Sheffield Teaching Hospitals NHS Foundation Trust

Annual Infection Prevention and Control Report

April 2011 – March 2012

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. In addition to the 'normal' everyday challenges that occur year on year, *C.difficile,* influenza and norovirus were once again additional burdens.

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
- *Clostridium difficile* – *C.difficile*
- *Clostridium difficile* toxin associated diarrhoea - CDD
- Infection Prevention & Control, relating to a team, group, programme etc. - IPC
- Infection Control, relating to the title of team members – IC
- Department of Health – DH
- Director of Infection Prevention and Control – DIPC
- Health Care Associated Infection – HCAI
- Sheffield Primary Care Trust (PCT) also known as NHS Sheffield

Several Department of Health documents are referred to throughout this Report, the references for which are given here:

1. Saving Lives: A delivery programme to reduce Healthcare Associated Infection (HAI) including MRSA. http://webarchive.nationalarchives.gov.uk/20120118164404/http://hcai.dh.gov.uk/
2. NHSLA Risk Management Standards for Acute Trusts. NHS Litigation Authority http://www.nhsla.com/RiskManagement
3. Health and Social Care Act 2008: Code of Practice for the Prevention and Control of Infections and related Guidance http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_122604
4. *Clostridium difficile* Infection: How to Deal with the Problem http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_093220
5. Care Quality Commission registration Standards http://www.cqc.org.uk/sites/default/files/media/documents/gac_-_dec_2011_update.pdf
6. National Institute of Health and Clinical Excellence (NICE): PH36 Prevention and Control of Healthcare-associated Infection Guidelines http://www.nice.org.uk/nicemedia/live/13763/59578/59578.pdf
7. Guidelines for the management of norovirus in acute and community health and social care settings http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131639453

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 2011 to 31st March 2012. However where appropriate, data/ information have been included from April 2012 onwards although the majority of this will be reported in the 2012/13 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 Paul Zadik, Trevor Winstanley, Patty Hempshall and Mohammed Raza for providing data which have been included in various sections of this Report.

Dr C J Bates
Director of Infection Prevention and Control
August 2012

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. The documents that have been used to assess infection prevention and control services over the last few years are listed in this Section, including the Health and Social Care Act[3] and the Care Quality Commission Standards[5].The Trust has undertaken an in-house assessment of current compliance against these standards - see Section 3 of this Report.

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 D of this Report. In addition to the roles and responsibilities of the specialist IPC Team, those of the Communications Team, the Trust Governors 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 annual IPC Programme was written in a similar format to previous years and the process for monitoring progress during the year also remained largely unchanged. Each Group or Department completes a quarterly assessment form and returns this to the DIPC for review. Results of these reviews are reported at the quarterly IPC Committee, see Section 4 of this Report.

Section 3: Assessment of Progress in Respect of the Health and Social Care Act[3] and the Care Quality Commission Standards[5]

The Trust regularly reviews progress and compliance against relevant infection prevention and control standards and uses these assessments to develop and update the IPC Programme. Over the years the standards and tools used have varied depending on the national requirements and documents available. The current assessments are made using an in-house tool based on the requirements of the latest version of the Health and Social Care Act[3] and the Care Quality Commission registration standards[5]. The results of this self-assessment are given in this Section. All criteria have coded as Blue or Green. Overall the coding shows a small fall in percentage compliance to 94.78%. This is due to the integration of Community Services into the Trust. Work is ongoing to fully implement the governance and assurance structures already embedded in the rest of the Trust, within this Group. Actions required to further improve compliance form part of the Trust 2012/13 IPC Programme.

Section 4: Report on the Infection Prevention & Control Programme 2010/11

The main focus this year has continued to be the Infection Control (IC) Accreditation Scheme. 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. In addition, compliance with the Health and Social Care Act 2008[3], prevention and control of norovirus and

C.difficile, development and delivery of the infection prevention and control e-learning programme and beginning the process of integrating Community Services into the wider Trust, were key issues. Progress in respect of the Programme is detailed in this Section of the Report.

The Programme is divided into the following sections: 'IC Accreditation', 'Saving Lives Toolkit', 'Health and Social Care Act', 'Audit and Review', 'Ownership at Group, Directorate and Ward level', 'Decontamination of Medical Devices', 'Surveillance', 'MRSA', '*C.difficile'*, 'Influenza', ' Norovirus', 'Hand Hygiene', 'Management of Peripheral & Central Intravenous Cannulae', 'Environmental & Cleaning Issues', 'Education & Training' and 'Communication and Information'.

Progress in respect of the Programme was assessed quarterly by completion of Performance Assessment Forms. These assessments were reviewed by the DIPC and each area coded Red, Amber, Yellow, Green or Blue depending on progress made, Table 1 summarises the results.

In summary:

- Coding was as follows: Blue 95-100% of the IPC Programme completed, Green 90-94%, Yellow 80-89%, Amber 65-70% and Red <65% or no return received
- All areas made significant progress during the year
- No areas coded as Red or Amber at any point during the year
- All areas coded as Yellow, Green or Blue at the end of the year.
- The major reason areas were not coded as Blue at the end of the year was that some non-ward areas are still to achieve IC Accreditation. In addition some areas struggled to consistently undertake the quarterly antibiotic prescribing audits that were introduced during the year.

Section 5: Key Indicators

The following key indicators have been used to monitor the quality of the Infection Prevention and Control (IPC) Service for April 2011 to March 2012:

- Progress in respect of the Trust IPC Programme - See Section 4 of this Report
- Compliance against the Heath Act[3] using the Care Quality Commission Standards[5] - See Section 3 of this Report
- Total number of new meticillin resistant *Staphylococcus aureus* (MRSA) cases detected by the Trust laboratories – See Sections 6.5 to 6.7 of this Report.
- Number of *Clostridium difficile* toxin associated diarrhoea (CDD) episodes within the Trust – See Sections 7.2 to 7.3 of this Report
- Results of the mandatory Department of Health surveillance schemes
    - Serious clinical incidents related to infection – Only one incident was reported, see Sections 5.7 to 5.8 of this Report
    - MRSA bacteraemia - See Sections 6.8 to 6.14 of this Report
    - CDD infections - See Sections 7.4 to 7.9 of this Report
    - Glycopeptide resistant enterococcal bacteraemia - For Oct 10 - Sep 11 the STHFT total was 3. This placed the Trust 4th out of the 25 Acute Teaching Hospital trusts in England
    - Surveillance of infections in patients undergoing surgery for fractured neck of femur was undertaken during April to June 11. The Trust infection rate was 9%. The national average for this procedure was 2%. A review of the data showed that the patients treated within the Trust were older and had more underlying health issues than the national average. This may partly explain why the infection rate locally was higher than that generally seen nationally. However, the rate was a cause of concern and a multi-disciplinary review

was undertaken of the care provided to this group of patients to determine if any changes in practice were required. Overall, there did not appear to be a clear reason for the infection rate and a package of measures designed to optimise care for patients in relation to a number of issues was implemented. Early indications are that the infection rate has reduced significantly. Follow-up surveillance has taken place during the April to June 2012 quarter, the results of which will be reported in the 2012/13 Report.

- *Staphylococcus aureus* (*S.aureus*) bacteraemia – Overall the number of *S.aureus* bacteraemia episodes has continued to fall. Pleasingly there was a 19% fall in MSSA cases in 2011/12 compare to recent years including a 21% fall in episodes categorised at hospital attributable. Since 2001, it has been mandatory to report MRSA bacteraemia to the DH. This scheme was extended to include MSSA as from January 2011. The first MSSA bacteraemia rates for trusts across the country were published in June 2012. These showed that the Trust performed relatively poorly compared to other teaching hospitals, coming 19th out of the 25 trusts in this category. The reasons for this situation are not immediately apparent. The IPC Team have reviewed the data collected to date and began to produce an action plan to address the issues identified.
- *Escherichia coli bacteraemia* - Overall the number of episodes recorded has risen by 4.6% compared to last year. However the proportion of episodes that are community acquired (36.42), healthcare associated (26.49) or hospital acquired (34.93) has remained relatively static; please see page 28 for episode definitions. Overall this year, 14.7% of strains were ESBL producers. This is a significant rise compared to the last two years (7.8% and 7.1% respectively). The percentage of local isolates that were ESBL producers from community acquired cases was 11.36, healthcare associated cases 21.87 and hospital attributable cases 12.8. It is not entirely clear why healthcare associated cases should have such a high level of resistance compared to community and hospital attributable cases. The Health Protection Agency report that in 2011, 11% of blood culture isolates of *E.coli* were ESBL producers nationally. This would indicate that local figures for community and hospital attributable cases are in line with national averages, with the healthcare associated figure being an outlier. Surveillance of *E.coli* bacteraemia became part of the Department of Health national mandatory surveillance scheme from June 2011 onwards. Data from this scheme is not available at present so it is not possible to compare local data from this scheme with that observed elsewhere.

Section 6: Meticillin resistant *Staphylococcus aureus* (MRSA)

Overall, the number of new cases of MRSA infection or colonisation continues to fall year on year. This is despite a continued increase in the amount of MRSA admission screening undertaken during this time period. The majority of new cases are detected on admission.

The number of episodes of Trust attributable MRSA bacteraemia during 2011/12 was 2. It is pleasing to note that the Trust once again has the lowest rates for MRSA bacteraemia amongst the 25 Acute Teaching Hospitals in England. The average rate of MRSA bacteraemia episodes per 100,000 bed-days across all trusts within England was 1.3 compared to the Trust rate of 0.3.

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 root cause analysis tool is used to identify any actions required to improve practice and action plans produced to implement these. The results of these meetings are copied to NHS Sheffield who

monitor the Trust's performance in this regard.

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.

The comprehensive Trust MRSA screening programme continues. Compliance against the MRSA screening protocols has been reported to NHS Sheffield on a monthly basis; compliance is consistently above 100%

Section 7: *Clostridium difficile* toxin associated diarrhoea (CDD)

Overall, comparing 2011/12 with 2010/11 there has been a 10% decrease in the number of CDD episodes detected in patients within the Trust. This follows reductions of 4%, 21% and 46% in the past three years. This data relates to all episodes detected in patients within the Trust and will include both 'Trust attributable' and 'not Trust attributable' cases.

The number of 'Trust attributable' CDD episodes detected in 2010/11 has fallen by 3% compared to last year. This follows reductions of 9%, 24% and 48% in the past three years.

Whilst it is pleasing to note the continued fall in the number of cases detected, the year on year percentage reduction is decreasing. This is not unexpected in that the main package of actions and initiatives designed to combat *C.difficile* was rolled out in 2008/09 and these will have had their main effect in the years immediately following their introduction. In addition to the challenge of the plateauing in the number of cases from a purely local and clinical point of view, the continued expectation by the DH that further significant reductions were possible was reflected in the targets set for 2011/12. For 2011/12 the DH set a target of a further 27% reduction on the 2010/11 outturn to be attained within one year. This was obviously going to be a difficult challenge

The Trust target for 2011/12 was 134 episodes. The actual number recorded was 178, meaning the Trust did not achieve the reduction target. This was obviously disappointing.

The Trust response to this situation, the subsequent Action Plan and the outcome of the actions taken is summarised in Sections 7.10 to 7.22 of this Report. The vast majority of the actions within the plan were completed by the end of 2011/12 or are on-going. Many actions took a number of weeks or months to instigate. The financial investment required to implement the action plan was considerable and in excess of £1 million. Implementation of the Plan commenced in early June but, as predicted, the number of cases of CDD did not begin to fall significantly until several months later, see Table 15. Given the performance early in the 2011/12 period, it was not possible for the Trust to attain the DH target of 134. However from October onwards, the Trust was in run-rate balance with the target.

Altogether, the reversal of the upward trend in the number of cases of CDD, followed by a significant reduction, is a great achievement. It is due to a great deal of hard work by clinical, infection prevention and control and managerial staff plus and the ongoing commitment and support of the Governors' Council and the Board of Directors; all concerned should be congratulated. In particular those involved in the rolling deep clean programme should be mentioned as this initiative took, and continues to take, a great deal of hard work to implement. To that end I would like to thank the Domestic Services staff, in particular the deep clean teams, and the IPC

Nurse Specialists and Assistants. Without their hard work and determination the deep clean programme would not have been possible. The challenge for 2012/13 will be to sustain the improvements made during 2011/12 and if possible achieve further reductions.

All cases of CDD are taken extremely seriously and the IPC Team undertake regular reviews of each individual patient with this infection to ensure their care is optimised. Data are collected on an on-going basis and where clusters of cases occur, the Infection Prevention and Control Team undertakes a review. This review includes details of each case including where they were nursed, whether they were in contact with other cases and the antibiotic therapy they had received. In addition, infection prevention and control procedures in the area concerned are reviewed. Action is then taken depending on the findings of this review. Details of surveillance and follow-up of CDD infections can be found in this Section together with a number of action points. These include the on-going work being undertaken in relation to cleaning and disinfecting the environment, laboratory testing and antibiotic prescribing. The specialist unit to care for patients with *C.difficile* infection situated on Robert Hadfield 4 at the Northern campus continues to function. The unit continues to be a great success with positive feedback received from both patients and their relatives.

Section 8: Outbreaks, Major Incidents and Complaints

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'. The IPC Team always aims to control an outbreak by causing the minimal disruption 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.

In summary, this year at least 1333 patients and 121 staff have been involved in clusters or outbreaks and at least 1932 bed-days lost. The majority of these incidents were due to Norovirus.

One serious infection related incident was reported this year. This was reported to the Lead Commissioners for the Trust (NHS Sheffield) who monitored the Trust's response; see Sections 5.7 to 5.8 of this Report.

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:

- Lack of awareness by a patient of their MRSA status – proved to be due to lack of communication by the patient's General Practitioner
- Concern regarding the overall care of a patient following a fall and subsequent surgery including some aspects relating to infection
- Concern regarding the overall care of a patient with malignancy including some aspects relating to infection – this was in 1999 so a detailed investigation was not possible
- A delay in availability of a norovirus result
- Confusion between wards as regards the norovirus status of a patient
- Incorrect labelling by the ward of a sample that grew MRSA causing confusion as to how to manage the result

- Alleged inappropriate transfer of a patient to another hospital as the patient had possibly been exposed to norovirus – this proved to be inaccurate
- Incorrect labelling of a patient's notes in respect of their MRSA status
- Staff member entering a zone that had been cordoned off as hydrogen peroxide vapour misting was underway – the staff member was unharmed
- Injury to IPC Team members whilst training other staff (two)
- Alleged acquisition of MRSA within the Trust (two)
- Possible Listeria acquisition within the Trust
- Possible Scabies acquisition within the Trust
- Possible *Clostridium difficile* acquisition within the Trust
- Alleged acquisition of Norovirus within the Trust
- Sewage leaks due to blocked pipework (five)

The STHFT takes seriously any complaint of acquisition of an organism whilst a patient is being cared for within the Trust. Appropriate lessons learnt from the investigations into these cases are taken on board. However, for some of the cases mentioned above, investigations revealed that it was unlikely that the organism had been acquired within the Trust or that an alternative source was equally probable.

