The Queen Elizabeth University Hospital/ NHS Greater Glasgow and Clyde Oversight Board

Final Report

March 2021

Contents

Summary: Full List of Recommendations

This Final Report sets out the findings and recommendations of the NHS Greater Glasgow and Clyde (GGC) Oversight Board's programme of work in response to the infection issues affecting the Queen Elizabeth University Hospital (QEUH) and the Royal Hospital for Children between 2015 and 2019. It summarises the work on investigation, dialogue and improvement driven by the Oversight Board since its establishment in December 2019 through to March 2021.

The Oversight Board was established by the Director-General of Health and Social Care in the Scottish Government and Chief Executive of NHS Scotland in November 2019. This decision was taken in response to critical issues relating to the operation of infection prevention and control, governance, and communication and engagement with respect to the Queen Elizabeth University Hospital and the handling of infection incidents affecting children, young people and their families within the paediatric haemato-oncology service. The appointment of an Oversight Board was a direct consequence of the escalation of the Health Board to Stage 4 of NHS Scotland's national performance framework.

The Oversight Board consists of a group of experts and representatives drawn from other Health Boards, the Scottish Government and the affected families themselves. Chaired by Scotland's Chief Nursing Officer, Professor Fiona McQueen, the work of the Board was carried out principally through three Subgroups: Infection Prevention and Control and Governance; Technical Issues; and Communication and Engagement. Overall, the Oversight Board has focused on assurance of current systems and reviewing the historical issues that gave rise to escalation , essentially through a focus on a set of overarching questions:

- To what extent can the source of the infections be linked to the environment and what is the current environmental risk?
- Are infection prevention and control (IPC) functions 'fit for purpose' in NHS GGC, not least in light of any environmental risks?
- Is the governance and risk management structure in NHS GGC adequate to pick up and address infection risks?
- Has communication and engagement by NHS GGC been sufficient in addressing the needs of the children, young people and families with a continuing relationship with the Health Board in the context of the infection incidents?

In addition, an independent Case Note Review was commissioned to examine the individual incidents of infection among the children and young people. This review is being overseen by an Expert Panel that is reporting separately but at the same time as the Oversight Board. Its findings have informed this Final Report.

Infection Prevention and Control

The Interim Report[1] covered the following selected areas of Infection Prevention and Control (IPC):

- the degree to which specific IPC processes in the QEUH have been aligned with national standards and good practice; and
- the extent to which the IPC Team has demonstrated a sustained commitment to improvement in infection management across the Health Board.

These recommendations are set out in **blue** in the boxes below.

The Final Report makes further findings and recommendations for the remaining IPC issues, particularly: IPC governance; the responsiveness of the Health Board's IPC to the infection incidents; the effectiveness of joint working in support of IPC in the QEUH; and the strength and organisation of leadership in IPC.

Local Recommendations

Interim Report

- With the support of ARHAI Scotland and Healthcare Improvement Scotland, NHS GGC should undertake a wide-ranging benchmarking of key IPC processes through a more comprehensive Peer Review exercise. Particular attention should be given to the approach to IPC audits, surveillance and the use of Healthcare Infection Incident Assessment Tools (HIIATs).
- With the support of ARHAI Scotland, NHS GGC should review its local translation of national guidance (especially the National Infection Prevention and Control Manual) and its set of Standard Operating Procedures to avoid any confusion about the clarity and primacy of national standards.
- With the support of Health Facilities Scotland, NHS GGC should undertake a review of current Healthcare Associated Infection Systems for Controlling Risk in the Build Environment (HAI-SCRIBE) practice to ensure conformity with relevant national guidance.
- A NHS GGC-wide improvement collaborative for IPC should be taken forward that prioritises addressing environmental infection risks and ensuring that IPC is less siloed across the Health Board.

[1] https://www.gov.scot/publications/queen-elizabeth-university-hospital-nhs-greater-glasgow-clyde-oversight-board-interim-report/.

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- Strengthened arrangements for IPC, commensurate with the complexity and size of the Health Board, should be put in place in line with relevant national guidelines.
- The structure of IPC should reflect the continuing need to address the complex and continuing issues within the QEUH. IPC resourcing and skills should be reviewed, and active consideration given to whether there should be appointment of specific IPC roles with QEUH responsibility.
- NHS GGC should ensure that there is a full, effective and standardised approach to the relevant microbiological, water testing and other information regarding the QEUH outbreaks. Relevant data should be integrated in a way that allows effective collecting, recording and analysis of information relating to the incidents, which will be reported through the IPC governance system.
- Building on work already in place, there should be further visible and systematic planning for strengthening coordination between IPC and Facilities and Estates, particularly with respect to forward planning in addressing continuing infection risks with the QEUH and specifically in relation to water testing.

National Recommendations

Interim Report

- ARHAI Scotland should review the National Infection Prevention and Control Manual in light of the QEUH infection incidents.
- Health Facilities Scotland should lead a programme of work to provide greater consistency and good practice across all Health Boards with respect to the use of HAI-SCRIBE.
- ARHAI Scotland should review the existing national surveillance programme with a view to ensuring there is a sustained programme of quality improvement training for IPC Teams in each Health Board, not least with respect to surveillance and environmental infection issues.
- ARHAI Scotland should lead on work to develop clearer guidance and practice on how HIIAT assessments should be undertaken for the whole of NHS Scotland.

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- ARHAI Scotland should lead in developing and implementing a research programme to address any current gaps in the understanding of environmental infections and how hospitals can address them.
- There are a number of existing national recommendations that were made in the 2018 Health Protection Scotland report that have yet to be fully implemented. ARHAI Scotland should provide an update and timebound action plan for implementing these.
- IMTs in NHS GGC should be more rigorous in developing and making accessible key documentation to support records and analyses of a series of outbreaks over a prolonged period. This should be implemented by NHS GGC, with support from ARHAI Scotland who can identify best practice and make changes to national guidance if this is required.
- Where there are a number of successive infection incidents in the same or a related location, NHS GGC should work with ARHAI Scotland to pilot a process that goes beyond the current IMT focus on individual incidents on behalf of NHS Scotland.

Governance and Risk Management

To address one of its key questions – is the governance structure in NHS GGC adequate to pick up and address infection risks? – the Oversight Board considered how infection management and risk was addressed by NHS GGC. This included reviewing: the framework for governance around IPC; how that system was implemented over the period; and how the risks around these infection incidents were identified, assessed and managed.

Local Recommendations

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- The Health Board should finalise and implement its IPC Assurance and Accountability Framework.
- A review should be undertaken of how the environmental risk of significant water contamination within the QEUH is being assessed and managed in the Health Board's approach to risk management, and changes made to relevant risk registers and risk management planning as a result.
- The Health Board should set out a clearer, more targeted focus on the corporate risk process.
- The Health Board should review how concerns raised about environmental risks are communicated to senior Committees and the Board, and the procedures to ensure that such concerns are addressed. Moreover, it should also ensure the responses are communicated appropriately to those raising concerns.

National Recommendations

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- The experience of NHS GGC in addressing the unique challenges of the QEUH should be systematically used to shape NHS Assure as early as possible. This should be part of a comprehensive process of developing a template for a 'ward-through-Board' governance system that ensures risks of this nature are appropriately escalated and de-escalated.

Communication and Engagement

Recommendations are set out below with respect to the overarching question considered by the Oversight Board: has communication and engagement by NHS GGC been sufficient to address the needs of the children, young people and families with a continuing relationship with the Health Board in the context of the infection incidents? The recommendations from the Interim Report are presented in blue.

Local Recommendations

Interim Report

- NHS GGC should pursue more active and open transparency by reviewing how it has engaged with the children, young people and families affected by the incidents, in line with the person-centred principles of its communication strategies. That review should include close involvement of the patients and families themselves.
- NHS GGC should ensure that the recommendations and learning set out in this report should inform an updating of the Healthcare Associated Infection Communications Strategy and an accompanying work programme for the Health Board.
- NHS GGC should make sure that there is a systematic, collaborative and consultative approach in place for taking forward communication and engagement with patients and families. Co-production should be pursued in learning from the experience of these infection incidents.
- NHS GGC should embed the value of early, visible and decisive senior leadership in its communication and engagement efforts and, in so doing, more clearly demonstrate a leadership narrative that reflects this strategic intent.
- NHS GGC should review and take action to ensure that staff can be open about what is happening and discuss patient safety events promptly, fully and compassionately.

