures have been reviewed in light of changes in national guidance to support management of Covid-19. The report provides assurance that the Trust meets the required standards, and that where there are gaps in performance, assurance or mitigation there is a clear plan to manage this.

As our understanding of COVID-19 has developed, PHE and related guidance on required infection prevention and control measures has been published, updated and refined to reflect the learning. This continuous process will ensure organisations can respond in an evidence-based way to maintain the safety of patients, services users and staff.

NHS England developed and published a Board Assurance Framework to support providers to self-assess compliance with Public Health England (PHE) and other COVID-19 related IPC guidance. The use of the framework is not compulsory, but is a useful source of internal assurance to support organisations to maintain quality standards at this time.

The Assurance Framework was first published on 4th May 2020. There have been 4 further versions issued, most recently in February 2021. Use of the framework is not compulsory, however its use as a source of internal assurance will support the organisation to maintain quality standards.

Legislative Framework

The assurance framework is developed from the existing 10 criteria in the Code of Practice on the prevention and control of infection, which links directly to Regulation 12 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2014.

The other important legislation to note in this context is the Health and Safety at Work Act 1974 which places wide ranging duties on employers to protect the ' health, safety and welfare' at work of all their employees, as well as others on their premises, including temporary staff, visitors and the general public. The act also imposes a duty on staff to take reasonable care of health and safety at work for themselves and for others. Robust risk assessment is central to this. Where risk cannot be eliminated, it must be assessed, managed and mitigated. In the context of COVID-19 there is an inherent level of risk for NHS staff who are treating and caring for patients as well as for the patients themselves. All organisations must ensure that risks are identified, managed and mitigated effectively.

Response to SARS CoV2 (COVID-19)

A responsive IPC service has remained in place which has flexed up to cover 6/7 day a week service at the height of the pandemic. Essential IPC business has remained in place with quarterly audit days running and normal microbiology, virology and appropriate investigation of healthcare associated infections.

In addition to this guidelines, flowcharts, FAQ's and teaching sessions have been created and updated as guidance has been issued and subsequently amended in line with national policy. Testing has been established in the laboratory for symptomatic/asymptomatic patients, parents and symptomatic test. The significant increase in workload has led to an

additional band 8a lead practice educator joining the team and a band 7 IPC nurse post going out to advert.

Hospital Acquired COVID-19 Infections

There have been 18 COVID-19 infections in the Trust since March 2020 which appear to be healthcare associated. All hospital acquired cases were investigated by the IPC team. 11 of the 18 cases had confirmed positive parents, and this re-enforced the important of the hospital strategy to undertake parental screening as an important part of COVID-19 prevention.

The table below outlines the locations and dates of all infections over the course of the last year. There is no indication that these cases were linked.

Ward	Date of test	Days since admission tested positive	Classification
CHAMELEON	25/3/2020	61	Hospital-Onset Healthcare-Associated
ROBIN	01/04/2020	60	Hospital-Onset Healthcare-Associated
BUTTERFLY	06/04/2020	205	Hospital-Onset Healthcare-Associated
SQUIRREL ENDO/MET	09/04/2020	25	Hospital-Onset Healthcare-Associated
BUTTERFLY	28/04/2020	30	Hospital-Onset Healthcare-Associated
PELICAN	12/10/2020	11	Hospital-Onset Probable Healthcare-Associated
BUTTERFLY	15/10/2020	9	Hospital-Onset Probable Healthcare-Associated
EAGLE	23/10/2020	15	Hospital-Onset Healthcare-Associated
SKY	21/12/2020	7	Hospital-Onset Indeterminate Healthcare-Associated
BEAR	29/12/2020	15	Hospital-Onset Healthcare-Associated
KOALA	31/12/2020	4	Hospital-Onset Indeterminate Healthcare-Associated
SQUIRREL ENDO/MET	08/01/2021	12	Hospital-Onset Probable Healthcare-Associated
ELEPHANT	09/01/2021	69	Hospital-Onset Healthcare-Associated
SKY	15/01/2021	4	Hospital-Onset Indeterminate Healthcare-Associated
EAGLE	24/01/2021	18	Hospital-Onset Healthcare-Associated
BEAR	30/01/2021	13	Hospital-Onset Probable Healthcare-Associated
PICU	02/02/2021	9	Hospital-Onset Probable Healthcare-Associated