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 9: Antibiotic Resistance

Local antibiotic resistance rates generally compare well to those seen nationally. However, resistant *Staphylococcus aureus*, *Enterococcus spp. Streptococcus pneumoniae* and 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 does not increase further.

Section 10: Influenza

Influenza activity increases each year during the autumn and winter months, with the predominant strains varying from year to year. Overall the Trust laboratories tested 7129 samples for influenza of which 418 (5.8%) were positive. The total number of STHFT in-patients with confirmed influenza was 203. Sadly 15 individuals died. Relatively few staff became ill with influenza and staff absence did not significantly affect the day to day running of the Trust.

The Trust Influenza Planning and Steering Group met regularly over the autumn and winter to review guidance from the Department of Health and Health Protection Agency and to implement this as necessary. The group updated the Trust seasonal influenza protocols for managing patients with suspected and confirmed influenza and advised on a range of strategic and operational issues relating to this infection.

Although activity was lower than last year, the impact was more severe due to the timing of these cases. Usually the influenza season occurs from November to January but this year the majority of cases occurred between the end of January and the end of March 2012. This coincided with the peak in the number of cases of norovirus and resulted in a challenging situation in respect of patient placement and infection prevention and control management.

Overall, front line staff and the Infection Prevention and Control Team were able to manage the situation in such a way as to minimise disruption to normal Trust business. It should be noted that even though Trust business generally continued unabated the impact on specific individuals and groups of staff was considerable. The following departments 'bore the brunt' of the impact: Virology, Infection Prevention and Control, Clinical Operations, Infectious Diseases, Supplies, Critical Care, Medical Emergency Admissions, Accident & Emergency and Occupational Health.

Section 11: Norovirus

Norovirus once again affected the Trust during 2011/12 and, as in previous years, the Trust followed national guidance as to how to manage the situation. This included the updated guidance on managing norovirus in healthcare settings[7] which was published in November 2011. One of the more significant changes in the updated national guidance[7] is the recommendation that, when cases of norovirus are suspected or confirmed, initial management should concentrate on bay by bay closure rather than early full ward closure. Details of the Trust strategy can be found in previous year's Reports. The Trust's strategy already included most of the recommendations within the updated guidance[7] including the use of bay by bay closure rather the full ward closure. However, attempts were made to widen this practice, where appropriate.

During 2011/12, 109 norovirus clusters/outbreaks were detected involving 923 patients and 85 staff. At least 1932 bed-days were lost. The number of clusters and patients affected was higher than last year although less than 2009/10. The norovirus activity seen within the Trust varies year by year and generally reflects activity in the community.

Overall, norovirus has once again been the infection which has had the most significant impact on the Trust's ability to provide quality and timely care to patients. Addressing this will continue to be a key issue for the coming year. Although this situation is not confined to Sheffield, indeed this is a national problem, the Trust has identified trying to improve the situation as the one of the infection prevention and control priorities for 2012/13. Norovirus will be one of the issues the Winter Planning Group will take into account when planning for the coming year.

Section 12: Conclusion & The Future

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. Preventing and controlling infection is an on-going issue for any healthcare establishment and STHFT is no exception in this respect. 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.

Section 2

Infection Prevention and Control Service

2.1 2011/12 has once again been a busy year for the STHFT Infection Prevention and Control (IPC) Service with challenges and opportunities occurring throughout the year.

Health and Social Care Act[3] and Assessment of the IPC Service

2.2 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.

The Health and Social Care Act[3] remains the main national standard for infection prevention and control services. This document is used as the basis for assessment of trusts by a number of bodies, including the Care Quality Commission, and trusts are encouraged to use it as the basis for their infection prevention and control programmes. The IPC Team continues to review the latest version of the Act[3] to ensure the STHFT IPC Service and Programme are as compliant as possible with current requirements.

Similarly, registration with the Care Quality Commission (CQC) requires compliance with Outcome 8 of the registration standards[5]; Outcome 8 relates to infection prevention and control.

In November 2011 the National Institute of Health and Clinical Excellence (NICE) published a document[6] containing guidance on how trusts might assess the quality of their infection prevention and control service. In many respects this document reflects the standards within the Health and Social Care Act[3]. The Trust has for a number of years undertaken an in-house review of compliance against the Health and Social Care Act[3] and the Care Quality Commission Standards[5] by using an in-house tool. The Trust has decided to continue to use the in-house tool but will from time to time use elements of the NICE guidance as appropriate. The most recent review can be found in Section 3 of this Report

2.3 The major standards against which the IPC Service is currently judged are:

- Saving Lives – A Delivery Programme to Reduce Healthcare Associated Infection including MRSA[1]
- NHS Litigation Authority Standards[2]
- Health and Social Care Act 2008: Code of Practice on the Prevention and Control of Infections and Related Guidance[3]
- *Clostridium difficile*: How to Deal with the Problem[4]
- Care Quality Commission Registration Standards[5]
- National Institute of Health and Clinical Excellence (NICE) guidance on prevention and control of healthcare-associated infection[6]

2.4 The Care Quality Commission aims to visit all trusts regularly, the frequency and timing being based on a risk assessment. The Commission last inspected STHFT in respect of infection prevention and control standards in January 2010; Section 4 of the Trust 2009/10 Report summarises their findings.

Structure of the STHFT IPC Service

2.5 The current STHFT IPC Service structure can be found in Appendix D of this Report.

2.6 The Executive Lead for infection prevention and control continues to be the Chief Nurse/Chief Operating Officer, Hilary Chapman. The Deputy Chief Nurse, Chris Morley, manages the IPC Service in conjunction with the Lead Infection Control Nurse Specialist, Patty Hempshall.

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

2.8 Elizabeth McLellan and Helena Parsons continue to undertake the roles of operational IC Doctors for the Central and Northern campuses respectively. Dave Partridge and Sarah Thompson undertook many of the operational IC Doctor duties for the Central campus whist Dr McLellan was on leave. Mohammed Raza continues as the consultant virologist with responsibility for virological aspects of infection prevention and control across the Trust.

2.9 Patty Hempshall continues as the Lead IC Nurse Specialist with a team of nine IC Nurse Specialists. Due to changes in the workload on the various sites across the Trust, it was felt appropriate to restructure the team and appoint a site Lead IC Nurse Specialist for the Northern campus. Rachael Duckworth acted up into this post during the year and was subsequently appointed to the substantive post in June 2012. Team members have rotated across the Trust during the year to enable 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 the campuses.

During the year many of the services provided in the community under the auspices of NHS Sheffield, were transferred into the STHFT. These services are now known as the Primary and Community Care Group within the Trust and work is ongoing to integrate them into the existing Trust structures. This includes the infection prevention and control elements of the care provided by this Group. The IC Nurse Specialists working in this sector, Katie Grayson and Diane Allender, have therefore become part of the Trust IPC Team. A key element of the 2012/13 IPC Programme will be determining how the existing infection prevention and control strategy and initiatives apply to the Primary and Community Care Group.

2.10 The nine IC Assistants continue to play a key part in delivering the IPC agenda. These individuals specifically concentrate on issues relevant to the prevention and control of MRSA and CDD including optimising decolonisation regimens, MRSA screening, ward inspections, audit of infection prevention and control practice e.g. hand hygiene, environmental cleaning and decontamination, including the use of hydrogen peroxide vapour technology.

2.11 The two antibiotic pharmacists continue to work with the IPC and Microbiology Teams. These individuals concentrate on optimising the antibiotic prescribing polices in conjunction with Dr E Ridgway and the two operational IC Doctors. In addition, work is continuing on the antibiotic prescribing web-site and regular audits of prescribing practice against the Trust antibiotic policies and guidelines are undertaken.

2.12 Glenn Radford continues as the IPC Systems Manager. His role is to work with the IPC Team to develop information systems and optimise the reporting of data to staff, patients and the public. Significant progress has once again been made this year.

2.13 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. Infection prevention and control data and issues form part of the monthly reports in the Team Brief and features are regularly included in Link, Primary Link and Good Health. In addition, they are involved in leading the communication of various infection prevention and control initiatives throughout the Trust. During 2011/12 they assisted the IPC Team by arranging the purchase of some display banners informing the public about infection prevention and control.

2.14 The Trust Governors continue to contribute to the work of the IPC Service. Their key role, along with the IPC Team, is to ensure that the Service is in line with the wider Trust agenda and that the patient and public perspective is taken into account. Anne Eckford and Graham Thompson are the Governors who specifically undertake this role which includes them being members of the IPC Committee. Their help and assistance continues to be extremely valuable. 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.

<u>Ownership of infection prevention and control at a clinical level</u>

2.15 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.

2.16 Infection prevention and control continues to be increasingly embedded into the Trust Healthcare Governance system with the IC Accreditation scheme linking up with the Trust Clinical Assurance Toolkit. Participation in the IC Accreditation Scheme has now been extended to all in-patient and out-patient wards and departments.

2.17 The annual IPC Programme was written in a similar format to previous years and the process for monitoring progress during the year also remains largely unchanged. Each Group or Department completes a quarterly assessment form and returns this to the DIPC for review. Results of these reviews are reported at quarterly at the IPC Committee and Healthcare Governance Committee, see Section 4 of this Report.

Section 3

Assessment of Progress in Respect of the Health and Social Care Act[3] and the Care Quality Commission Standards[5]

3.1 The Trust regularly reviews progress and compliance against relevant infection prevention and control standards and uses these assessments to develop and update the IPC Programme. The current assessments are made using an in-house tool based on the requirements of the latest version of the Health and Social Care Act[3] and the Care Quality Commission registration standards[5]. The self-assessment tool is divided into ten Criteria, each with a list of actions/ targets. A score is allocated to each of these actions and a balanced scorecard generated. Each duty is then colour coded:

Blue	95-100%	Full compliance
Green	70-95%	Action required
Amber	50-70%	Urgent action required
Red	=<49%	Trust priority

3.2 The annual self-assessments undertaken in June 2007 to 2011 are recorded in previous year's Reports. The overall codings for these years shows year by year progress in compliance, 71%, 87%, 91%, 93% and 97% respectively.

3.3 The results of the self-assessment carried out in June 2012 show overall compliance at 94.78%. All Criteria have coded as Blue or Green. Overall the coding shows a small fall in compliance. This is due to the integration of the Primary and Community Care Group into the Trust. Work is ongoing to fully implement the governance and assurance structures already embedded in the rest of the Trust, within this Group. Specifically, it is the need to have assurance for the standards of cleanliness and maintenance in the multiple locations that this Group uses, rather than any concerns about clinical or infection prevention and control practice. Actions required to further improve compliance form part of the Trust 2012/13 IPC Programme.

Figure 1
STHFT Saving Lives Balanced Scorecard - June 2012

Criterion 1	Criterion 2	Criterion 3
Systems to manage and monitor the prevention and control of infection (99.21%)	Provide and maintain a clean and appropriate environment (70.71%)	Provide suitable accurate information on infections to service users and visitors (100%)
Criterion 4	Criterion 5	Criterion 6
Provide information on infections to those providing further nursing/medical care (100%)	Identify those with an infection and provide appropriate treatment /care to reduce the risk of spread (100%)	Staff are fully involved in preventing and controlling infection (100%)
Criterion 7	Criterion 8	Criterion 9
Isolation facilities (100%)	Laboratory support (100%)	Infection Prevention and Control Policies and protocols (84.52%)
Criterion 10		Overall Status
Healthcare workers are free of and protected from exposure to communicable infections during the course of their work and that all staff are suitably educated in the prevention an control of HCAI (93.33%)		94.78%

Section 4

Report on the Infection Prevention & Control Programme April 2011 - March 2012

4.1 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.

4.2 The main focus this year continued to be the Infection Control (IC) Accreditation Scheme. Most of the other activities relate to this Scheme by either being an integral part of it or via audit, ownership etc. In addition, compliance with the Health and Social Care Act 2008[3], prevention and control of norovirus and *C.difficile*, development and delivery of the infection prevention and control e-learning programme and beginning the process of integrating Community Services into the wider Trust. The Programme is divided into the following sections:

- Infection Control Accreditation
- Saving Lives Toolkit
- Health and Social Care Act
- Ownership at Group, Directorate and Ward level
- Audit and Review
- Decontamination of Medical Devices
- Surveillance
- Communication and Information
- Meticillin resistant *Staphylococcus aureus* (MRSA)
- *Clostridium difficile* (*C.difficile*)
- Influenza
- Norovirus
- Hand Hygiene
- Management of Peripheral and Central intravenous cannulae
- Environmental and Cleaning Issues
- Education and Training

4.3 Progress in respect of the IPC Programme was assessed quarterly 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 or Blue depending on progress made, see Section 4.4 and Table 1 below. The full IPC Programme, including the quarterly assessment forms, can be found on the Infection Control web-page on the Trust intranet. The main body of the Programme can also be found on the Trust internet site.

4.4 In summary:

- All areas made significant progress during the year
- No areas coded as Red or Amber at any point during the year
- All areas coded as Yellow, Green or Blue at the end of the year.
- The major reason areas were not coded as Blue at the end of the year was that some non-ward areas are still to achieve IC Accreditation. In addition some areas struggled to consistently undertake the quarterly antibiotic prescribing audits that were introduced during the year.