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- Given that organisational duty of candour was considered, but not formally activated, NHS GGC should review its approach to ensure that it is not simply focused on patient safety incidents and circumstances where causality is clear. There should be greater consideration of the duty where events could result in death or harm. There should also be improved guidance on how the Health Board will balance with other duties perceived as barriers to meeting the organisational duty of candour obligations.

National Recommendations

Interim Report

- The experience of NHS GGC should inform how all of NHS Scotland can improve communication with patients and families 'outside' hospitals in relation to infection incidents.
- The experience of NHS GGC in systematically eliciting and acting on people's personal preferences, needs and wishes as part of the management of communication in these infection incidents should be shared more widely across NHS Scotland.
- NHS GGC should learn from other Health Boards' good practice in addressing the demand for speedier communication in a quickly-developing and social media context. The issue should be considered further across NHS Scotland as a point of national learning.
- The Scottish Government, with Healthcare Improvement Scotland and ARHAI Scotland, should review the external support for communication to Health Boards facing similar intensive media events.

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- The findings of the Oversight Board in respect of the application of the organisational duty of candour in NHS GGC should be considered by the Scottish Government and Healthcare Improvement Scotland in order that further implementation support and guidance can be developed around the issues noted.

General Issues

Local Recommendations

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- The Health Board should expedite the refurbishment of Wards 2A and 2B in the RHC as safely and quickly as possible, and keep affected children, young people and families fully informed of the developments.
- A programme of testing and review should be put in place to assess any potential impacts of the chemical dosing water solution on infrastructure.

- The various action plans and reviews attached to these recommendations should be compiled into a single response to the Oversight Board, and implementation overseen by NHS GGC and the Scottish Government.

1. Introduction

1. The Oversight Board was established by the Director-General of Health and Social Care in the Scottish Government and Chief Executive of NHS Scotland in November 2019. Its aim has been to review and address the set of critical issues relating to the operation of infection prevention and control (IPC), governance and communication and engagement with respect to the Royal Hospital for Children (RHC) and the Queen Elizabeth University Hospital (QEUH) and the handling of infection incidents affecting children, young people and their families within the paediatric haemato-oncology service of NHS Greater Glasgow and Clyde (GGC). The Oversight Board was a direct consequence of the escalation of the Health Board to Stage 4 of NHS Scotland's National Performance Framework (as described more fully in the Interim Report).

2. The Oversight Board consists of a group of experts and representatives drawn from other Health Boards, the Scottish Government and the affected families themselves. Chaired by Scotland's Chief Nursing Officer, Professor Fiona McQueen, the work of the Board has been carried out through three Subgroups, each focusing on distinctive groups of issues.

- **Infection Prevention and Control and Governance**: this Subgroup has examined whether or not appropriate IPC and IPC governance was (and is currently) in place across NHS GGC in relation to these incidents and to recommend how to strengthen current approaches to mitigate avoidable infection harms. It was chaired initially by Irene Barkby MBE (Executive Director of Nursing, Midwifery and Allied Health Professionals in NHS Lanarkshire), and latterly by Scotland's Deputy Chief Nursing Officer, Diane Murray.
- **Technical Issues**: this Subgroup has focused on the technical operations of the hospitals in question, with a particular focus on key infrastructure issues, including the Board's approach to water safety. It has been chaired by Alan Morrison (Deputy Director for Health Infrastructure in the Scottish Government).
- **Communication and Engagement**: this Subgroup has considered effective communication with the children, young people and families of the paediatric haemato-oncology service of NHS GGC, as well as whether a wider, robust, consistent and reliable person-centred approach to engagement has been evident. It has examined the organisational duty of candour and other key review processes, such as the Significant Adverse Events Review (SAER) policy. It has been chaired by Professor Craig White (Divisional Clinical Lead, Healthcare Quality and Improvement Directorate of the Scottish Government).

The Terms of Reference for the Oversight Board and its supporting Subgroups are set out in **Annex A**.

3. The following Final Report sets out the findings, conclusions and recommendations arising from Oversight Board's programme of work from its establishment in December 2019 through to March 2021. The Oversight Board was

supported by a number of special reports which were commissioned to examine specific issues relating to the Health Board, including:

- a timeline of infections and governance – this report set out a timeline of the incidents where a Gram-negative and other unusual bacteria (such as Mycobacterium Chelonae) were identified and which occurred in Wards 2A and 2B of the RHC and latterly in Wards 4B and 6A in the QEUH (the timeline is presented in **Annex F**);
- a review of NHS GGC's IPC governance, particularly with respect to escalation as part of outbreak management, by the IPC and Governance Subgroup;
- a review of NHS GGC water safety policy within the QEUH, undertaken through the Technical Issues Subgroup; and
- reviews of the Health Board's policy on Significant Adverse Events Reviews and Mortality/Morbidity Reviews, overseen by the Scottish Government's Directorate for Healthcare Quality and Improvement.

4. The work programme was also supported by a number of key individuals who worked alongside and within NHS GGC to support specific aspects of improvement:

- Professor Marion Bain (Deputy Chief Medical Officer, Scottish Government), who was appointed as the Executive Lead for Healthcare Associated Infection (HAI) within NHS GGC in December 2019 to set the strategic direction for IPC improvement (jointly reporting to the Chair of the Oversight Board as well as the Chief Executive for NHS GGC);
- Professor Angela Wallace (Nurse Director, NHS Forth Valley), who was appointed in February 2020 to work with and succeed Professor Bain as the Health Board's Interim Operational Director for IPC (also jointly reporting to the Chair of the Oversight Board as well as the Chief Executive for NHS GGC); and
- Professor Craig White, who was appointed by the Cabinet Secretary for Health and Sport in October 2019 to work with the families of the children and young people in the paediatric haemato-oncology service to address communication issues within NHS GGC.

5. Alongside the Oversight Board, the Cabinet Secretary for Health and Sport commissioned a **Case Note Review** in her statement to Parliament on 28 January 2020. Overseen by Professor Marion Bain and a panel of independent external experts led by Professor Mike Stevens (Emeritus Professor of Paediatric Oncology at the University of Bristol), the Case Note Review team has examined the individual case notes of those children and young people in the paediatric haemato-oncology service in the RHC and the QEUH from 2015 to 2019 who had a Gram-negative environmental pathogen bacteraemia (and selected other organisms, as identified in laboratory tests). Its terms of reference are presented in **Annex B** and it has contributed to the Oversight Board's final report. Its own final report is being published separately and alongside this Final Report.

6. The Oversight Board has already set out some of its findings and recommendations in its Interim Report, which was published in December 2020.[2] The Interim Report specifically set out findings and recommendations:

- for infection prevention and control, a review of key processes/systems and the approach to improvement of IPC in NHS GGC; and
- for communication and engagement, a review of the way in which the Health Board communicated and engaged with affected patients.

The Final Report does not repeat these findings. **Annex C** sets out what has been covered by the Interim Report, and what is covered in the Final Report, and the Interim Report recommendations are set out again in the Summary.

7. The Final Report presents findings and recommendations in the remaining areas that have been examined. Following this introduction, the report consists of several sections:

- **Background to the Oversight Board**: the context for the establishment of the Oversight Board and the infection issues within the QEUH and the way the Oversight Board took forward its work;
- **Infection prevention and control**: a review of the responsiveness, joint working between IPC and other key staff, and senior leadership of IPC within the QEUH, and how the Health Board has learned from the experience of the infection incidents;
- **Governance and risk management**: a review of the governance and management of risk with respect to these infection issues;
- **Technical review**: a review of the Health Board's current water safety policy in the QEUH and its approach to infrastructure maintenance given the infection issues faced by the hospital;
- **Communication and engagement**: a review of the Health Board's approach to the organisational duty of candour, its Significant Adverse Events Review policy and approach to Mortality/Morbidity Reviews;
- **Case Note Review**: a summary of the Case Note Review's independent Expert Panel's key findings as they relate to the Oversight Board's programme of work; and
- **Conclusions and the way forward**: the findings and recommendations of this Final Report, including an overarching assessment of NHS GGC's current escalation to Stage 4.

8. In addition, there are several annexes:

A. the terms of reference for the Oversight Board and its Subgroups;

B. the terms of reference for the Case Note Review;

C. a description of what is covered in the Interim and the Final Reports;

[2] Queen Elizabeth University Hospital/NHS Greater Glasgow and Clyde Oversight Board: interim report - gov.scot (www.gov.scot).

D. the Key Success Indicators identified by the Oversight Board;
E. the current structure of IPC governance and assurance in NHS GGC; and
F. a timeline of infection incidents in the QEUH between 2015 and 2019.