LION	05/02/2021	231	Hospital-Onset Healthcare-Associated

Staff Testing and Risk Assessments

Lateral flow testing was rolled out across the Trust in December 2020. Staff continue to be able to access PCR testing in line with our staff testing guidance. Positive results lead to a robust risk assessment process being undertaken by the Infection Control Team (rather than Occupational Health) to ensure that all potential exposures are identified and managed in a way that minimises risks.

Outbreaks

There have been 5 outbreaks between 1st April 2020 and March 2021. These were outbreaks amongst staff and they do not appear to have affected any patients directly.

The following services were affected:

Location	Number of positive staff	Reported externally?
Ventilation Technician Department (Heart & Lung)	3	Yes
MRI sedation service (Operations & Images)	3	Yes
Blood Cells and Cancer services	5	Yes
Recovery (Operations & Images)	2	Yes
Estates department	4	Yes

The review of the cases has identified the following themes:

- Use of rest and break spaces
- Social distancing and risk of not wearing of masks at all times when not alone (except when eating and drinking).

Fit Testing

Fit testing is recognised as a key element of protection for staff. This is all recorded on a central database. The key challenges which we have faced are around consistency in the brand/make of FFP3 masks supplied centrally, particularly where this has meant we need to re-fit-test all relevant staff. There has also been a higher failure rate in some of the masks provided through the central system. A dedicated fit testing testing operations 3 days a week providing fit testing to the organisation. A business case has been submitted to support a sustainable fit testing service going forward.

Infection Control Audits

The infection control team have continued the 'business as usual' approach to healthcare infections, and continue to run regular audits centrally as well as supporting infection control link audit days to ensure there is a continued focus on all aspects of infection control. There have been additional audits and programmes of work in response to COVID-19 including:

- Hands, Face, Space and Place Audits

Hands, Face, Space and Place audits have been running in the Trust since October 2020. The audits are undertaken across the trust by local teams with support from the Clinical Audit Manager, and there has been a high level of engagement across the hospital with daily updates on audit results on a daily basis during audit weeks. The last audit took place in January 2021. Comparative results are shown below. The next audit is due to take place in the week commencing 23rd March 2021.

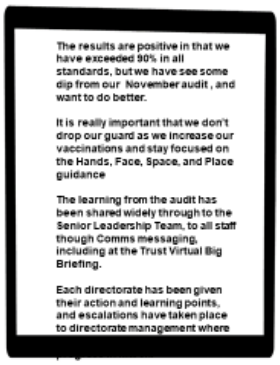
Hands, Face, Space, Place audit . January 2021

NHS Great Ormond Street Hospital for Children NHS Foundation Trust

This support our collective responsibility for keeping each other safe by meeting our Hands, Face, Space and Place guidance. We do this to check where we are , own solutions, and identify any themes that need attention.

Where we are

Area	14th and 15th October audits (49 audit)	Week of 19th October plus (164 audits)	Week of 23rd November (127 audits)	Week of 18th January 2021 (124 audits)
HANDS	74%	88%	94%	90%
FACE	77%	91%	93%	91%
SPACE	80%	87%	97%	90%
Place	100%	99%	100%	100%



- Break the Chain Week

The Infection Control Team developed and rolled out 'Break the Chain' week (running from 2nd – 6th November), which was focussed on educating staff around the Trust. Each ward had a Break-the-Chain Champion working in a supernumerary capacity to provide education and support to staff each day during the week. During this week, we initiated the traffic light bed side PPE posters to help staff quickly identify the PPE requirements required to care for that patient. Over 100 staff participated in the infection control focussed Little Room of Horrors in which teams were invited to try to identify all the infection control risks in the simulated clinical space.