Table 1

Assessment of Progress in respect of the 2011/12 IPC Programme

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
South Yorkshire regional Services				
• Renal	99%	99%	99%	98%
• Cardiac	95%	95%	95%	95%
• Vascular	95%	97%	96%	94%
Emergency Care Group				
• Diabetes and Endocrinology	92%	93%	93%	92%
• Respiratory	89%	91%	91%	91%
• Gastroenterology	97%	96%	96%	97%
• Emergency Care	94%	93%	94%	94%
• Geriatric and Stroke Medicine	94%	93%	95%	95%
Head & Neck Services	99%	98%	99%	99%
Specialised Medicine & Rehabilitation				
• Infectious Diseases	96%	98%	98%	97%
• GUM	99%	99%	99%	99%
• Rheumatology/O Day ward	99%	99%	99%	99%
• Dermatology	95%	97%	99%	99%
• Metabolic Bone	99%	99%	99%	99%
• Haematology - Wards & Haemophilia	99%	99%	98%	99%
• Immunology	99%	98%	99%	99%
• Macmillan Palliative Care	97%	97%	99%	98%
• Rehabilitation	93%	96%	94%	98%
• Cancer - Inpatient services	98%	98%	98%	98%
• Cancer – Outpatient services	99%	99%	99%	99%
• Cancer – Radiotherapy	99%	99%	99%	99%
• Cancer – Clinical Trials centre	88%	90%	93%	94%
O,G,N & U				
• Maternity Services	94%	98%	99%	99%
• Gynaecology	97%	97%	96%	99%
• Neonatal Unit	99%	99%	99%	99%
OSCCA - Operating Service, Critical Care & Anaesthesia	92%	92%	93%	89%
Surgical Services - General Surgery, Orthopaedics & Plastics, Urology	94%	94%	96%	94%
Clinical Research Facility/Research Dept	100%	100%	100%	100%
Occupational Health				87%
Pharmacy	97%	98%	99%	100%
Medical Imaging & BME	99%	98%	98%	98%
Professional Services				
• Medical Illustration, Therapy Services, Dietetics, Chaplaincy, Psychology, Speech & Language therapy	87%	93%	94%	96%
Laboratory Medicine	96%	96%	96%	96%
Estates	100%	100%	100%	100%
Hotel Services (HS)				
• Waste	100%	100%	100%	100%
• Security	96%	96%	96%	98%
• Domestic Services	96%	100%	100%	100%
• Portering/Transport	100%	100%	100%	100%
• Catering	100%	100%	100%	100%
• Laundry	92%	96%	96%	98%
Infection Control Team	81%	86%	90%	93%
Trust-wide	81%	88%	92%	95%

Blue = 95-100% Green = 90-94% Yellow = 80-89% Amber = 65-79% Red = < 65% or non-return

4.5 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 Control Accreditation

4.6 Details of the IC Accreditation Programme have been laid out in previous year's annual IPC Reports. The Accreditation scheme continues to be the main means by which infection prevention and control practice is standardised, improved and assessed across the Trust.

4.7 All established and newly configured in-patient wards have now attained Accreditation at least once. A couple of wards that were only open for a few months at busy times during the year, struggled to fully engage with the Accreditation process. One of the aims for the coming year is to produce a module within the Accreditation scheme designed specifically for this type of ward.

4.8 75% of out-patient, day-case and non-ward based in-patient clinical areas have now Accredited as least once. A number of areas not previously covered by the scheme have started to undertake the programme e.g. the Occupational Health department.

4.9 The IPC Team have undertaken a review of how progress towards Accreditation and annual Re-accreditation is assessed and monitored. A report is now sent out quarterly to senior staff within each department highlighting how many months have passed since each area Accredited. An escalation process has been established should wards/areas fail to make satisfactory progress throughout the year. Most wards/areas are making satisfactory progress towards Re-Accreditation and should be congratulated for all the hard work that staff in these areas undertake day in day out.

In addition, the IPC Team provides a quarterly 'top performers' summary, in respect of hand hygiene and cleanliness audit results. These results are distributed to senior staff in each area/ward and to those responsible for Trust-wide governance issues.

4.10 For 2011/12 the Accreditation Programme was revised to include a number of new or updated modules, in particular the standards required for commodes/seat-raisers and antibiotic prescribing.

4.11 As one of the measures to ensure that infection prevention and control is an integral part of the Trust Healthcare Governance system, progress in respect of the Accreditation scheme continues to form part of the Trust Clinical Assurance Toolkit (CAT) review.

Audit and Review

4.12 The majority of the infection prevention and control related audit programme takes place via the IC Accreditation Scheme. See Sections 4.6 to 4.11 of this Report. Full audit results can be obtained from the matrons and ward managers of the various areas taking part in the Scheme.

4.13 Progress in respect of the IPC Programme was regularly reviewed as outlined in the IPC Programme, see Section 4.4 and Table 1 above.

4.14 The Trust's position as regards the infection prevention and control related standards within the Care Quality Commission Registration Standards was reviewed as requested by the Healthcare Governance Department. Compliance with all these standards was declared.

4.15 The Trust's position as regards the infection prevention and control related standards within the NHS Litigation Authority scheme was reviewed as requested by the Clinical Governance Department. Compliance with all these standards was declared at level 1.

4.16 The IPC Team has a rolling programme of MRSA screening audits which is on-going. The results from these audits revealed that compliance with the MRSA admission screening policy was generally good varying from 85-100%. Ideally compliance would be 100% and the results have been fed back to the areas concerned and re-auditing has taken place as appropriate. The re-audits undertaken to date have shown improvements in all cases. In addition to admission screening, wards are requested to re-screen patients every four weeks during their stay. Compliance with this element of screening has historically been less well implemented. The IPC Team have concentrated on this during the year and compliance has improved significantly.

The DIPC also reviews the overall number of screens received by the Trust laboratories and compares this to the overall number of patient episodes where MRSA screening should be being undertaken. The percentage compliance for this parameter is reported monthly to NHS Sheffield. During 2011/12 the monthly percentage compliance was always greater than 100%.

4.17 The IPC Team has continued the major review of infection prevention and control guidelines. Progress in this respect has been reviewed at the monthly IPC Team and quarterly IPC Committee meetings. A number of new policies have been written and others updated as appropriate. This is a large project and progress continues to be slower than anticipated partly due to the extra work undertaken by the Team in response to the *C.difficile* and norovirus infections mentioned elsewhere in this Report. The list of policies and guidelines that the IPC Team has primary responsibility for producing and reviewing can be found in Appendix E.

4.18 Wards/departments were required to review compliance against a number of key issues detailed below and to take appropriate action to rectify any non-compliances found:

- Areas defined as 'Points of Access' were asked to check the contents of the SARS/Avian Influenza Equipment Boxes to ensure these were in line with the requirements of the Trust policy. All areas declared compliance
- Areas were asked to ensure all staff taking samples for blood culture were trained to do so. All areas declared compliance
- Areas were asked to review their procedures for asking CJD screening questions and ensure these were in line with the Trust policy. All areas took action to update their protocols, although some difficult issues remain to be solved.

Decontamination of Medical Devices

4.19 The Decontamination Group has continued to progress the improvements required to optimise decontamination practice across the Trust. Membership of the Decontamination Group can be found in Appendix C.

4.20 The project to review the decontamination facilities within the endoscopy units at the Central campus has been completed. A centralised endoscopy decontamination facility was the preferred solution and work on this has commenced. It is hoped that this facility will be operational before the end of 2012/13.

The rolling programme for auditing endoscope decontamination areas has continued and reports are received at the Decontamination Group on a rolling basis. Thanks in particular go to Nigel Martin and Patty Hempshall who have undertaken the bulk of this work.

4.21 The Sterile Services Supercentre project continues to progress and both on-site Sterile Services Departments moved off-site during 2011/12.

Hand Hygiene

4.22 The Trust has continued to promote best practice in respect of hand hygiene via the IC Accreditation Scheme.

4.23 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.

4.24 The Supplies and Occupational Health departments continue work with the IPC Team to optimise the hand hygiene products available to staff and patients

4.25 The Trust Dress Code for all staff has been developed and this Code includes the requirement to dress in a manner that will allow optimal hand hygiene.

Environmental and Cleaning Issues

4.26 Audit of the ward environment and the standard of cleanliness forms part of the IC Accreditation scheme. See Sections 4.6-4.11 of this Report.

4.27 The Patient Environment Group continues to meet and oversee the refurbishment and cleanliness agenda. The Trust continues to review the domestic services provision and how it is delivered.

4.28 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, in particular the IC Assistants.

4.29 The Estates and Domestic Services departments have continued to work with the IPC Team to implement protocols for the cleaning of radiators and ventilation grills.

4.30 Clinical staff and the Domestic Services departments have continued to work with the IPC Team to implement protocols for the cleaning of bed spaces and beds as per agreed protocols.

4.31 The IPC Team has continued to undertake a rolling programme of audit of the cleanliness and state of repair of commodes throughout the Trust.

4.32 The Trust continues to employ hydrogen peroxide vapour (HPV) misting to aid in cleaning and decontaminating the environment after wards/areas have been upgraded or refurbished. This is also employed in response to clusters or outbreaks of various infections on an ad-hoc basis. Previously this work has been carried out by the IC Assistants. However, the demand for HPV misting began to outstrip the resources available within the IPC Team and the involvement of other disciplines was progressed during 2011/12. Domestic Service staff now undertake much of the HPV work and the hard work of all those involved in training, supervising and providing this service should be acknowledged.

4.33 Last year a paper outlining the options for optimising management of bed-pan washers was submitted to the Decontamination Group by the Estates department. These machines were also one of the issues of concern in respect of *C.difficile* control and it was determined to replace bed-pan washers with macerators throughout the Trust. The first phase of this project has been completed and further phases are planned for 2012/13.

4.34 All areas are required to determine who is responsible for the regular cleaning of patient trolleys used in their area and ensure these items are regularly and appropriate cleaned.

4.35 The guidelines for cleaning computer keyboards in clinical areas are available on the intranet. All such keyboards should be being cleaned regularly. Where available, keyboard covers are used in addition to regular cleaning.

4.36 Wards and departments have responsibility for flushing infrequently used water outlets on a daily basis as part of the Legionella prevention programme. The Trust Legionella Committee continues to work to optimise this system and investigate the options for electronically logging this activity.

<u>Education and Training</u>

4.37 The Trust policy is that all staff should receive infection prevention and control training at induction and appropriate annual updates thereafter. This education should be documented.

4.38 This policy forms part of the IPC Programme and Directorates do provide appropriate education programmes and sessions. Documentation of infection prevention and control education does occur but is not always easily available due to the lack of a centralised, electronic system for recording this information. The roll out of the Electronic Staff Record has helped to address this problem although progress is still required to optimise the system.

4.39 The IPC Team have produced an in-house induction IPC e-learning package. This contains modules which are modified to reflect the different knowledge base required by the various staff groups within these organisations e.g. Medical staff, Nursing staff, AHPs, secretaries, Executives etc. This package allows consistent training and education to be available at induction into the Trust. Recording of completion of the packages will also be facilitated. The material for the package was completed during 2010/11 and rolled out during 2011/12. The material and quiz sections were reviewed in Jan 2012. A shorter annual updated e-learning package is planned for 2012/13

4.40 In addition to the above e-learning package, infection prevention and control is a key element of the centralised Trust induction days. IPC Team members participate in these days which include a hands-on hand hygiene module.

Communication, Information and Community

4.41 Ward level infection prevention and control information for patients and visitors is displayed near the entrances to all wards. The data for this information are taken from ward based audit results from the Accreditation scheme and MRSA and *C.difficile* data collected by the IPC Team. The IPC Team work with Patient Partnership to collate, publish and update this information on a three monthly basis.

4.42 The IPC Team have begun to work through the implications of assuming responsibility for the management of Adult Community Services. The IPC Nurse Specialists Katie Grayson and Diane Allender, who have worked within this sector for a number of years, have become part of the wider Trust IPC Team.

A review of the infection prevention and control issues for the services provided within this new Care Group will take place in 2012/13. The needs of these services are now taken into account when any of the infection prevention and control related policies/guidelines etc are reviewed and updated.

Section 5

Key Indicators

5.1 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
- Compliance against the Heath and Social Care Act[3]
- Total number of new methicillin resistant *Staphylococcus aureus* (MRSA) cases detected by the Trust laboratories (includes cases of colonisation and infection at all body sites)
- Number of *Clostridium difficile* toxin associated diarrhoea (CDD) episodes within the Trust
- Results of the mandatory Department of Health surveillance schemes
- *Staphylococcus aureus* (*S.aureus*) bacteraemia
- *Escherichia coli bacteraemia*

Progress in respect of the trust-wide IPC Programme

5.2 This is addressed in detail in Section 4 of this Report.

Compliance against the Heath Act[3] using an in-house self-assessment tool

5.3 This is addressed in detail in Section 3 of this Report.

Number of new MRSA cases

5.4 See Sections 6.5 to 6.7 of this Report.

Number of CDD episodes

5.5 See Sections 7.2 to 7.3 of this Report

Results of mandatory Department of Health surveillance modules

5.6 The mandatory surveillance scheme includes the following modules:

- Serious clinical incidents related to infection
- MRSA bacteraemia - see Sections 6.8 to 6.14 of this Report
- MSSA bacteraemia – see Sections 5.15 to 5.19 of this Report
- CDD – see Sections 7.4 to 7.9 of this Report
- Glycopeptide resistant enterococci (GRE) bacteraemia
- Wound infection rates for orthopaedic surgery

Serious incidents related to infection

5.7 One incident was reported under the Serious Incidents Related to Infection surveillance scheme during 2011/12.

5.8 This incident related to a cluster of cases of *C.difficile* infection, which occurred within the vascular unit during the spring of 2011. The area concerned was deep cleaned and hydrogen peroxide vapour misting was also employed. Regular audit of the clinical practice and cleanliness on the ward affected was undertaken. No further cases have been associated with the ward since. A more detailed review of the management of *C.difficile* within the Trust over the past year can be found in Section 7 of this Report.

Glycopeptide resistant enterococcal (GRE) bacteraemia

5.9 The GRE scheme, which commenced in October 2003, relates to the number of GRE positive blood cultures detected by the Trust laboratories. Data are expressed as crude numbers and due to the small numbers involved, the significance of the results is 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. The results of the national mandatory GRE surveillance scheme are published for the time period October to September each year.

5.10 For 2010/11 the STHFT total was three. This represented a fall from the previous year but, given the small numbers involved, the significance of this change is uncertain. National data shows that the Trust performs well in regard to this parameter having the 4th lowest rate amongst the 25 Acute Teaching Hospitals in England. The data for 2011/12 to date shows an increase in the number of episodes, to numbers similar to those seen in 2009/10. Review of the episodes showed that three were from the same patient and there was no pattern to these infections or areas of concern.

Table 2
Details of GRE bacteraemia detected by the Trust laboratories
(Reporting year is October to September)

	2003/4	2004/5	2005/6	2006/7	2007/8
Number of episodes	11	12	10	8	3

	2008/9	2009/10	2010/11	2011/12*	
Number of episodes	2	9	3	7	

* 10 months data only

Wound infection rates for orthopaedic prosthetic implant surgery

5.11 The orthopaedic surgical site infection scheme differs from the aforementioned 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.

5.12 For 2010/11 the Trust elected to undertake surveillance of fracture neck of femur. Surveillance was undertaken for the April to June 2011 quarter. During this time period 67 operations were undertaken that met the surveillance criteria of which 6 were deemed to have become infected. The overall infection rate is therefore 9.0%. The national average infection rate for this procedure was 2.0%.

5.13 A review of the data showed that the patients treated within the Trust were older and had more underlying health issues than the national average. This may partly explain why the infection rate locally was higher than that generally seen nationally. However, the rate was a cause of concern and a multi-disciplinary review was undertaken of the care provided to this group of patients to determine if any changes in practice were required. There was

concern that an increase in the dose and usage of thrombosis prophylaxis, required by national guidelines, may have increased the risk of bleeding and weeping from wounds and that this may have in turn increased the risk of these wounds becoming infected.