2. Background to the Oversight Board

2.1 Context for Escalation

9. On 22 November 2019, the decision was taken by Malcolm Wright, Director-General of Health and Social Care in the Scottish Government and Chief Executive to NHS Scotland, to escalate NHS GGC to Stage 4 of the NHS Scotland Board Performance Escalation Framework. An Oversight Board was established to focus on three broad areas:

- infection, prevention and control;
- governance; and
- communication and engagement.

10. Escalation of NHS GGC to Stage 4 was set within the procedure for NHS Board performance. The Escalation Framework lays out the triggers and actions when Health Boards are unable or hindered in taking forward their essential responsibilities. The Framework describes a scale of acuteness for taking action, and what steps are needed following a decision to escalation, depending on the 'stage' on the framework. Stage 5 is the most serious stage; Stage 4 is defined as "significant risks to delivery, quality, financial performance or safety, (and) senior level external transformational support (is) required." It is applied where the Scottish Government believes that a NHS Board requires enhancement to address local issues and additional direct management or transformation support may be required.

11. Escalation came against a background of a series of infection issues affecting children and young people in the paediatric haemato-oncology service at the QEUH and the RHC over a number of years, combined with rising concerns about the source(s) of those infections and how they were being handled.

- While cases were reported in 2016 and 2017, concerns significantly mounted between January and September 2018 when the number and diversity of type of infections substantially increased. According to Health Protection Scotland (HPS), there were at least 23 cases, involving 11 different organisms.
- From Spring 2018, there was a succession of outbreaks, including one in September in the RHC which led to the de-canting of patients into the QEUH and extensive (and continuing) refurbishment of Wards 2A and 2B. In 2019, there was a further major outbreak in Ward 6A in the QEUH, into where the children and young people had been moved after de-canting.
- The organisms associated with these outbreaks were unusual and often linked to environmental bacteria. In 2018, water testing results suggested that there was systemic water contamination in the QEUH, prompting the introduction of a site-wide chemical dosing solution later that year.

- Concerns had been raised about the fitness of the new hospitals by several clinicians and microbiologists with respect to environmental infections at various points over the period, dating back to the completion and handover of the building. Some QEUH/RHC clinicians and microbiologists did not feel that their concerns – particularly about water and ventilation safety – were being effectively addressed, and in some cases, formal whistleblowing procedures were triggered.
- Concerns were also raised by families of the patients involved about how the Health Board was communicating and engaging with them in light of their increasing anxieties about the safety of the hospitals. (These issues have been discussed in the Oversight Board's Interim Report.)
- It was not until summer 2018 that senior management were made aware of the existence of external reports highlighting the risks of water contamination as early as 2015, but which had not been acted upon at the time. These reports were discussed publicly for the first time in November 2019.

12. In February 2020, NHS GGC was escalated again to Stage 4 for a range of issues beyond the circumstances of the QEUH incidents, including wider performance management on waiting times, the Board's out-of-hours service and financial matters. Work on this has been overseen by a separate Performance Oversight Group, chaired by John Connaghan, then-Interim Chief Executive of NHS Scotland. Care has been taken throughout not to duplicate areas being covered more thoroughly by this group.

13. The purpose of the NHS GGC/QEUH Oversight Board has been to ensure NHS GGC takes the necessary actions to deliver and increase public confidence in safe, accessible, high-quality, person-centred care at the QEUH and RHC, and to advise the Chief Executive of NHS Scotland that such steps have been taken – or as set out in the Cabinet Secretary's statement, to "[restore] confidence that the places families take their children to be cared for are as safe as they possibly can be." In particular, the Oversight Board has sought to:

i. ensure appropriate governance is in place in relation to infection prevention, management and control;

ii. strengthen practice to mitigate avoidable harms, particularly with respect to infection prevention, management and control;

iii. build on and improve how families with children being cared for or monitored by the haemato-oncology service have received relevant information and been engaged with;

iv. confirm that relevant environments at the QEUH and RHC are and continue to be safe;

v. oversee and consider recommendations for action further to the review of relevant cases, including cases of infection;

vi. provide oversight on connected issues that emerge;

vii. consider the lessons learned that could be shared across NHS Scotland; and

viii. provide advice to the Chief Executive of NHS Scotland about potential de-escalation of the NHS GGC Board from Stage 4.

14. Throughout this work of robust scrutiny and challenge, the Oversight Board has been focused on improvement. While that requires an understanding of what has happened in the past and how processes operated at different points in the period since the opening of the QEUH and the RHC, this has been in the service of understanding what happened with these incidents to support patients and families and assessing the quality and efficacy of processes in place now. History has been important in reflecting the Health Board's own capacity for learning lessons, making any necessary improvements and tracking the implementation and adequacy over those changes going forward. The Oversight Board has consequently aimed to ensure that learning is captured, shared locally and nationally, and most importantly, acted upon. It has also sought to highlight the improvements that have already been put in place by the Health Board in advance of and throughout this process.

Context of Other Reviews

15. The Oversight Board has acted separately from the **Independent Review**. On 5 March 2019, Dr Andrew Fraser and Dr Brian Montgomery were appointed by the Cabinet Secretary for Health and Sport to lead an Independent Review with the aim of: "establish[ing] whether the design, build, commissioning and maintenance of the QEUH and the RHC has had an adverse impact on the risk of Healthcare Associated Infection and whether there is wider learning for NHS Scotland." The Independent Review's report was published on 15 June 2020. NHS GGC has welcomed the Independent Review, and the Scottish Government has committed to implement the relevant recommendations.[3]

16. A fuller accounting of these issues will be the responsibility of the **Hospitals Public Inquiry**. The Oversight Board has been careful not to duplicate its prospective work, but has necessarily covered similar territory in some instances in order to get to address the key issues of Stage 4. The Inquiry is chaired by the Right Honourable Lord Brodie QC PC and its terms of reference have been published.[4]

2.2 Priority Issues

17. The Oversight Board has focused on assurance of current systems. Consequently, for the key areas that it has examined – IPC, governance and communication and engagement – the Oversight Board set out what 'good should look like' through a set of key success indicators (described in **Annex D**). These principles have been applied in how the Board has considered its terms of reference, essentially through a set of overarching questions:

[3] Queen Elizabeth University Hospital Independent Review - report recommendations: Scottish Government response - gov.scot (www.gov.scot).
[4] Inquiry into the construction of the QEUH, Glasgow and the RHCYP/DCN, Edinburgh: terms of reference - gov.scot (www.gov.scot).

i. **To what extent can the source of the infections be linked to the environment and what is the current environmental risk?**

ii. **Are IPC functions 'fit for purpose' in NHS GGC, not least in light of any environmental risks?**

iii. **Is the governance and risk management structure in NHS GGC adequate to pick up and address infection risks?**

iv. **Has communication and engagement by NHS GGC been sufficient in addressing the needs of the children, young people and families with a continuing relationship with the Health Board in the context of the infection incidents?**

Major aspects of questions **iii** and **iv** were addressed in the Interim Report (as summarised in **Annex C**). The concluding chapter of the Final Report returns to these questions as a whole.

18. These issues have arisen in relation to a particular patient group within the QEUH, but the Oversight Board has widened its focus where wider implications have been important to acknowledge, whether for the whole Health Board or NHS Scotland.

19. The Oversight Board conducted its work through a review of key documents and direct inquiry with NHS GGC involving experts who took part in the Oversight Board and its Subgroups. Documentation included:

- the papers and material presented by NHS GGC to the Oversight Board's meetings, including minutes of the Health Board, relevant committees (such as the Board Infection Control Committee and the Clinical and Care Governance Committee) and Incident Management Teams (IMTs), action plans and special presentations;
- specially-commissioned topic-specific 'situation, background, assessment, recommendation' papers (SBARs) from NHS GGC as well as external experts and statements on specific issues, such as the use of anti-fungal prophylaxis, water testing policies and the approach to Significant Adverse Events Reviews;
- material provided previously to the Cabinet Secretary and the Health and Sport Committee of the Scottish Parliament by several NHS GGC clinicians and microbiologists; and
- key external documents, such as the Health Facilities Scotland (HFS) report, 'Water Management Issues Technical Review: NHS Greater Glasgow and Clyde – Queen Elizabeth University Hospital and Royal Hospital for Children' (finalised March 2019), and the HPS reports, 'Summary of Incident and Findings of the NHS Greater Glasgow and Clyde: Queen Elizabeth University Hospital/Royal Hospital for Children Water Contamination Incident and Recommendations for NHSScotland' (published February 2019) and 'Review of NHSGG&C Paediatric Haemato-oncology Data' (published November 2019).