- ICU Covid Testing Audit

Learning from incident reporting highlighted the need to ensure that all patients in the ICU areas have a repeat SARS-CoV2 test at the 3rd day/72hour point into their admission. This audit reviewed all ICU patients between 20th and 26th February 2021 to establish whether this is happening, and whether tests on admission are taking place. The audit found all patients were tested in line with the timeframes required.

- Red-Amber-Green Pathway Audit

In March 2021 the infection control team, and infection control link nurses undertook a series of audits. This included an audit of compliance with the Red-Amber-Green pathway. The audits are still being finalised but preliminary results show overall good compliance with the pathways.

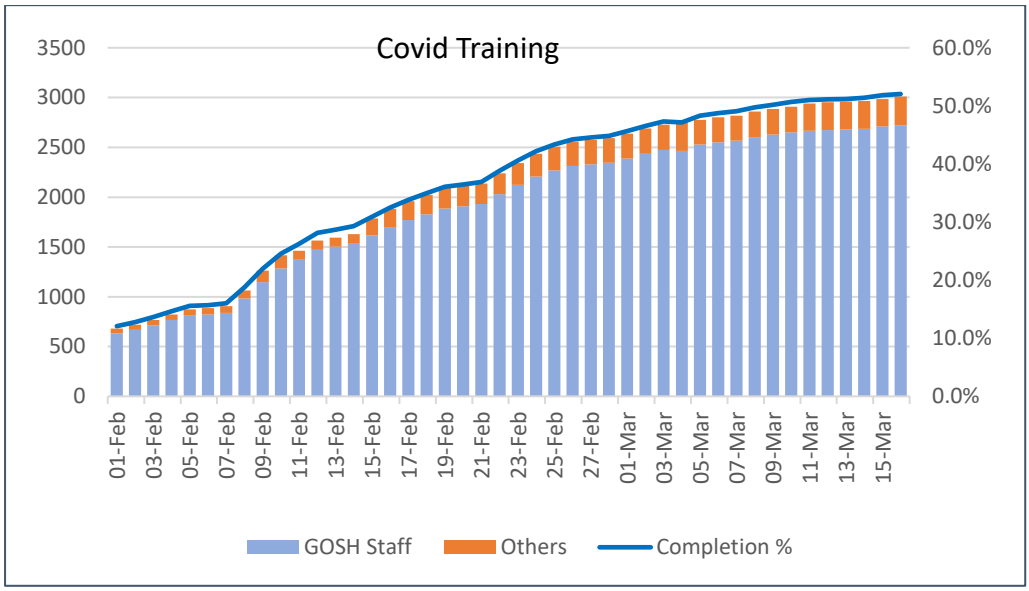
- Learning from Incidents

The Trust declared a serious incident following the identification of a neurosurgical site infection. The investigation identified the use of valved masks in the operating theatre as the most likely root cause. This finding has led to a national alert being issued about the risks of the use of these masks in theatres.

Covid-19 Mandatory Training

A new online training module was rolled out in January 2021 to support staff in understanding how to keep safe and manage infection control risks.

Uptake to date has been good, and this is reviewed regularly through the daily Sitrep report which is reviewed at Silver and Gold meetings.



Board Assurance Framework (BAF)

The BAF is a live document and has been presented regularly to the trust board and executive management team since it was published in May 2020. Based on our self-assessment against the Assurance Framework, we identified a programme of work to support further implementation and improvement in our ways of working in response to COVID-19. This programme of work is regularly updated and any gaps in compliance or areas of risk are highlighted appropriately.

The largest area of risk currently identified is the around the lack of assurance around ventilation within the organisation and the identification that not all standard bedrooms in the trust were commissioned to 6 air changes when they were opened despite them being designed to 6 air changes. An action plan and remediation plan is awaited from estates and an RCA is underway. Immediate risk mitigation was undertaken with COVID positive patients being looked after in Positive Pressure Ventilated Lobby's (PPVL) or other appropriate rooms and the fallow time being increased post aerosol generating procedures (AGPs).

Care Quality Commission (CQC)

The CQC carried out a virtual visit and review of evidence in the Summer of 2020. They were satisfied with our compliance to the national guidance and response to the BAF and raised no areas of concern.

11 Recommendation

The Trust Board is asked to receive this report and note the content.