5.14 Overall, there did not appear to be a clear reason for the infection rate and a package of measures designed to optimise care for patients in relation to a number of issues, not just infection related ones, was implemented. This included a change in the type of wound dressing used. Early indications are that the infection rate has reduced significantly and official surveillance has taken place during the Apr to Jun 2012 quarter. The results of this will be reported in the 2012/13 Report.

Staphylococcus aureus bacteraemia

5.15 Much attention is given to methicillin resistant *Staphylococcus aureus* (MRSA) but methicillin 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 but 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.

5.16 Chart 1 shows data for all *S. aureus* bacteraemia episodes (MSSA and MRSA) detected within the Trust laboratories over the past few years. Overall the number of episodes decreased by 37% between 2003/4 and 2010/11. Part of this decrease was due to an 85% decrease in MRSA episodes during that time. However, there was also an 18% decrease in the number of MSSA episodes, in particular those classed as hospital acquired cases (47% decrease since 2005/6).

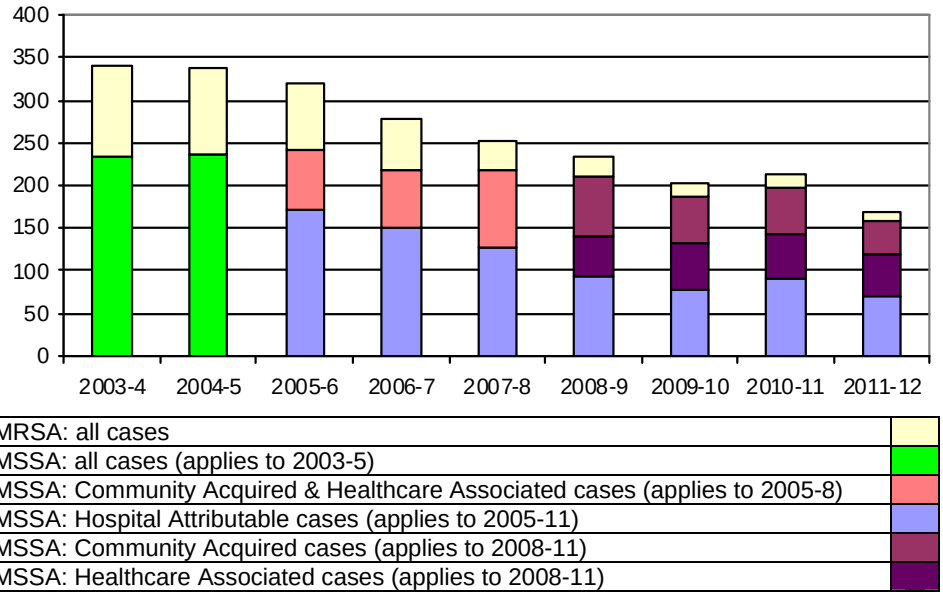
Pleasingly there was a further 19% fall in MSSA cases in 2011/12 compare to recent years including a 21% fall in episodes categorised at hospital attributable.

5.17 Since 2001, it has been mandatory to report MRSA bacteraemia to the DH. This scheme was extended to include MSSA as from January 2011. The first MSSA bacteraemia rates for trusts across the country were published in Jun 2012. These showed that the Trust performed relatively poorly compared to other teaching hospitals, coming 19th out of the 25 trusts in this category. The reasons for this situation are not immediately apparent. The Infection Prevention and Control Team have reviewed the data collected to date, see below for details, and began to produce an action plan to address the issues identified. Addressing MSSA bacteraemia will form part of the 2012/13 IPC Programme.

5.18 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 3 and 4 below. This information helps to determine which interventions are likely to be most effective in reducing the number of hospital attributable and health-care associated episodes.

5.19 Although the numbers for each ward and Directorate are small, Directorate and source data would indicate the following are areas where interventions may help: a) intravenous (peripheral, central and other) line care across most Directorates b) post-operative wound infections in Orthopaedics and Cardiac, c) Central line management in Renal and d) Special Care Baby Unit (SCBU). Work has already commenced within the SCBU and Renal Directorates and pleasingly, the number of episodes detected in these areas during the second half of 2011/12 was lower then in the first half.

Chart 1
Details of *S aureus* bacteraemia episodes detected by the Trust laboratories



MRSA: all cases
MSSA: all cases (applies to 2003-5)
MSSA: Community Acquired & Healthcare Associated cases (applies to 2005-8)
MSSA: Hospital Attributable cases (applies to 2005-11)
MSSA: Community Acquired cases (applies to 2008-11)
MSSA: Healthcare Associated cases (applies to 2008-11)

Community Acquired = cases detected within 48 hours of admission and the patient had not been within the STH in the past 6 weeks
Healthcare Associated = cases detected within 48 hours of admission but the patient had been within the STH in the past 6 weeks
Hospital Attributable = cases detected more than 48 hours after admission
MRSA = Meticillin resistant *Staphylococcus aureus*
MSSA = Meticillin sensitive *Staphylococcus aureus*

Table 3
Number of Trust Attributable and Healthcare Associated MSSA bacteraemia episodes by Most Likely Source for 2011/12

Directorate	Total year to date Trust Attributable	Total year to date Healthcare Associated
Peripheral line	12	2
Central line	4	12
Other intravenous line	11	2
Post–operative wound	11	2
Soft tissue or bone	10	17
Respiratory tract	11	3
Urinary tract	1	0
SCBU – unknown source	3	0
Other	2	3
Unknown	6	8
Total	71	49

Table 4
Number of Trust Attributable and Healthcare Associated MSSA bacteraemia episodes by Directorate for 2011/12

Directorate	Total year to date Trust Attributable	Total year to date Healthcare Associated
Emergency Medicine	5	4
Respiratory Medicine	1	1
Diabetes/Endocrine	4	0
Geriatric/Stroke Medicine	1	2
Gastroenterology	5	3
General Surgery	5	0
Plastic Surgery	0	0
Urology	3	0
Orthopaedics	10	2
Cardiac	11	6
Renal	2	20
Vascular	0	2
Haematology	3	4
Cancer Services	3	4
Specialised Rehabilitation	1	0
Communicable Diseases	1	0
Specialised Medicine (remainder)	0	0
Neurosciences	3	0
ENT	0	1
Ophthalmology	0	0
Oral & Dental Services	0	0
Obs/Gynae	1	0
Neonatology	7	0
OSCCA	5	0
Total	71	49

Escherichia coli (E.coli) bacteraemia

5.20 *E.coli* causes a range of infections in hospital 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, peritonitis and blood stream infections. 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.

5.21 The commonest means by which *E.coli* strains develops resistance to standard antibiotics, 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 likely to be a key factor.

5.22 Chart 2 shows data for all *E.coli* bacteraemia episodes detected within the Trust laboratories over the past two years. Overall the number of episodes recorded has risen by 4.6 % compared to last year and this is in addition to a 10% increase the year before. However, the proportion of episodes that are community acquired (36.42), healthcare associated (26.49) or hospital attributable (34.93) has remained relatively static; please see page 28 for episode definitions. There is a small rise in the percentage of healthcare associated cases and a corresponding fall in community acquired cases but it is too early to say if this is significant or if a trend is emerging.

5.23 Overall this year, 14.7% of strains year were ESBL producers. This is a significant rise compared to the last two years figure's of 7.8% and 7.1% respectively.

The percentage of local isolates that were ESBL producers from community acquired cases was 11.36, healthcare associated cases 21.87 and hospital attributable cases 12.8. It is not entirely clear why healthcare associated cases should have such a high level of resistance compared to community and hospital attributable cases. The Health Protection Agency report that in 2011, 11% of blood culture isolates of *E.coli* were ESBL producers nationally. This would indicate that local figures for community and hospital attributable cases are in line with national averages, with the healthcare associated figure being an outlier.

The percentage of ESBL producers within *E.coli* isolates from all samples is reported in Section 9 and is 4.9%. Therefore the rise in cases due to ESBL producers seems to be related to severe infection e.g. bacteraemia and is not reflected in infections across the board e.g. urinary tract infections

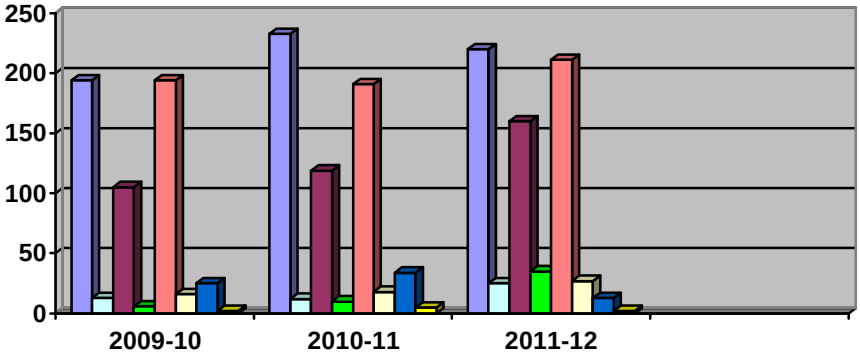
5.24 Surveillance of *E.coli* bacteraemia became part of the Department of Health national mandatory surveillance scheme from June 2011 onwards. Data from this scheme is not available at present so it is not possible to compare local data from this scheme with that observed elsewhere.

5.25 The IPC Team will continue to monitor the situation comparing the local position year on year and how this compares to the national picture.

Chart 2

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

(Number of episodes)



E.coli: Community acquired cases – total number	
E.coli: Community acquired cases – number of total that are ESBL producers	
E.coli: Healthcare Associated cases – total number	
E.coli: Healthcare Associated cases – number of total that are ESBL producers	
E.coli: Hospital Attributable cases – total number	
E.coli: Hospital Attributable cases – number of total that are ESBL producers	
E.coli: SCH samples or episode associated with healthcare in another trust – total number	
E.coli: SCH samples or episode associated with healthcare in another trust – number of total that are ESBL producers	

Community Acquired = cases detected within 48 hours of admission and the patient had not been within the STH in the past 6 weeks

Healthcare Associated = cases detected within 48 hours of admission but the patient had been within the STH in the past 6 weeks

Hospital Attributable = cases detected more than 48 hours after admission

Section 6

Meticillin Resistant *Staphylococcus aureus*

6.1 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

6.2 During 2008 the DH informed trusts that all elective admissions (and certain attendances) should be screened for MRSA. The STHFT significantly expanded its MRSA screening programme in 2005 and this had become increasingly comprehensive in the intervening years. The aforementioned DH requirements were implemented well ahead of the DH deadlines with full implementation occurring for both elective and emergency screening by September 2008.

6.3 Chart 3 shows the increase in the number of patients being screened over the past few years. Currently over 10,000 patients per month are screened. Despite this increase in screening the number of samples and patients found to be positive for MRSA has fallen and then plateaued, see Charts 4 and 5. The positivity rate has therefore fallen sharply, being 0.9% and 1.2% for samples taken and patients screened, respectively. Most of the positive results now come from previously known carriers of this organism, with the number of new cases continuing to fall, see Table 5.

Audit of compliance with MRSA screening protocols takes place on a Trust-wide and ward level basis. For details see Section 4.16 of this Report.

Follow up of patients found to be positive at pre-admission MRSA screening

6.4 The majority of patients having elective surgery are now screened for MRSA as part of their pre-assessment work-up. The pre-assessment clinics within the Trust have been rationalised and, although this is not primarily due to the MRSA screening issue, it helps standardise practice none the less.

As reported in previous years' Reports a pathway has been developed for the treatment of patients found to be carrying MRSA and their follow up screening. This standardises practice and is also patient focused. Patients found to be colonised with MRSA are seen in a specialised review clinic and given advice and treatment. Each patient is followed up as appropriate depending on the surgery they are to have and their individual circumstances. The pathway has evaluated well and is popular with patients.

Chart 3
Number of patients screened for MRSA each month within the STH

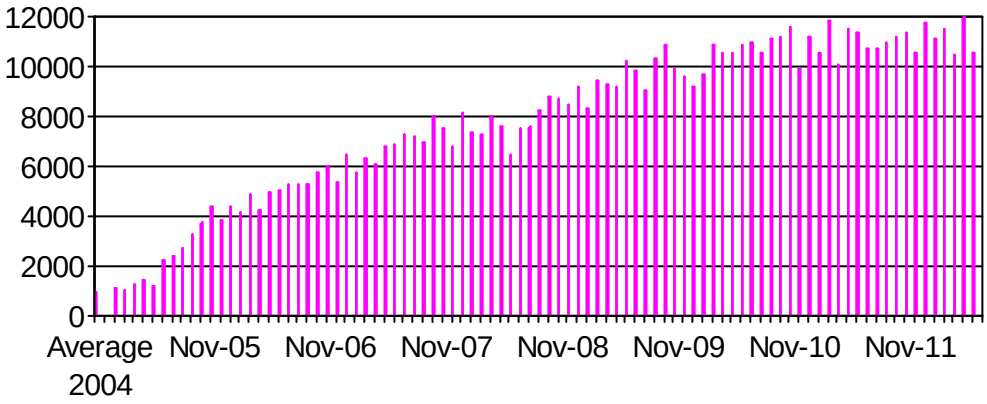


Chart 4
Percentage of samples and patients screened for MRSA that are positive

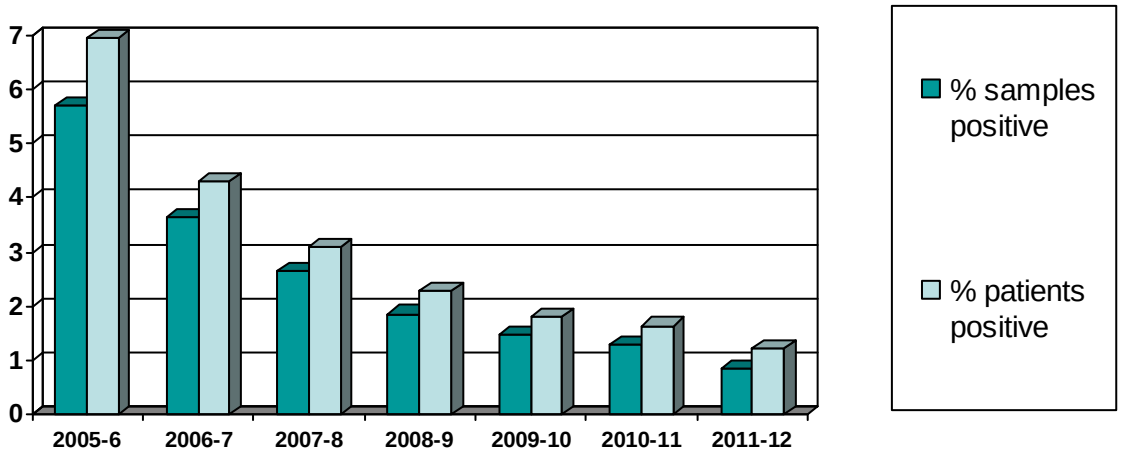
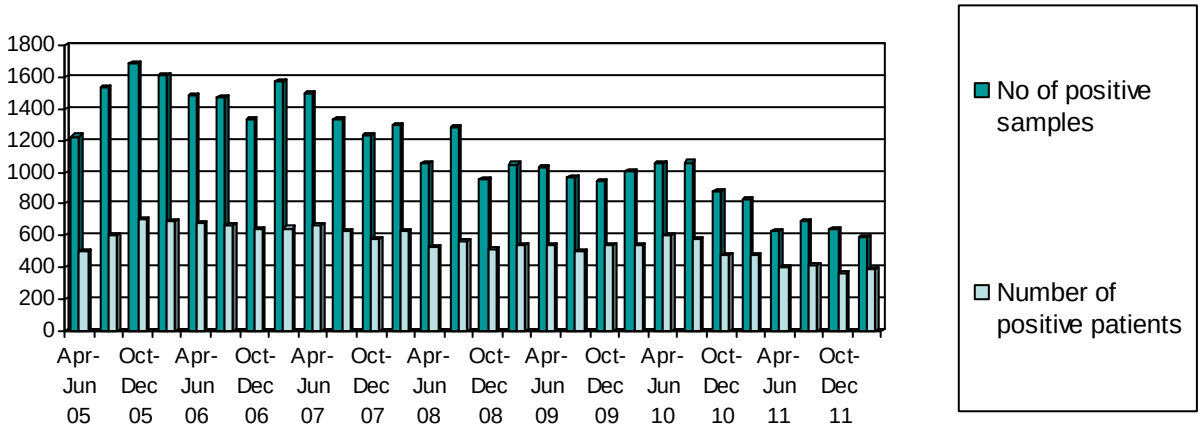


Chart 5
Number of samples and patients screened for MRSA that are positive



Number of new MRSA cases

6.5 Overall, the number of new cases of MRSA infection or colonisation continues to fall. This is despite the continued increase in MRSA admission screening during this time period. The majority of new cases detected are detected on admission.