20. There was no programme of comprehensive interviewing or evidence gathering from individuals and organisations, apart from what was undertaken as part of the commissioned work described above. However, specific clarifying discussions were held with representatives of the affected children, young people and families, some NHS GGC clinicians and microbiologists that had raised concerns about the Health Board and NHS GGC representatives throughout the Oversight Board's programme of work. The Oversight Board is grateful for the full support provided by all to this work.

3. Infection Prevention and Control

21. As noted in the Interim Report, the last few decades have witnessed an increased sensitivity to the risks associated with hospital-associated infections. The Vale of Leven Inquiry underlined the importance of rigorous processes, monitoring and escalation procedures in addressing the new challenges to IPC, and its recommendations[5] have underpinned the current systems across NHS Scotland, and the requirements set out in the National Infection Prevention and Control Manual[6].

22. New national guidance and expectations (especially through the National IPC Manual) form one part of the context to reviewing the approach to IPC in NHS GGC. The other is recognising the unprecedented challenges of the problems associated with the building of the QEUH: these have been rehearsed in the Independent Review's final report and are not repeated here. However, the shortcomings of the hospital environment formed a challenging set of difficulties for the Health Board as it experienced an unusual number and diversity of environment-related infections. While the National Manual now contains aide-mémoires[7] addressing water- and ventilation-associated infections, national advice and support on these unusual infections was not consistently available through this period.

23. The background of an increasing need for ever-more robust IPC procedures and the drive for improvement form an important backdrop for the Oversight Board's assessment of IPC within NHS GGC. In its terms of reference, the Oversight Board recognised that there would be key points of learning and a need for improvement for NHS Scotland as a whole. Consequently, while it can be difficult at points to separate out historical and current matters, the Oversight Board has concentrated on issues and incidents and considered this in relation to the current and future capability of IPC in the Health Board. The following chapter balances a review of how the Health Board reacted to the emerging infection challenges with an understanding of what it has learnt from those experiences and whether the current systems provide assurance that any future outbreaks would be managed in a satisfactory way.

24. The concept of assurance is at the heart of the Oversight Board's work. Specifically, the overarching question before the Oversight Board has been whether current IPC processes within NHS GGC have been 'fit for purpose', in terms of national standards and good practice. In this respect, the Oversight Board has measured the Health Board against the key success factor: "the current approaches that are in place to mitigate avoidable harms, with respect to infection prevention and control, are sufficient to deliver safe, effective and person-centred care" (as set out in **Annex D**). It has also emphasised assessment of whether NHS GGC has been able to recognise any shortcomings through the succession of incidents, taken

5 https://webarchive.nrscotland.gov.uk/20170401011220/http://www.valeoflevenhospitalinquiry.org/report.aspx.

6 National Infection Prevention and Control Manual: Home (scot.nhs.uk).

7 1_water-incidents-info-sheet-v1.0.pdf (windows.net) and 1_2019-10-16-ventilation-crib-card-v1.0.pdf (windows.net).

appropriate steps to address them (and indeed, acknowledge them to relevant parties, such as patients and families) and sought to prevent them being repeated. These are essential features of an organisation which has the ability to learn from its experience and find better ways to deliver care and support patients and families.

25. To answer the overarching questions for this work – particularly, **are IPC functions fit for purpose in NHS GGC, not least in light of any environmental risks?** – the Oversight Board set in motion a range of work. In particular, the Oversight Board has:

- commissioned a detailed description of the timeline of infection incidents between 2015 and 2019 and formal meetings to address the incidents, to present a narrative of how the outbreaks seemed to emerge and acted upon (as set out in **Annex F**);
- commissioned a system-wide peer review of current IPC systems and processes and associated governance scheme of delegation and escalation mechanisms against relevant national standards and guidance through the IPC and Governance Subgroup;
- commissioned bespoke SBARs on particular issues, such as the use of prophylaxis drugs and the current water safety policy;
- received reports from key individuals placed within the Health Board, as noted above, particularly Professors Bain, Wallace and White; and
- determined if there were any gaps when mapped against national standards and guidance and, if so, identify areas for improvement and shared learning with respect to IPC audit, performance, compliance and assurance, as well as operational delivery of IPC, including staffing/resourcing, minimum skills and joint working between relevant units.

26. Several IPC issues have already been reviewed in the Interim Report, specifically certain systems and processes (such as compliance with the National Manual and the use of Healthcare Infection Incident Assessment Tools) as well as the approach to improvement in IPC. The Final Report addresses the remaining key issues for IPC:

- **Responsiveness**: over the period, how did IPC functions identify relevant contamination issues and respond to the outbreaks, particularly with respect to identifying infections early enough, taking appropriate action and learning from each incident through understanding the potential sources;
- **Joint working in IPC**: as was described in the Interim Report, the systems and processes that enable effective IPC within a Health Board depend not just on the effectiveness of the IPC Team, but how that Team links with other key functions across the organisation – this section reviews how well cooperative working to support IPC was evident in the QEUH, particularly between key staff with a responsibility for undertaking IPC such as Facilities and Estates and microbiologists;
- **Leadership**: the effectiveness of the current structure of responsibilities for the IPC Team in NHS GGC, and whether those divisions of responsibilities are best suited in these circumstances; and

- **Learning from the Experience**: the programme of work that NHS GGC has put in place to start addressing the issues arising from escalation, led by the Board Chief Executive.

3.1 Responsiveness

27. The responsiveness of a Health Board to infection incidents is critical to assurance on IPC. A responsive approach to IPC would be characterised by: clear descriptions of processes and systems within the governance system; the ability to identify and respond quickly, appropriately and effectively to incidents; ensuring the right processes remain in place (and adapted as appropriate in an improvement culture over time); having the right individuals and services working together; knowing when to stand down support; and having a robust approach to any 'lessons learned' in reference to best practice and national standards.

28. How the Health Board should respond to infection outbreaks was provisionally set out in the Governance and Quality Assurance and Accountability Framework for Infection Prevention and Control Services developed by NHS GGC (as described in more detail in the Governance section, which will focus on how escalation and risk management has taken place). The document was developed by NHS GGC in response to a Healthcare Improvement Scotland (HIS) inspection in January 2019.[8] A requirement of this inspection (which was to be implemented immediately) was to improve governance in both estates and facilities and infection prevention and control teams to assure themselves of safe patient care in line with the Scottish Government's guidance Blueprint for Good Governance (2019). Plans for implementing this in NHS GGC have been progressing through the lifetime of this Oversight Board.

29. The document describes a process for the management of infection incidents/outbreaks, including the establishment of an IMT, reporting mechanisms to the Board Infection Control Committee and relevant Sector, Directorate and other Board Committees, including inclusion in the weekly Healthcare Infection Incident Assessment Tool (HIIAT) reports to HPS (formerly, but Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland latterly). The Framework also aims to describe the formal delegation of authority and responsibilities within the Health Board.

30. To assess NHS GGC's responsiveness, several elements have been considered by the Oversight Board:

- its response to the 'phases' of incidents over the period, particularly in the context of whether appropriate action was taken at the earliest possible juncture;

[8] http://www.healthcareimprovementscotland.org/news_and_events/news/news_qeuh_mar_19.aspx.

- how precautionary (or prophylactic) antibiotic and anti-fungal treatment was prescribed to the patient group, apparently as part of the mitigation of potential infection risks, in response to the concerns that were raised by some families about the implications of their use and as part of an understanding of how the Health Board responded to the prolonged uncertainty regarding the infection incidents; and
- the learning derived from the incidents and the Health Board's responses.

Responding to the Incidents

31. Infection incidents in hospitals have regrettably been a regular occurrence across Scotland over the last few decades; indeed, internationally it is recognised as a key risk within the clinical setting. In seeking assurance that a Health Board is addressing incidents effectively and timeously, the issue is consequently about prevention as well as control. It is also important to consider whether a Health Board is acting in line with established good practice and national standards. In the case of the incidents at the QEUH, there are significant additional elements to consider.

- First, the number of Gram-negative and other environmental bacteria and the link to environmental risk presented challenges to the Health Board because of the diversity and rare occurrence of the organisms identified, and indeed, the absence of comprehensive national guidance on these matters at the key points in the timeline.
- Second, the succession of incidents over the period raised questions related to the environment of the building, as described in some detail in the Independent Review.