Part B - Programme of work

New projects:

Programme of Work of new project	Lead	Time frame	Progress to date	Action required	Hygiene code
Set-up and establishment of Paediatric IPC module with university accreditation	Lead PE IPC	Sep 2021	Course approved, recruitment underway		1-10
Surveillance- creation of a trust wide surveillance oversight group which will monitor all aspects of the surgical pathway	IPC Team	Commence ASAP	Held up due to COVID-19	Yes	1, 6
Ventilation- the team will work closely with the estates/ commissioning teams to create a standard user manual relating to ventilation forward staff to use on occupation of wards	IPC team/ Commissioning	commence April 2018	Manuals and user guides in place on an ad hoc basis across the trust. Format and content to be standardised in 19/20 Delayed due to COVID-19	Yes	1, 9
Mobilisation of cleaning contract (in-house)	IPC Team	Commence April 2021			1,2
Review the electronic filing system to ensure the system is	IPC PA	Commence Aug 2018	Commenced and ongoing but delayed due to COVID-19	Yes	1

clearly labelled and data is robustly stored					
Surveillance- All required data reported to PHE. RCA's currently taking place for HCAI Staphylococcus aureus infections To be expanded to Gram negatives in 19/20	IPC team/ Divisions	Commence Summer 2019	Delayed due to COVID-19		1,3,5,8
Children's Cancer Centre- support the built environment with the design of CCC and decant and enabling works	IPC nurse for the built environment with support from IPC team	April 2021	Project re-commenced with regular meetings		2

Programme of work: Ongoing

Programme of ongoing Work	Lead	Time frame	Progress to date	Action required	Hygiene code
Audits- monitor wards/departments compliance with the annual audit plan for hand hygiene. Support divisions with improving compliance as and when needed.	IPC Team	On-going	Undertaken quarterly	No	1, 6, 9, 10
Audits- High impact and CVL infections are monitored on a monthly basis. Update the care bundles to reflect any improvements made in care since they were introduced	IPC Team	Ongoing	Undertaken quarterly	No	1, 6, 9, 10
Audits- conduct regular audits with the facilities and clinical users to assess the environment and standard of cleaning	IPC Team/Facilities	Ongoing	Undertaken quarterly	No	1, 2
Audit- the team/IPC Links will audit compliance against policies in place across the trust should be monitored through audit. Examples of this include the isolation audit.	IPC team	Completed as part of IPC Link audit days	Undertaken quarterly	No	1, 7

Training- The IPC team will monitor and feedback training compliance with level 1 & 2 training	IPC Team	On-going	Feedback monthly at IPCC	No	6
Information dissemination- The team will update/create patient/staff infection leaflets pertinent to infection prevention control	IPC team	On-going	Updated bi-annually	Yes- ensure up to date	3
Information dissemination- the team will review and update policy and guidelines to ensure they reflect new evidence and best practice	IPC team	On-going	Updated as required	Yes- ensure up to date	
Surveillance- The team will continue to report and collect information on mandatory surveillance categories required by PHE. Where the infections are healthcare associated a root cause analysis +/- RCA review meeting will take place.	IPC Team	On-going	Updated in and submitted to PHE **Targets for 21/22:** - Cdiff <7 - E-coli <8 - Pseudomonas aeruginosa <18 - Klebsiella sp <21	No	1, 5, 9
Work with the EPR teams to ensure the successful development and	IPC team/ EPR	Ongoing	Regular twice monthly meeting	No- ongoing	1, 2, 4, 9

rollout of EPIC and RL solutions					
Water management- the team will co-ordinate the testing and management of appropriate water outlets for pseudomonas aeruginosa and legionella in close collaboration with the estates department. In addition the team will access and provide guidance on any other waterborne pathogens which may cause disease in patients/staff.	IPC team	On-going	Monthly monitoring meeting and quarterly water safety group	No	1, 8, 9
Divisional IPC support- the team will provide infection control support to the divisions at divisional infection control meeting and on a day to day basis. In order to facilitate this the team will each lead on certain divisions.	IPC Team	On-going.	Monthly meetings	No	1