The fall in the number of newly detected cases in the face of enhanced detection strategies is an indication that the various measure taken to prevent and control MRSA spread over the past few years are having an effect on the amount of MRSA present both within the Trust and in the community. This is of course extremely pleasing and efforts will continue to attempt to reduce this figure further over the coming years. In particular, liaison with colleagues in the community remains a priority for the coming year as strategies to optimise management of MRSA outside of the acute areas of the Trust will be required if further falls in MRSA infections and colonisations are to be seen.

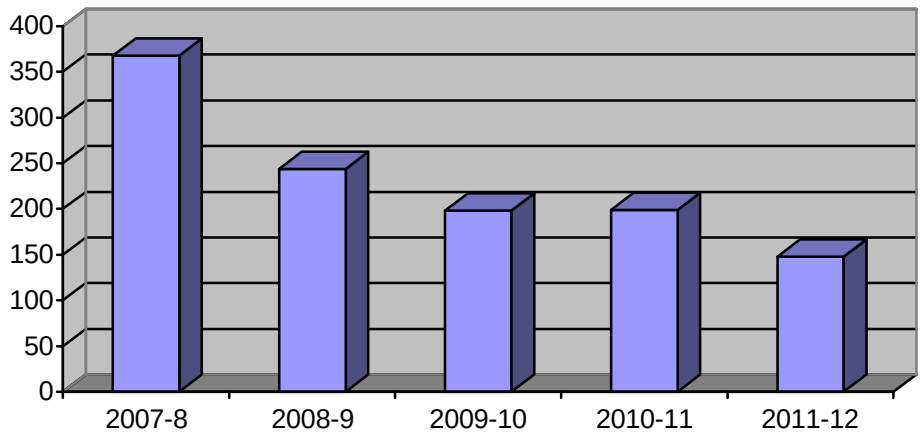
Table 5
Number of new cases of MRSA infection or colonisation, detected by the Trust laboratories

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

2008/9	2009/10	2010/11	2011/12			
1256	1038	954	802			

6.6 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 then 48 hours after admission. Once again the number of patients with new hospital acquired MRSA infection or colonisation remained low compared to previous years, see Chart 6 below.

Chart 6
Annual number of new STH acquired MRSA infections and colonisations detected



6.7 Another useful parameter is the percentage of new *Staphylococcus aureus* (*S.aureus*) isolates that are MRSA. For 2011/12, the STHFT figure is 5.0% for all isolates and 6.0% for blood culture isolates alone; see Tables 6 and 7. National data are available for resistance rates amongst blood culture isolates, which was 10.8% in 2012. Therefore, Sheffield is in an enviable position, in that the percentage of S.aureus isolates overall, and for bacteraemia alone, that are MRSA are significantly lower than the national average. This means that the majority of staphylococcal infections can still be treated with traditional antimicrobial agents, which have fewer side effects and are much cheaper than those required for MRSA. The figures in Tables 6 and 7 show that the percentage of *S.aureus* isolates that are MRSA locally continues to decrease compared to previous years.

Table 6
Percentage of new *S.aureus* isolates, from all sources and body sites, that are MRSA, for samples submitted to the Trust laboratories

	%
2000/2001	17.6
2001/2002	21.0
2002/2003	24.0
2003/2004	23.9
2004/2005	20.3
2005/2006	26.0
2006/2007	16.8
2007/2008	10.2
2008/2009	9.2
2009/2010	7.7
2010/2011	6.5
2011/2012	5.0

Table 7
Details of *S.aureus* bacteraemia episodes detected by the Trust laboratories

	MSSA (No.)	MRSA (No.)	Total (No.)	MRSA/ Total (%)
2003/2004	234	105	339	31
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	10	168	6.0

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

Mandatory MRSA bacteraemia surveillance scheme

6.8 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. Since October 2005, the system for reporting MRSA bacteraemias is via a web-based package. Figures are collected monthly and the data signed off and locked down by the Trust Chief Executive's Office.

6.9 Until 2009/2010, all MRSA bacteraemia episodes were allocated to the Trust where the sample was taken regardless of whether the patient had been in the trust for some time or only a few hours. Data reported in previous Reports reflects this allocation.

6.10 From 2010/11 the scheme has two targets/objectives; the first relates to episodes deemed to be attributable to acute trusts and the second to the number of episodes occurring in residents of any particular primary care trust.

The acute trust attributable objective relates to episodes detected in samples taken >48 hours after the patient was admitted. The primary care trust objective relates to episodes in residents of any particular primary care trust regardless of where the episode was detected and therefore includes all cases detected in acute trusts nationwide plus other healthcare providers including private hospitals and general practitioners.

Each acute or primary care trust has been given an objective based on reducing their rate to below the national mean or towards the next quartile, whichever is the lower rate. The STHFT objective for 2011/12 was 10 'Trust Attributable' episodes.

6.11 A summary of the STHFT results is given in Tables 8 and 10. The STHFT has always been in the top quarter (i.e. amongst those with the lowest rates) of the hospital group to which it has been allocated – Acute Teaching Hospitals Group. It is extremely pleasing to note that for 2011/12 the Trust MRSA bacteraemia rate remains amongst the lowest in this group; the Trust performance being the best of all hospitals in this category, see Table 9 below. In addition, the Trust is well below the national average for all types of trusts, the Trust rate being 0.3 episodes per 100,000 bed-days whilst the national average is 1.3. However, the Trust is not complacent in this regard as this standard needs to be maintained and where possible the number and rate reduced further.

Table 8
Episodes of trust-attributable MRSA bacteraemia rate per 100,000 bed-days (number)

Time period	Total STHFT
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)

Table 9
STHFT MRSA trust-attributable bacteraemia rate and national ranking

	MRSA bacteraemia rate per 10000 bed nights	National ranking within Acute Teaching Hospitals Group*#
2008/9	2.1	1st
2009/10	1.4	3rd
2010/11	1.4	6th
2011/12	0.3	1st

* 1st has lowest rate
\# Acute Teaching Hospitals Group of 25 trusts

6.12 Each year the DH sets each trust a reduction target for MRSA bacteraemia. The STHFT has consistently attained and surpassed these targets which is extremely good news and is due to a great deal of hard work by clinical, infection prevention and control and managerial staff together with the ongoing commitment and support of Governors' Council and the Board of Directors; all concerned should be congratulated. However, as stated above MRSA bacteraemia does still occasionally occur and the aim is to keep the number of such episodes to a minimum.

Table 10
STHFT reduction targets for MRSA trust-attributable episodes

	2010/11	2011/12
STHFT reduction targets	13	10
STHFT actual number detected	9	2

6.13 The Sheffield primary care trust objective relating to episodes in Sheffield residents anywhere in the country was 13 or less. The actual number of episodes recorded was 11 with a rate of 2.0 per 100, 000 population. This is below the national primary care trust average of 2.1.

6.14 Chart 7 and Tables 11 and 12 below show the MRSA bacteraemia data in relation to the monthly and annual target for 2011/12 and the speciality where the episodes occurred.

Chart 7
STH-attributable MRSA bacteraemia data 2011/12
Number of episodes

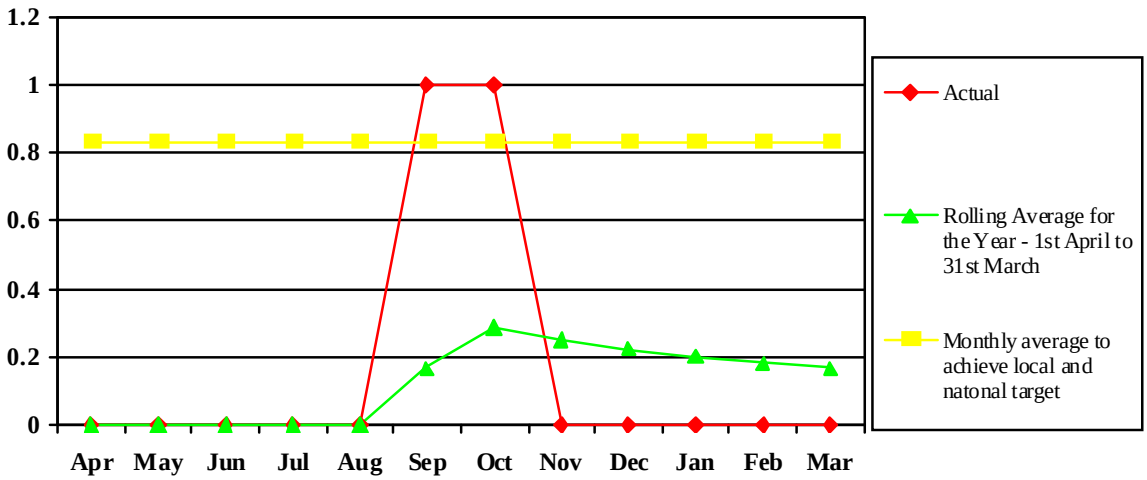


Table 11
STH-attributable MRSA bacteraemia data 2011/12
Number of episodes

Month	Monthly Total	Cumulative Total	Cumulative Local Indicator Target and National Objective
April	0	0	1
May	0	0	2
June	0	0	3
July	0	0	4
August	0	0	5
September	1	1	6
October	1	2	7
November	0	2	8
December	0	2	9
January	0	2	10
February	0	2	10
March	0	2	10
Total	-	2	10 or less

Table 12
MRSA bacteraemia episodes by specialty

	2010/11	2011/12
Medicine	2	1
Surgery	1	0
GITU/HDU	1	1
SCBU	2	0
Spinal	0	0
Orthopaedics and Plastics	0	0
Renal	0	0
Cardiac	2	0
Neurosciences	1	0
Communicable Diseases	0	0
Haematology	0	0
Obstetrics and Gynaecology	0	0
Weston Park	0	0
Admissions units/A&E	0	0
Total Trust attributable	09	02
Non-Trust attributable	07	12
Total	16	14

Surveillance, follow up and action in respect of MRSA cases

6.15 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 root cause analysis 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 NHS

Sheffield who monitor the Trust's performance in this regard. Where cases arise within 48 hours of admission an assessment is made as to any community element to the case and where appropriate NHS Sheffield and Sheffield Health and Social Care NHS Foundation Trust staff are included in the root cause analysis meetings. 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.

6.16 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.

6.17 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 in Sections 6.2 to 6.3 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

Section 7

Clostridium difficile toxin associated diarrhoea

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

- Total number of CDD episodes detected in patients within the Trust
- Number of Trust Attributable CDD episodes/Data from the Department of Health (DH) mandatory CDD surveillance scheme
- DH guidance on controlling and managing CDD

Number of CDD episodes detected in patients within the Trust

7.2 Overall, comparing 2011/12 with 2010/11 there has been a 10% decrease in the number of CDD episodes detected in patients within the Trust. This follows reductions of 4%, 21% and 46% in the past three years. These data relate to all episodes detected in patients within the Trust and include both 'Trust attributable' and 'non-Trust attributable' cases. Data relating to 'Trust attributable' episodes only can be found in Sections 7.4 -7.8 of this Report. Data relating to all episodes continues to be included in this Report to enable comparison with previous years when there was no differentiation between 'Trust' and 'non-Trust attributable' cases.

7.3 Chart 8 shows the figures for CDD episodes detected in patients within the Trust by quarter over the past eight years. Table 13 shows where these cases occurred within the various Directorates within the Trust. These reflect the significant reductions seen since 2008/9 with numbers tending to plateau in recent years. The numbers seen during the first half of 2011 were slightly higher than the previous year with numbers falling again in the second half of 2011 and into 2012. The actions taken to bring about the most recent reduction in the number of cases are detailed in the Sections 7.10 to 7.22 of the Report.