Consequently, it is important to recount the sequence of incidents (through the timeline of incidents found in **Annex F**).

32. Reviewing the period from 2016 to 2019, 2018 emerges as a critical point; before then, incidents of environmental-related infections seemed to be treated by the Health Board as isolated. In its report published in February 2019, HPS summarised the incidents in this 'earlier' period, but focused on incidents within specific locations in the QEUH: ie. "any child linked to wards 2A/B RHC with a blood stream infection caused by a gram negative bacillus that had been identified from organisms identified within the water system." A focus on infections in the specific RHC wards for paediatric haemato-oncology patients does not give a full picture of the number and diversity of Gram-negative environmental infections seen before 2018 in the QEUH (as the timeline in **Annex F** shows).

- In 2016, in both Ward 2A and the Paediatric Intensive Care Unit (PICU), there were four infection incidents, involving ten patients.
- In 2017, there were 14 incidents, involving at least 25 patients and what appears to be 26 organisms. Three patients who died had infections during the course of their treatment.

33. At this point, IMTs focused on actions that typically addressed the cleanliness of the immediate environment and possible transmission via individuals. For example, there was a succession of extensive environmental cleaning exercises (or

'deep cleans') of the affected locations, and in 2017, a review of the cleanliness of the environment in terms of compliance with national standards by the Lead Nurse for IPC, the Senior Charge Nurse and the Domestic Manager. Staff also acted quickly to determine what might be done to improve practice through work to reduce Central Line Associated Bloodstream Infections (CLABSI) rates. IMTs were diligent and focused in their responsiveness – for example, in response to an incident of infection cases in Ward 2A in the RHC that were given a 'Red' HIIAT, in June 2017, the following actions were taken:

- cleaning of rooms occupied by patients;
- typing of bacteria;
- review of the environment by the Lead Nurse for IPC, the Senior Charge Nurse and Domestic Manager, covering cleanliness of ward and equipment and compliance of staff with IPC processes;
- education work with families about infection control;
- review of line care;
- regular reporting, including the updating of the Healthcare Infection, Incident and Outbreak Reporting Template (HIIORT) (13 times between 26 July and 15 August);
- increasing water sampling in Ward 2A; and
- advice explicitly from HPS of any further action that could be taken.

34. The isolated nature of these incidents did not necessarily point to any wider links with the wider environment. For the Gram-negative and unusual environmental bacteria incidents in the Schiehallion Unit in 2017, a connection to a common source was not made as each bacteria had a unique strain. Water testing results were consistently proving negative: 151 water samples were tested between 7 March 2017 and 17 November 2017, and all were negative for Elizabethkingia, coliforms, Pseudomonas sp., Legionella and Stenotrophomonas maltophilia within the water system. Although water testing results cannot be definitive that there are not environmental issues, there was no clear evidence of a 'pattern'.

35. Nevertheless, concerns about the environment had been raised by some clinicians and microbiologists since before the handover of the hospital, some of whom were raising the possibility of water contamination. The Independent Review has already discussed the succession of problems associated with the building at handover and commissioning that were starting to appear through this period. A list of failures to meet buildings standards and environmental defects was recorded in a SBAR in October 2017 by a number of QEUH clinicians and microbiologists, which prompted action by senior management to address the problems.

36. There is evidence of a recognition of the unusualness of the number and diversity of infections. For example, in early March 2017, a Problem Assessment Group (PAG) was convened to discuss the seemingly high number of positive blood cultures in Ward 2A. This group agreed several actions including a retrospective look back at blood culture rates on the unit by the IPC Team, revealing a gradual upward trend over the six months prior. Links between problems with the building and some

infections were already being actively explored in IMTs. For example, in investigating suspected cases of Aspergillus in Ward 2A in 2016 (and again, in 2017 with another Aspergillus case), condensation resulting from the leaking of chilled beams as a source of infection was being considered as a potential source in the IMT (although the hypothesis was discounted after investigation).

37. For the Oversight Board, this raises the question of whether the potential risks associated with the building – especially water contamination – which were identified and acted upon in 2018 should have triggered action earlier by the Health Board. As already noted, action was being taken to explore environmental hypotheses through IMTs, although it is not clear if consideration of environmental risks was taking place in the relevant governance committees. For example, meetings of the Board Infection Control Committee (in November 2017), the Acute Infection Control Committee (also in November) and the Clinical and Care Governance Committee (December) highlighted several incidents of infection, but did not seem to discuss the number of infections as a whole or the reports of building issues.

38. Moreover, information about the individual incidents and the concerns about the building were not brought together in a way that might raise these questions. As will be explored further, this partly arose from the structure of reporting/escalation within the Health Board, and in particular, relationships (at the time) between IPC and Facilities and Estates staff. Of particular relevance here is a water risk assessment prepared by an external water specialist consultant (DMA Canyon Ltd) in April 2015, which drew attention to significant risks associated with Legionella arising from a large number of building defects, problems with the water system as well as high total viable counts (TVCs). The report was not shared with relevant IPC staff and microbiologists, nor indeed was it acted upon at the time (the issue is examined in more detail in the Governance section of this report). Consequently, while there was increasing evidence of environmental infection risks associated with the QEUH, the Health Board's mechanisms for identifying and transmitting relevant information to the right staff did not support staff considering in full any potential link between the infections and the emerging problems with the building.

39. The key period for infection issues was 2018, when a succession of incidents ultimately prompted more challenging questions to (and indeed, by) the Health Board in how to respond. This was the point where the evidence pointing to a more significant set of environmental risks proliferated. Throughout 2018, there was an increase in the number of infection incidents involving unusual organisms. As the February 2019 HPS report noted: "between the period of 29th January and 26th September 2018, 23 cases of blood stream infections (11 different organisms) with organisms potentially linked to water contamination were identified."

40. The cases occurred at different points across the year. After a series of infection cases in March 2018, IMTs were held until no new cases were reported and control measures were in place, at which point the IMT was closed (27 March). Following seven new cases of Gram-negative bacteraemia in Wards 2A and 2B in April and May, a further IMT was held, which was closed on 21 June, again when no further cases were reported. The IMT was reconvened in September when three new Gram-negative cases were identified in Ward 2A, and IMT meetings continued

to be held through to the end of November, a period that included the decisions to de-cant the affected wards and to put in place a chlorine dioxide dosing system.

41. Despite the 'stop-start' nature of these outbreaks, the actions in themselves in this period were timely, robust and focused, although there were issues regarding their monitoring and follow up (as discussed in the Case Note Review chapter). The full Incident Management Report in April noted the actions that were taken in the first infection outbreak. In terms of investigation, these included:

- "patient timelines;
- retrospective analysis of bacteraemias;
- ongoing analysis with HPS support looking at current cases, retrospective cases and national picture;
- review of epidemiology from Public Health Consultant; and
- sampling of water, taps, showers, drains."

A range of control measures were deployed as well, including:

- "dosing of system with Sanosil and Chlorine;
- patient showers taken out of use for immunocompromised patients across RHC/QEUH site;
- extra hand hygiene precautions put in place, additional alcohol gel step;
- bottled water for drinking;
- bottled water to brush teeth;
- sterile water for [bone-marrow transplant] BMT patients;
- portable sinks to provide warm water for washing children on 2A and for parents use during periods of dosing;
- point-of-use filters fitted to hand wash basins and showers in all high-risk wards. A small number of filters were fitted in all other inpatient areas so that immunocompromised patients could be cared for in any ward if necessary. Some other day wards/departments had filters fitted depending on patient group. Quality assurance checks carried out at time of fitting by estates staff; and
- ciproxin prophylaxis for high-risk patient groups."

In addition, longer-term control measures were also identified and taken forward:

- "dosing with chlorine dioxide or copper-silver ionisation;
- removal of mixer taps in high-risk areas and replacement with more simple taps; and
- regular maintenance of tap-flow straighteners in other areas; [and]
- use of filters long term in high-risk areas."

The April Incident Management Report noted that these measures appeared to have been successful with the cessation of new bacteria (at least at that stage).

42. The actions did not always result in the anticipated outcomes. There were several actions whose results did not fit analytical expectations, often in ways that were unprecedented, for example:

- the failure of 'shock doses' of silver hydrogen peroxide to bring about rapid reduction in bacteria, suggesting the issue was not simply a problem with outlets as originally hypothesised;
- the application of filters leading to new problems with the drains, as the filters reduced distance between the tap and drain, causing increased splashing and new opportunities for bacteria to develop; and
- extensive mould in the showers and bathrooms, a reflection that the gyprock was not as water resistant as had been stated in the original building plans.