Chart 8
CDD data for episodes detected within the Trust by quarter
(includes episodes detected within 48 hours of admission
i.e. not all episodes are 'Trust attributable')

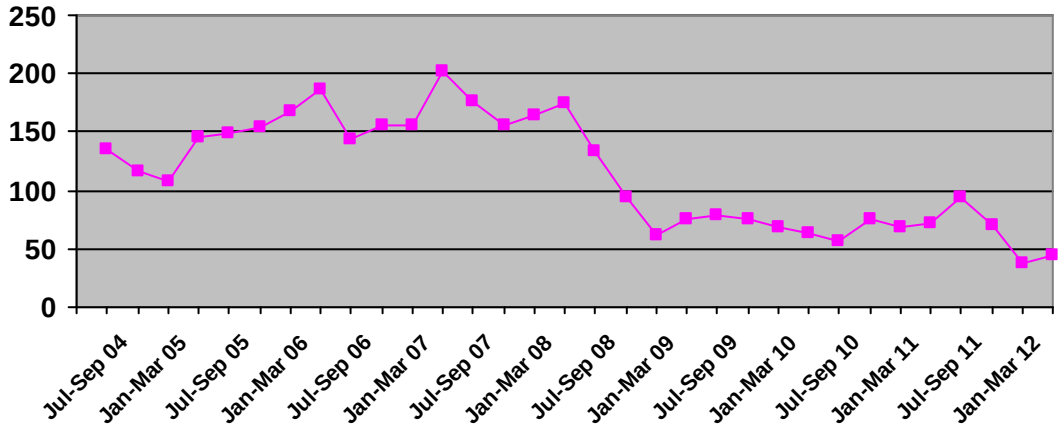


Table 13
CDD data for episodes detected within the Trust

	2008/9	2009/10	2010/11	2011/12
Medicine - Total	124	100	78	78
Medicine - Respiratory	N/A	N/A	N/A	12
Medicine – Diabetes & Endocrinology	N/A	N/A	N/A	9
Medicine – Geriatrics & Stroke	N/A	N/A	N/A	45
Medicine - Gastroenterology	N/A	N/A	N/A	9
Medicine – Emergency Care	N/A	N/A	N/A	3
Surgery - Total	46	39	31	40
Surgery – General	N/A	N/A	N/A	28
Surgery - Vascular	N/A	N/A	N/A	9
Surgery - Urology	N/A	N/A	N/A	3
Surgery - Other	N/A	N/A	N/A	0
Orthopaedic and Plastics	21	8	16	8
GITU/HDU	4	8	7	7
Renal	20	19	10	8
Cardiac	18	7	13	9
Neurosciences	9	1	8	6
Communicable Diseases	0	1	3	0
Haematology	11	2	6	8
Spinal	6	7	4	1
Palliative Care	N/A	N/A	N/A	5
Obstetrics and Gynaecology	3	1	0	1
Weston Park	5	9	7	7
Other	0	0	1	0
Total STH Attributable cases	267	202	184	178
Non-STH Attributable cases detected within the STH	96	83	89	69
Total	363	285	273	247

Mandatory CDD surveillance scheme

7.4 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. From 2008/9 onwards CDD episodes have been designated as either 'Trust attributable' or 'non-Trust attributable' depending on when the sample was taken in relation to admission. Episodes detected from samples taken in the community, out-patient departments or within 72 hours of admission are 'non-Trust attributable', the remainder being' Trust attributable'. The system for reporting CDD cases is via a web-based package. Figures are collected monthly and the data have to be signed off and locked down by the Trust Chief Executive's Office.

7.5 Tables 14 and 15 summarise the CDD data for 'Trust attributable' cases. This data set includes all patients two years of age or older and where the episode was detected greater than 72 hours after admission.

The number of 'Trust attributable' CDD episodes detected in 2011/12 has fallen by 3% compared to last year. This follows reductions of 9%, 24% and 48% in the past three years. Whilst it is pleasing to note the continued fall in the number of cases detected, the year on year percentage reduction is decreasing. This is not unexpected in that the main package of actions and initiatives designed to combat *C.difficile* was rolled out in 2008/09 and these

will have had their main effect in the years immediately following their introduction. It is pleasing to note that the effect has been sustained longer term. The challenge faced by the Trust during 2011/12, along with trusts across the country, was to determine whether an irreducible minimum number of cases was being reached or whether further actions might be successful in driving down the number of cases further.

7.6 In addition to the challenge of the plateauing in the number of cases from a purely local and clinical point of view, the continued expectation by the DH that further significant reductions were possible was reflected in the targets set for 2011/12.

Since 2008/9 the DH has set a reduction target for 'Trust attributable' cases of CDD, using the figures from 2007/8 as a baseline. The number of CDD episodes was to be reduced by 30% nationally over the three year period April 2008 to March 2011. Year on year trust specific targets were set. The STHFT met this three year 30% reduction target achieving a 64% reduction. For 2011/12 the DH set a target of a further 27% reduction on the 2010/11 outturn to be attained within one year. This was obviously going to be a difficult challenge. Details of the STHFT targets are given below in Table 14.

As stated in Section 7.5, the Trust achieved a 3% annual reduction in 2011/12 and therefore did not achieve the 27% set by the DH. This was obviously disappointing. The Trust response to the challenges mentioned in Sections 7.5 and 7.6 and the outcome of the resulting actions is summarised in Sections 7.10 to 7.22 below.

7.7 Compared to other Acute Teaching Hospitals the Trust has generally compared relatively well being 7th to 9th out of the 25 trusts in this category.

However, this position was not maintained during 2011/12 with the Trust being 20th out of the 25 trusts in this category for this time period; see Table 16. The average rate of 'Trust attributable' CDD episodes per 100,000 bed-days across the whole of England for all trusts was 21.8 compared to the Trust rate of 30.1.

The reason for the slip in performance in relation to other trusts is not easily explained but is likely to be multi-factorial. One reason may be inequality in how trusts test for and report cases of CDD. Compared to previous years, the STHFT has not changed how cases of CDD are diagnosed or reported locally but there has certainly been a variable approach nationally. This makes comparisons between trusts less meaningful than previously. In response to the fragmentation of the testing and reporting system, the DH produced guidance in 2011 with the aim of once again standardising and improving the diagnosis and reporting of CDD infections. This new guidance is to be implemented from April 2012. However, there may have also been an element of true slippage in performance compared to others and the Trust response to this and the outcome of the resulting actions is summarised in Sections 7.10 to 7.22 below.

Table 14
STHFT reduction targets for 2008-2012

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

Table 15
Number of 'Trust attributable' CDD episodes in patients 2 years of age or older
1st April – 31st March 2011/12

Month	Monthly Total	Cumulative Total	Target Cumulative Total	Cumulative variance from target
April	24	24	12	+12
May	22	46	24	+22
June	25	71	35	+36
July	19	90	46	+44
August	19	109	59	+50
September	16	125	68	+57
October	9	134	79	+55
November	8	142	90	+52
December	7	149	101	+48
January	9	158	112	+46
February	6	164	123	+41
March	14	178	134	+44
Total	178	178	134	+44

Table 16
'Trust attributable' CDD data for patients 2 years of age or older
1st April - 31st March

Time period Apr-Mar	Number of episodes	Rate per 100,000 bed days	National ranking within Acute Teaching Hospitals Group**
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*

* 1st has lowest rate
** Trust is in the Acute Teaching Hospitals Group of 25 trusts

7.8 In addition to 'Trust attributable' cases, CDD data are also collected on a primary care trust basis. This includes cases detected in residents of that primary care trust regardless of where the episode was detected and therefore includes all cases detected in acute trusts nationwide plus other healthcare providers including private hospitals and general practitioners. The rate is based on the primary care trust population.

7.9 Since 2008/9 the DH has set a reduction target for 'primary care trust attributable' cases of CDD, using the figures from 2007/8 as a baseline. The number of CDD episodes was to be reduced by 30% nationally over the three year period April 2008 to March 2011. Year on year primary care trust specific targets were set. The Sheffield PCT met this three year 30% reduction target achieving a 55% reduction. For 2011/12 the DH set a target of a further 33% reduction on the 2010/11 outturn to be attained within one year. This was obviously going to be a difficult challenge. Details of the Sheffield PCT targets are given below in Table 17.

The Sheffield PCT achieved a 3% annual increase in 2011/12 and therefore did not achieve the 33% reduction set by the DH; see Tables 17 and 18. This was obviously disappointing. It should be noted that the primary care trust performance will to some extent reflect that achieved by the local acute trusts as the two data sets are not mutually exclusive. However, even taking the STHFT performance into account, the Sheffield PCT numbers rose compared to last year. An initial audit of cases deemed to be truly community acquired did not show an obvious reason for the increase. One issue that may have contributed to the increase could be increased ascertainment due to increased awareness by general practitioners of the condition following the publicity and education undertaken during the year by the PCT in respect of this infection. However, a further more in-depth audit is planned for 2012/13.

Table 17
Sheffield PCT/NHS Sheffield reduction targets for 2008-2012

	2008/9	2009/10	2010/11	2011/12
Sheffield PCT reduction targets	576	489	444	191
Sheffield PCT actual number detected	400	294	289	299

Table 18
Number of 'Sheffield PCT attributable' CDD episodes in patients > 2 years of age
1st April – 31st March 2011/12

Month	Monthly Total	Cumulative Total	Target Cumulative Total	Cumulative variance from target
April	33	33	15	+18
May	30	63	31	+32
June	41	104	47	+57
July	27	131	63	+68
August	31	162	79	+83
September	34	196	95	+101
October	21	217	111	+106
November	23	240	127	+113
December	13	253	143	+110
January	18	271	159	+112
February	15	286	175	+111
March	13	299	191	+108
Total	299	299	191	+108

Actions taken during 2011/12 to combat *Clostridium difficile* (*C.difficile*)

7.10 As mentioned in Sections 7.5 and 7.6, the challenge faced by the Trust during 2011/12 was to address the plateauing in the reduction of the number of cases seen each year and determine whether further actions might be successful in driving down the number of cases further. A reduction in cases would not only be of benefit to patients but also help attain the challenging 27% annual reduction target set by the DH for the year.

7.11 The Infection Protection and Control (IPC) Team began to plan for the 2011/12 IPC Programme, including actions related to *C.difficile*, in January 2011. In addition to local deliberations, the Director of Infection Prevention

and Control (DIPC) contacted a number of large teaching hospitals across the country who were performing well in respect of CDD rates, to determine what actions they had taken that were not already in place within the STHFT.

7.12 The discussions with other hospitals confirmed that a similar picture had been taking place across the country as in Sheffield in that a) the reduction in the number of cases each year was slowing, b) when clusters of cases were found on wards they were generally of different strains i.e. direct cross infection was not the cause of the cluster and c) the 27% reduction target for 2011/12 was considered to be extremely challenging.

7.13 The conclusion from these discussions was that the actions taken by trusts several years ago, which were based on the national recommendations *Clostridium difficile* Infection: How to Deal with the Problem[4], had been successful in bringing about a greater than 60% reduction in cases mainly by reducing direct cross infection from patient to patient. However, further significant benefits were unlikely to accrue and a different approach was necessary to address the remaining cases. Rather than concentrating mainly on direct patient to patient spread, the issue of environmental contamination needed to be addressed. The thinking behind this is that the environment is continually being seeded with *C.difficile* spores from multiple patients some of whom are a) known to have *C.difficile* induced diarrhoea, b) carrying *C.difficile* in their gastrointestinal tracts but have diarrhoea for another reason and c) carrying *C.difficile* in their gastrointestinal tracts but have no diarrhoea. Patients can then acquire random strains maybe weeks after these were seeded into the environment. The patient may not present with symptoms for weeks or months after they acquire the organism. The above scenario would better explain the epidemiology of most cases now seen within the NHS.

7.14 The 2011/12 IPC Programme therefore included a number of new actions including those listed below, which were commenced at the beginning of April.

- Widening of cleaning after each case to include nurses station, sluices and toilets rather than just the patient's bed space
- Cleaning the whole Trust with a chlorine disinfectant during the first week of the month
- Increased frequency of IPC environmental reviews to be undertaken by senior ward staff on high risk wards

7.15 A range of other actions were put forward for possible consideration during the year. However by mid May 2011, 35 cases had already been detected which was well over the target schedule of 11 cases per month. In addition this represented a small upward trend in relation to the previous year. The reason for this upward trend is not obvious but may be partly due to environmental contamination over the winter caused by the increase in patients with norovirus, some of whom will have been *C.difficile* carriers.

7.16 A meeting took place between senior management and infection prevention and control staff and it was determined that a new wide ranging action plan was required and to be instigated as soon as possible. This was developed based on optimising the actions in previous action plans and expediting those that had been under consideration. The rolling deep clean, including hydrogen peroxide vapour (HPV) decontamination, of the majority of the wards within the Trust was felt to be of particular importance. Other actions were added after a visit to a high performing trust and an external review by a team of experts including the Health Protection Agency.

7.17 The action plan is summarised below:

Reducing Contamination on High Risk Wards

- Rolling deep clean including HPV programme of all wards (3 wards per week – new staff recruitment to undertake this)
- Staff other than IPC Team trained to undertake HPV decontamination
- Re-organise Trust services to allow a decant ward at the NGH site
- All areas to be cleaned with Chlorclean in the first week of the month
- Trial of Difficile-S: cleaning product with possible more activity against *C.difficile*
- Programme to replace bed pan washers with macerators
- Radiator cleaning programme

Optimising Infection Prevention and Control Practice

- Increase auditing of commode cleanliness and strengthening of the existing IPC Accreditation Programme
- Commode inspection and replacement programme
- Strengthen hand hygiene awareness
- IPC Nurse Specialists to undertake shifts on high risk wards to get a better idea of issues in certain areas

Evidence Based Prescribing

- Appropriate modifications to some antibiotic policies
- Antibiotic prescribing to be audited quarterly as part of the Infection Control Accreditation Programme
- Inpatient prescription chart amended to include a specific section on antibiotic prescribing to encourage short course prescribing
- Guidelines on the prescription of proton pump inhibitors

C.difficile Case Follow Through and Actions

- Any case of CDD to be followed by an extended clean of the bed space, toilet, dirty utility rooms and nurses' station
- Cases of CDD to be subject to a department based Root Cause Analysis (RCA) to be presented to the IPC Team/Deputy Chief Nurse – tool produced by the IPC Team
- Lessons learnt from RCAs disseminated across the organisation at *C.difficile* monthly summits

Raising the Profile of Infection Prevention and Control

- Series of *C.difficile* summits, chaired by the Chief Executive, the IPC Team and involving Nurse Directors, Clinical Directors, Lead Nurses, Matrons and Ward Managers from high risk wards, to outline the current situation and the plans required to improve performance
- Ideas brought forward by staff to be investigated and actioned as appropriate
- Clinical leadership walk rounds involving the Chief Executive, Chief Nurse/Chief Operating Officer and Medical Director
- Infection control to be discussed in the first hour of the following Trust meetings: Board of Directors, Healthcare Governance Committee, Trust Executive Group, Clinical Management Board, Operational Board

Monitoring

- Weekly email sent to Clinical Directors, Medical Infection Prevention and Control leads, Nurse Directors, Matrons and Lead Nurses from the Director of Infection Prevention and Control regarding the number of CDD cases recorded each week.
- Daily email sent from the Director of Infection Prevention and Control to the Clinical Directors, Medical Infection Prevention and Control leads, Nurse Directors, Matrons, Lead Nurses and Ward Managers responsible for high risk wards detailing the cases recorded
- External review by experts including the Health Protection Agency (August 2011)

7.18 A *C.difficile* Executive Group was convened tasked with implementing the Action Plan. The Group had representation from Central Nursing, the DIPC, the IPC Team, Estates department, Hotel Services Department and Antibiotic Pharmacists.

7.19 The vast majority of the actions within the plan were completed by the end of 2011/12 or are on-going. Many actions took a number of weeks or months to instigate. For example the rolling deep clean of wards involved emptying the area being cleaned thereby reducing bed–stock and it was felt that an appropriate compromise was to clean three wards per week; cleaning all the wards within the Trust therefore took many months. Wards were prioritised based on the risk of patients carrying *C.difficile.*

7.20 The financial investment required to implement the action plan was considerable and in excess of £1 million. Much of this will need to be recurrent funding for key elements to be continued into the future.

7.21 Implementation of the Plan commenced in early June but, as predicted, the number of cases of CDD did not begin to fall significantly until several months later, see Table 15. Given the performance early in the 2011/12 period, it was not possible for the Trust to attain the DH target of 134. However from October onwards, the Trust was in run-rate balance with the target, i.e. achieving fewer cases of CDD per month than that required to achieve one twelfth of the annual target. This rate would have placed the Trust amongst the top performing teaching hospitals in the country. The final year end number of 'Trust Attributable' CDD cases was 178 which was a 3% reduction on the previous year, see sections 7.5 and 7.6 above.

7.22 Altogether, the reversal of the upward trend in the number of cases of CDD, followed by a significant reduction, is a great achievement. It is due to a great deal of hard work by clinical, infection prevention and control and managerial staff plus the ongoing commitment and support of the Governors' Council and the Board of Directors; all concerned should be congratulated. In particular those involved in the rolling deep clean programme should be mentioned as this initiative took, and continues to take, a great deal of hard work to implement. To that end I would like to thank the Domestic Services staff, in particular the deep clean teams, and the IPC Nurse Specialists and Assistants. Without their hard work and determination the deep clean programme would not have been possible. The challenge for 2012/13 will be to sustain the improvements made during 2011/12 and if possible achieve further reductions.

Surveillance, follow up and action in respect of CDD cases

7.23 All cases of CDD are taken extremely seriously. The IPC Team reviews each case every 2-3 days. The frequency and extent of the review varies depending on the patient's clinical status. A formal review of all cases currently within the Trust is undertaken at least once a week. Input from appropriate medical and surgical colleagues is requested as necessary.

7.24 The data set collected for each CDD case includes severity scores and outcome parameters.

7.25 Data on CDD episodes are collected on a daily basis and wards are coded as Red, Amber or Green based on how many cases have been detected on that ward in the past 28 days. Two or more cases within seven days or four or more within 28 days results in a Red coding, two or three within 28 days in an Amber coding and zero or one a Green coding.

7.26 Where a ward flags with a Red or Amber coding the IPC Team undertakes a review of the situation. This review includes details of each case including where on the ward they were nursed, whether they were in contact with other cases on the ward and the antibiotic therapy they had recently received. In addition, a series of audits are undertaken including the infection prevention and control procedures on the ward, general environment and hand hygiene. These audits are repeated weekly for at least 3 weeks. Action is then taken depending on the findings of these reviews. This may include bed closures and extra cleaning, and education of appropriate staff groups. The results of the IPC Team reviews are sent to those responsible for the area, the Domestic Services Department, the DIPC and Chief Nurse's office.

7.27 The IPC Team produces data on a monthly basis detailing the number of new CDD cases detected and the number of probable hospital acquired episodes. These data include 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. The data are also discussed at the Directorate Healthcare Governance meetings.

Weekly emails are also sent by the DIPC to Clinical Directors, Medical Infection Prevention and Control leads, Nurse Directors, Matrons and Lead Nurses regarding the number of Trust Attributable cases of CDD each week.

7.28 A great deal of work continues designed to reduce the likelihood of patients experiencing CDD. A number of key issues are summarised below.

- The IPC Team has continued to work with the Domestic Services Department to undertake the rolling deep clean programme of all areas in addition to those areas where patients with CDD have been detected.

- The Infection Control Assistants have undertaken a range of activities including ward inspections and audit of infection prevention and control practice e.g. commode cleanliness, hand hygiene practice and environmental cleanliness and decontamination.

- To aid in cleaning and decontaminating the environment the Domestic Services and IPC Teams use hydrogen peroxide misting machines. These are used as part of the deep cleaning programme and in response to clusters or outbreaks of various infections on an ad-hoc basis

- Reviews of the Trust antibiotic policies continue on a rolling basis including policies for surgical prophylaxis.

- The restricted antibiotic prescribing policy continues and has been regularly reviewed. This restricts the prescribing of a small number of antibiotics meaning that they can only be released by pharmacy if sanctioned by a medical microbiologist. The antibiotics on this list have been restricted for a number of reasons, one of which is the propensity to induce CDD.

- The antimicrobial pharmacists continue to audit antibiotic prescribing in number of areas and have developed an expanded programme of such audits. They have also developed an Antibiotic Prescribing web-site and bulletins to feedback prescribing data to wards and departments.

- The specialist unit to care for patients with *C.difficile* infection situated on Robert Hadfield 4 at the Northern campus continues to function. The infection prevention and control, domestic services and clinical staff on the ward work extremely hard to implement the necessary clinical and infection prevention and control care pathways resulting in optimal care for each affected patient. The unit continues to be a great success with positive feedback received from both patients and their relatives.

- The Trust microbiology laboratories continue to provide a seven day a week testing service for *C.difficile*.

Section 8

Outbreaks, Major Incidents and Complaints

Outbreaks and Major Incidents

8.1 One Serious Untoward Incident Related to Infection occurred this year; see sections 5.7 and 5.8 of this Report.

8.2 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 the minimal disruption 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.

8.3 A summary of 'major' clusters/outbreaks is given below. 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 true effect of these clusters and outbreaks on patient throughput cannot truly be estimated from the figures below.

8.4 Meticillin resistant *Staphylococcus aureus* (MRSA):

- Eight clusters were detected involving 29 infected or colonised patients, 10 colonised staff and resulted in 0 bed-days lost. These figures are lower than in recent years.

Diarrhoea/Gastro-enteritis:

Norovirus (confirmed or suspected)

- The data for the 2011/12 year is included in the Table 19 below.

Table 19
Data for Norovirus clusters detected within the STHFT

	Number of Clusters	Number of Patients	Number of Staff	Number of Bed-days lost
2008/09	55	637	179	2861
2009/10	126	1105	157	2011
2010/12	64	672	102	1738
2011/12	109	923	85	1932

The number of clusters and patients affected was higher than last year although less than 2009/10. The norovirus activity seen within the Trust varies year by year and generally reflects activity in the community. However, the clusters and outbreaks were managed with less disruption to services than in previous years, in that less bed days were lost compared to 2008/09 and 2009/10. The crude number of bed-days lost this year was higher than last year. However, given the increased number of cases detected, the increase in the number of bed-days lost was not significantly different.

Clostridium difficile (C.difficile)

- 58 clusters/outbreaks were detected involving 167 patients and 0 staff. The figures for the last two years were 40, 103, 0 and 32, 89 and 0 respectively. The increased number of clusters and associated patients over the past few years does not indicate that more cases are occurring but reflects the increased surveillance and cluster investigation of *C.difficile* cases over this time period. Cases previously thought to be sporadic are now included in the cluster definition regardless of whether the cases were caused by the same strain or not. Investigation of the 58 clusters showed that in many 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 7 of this Report.

Other gastrointestinal organisms or no organism detected

- 40 clusters/outbreaks were detected involving 158 patients and 8 staff.

Other organisms (e.g. Influenza, Respiratory Syncytial Virus, Scabies)

- 8 clusters were detected involving 56 patients and 18 staff

<u>Complaints and Incidents</u>

8.5 The IPC Team received eighteen complaints/incidents this year, which is similar to the previous three years; thirteen, seventeen and fifteen, respectively. 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.

8.6 The infection prevention and control related complaints and incidents are summarised below:

- Lack of awareness by a patient of their MRSA status – proved to be due to lack of communication by the patient's General Practitioner
- Concern regarding the overall care of a patient following a fall and subsequent surgery including some aspects relating to infection
- Concern regarding the overall care of a patient with malignancy including some aspects relating to infection – this was in 1999 so a detailed investigation was not possible
- A delay in availability of a norovirus result
- Confusion between wards as regards the norovirus status of a patient
- Incorrect labelling by the ward of a sample that grew MRSA causing confusion as to how to manage the result
- Alleged inappropriate transfer of a patient to another hospital as the patient had possibly been exposed to norovirus – this proved to be inaccurate
- Incorrect labelling of a patient's notes in respect of their MRSA status
- Staff member entering a zone that had been cordoned off as hydrogen peroxide vapour misting was underway – the staff member was unharmed
- Injury to IPC Team members whilst training other staff (two)
- Alleged acquisition of MRSA within the Trust (two)
- Possible Listeria acquisition within the Trust

- Possible Scabies acquisition within the Trust
- Possible *Clostridium difficile* acquisition within the Trust
- Alleged acquisition of Norovirus within the Trust

The STHFT takes seriously any complaint of acquisition of an organism whilst a patient is being cared for within the Trust. Appropriate lessons learnt from the investigations into these cases are taken on board. However, for some of the cases mentioned above, investigations revealed that it was unlikely that the organism had been acquired within the Trust or that an alternative source was equally probable.

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.

Other Incidents:

Blockage of pipe-work within the various buildings across the Trust can lead to sewage leaks which cause disruption to the areas concerned and the services provided by the staff in these areas. Dealing with these leaks, and the subsequent cleaning and decontamination, requires a multi-disciplinary team effort. Domestic Services, Estates 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. Five major sewage incidents occurred during the year generally due to inappropriate disposal of items e.g. wipes into the Trust sewage system

Section 9

Antibiotic Resistance

9.1 The data presented in Table 20 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 similar to last year. Historically these organisms were found occasionally in hospitals but they are increasingly being seen in both hospitals and the community.
- The incidence of penicillin resistant *Streptococcus pneumoniae* has not changed compared to last year and remains at a low level
- The rate of glycopeptide resistant *Enterococcus spp*. remains low although higher than in recent years. The actual number of isolates is small so it is likely that this rise is not significant
- The percentage of *Staphylococcus aureus* isolates that are methicillin/ flucloxacillin resistant i.e. MRSA, has once again decreased compared to previous years.

Table 20
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							
Methicillin/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
Strep. pneumoniae							
Penicillin ##	3.0	3.7	3.6	3.6	4.1	5.2	4.1

	2008/9	2009/10	2010/11	2011/12			
E.coli							
ESBL producers*	4.0	4.6	4.1	4.9			
Staph. aureus							
Meticillin/Fluclox**	9.2	7.7	6.5	5.0			
Enterococcus spp.							
Vancomycin#	0.5	1.3	0.9	2.5			
Strep. pneumoniae							
Penicillin ##	5.9	7.1	5.4	5.4			

Data from the Health Protection Agency

* 2011 UK data for blood culture isolates estimates 11% resistance to third generation cephalosporins which although not a strict comparison is a useful proxy measure

** 2012 UK data for blood culture isolates shows 10.8 % resistance

\# 2010 UK data for blood culture isolates shows 8.4% resistance

2007 UK data for blood culture isolates shows 3.8% resistance

9.2 Generally these figures show that resistance rates in Sheffield compare well with historical and recent national data. UK data generally concentrate on invasive and not total isolates and are therefore not strictly comparable. However, 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.

Section 10

Influenza

10.1 Influenza activity increases each year during the autumn and winter months, with the predominant strains varying from year to year.

10.2 Overall the Trust laboratories tested 7129 samples for influenza of which 418 (5.8%) were positive. Last year 15604 samples were tested, 1169 of which were positive. The total number of STHFT in-patients with confirmed influenza was 203. Sadly 15 individuals died.

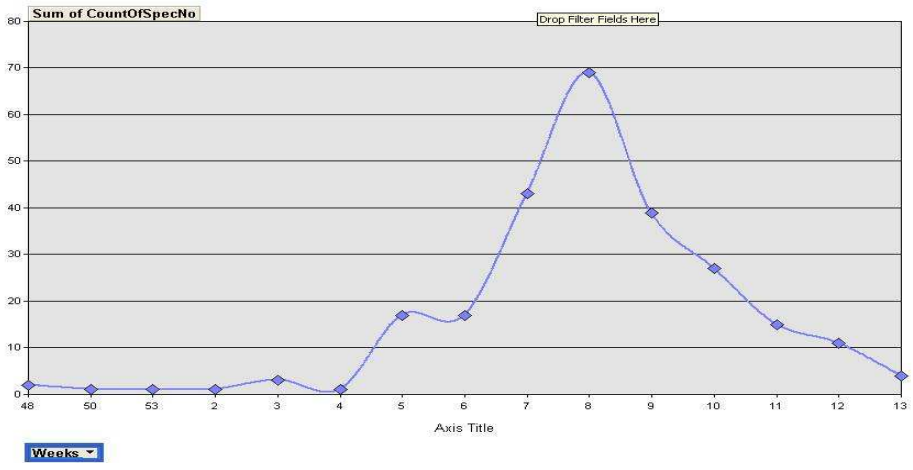
10.3 Relatively few staff became ill with influenza and staff absence did not significantly affect the day to day running of the Trust.

10.4 The Trust Influenza Planning and Steering Group met regularly over the autumn and winter to review guidance from the Department of Health and Health Protection Agency and to implement this as necessary. The group updated the Trust seasonal influenza protocols for managing patients with suspected and confirmed influenza and advised on a range of strategic and operational issues relating to this infection.

10.5 Although activity was lower than last year, the impact was more severe due to the timing of these cases. Usually the influenza season occurs from November to January but this year the majority of cases occurred between the end of January and the end of March 2012. This coincided with the peak in the number of cases of norovirus and resulted in a challenging situation in respect of patient placement and infection prevention and control management

10.6 Overall, front line staff and the Infection Prevention and Control Team were able to manage the situation in such a way as to minimise disruption to normal Trust business. It should be noted that even though Trust business generally continued unabated the impact on specific individuals and groups of staff was considerable. The following departments 'bore the brunt' of the impact: Virology, Infection Prevention and Control, Clinical Operations, Infectious Diseases, Supplies, Critical Care, Medical Emergency Admissions, Accident & Emergency and Occupational Health.

Figure 2
Number of influenza cases admitted to the STH 2011/12



10.7 During the coming year the Winter Planning Group will review the options for managing influenza within the Trust to specifically determine areas for improvement locally.

The areas that have been identified to date for discussion are

- Optimising where influenza cases should be managed
- Where any influenza cohort wards should be situated and mechanisms for opening and closing such facilities
- Improving staff influenza vaccination rates
- Updating the Trust Influenza Plan

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 occur each year, generally during the colder months, both in the community, hospitals and other 'closed' environments e.g. hotels, schools, cruise ships. The 2009/10 Report detailed how this illness presents and the difficulties encountered in trying to contain it.