43. Throughout this period, a variety of hypotheses were explored with regards to the source of infections.

- Discovery of Gram-negative organisms in tap outlets – alongside negative water testing results for the main water supply – originally favoured a hypothesis that the individual water outlets were the source of infection (potentially as a result of the design of the flow straighteners and their encouragement of the development of bio-film). On the back of this hypothesis, the IMT sanctioned appropriate action in the widespread replacement of taps and installation of point-of-use filters.
- By May 2018, as drain swabs revealed a range of Gram-negative organisms, the hypothesis that the interaction of the sinks and the new point-of-use filters (and the resulting 'splash' effect spreading bacteria around the sink areas) was the source was being actively explored – and as a result, metal waste pipes in Wards 2A and 2B were replaced with plastic ones, sink drains were removed and drains were decontaminated with hydrogen peroxide.

44. Increasingly, there was a recognition of potential contamination of the water system for the site. By the IMT meeting on 16 March 2018, water testing had expanded from Ward 2A where the original infections had been detected to include a number of other locations across the RHC and the QEUH. By 27 March, it was reported at the IMT that "RHC, therefore, has evidence of [a] widespread problem", and that "overall Gram-negative pathogens and fungal counts… have been found throughout the QEUH and RHC sites." In the April Incident Management Report, it was concluded that:

> "Water testing revealed contamination of water supply within RHC and QEUH… Hypothesis is that contamination took place during installation and has built up in the system creating thick biofilm."

The Incident Management Report further noted that the likelihood of a similar event occurring again was "high, in a new build hospital." This was reflected in the reports to relevant oversight groups, for example, the Board Infection Control Committee which heard on 28 March that "the issue is now widespread and they have positive results for RHC Hospital and in Ward 4B, QEUH," as well as that "it is unusual to have this level of bacteria in a hospital water supply."

45. The implications of this conclusion led to the introduction of longer-term and more comprehensive control measures. On 27 March 2018, when the IMT was stood down, a new **Technical Water Group** was announced, "consisting of IPC [Team], Facilities, HPS and HFS [which] will look into the remit of filter replacement, introduction of new taps, introduction of chlorine dioxide dosing to the water system and drain cleaning." The Technical Water Group brought together microbiologists, facilities and other key staff and gave direct advice to the IMT.

46. By June, the Group had concluded that a more comprehensive solution was required to address the environmental risks, and prepared its recommendations on the use of system-wide chemical dosing for the Board. Indeed, these longer-term measures became the focus for control and prevention going forward in the latter half of 2018, when it became clear that the key action to be taken by the Health Board to address the long-term safety of the water supply was chemical dosing.

47. The Technical Water Group was active and thorough in its planning for implementation of the system and in ensuring that water testing could provide verification of the expected results of water dosing. The planning led to the rapid installation of the system throughout the site by early 2019. Although it was expected to take a longer period for the full benefit of chemical dosing to be reflected in the incidence of infections, water testing results in the early months of 2019 seemed to suggest it was having some impact. Throughout the period, the Group was characterised by a clear focus, a sense of urgency and thought through the options and their execution, an example of how the Health Board was capable of an emphatic and effective approach to addressing the issues in the infection incidents. The Technical Water Group was an exemplary approach to recognising and acting upon the longer-term needs of infection control, and the model and experience merits national learning. The decision to introduce chemical dosing shows that the Health Board could take major decisions to support the health and safety of patients.

48. The Health Board was also active in 2018 in drawing in external advice. In March 2018, HPS and HFS were formally called in to review the range of incidents as a whole, triggered by the Scottish Government invoking the National Support Framework. Independently, NHS GGC sought out other Health Boards in Scotland as well as Public Health in England to see if there were any similar experiences of such incidents. Other hospitals, such as Great Ormond Street, were also visited to understand their practices in relation to water and ventilation systems. While such advice did not always provide NHS GGC with a decisive set of answers or solutions to its unique challenges, it demonstrated that the Health Board recognised the limits of its ability to understand and act on these incidents and the need to turn to appropriate expert advice from outside.

49. The role of external support is important to draw out. Although the Health Board had clear responsibilities for action here, it did so within a wider national framework of reporting and advice. Infections incidents were systematically reported to HPS (and latterly, ARHAI Scotland) throughout the period. As has been seen, HPS and HFS were invited to examine the issues from their perspectives. In March 2018, HPS had informed the Scottish Government of its findings of systemic water contamination, and later that month, the Chief Nursing Officer invoked the National

Support Framework (escalation process). From this point on, there was regular – and at times, intensive engagement – nationally on these issues. While the Health Board clearly led on these issues, for this period up until escalation to Stage 4 in November 2019, there was broad agreement on the nature and timing of the actions that the Health Board was putting forward and alternative courses of action were not being recommended from outside.

50. Nevertheless, the recurrence of infection suggested that all of these actions may not have been sufficient. Frustration was particularly expressed by clinicians. Early in 2018, exasperation was evident among some clinicians that concerns about the building and environment had been raised before, but not addressed (as noted in an October 2017 SBAR, described in detail later). On 6 March 2018, some felt that, while concerns had been reported "to the highest level in GGC and HPS over two years ago", they "felt dissatisfied that there had been any response from senior management or outwith GGC which offered reassurance to clinicians." At 8 June IMT, it was reported that "[clinicians were] saying they are not confident [the IPC Team] are in control of the environment as there have been numerous issues surrounding Ward 2A since its opening" (though they were met after the meeting and were reassured by the steps being taken by the IMT). This persisted into 2019 – for example, at an IMT in August, it was noted that:

> "[Clinicians] feel that it has been over a year since this has been highlighted and the problem still exists even after moving into Ward 6A, QEUH. Clinicians think the control measures are not working and it is still unclear what the underlying problem results in these Gram-negative bacteria."

As the infection incidents continued, it created an increasingly difficult environment for IPC action to be taken emphatically and in a way that would command widespread confidence.

51. Ultimately, in September 2018, the proliferation of cases and the need to work on the affected wards led to the decision to de-cant the patients of Wards 2A and 2B in the RHC to Wards 4A and 6B in the QEUH. The background and handling of this de-cant has been discussed in the Oversight Board's Interim Report, but the action is notable in the context of IPC for several reasons.

- First, it demonstrated the importance of patient safety that the Health Board continued to prioritise through these incidents – taking the decision to de-cant would have been a difficult one, and its implementation required significant planning and communication with the children, young people and families.
- Second, such a major step could be seen as an admission that other IPC measures were not working sufficiently to address the issues, and that the last recourse for the Health Board was to remove the patients from the immediate environment. This was envisaged as a short-term move but has since become a prolonged removal because of the succession of building problems uncovered in Wards 2A and 2B. This has had the risk of strengthening the perception that the Health Board is unable to address the infection problems.

52. In 2019, a number of cases arose that re-ignited environmental concerns about the QEUH. What was particularly striking about these cases was their appearance in new locations of the building (though with the same immuno-

compromised patient group), including Ward 6A in the QEUH and the PICU. These included:

- One paediatric case of Cryptococcus neoformans in January (as well as one adult case). Potential links to the environment were debated by the microbiologists, although the Independent Review and an internal Health Board report concluded that this hypothesis was highly unlikely. (As the Independent Review covered this issue, the Oversight Board did not review this in detail.)
- A series of infections in Ward 6A that started in June 2019, including incidents of Enterobacter cloacae, Mycobacteria chelonae, Chryseomonas, Stenotrophomonas spp. and Elizabethkinga miricola, with a particular spike between August and November.

53. By 2019, when the new incidents were appearing in Ward 6A , a range of alternative hypotheses were being explored as to the source of infection. Water testing results suggested that the chemical dosing was working, but environmental explanations were still being sought (and as has been seen, water testing results could be limited as a predictor of infection – the negative results in 2017 were followed by the extensive evidence of contamination in the 2018 outbreaks). For example, it was hypothesised that the leaking of chilled beams was giving rise to the growth of the bacteria, though ultimately this was concluded not to be a source. In August, the IMT was reporting:

> "The hypothesis of Gram-negative environment bacteraemia is still unexplained. It is the nature of the Gram-negative environment organisms being found and not the number which is convincing. The group are happy with the water coming out of the taps. The only other source is the chilled beam."

However, by the end of the year, following further analysis, that hypothesis was no longer being actively explored. Throughout the 2019 set of incidents, IMT action seemed to concentrate on local explanations – such as the chilled beams and the 'smart hubs' located in the wards – and there was limited discussion of the implications of a potentially wider-ranging contamination of the water system.

54. The infections in Ward 6A led to the establishment of an IMT in June 2019, which largely continued through until November. The number and diversity of cases prompted significant discussions within the IMT on the source of the infections (which is considered in the following section), but it is important to note the range of actions taken in response, including:

- restricting admissions into Ward 6A from 2 August onwards, with new patients being diverted to other Health Boards;
- consideration of alternative accommodation;
- a dedicated action plan by Facilities and Estates to address the issue of chilled beams in Ward 6A;
- a Standard Operating Procedure (SOP) developed for obtaining regular water, environmental and chilled beams samples; and
- prescription of precautionary prophylaxis.

There was also a review of the triggers for IMTs and actions to be taken, which was agreed in November and included:

- Root Cause Analyses to be done on all cases going forward (a significant change in practice that it is surprising had not been more explicitly and widely considered earlier, given the succession of incidents);
- a procedure for PAGs to be set up where two Gram-negative bacteria cases are reported within 30 days, or the upper warning limits of Statistical Process Charts are met; and
- if an immediate source is not identified, external advice to be sought early on a more systematic basis.

However, when the IMT was formally closed that year, and the November 2019 HPS report echoed its February 2019 report on the lack of evidence of a single source of infections, efforts to further understand the sources of infection in the context of potentially widespread water contamination continued to be challenging.

55. Several points are striking about what took place in 2019. The context was a set of infection incidents showing a similar scale and diversity of environmental-related bacteria to what had occurred to the same patient group before the de-cant in the RHC. Sources of the infections were proving very difficult to identify, frustrating to both the clinicians working with the patient group (as already highlighted) and the microbiologists seeking to understand what was happening. The continuing uncertainty – and increasing media focus on what was happening – created a highly pressured climate for staff grappling with an elusive, complex problem. Despite this, the IMT was responsive to the immediate infection issues, not simply in terms of actions to address the environment of Ward 6A, but identification of alternative accommodation as well.

56. However, despite the consistent commitment of staff to determining the sources and providing the best care to the patients, what was notable about the IMTs during this period – and the staff working together on IPC and the consequences of the outbreaks – was an increasing lack of cohesion and disintegrating working relationships between some staff, which seemed to spill out over into the conduct of the IMT meetings. The lack of unity has been discussed at length in the Independent Review's report and will not be rehearsed here, but it presented an important backdrop to the actions being taken.

57. What remained – and could not be discounted – was the persistent possibility of a link to the building. While actions in response to individual incidents appeared robust and appropriate, there continued to be a lack of an explanation for the source of these infections. This is not unusual for infection incidents, and the Health Board cannot be faulted for the efforts put in place to try to understand what was happening. However, by 2019, it was becoming clear that the question of whether the infections should be more systematically considered as a whole rather than individually should have been pressing. This was the view taken by the Scottish Government in 2019 when it asked the Health Board to examine a number of incidents in the PICU together rather than separately; and indeed, the Health Board is currently pioneering new methodologies to consider how such a 'long view' can be developed for the benefit of NHS Scotland. In that context, what is equally important

to the responsiveness of individual IMTs was how the Health Board as a whole was using risk management and escalation to address these environmental risks against this background of significant uncertainty; this is reviewed in the chapter on Governance.

Use of Precautionary Prophylaxis

58. The use of precautionary prophylaxis treatment has been a complementary approach to the IPC measures introduced to address the specific environment of infection locations and embedding good hygiene measures among staff. Their use has provided an additional protection to the children and young people against potential infections. However, there have been questions raised by some of the families about the approach to such prescription, not least around its prolonged and what appeared to be at times blanket use for the group of affected children and young people as a whole (as noted by the Cabinet Secretary in Parliament in December 2019[9]). Additional medication for such a vulnerable patient group needs to be considered carefully on a case-by-case basis, and communicated in a way that is clear and open about the rationale for its provision and which complements existing messages about the safety of the environment. Reviewing the approach has been an important aspect of the Oversight Board's work.

59. Prophylaxis treatment has been provided throughout the period of heightened awareness of infection risks. In October 2017, control measures included clinical teams risk assessing Ward 2A patients on a case-by-case basis on the prescription of anti-fungal prophylaxis. In response to infection incidents in March 2018, children and young people received Ciprofloxacin prophylaxis, while high-risk patients were provided with anti-fungal prophylaxis in January 2019 in the wake of the Cryptococcus cases. Its significant use was increasingly subject to clinician review towards the end of 2019. For example, in October, it was decided that patients in daycare should not be receiving it, a reflection of issues that were becoming more apparent in the widespread approach to their use.

60. The Oversight Board asked one of its members – Dr Andrew Murray, Medical Director of NHS Forth Valley and the co-chair of the Managed Clinical Network for Children's Cancer Services Scotland – to meet with a multi-disciplinary team of senior RHC clinicians for a clinician-led review of the use of these medicines in December 2019. The frontline team confirmed to Dr Murray that the use of antibiotic prophylaxis was being tailored to the needs of each individual patient and that families would be fully informed on their use and why. The haemato-oncologists confirmed that they had been reassured by Infectious Diseases and Infection Control specialists in the Health Board that ciprofloxacin was no longer required as a precaution for every patient with a central venous catheter.

61. Implementing this change in practice immediately was challenging given the heterogeneity of the patients in terms of the stage of their illness and other clinical features, but the approach was clearly set out. Similarly, anti-fungal prescribing was based on clear criteria and required to be continued when clinicians determined that

[9] Official Report - Parliamentary Business : Scottish Parliament.

patients met those criteria. The guidelines for anti-fungal prescribing are being reviewed to ensure alignment with latest evidence.

62. Following the meeting, Dr Murray recommended that the haemato-oncology clinicians should meet regularly with Infectious Diseases and IPC colleagues to ensure that the prescribing of antibiotics and anti-fungals remained case-by-case, clinically appropriate and in keeping with agreed guidance, and to review any adverse events through their prescribing, either in their regular weekly departmental meetings or separate governance group. It was also agreed that families and patients should be informed:

- any prescribing of antibiotics such as ciprofloxacin would be because the consultant had risk-assessed that patient on an individual basis;
- there would be no policy to prescribe all patients precautionary antibiotics because of environmental safety concerns;
- anti-fungals would be prescribed for patients according to a new protocol to be introduced, irrespective of location or current concerns; and
- all prescribing would be reviewed as appropriate by an oversight group with all consultants, meeting regularly – the Oversight Board suggests that the Clinical and Care Governance Committee undertakes a short review to ensure that these actions have been taken and to designate an appropriate means by which it can continue to assure themselves that these processes are being fulfilled.

Summary

63. In summarising the responsiveness of IPC within the Health Board, the Oversight Board concludes that once outbreaks were identified, the actions were swift and effective. Throughout the period, there was significant evidence that IMTs were characterised by commitment and pace in responding to individual incidents, notable for the determination of staff to put in place remedial actions to support patients and identify the sources of the infections.

64. That responsiveness also extends to more significant actions, particularly in 2018. The establishment of the Technical Water Group showed the Health Board capable of taking innovative and bold steps, carrying through to the difficult and resource-intensive decisions to introduce a site-wide chemical dosing system and to de-cant patients from Wards 2A and 2B, ultimately allowing extensive work to be carried out to address the environmental issues discovered there.

65. As the infection issues continued, the involvement of national bodies – and the Scottish Government – became more prominent. The Health Board showed itself open to external advice and reported the incidents and the actions being taken to others. While the responsibility for action remained with the Health Board, those actions were not being challenged by others.

66. However, the Oversight Board concludes that the Health Board's responsiveness was limited by problems in how different sources of information were being brought together to examine an ever more complex problem. The failure to

share the DMA Canyon reports compromised the ability of IMTs and the IPC Team to act because key information was not available. The concerns raised by some staff before the October 2017 SBAR did not lead to full consideration of the emerging problems with the building in the appropriate committees. Staffing tensions and problems in working relationships seemed to make it difficult for relevant information to come together and consensus decisions on action to be taken consistently.

67. This seemed to limit more active exploration of the implications of environmental risk and the ability to see potential links between the infection incidents. This issue will be returned to in the last section of this chapter, and the chapter on Governance.