11.2 Norovirus once again affected the Trust during 2011/12 and, as in previous years, the Trust followed national guidance as to how to manage the situation. This included the updated guidance on managing norovirus in healthcare settings[7] which was published in November 2011. One of the more significant changes in the updated national guidance[7] is the recommendation that, when cases of norovirus are suspected or confirmed, initial management should concentrate on bay by bay closure rather than early full ward closure. The effectiveness of this approach is still uncertain.

11.3 Details of the Trust strategy can be found in previous year's Reports. The Trust's strategy already included most of the recommendations within the updated guidance[7] including the use of bay by bay closure rather the full ward closure. However, attempts were made to widen this practice, where appropriate.

11.4 Details of the 2011/12 norovirus data can be found in Table 19, copied below.

Table 19
Data for Norovirus clusters detected within the STHFT

	Number of Clusters	Number of Patients	Number of Staff	Number of Bed-days lost
2008/09	55	637	179	2861
2009/10	126	1105	157	2011
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11.5 Overall, norovirus has once again been the infection which has had the most significant impact on the Trust's ability to provide quality and timely care to patients. Addressing this will continue to be a key issue for the coming year. Although this situation is not confined to Sheffield, indeed this is a national problem, the Trust has identified trying to improve the situation as the one of the infection prevention and control priorities for 2012/13. Norovirus will be one of the issues the Winter Planning Group will take into account when planning for the coming year.

Section 12

Conclusion & Plans for the Future

12.1 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:

- Compliance with the Health and Social Care Act[3] and the Care Quality Commission registration standards[5] is estimated at 94.78%
- All Groups/Departments completed a large percentage of the Infection Prevention and Control (IPC) Programme
- The total number of new methicillin resistant *Staphylococcus aureus* (MRSA) cases detected has continued to fall despite an increase in the number of patients screened. The majority of cases were detected on admission to the Trust.
- The MRSA bacteraemia rate has continued to be low and below the national average. The total number of episodes attributed to the Trust was 2 and the Trust has therefore once again achieved its nationally set objective for this parameter which was 10 cases or less.
- The number of *Clostridium difficile* toxin associated diarrhoea episodes (CDD) attributed to the Trust decreased to 178. The Trust therefore achieved a 3% reduction on the previous year. However, the Trust did not attain the Department of Health target of 134.
- The number of episodes of methicillin sensitive *Staphylococcus aureus* (MSSA) bacteraemia continues to fall with a 21% fall in Trust Attributable cases compared to last year.
- The number of blood stream infections caused by glycopeptide resistant enterococci and ESBL producing *Escherichia coli* compared well with available historical and national data

12.2 Throughout this Report planned initiatives have been mentioned which are designed to improve the IPC Service further. These will be detailed in the 2012/13 IPC Programme but a number of them are summarised below for information. The list is not exhaustive and, as always, new developments and actions are likely to be added throughout the year. Given that implementation of the 2012/13 IPC Programme will have already begun by the time this Report is published some of these issues will already be in place whilst the rest will be progressed over the coming months.

- Review the Trust's position against the Health and Social Care Act[3] and implement any necessary actions to address non or partial compliances
- Continue to use the Infection Control Accreditation Scheme to standardise, improve and monitor practice. Improvements to the recording and publishing of the audit data will be made. Be-spoke modules for seasonal wards and services within the Community sector will be developed.
- Continue to implement the induction e-learning package for the infection prevention and control education and training of all staff groups and make modifications as appropriate
- Develop an annual update e-learning package for the infection prevention and control education and training of all staff groups

- Continue to review and update infection prevention and control related policies and procedures.
- Continue to review and audit antibiotic prescribing across the Trust
- Continue to optimise decontamination facilities for medical devices by progressing centralising flexible endoscope decontamination
- Continue to review the prevention, control and management of CDD including the continued implementation of the *C.difficile* action plan
- Continue to review the prevention, control and management of MRSA
- Review the prevention, control and management of MSSA bacteraemia
- Review the Trust's response to influenza and determine areas for improvement locally
- Review the Trust's response to norovirus and determine areas for improvement locally
- Investigate possible options for increased surveillance of surgical wound infections
- Implement the Department of Health recommendations for reducing the risk from pseudomonas in the healthcare environment.
- Co-operate, as appropriate, with primary care colleagues to optimise infection prevention and control across the primary/secondary care interface
- Continue to integrate infection prevention and control across the acute and community groups following the inclusion of the Adult Community Services Group into the STHFT

12.3 Preventing and controlling infection is an on-going issue for any healthcare establishment and the STHFT is no exception in this respect. This Report indicates the substantial progress made during the past year and also indicates the work planned for the coming year to provide a continually improving Service. For a trust the size and complexity of the STHFT and the ever changing and increasing expectations of health care establishments, 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.

Appendix A

Membership of the STHFT Infection Prevention & Control Committee

Executive Lead for Infection Prevention and Control	Hilary Chapman
Board of Directors Non-Executive Representative	Anthony Weetman
Director of Infection Prevention and Control and Lead Infection Control Doctor	Christine Bates
Infection Control Doctors	Liz McLellan Helena Parson Dave Partridge (acting Oct-Dec 2011) Sarah Thompson (acting Jan-Mar 2012)
Lead Infection Control Nurse Specialist	Patty Hempshall
Deputy Chief Nurse	Chris Morley
Assistant Medical Director	Des Breen
Head of Patient and Healthcare Governance	Sandi Carman
Occupational Health Physician	Alison Rimmer
Infectious Diseases Physician	Steve Green
Antibiotic Pharmacist	Chris Winnard
Estates Department	Andrew Hudson Mick Wareing
Sterile Services Manager	Nigel Martin
Domestic Services	Joanne Burgan Gill Thirsk
Modern Matrons	Chris Coulson Karen Gott Sue Shepley
Trust Governors	Anne Eckford Graham Thompson
Consultant in Communicable Disease Control	Rosie McNaught
Primary care trust Representatives	Jane Harriman

Appendix B

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

Infection Control Doctors	Christine Bates Liz McLellan Helena Parsons Dave Partridge (acting Oct-Dec 2011) Sarah Thompson (acting Jan-Mat 2012)
Infection Control Nurse Specialists	Patty Hempshall Diane Allender Jackie Anderson Maggie Bacon Rachael Duckworth Andy Garner Katie Grayson Samantha Hill (secondment) Julie Parker Kim Tomlin Beverley Wade
Infection Control Information Analyst	Glenn Radford
Infection Control Assistants	Eric Moulds Dawn Shevlin Anna Green Natalie Greaves Sharon Grindle Wendy Ibbotson Jane Marsh Julie Taff Aimee Turner
Consultant Virologists	Mohammed Raza
Deputy Chief Nurse	Chris Morley
Occupational Health Department Staff	Alison Rimmer Helen Hough
Supplies	Michaela Fairest
Primary care representatives	Nikki Littlewood
Secretaries	Jan Waddingham Pat Brooks Elaine Leonard

Appendix C

Membership of the STHFT Decontamination Group

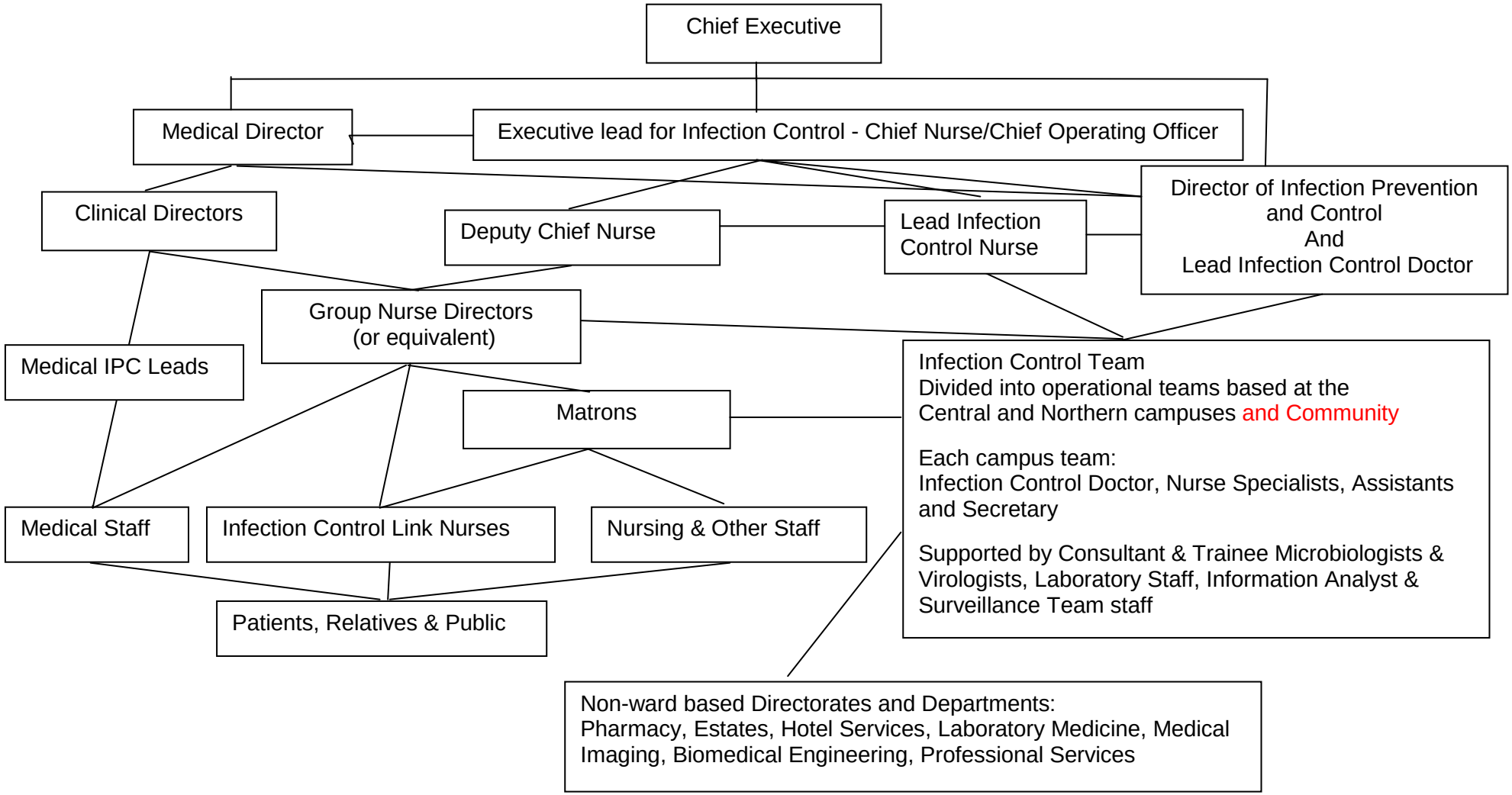
Membership consists of a core group of permanent members supplemented by powers of co-option as required.

DESIGNATION	NAME
Deputy Chief Operating Officer	Richard Parker
Deputy General Manager Operations	Chris Hayden
Trust Decontamination Manager	Nigel Martin
Director of Infection Prevention & Control	Dr Christine Bates
Lead Infection Control Nurse	Patty Hempshall
Supplies Manager	Helen Stanley
Patient and Healthcare Governance	Andrew Scott
Group Accountant	Janet Barker
Estates Manager/Engineering Manager	Andrew Hudson or Mick Wareing
Contract Manager - Decontamination Super Centre	Brian Lenihan
Care Group/Directorate Representatives	
Community Services	Annette Nuttall
Obstetrics & Gynaecology	Bell, Janet
Critical Care and Operating Services	Simon Richardson
CCDH	Hannah Wharam
DPU	Alison Cory
Cardiothoracic	Ian Lewin
Cardiothoracic	Darren Cook
ENT	Katherine Walker
Head And Neck	Faye Morley
WPH	Rebecca Gratton
Gastroenterology	Tina Macintosh
Endoscopy Suite Manager NGH	Carol Hill
Endoscopy Suite Manager RHH	Annie King
Urology	Sue Beaumont
Medical Imaging & Medical Physics	David Guymer
Medical Imaging & Medical Physics	Alan Swann

Appendix D

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 E

List of Trust Infection Prevention and Control Related Policies and Guidelines

General Infection Prevention and Control documents
Standard (Universal) Infection Control Precautions, Prevention of Exposure to Blood and Body Fluids and Prevention of Sharps Injuries
Hand Hygiene Policy
Aseptic Technique
Care of the Deceased Patient

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

Equipment, Devices, Environment etc. related policies/guidance
Linen Guidelines
Computer Keyboards & Equipment Cleaning Guidelines
Decontamination of Hospital Equipment and Medical Devices Policy
Decontamination Policy

Invasive Procedures
Bladder Management and Catheterisation Policy for Adults
Infection Control Guidelines for Central Venous Catheters (CVC)
Infection Control Guidelines for Peripheral cannula
Taking Blood Cultures Procedure

Specific organism policies/guidance

Specific organisms
Meticillin-Resistant Staphylococcus aureus [MRSA] Guidelines for the Control of Meticillin-Resistant Staphylococcus Aureus (MRSA)
Transmissible Spongiform Encephalopathies Creutzfeldt-Jacob Disease [CJD] and Related Disorders: Safe Working and the Prevention of Infection
Glycopeptide Resistant Enterococci Guidelines for the Control of Glycopeptide Resistant Enterococcus [GRE] in Hospitals (also known as Vancomycin Resistant Enterococcus or VRE)
Acinetobacter and other antibiotic resistant bacteria
Control of Tuberculosis, including MDRTB Tuberculosis – an Integrated Policy for the Control of TB in Sheffield
Respiratory Viruses Severe Acute Respiratory Syndrome [SARS], Human Cases of Avian Influenza Policy and Severe Respiratory Infection suspected to be caused by a Novel Infective Agent (SRINIA)
Viral Haemorrhagic Fevers
Anthrax Management and Control of Anthrax
Smallpox Management and Control of Smallpox
Chickenpox
Scabies
Lice and Fleas

Diarrhoea related policies/guidance
Suspected Infective Diarrhoea
Norovirus
Clostridium difficile Associated Diarrhoea – Protocol for the Management of Adult Patients
Protocol for use of Faecal Transplant in the management of *Clostridium difficile* disease at STH

Antimicrobial Prescribing
Antibiotic Review Policy
Antibiotic Prescribing Guidelines
Restricted Antibiotic Policy
Chest Infection & Pneumonia Guidelines

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
Legionella Control & Management Policy and Procedures
Regular flushing of taps
Birthing Pools
Hydrotherapy pools
Drinking Water Coolers
Ice Machines

Other Infection Control 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
Procedure for the Production of the Trust-wide IPC Programme
DIPC Job Description
DIPC Personal Specification