3.2 Joint Working in Infection Prevention and Control

68. IPC is not a standalone function, and the IPC Team does not operate in isolation. As set out in NHS Health Department Letter (HDL) 2005(8)[10], the Chief Executive has overall responsibility for ensuring that IPC is integrated with clinical governance and patient safety. Clear good practice about the importance of joint working is embedded in national standards, and seen in IPC when operated at its best in NHS GGC. For example, the Technical Water Group showed the importance of bringing together Facilities and Estates staff, technical experts, microbiologists and those leading IPC. That cooperative approach is essential for early detection of any problems and robust prevention measures, and was an important theme in both the recommendations of the Vale of Leven Inquiry and the key guidance letter, DL (2019) 23[11], issued by the Chief Nursing Officer on mandatory Healthcare Associated Infection and Anti-microbial Resistance policy requirements for all NHS Scotland healthcare settings.

69. In carrying out its functions, the IPC Team, in particular, needs to establish close links with other functions within the Health Board. For example, one of the IPC Team responsibilities is to "participate in the planning and upgrading of hospital facilities", as set out in the Health Board's Governance and Quality Assurance Framework for IPC Services (as reviewed in more detail in the Governance chapter), and that requires a close set of relationships with Facilities and Estates. As the infection incidents arose, particularly from 2018 on, and the issue of a potential environmental source of the infections was increasingly in the spotlight, the strength and effectiveness of those links came under closer inspection.

70. Aspects of those relationships have been assessed elsewhere. They have already been discussed in connection with the design, construction and handover of the hospital in the Independent Review. The Independent Review concluded that: "[the] quality of infection control advice relating to vital systems and standards, specifically with respect to both the water and air ventilation systems, was not sufficient to underline the importance of quality design and high standards of building practice." Its report highlighted issues around the relationship between IPC and Facilities and Estates during the handover of the building, reflecting, in part, a lack of

[10] https://www.sehd.scot.nhs.uk/mels/HDL2005_08.pdf.
[11] https://www.sehd.scot.nhs.uk/dl/DL(2019)23.pdf.

operational readiness in taking responsibility for the building and the significant number of defects that needed to be addressed initially.

71. The Oversight Board concluded that the links between Facilities and Estates and IPC staff were inconsistent over the years. This has been most clearly highlighted by the failure of Facilities and Estates staff to take timeous action on the 2015 and 2017 DMA Canyon reports on water testing, which identified serious infection risks, and communicating those risks to relevant IPC and microbiologist colleagues. In the period up to 2018 in particular, requests for water testing results by IMTs and their Chairs did not receive a consistently adequate response – indeed, there seemed to be a lack of systematic rigour in such requests, how they were recorded and how they were responded to. As the Independent Review also noted: "There was extensive and inconclusive correspondence between ICDs, with Estates and Facilities management, and general management of the hospital. Management and technical information was not forthcoming that was needed to inform ICDs' decision-making."

72. In large part, this seemed to be a consequence of the pressures placed on Facilities and Estates in the hospital's early years and the inadequacy of its existing structures to deal with those pressures fully. The pressures included an unexpected requirement to oversee extensive remedial work on the building at handover and continuing coordination of a significant number of sub-contractors, contributing to an overall sense of 'fire-fighting' within the Health Board. In addition, there were other notable weaknesses that contributed to the failure to address the report. There was no formal Authorised Person responsible for the water system within the Facilities and Estates team before 2018. While it was recognised that certain people had particular expertise or knowledge of an area, such as water, they were not formally assigned responsibility for looking after an area. This seemed to have been compounded by a high turnover of staff within Facilities and Estates at this time with what has been described as lack of systematic handovers. Again, to cite the Independent Review: "A lack of clarity over the roles and responsibilities within the Estates and Facilities team, combined with overwhelming workloads, due to defects, snagging and incomplete works, meant there was a missed opportunity to address the significant problems with the water system over a period of around two years, during which the risk remained 'high'."

73. Latterly, there have been significant improvements within Facilities and Estates that have resulted in improved coordination, in response to the failures identified through the DMA Canyon report incident. With the appointment of the new Director of Facilities and Estates in 2018 (and indeed, a new Chief Executive taking up post earlier), there has been significant reflection and improvement in Facilities and Estates. There has been evidence of structural and procedural changes that improved lines of accountability within the function and with other parts of the organisation, the effectiveness of these functions and its coordination with IPC. NHS GGC acknowledged these historical issues in discussions with the Oversight Board. The structure of the Facilities and Estates team has significantly changed and there is assignment of specific roles and responsibilities to ensure that issues (and reports) would not be overlooked in future. There has been a greater level of formal compliance introduced within the organisation, supported by the formal training and appointment of Approved Persons, not only for water, but for other systems as well.

Electronic compliance dashboards have been created for senior and estates managers to allow instant visibility of the compliance level on a site/sector and at Board level for all AE Audits, Water Risk Assessments, sustainability issues as well as the action plans supporting these reports. SOPs have also been introduced to ensure consistency among the work performed by the various sector estates teams.

74. This was reflected in improved coordination in support of IPC. A good example of the integrated approach was the Technical Water Group, as already detailed. This was particularly evident in consideration of the hypotheses of water contamination, assessment of different options for mitigation and taking forward the chlorine dioxide dosing solution. Overall, the terms of reference and minutes of the Technical Water Group and relevant oversight groups (such as the Board Infection Control Committee) showed integration working actively.

75. Staffing issues among microbiologists and IPC staff also created challenges in responding to the infection incidents. Periodically, these issues surfaced, complicating the environment for taking clear and coherent action. For example, questions were raised about roles and responsibilities by some individual clinical staff in 2017. In a SBAR of October by several microbiologists, it was noted that "roles within the infection control team are unclear and appear to have changed… [and] there appears to be a lack of resources to investigate potential outbreaks/ increase in infection rates". The Health Board took action to respond to these issues with a targeted action plan. A number of clinicians and microbiologists raised whistleblowing procedures within the Health Board. Also, as already noted, it is clear that there were notable tensions between staff. The Independent Review has commented on this more extensively, and noted:

> "The whistleblowing episode beginning in 2017, lack of resilience of management arrangements and instability of the lead IP&C Team's relationships set the scene for contested leadership into a particularly turbulent period, when the microbiologist community could not find the capability that would have enabled them, when it was important, to be able to agree to disagree respectfully. The IP&C team continued not to function as a leadership team."

76. The Oversight Board did not review these specific issues in depth, but staffing problems were a consistent thread through much of the period, compromising, at the very least, a cohesive and focused IPC response to a highly complex set of challenges. Recognising the importance of these issues, Professors Bain and Wallace undertook Organisational Development work in 2020 as a matter of priority to address their potentially harmful effects. This entailed in-depth discussions with staff within and working with the IPC Team in an environment that encouraged frank review and reflection. The work consisted of a five-stage programme:

i. 'entry and contracting': facilitating a series of interventions to ensure that staff are working in a positive and improvement work environment with appropriate support and governance;

ii. 'data collection and diagnosis': interviews with staff and stakeholders;

iii. 'feedback and action proposal': assessment and sharing of key findings and development of action plan;

iv. 'implementation': taking forward actions with appropriate points of review; and

v. 'impact evaluation and recommendations': fixing of end points and drawing out and implementing recommendations.

The results of this work have been important in identifying issues for immediate action and setting the long-term challenges and goals of the strategic work for change under the 'Silver Command' work discussed in the last section of this chapter.

3.3 Leadership

77. Leadership in healthcare is critical, perhaps no more so than when a health organisation is forced to address crises, not least prolonged ones. The impact on staff morale, patient, family and public confidence, and the ability to respond and learn from challenging situations cannot be underestimated. NHS Scotland – through programmes such as the Scottish Government-sponsored Project Lift[12] – has recognised the importance of this. Ultimately that will depend on the quality and performance of individuals, but equally, it is important that the right structure of leadership responsibilities is set out for individuals to fulfil the expectations of their roles. That structure needs to be clear and appropriate for the challenges of the role. The Oversight Board has considered how responsibilities for IPC have been organised within NHS GGC with a view to considering assurance for the approach. The focus is wholly on how relevant posts and management structures have been defined.

78. One aspect of their responsibilities – how senior leaders communicated and engaged with patients and families affected by the outbreaks – was treated at length in the Oversight Board's Interim Report. Issues more closely related to staff management – not least in the context of the whistleblowing issues noted in earlier sections – are not reviewed here, as they will be more properly covered by other processes such as the Scottish Hospitals Inquiry. This section concentrates on how the key roles with IPC responsibilities have been defined within the Health Board.

Senior Executive Role

79. The draft Governance and Quality Assurance Framework for the Health Board clearly sets out key senior roles within the Health Board. The document itself remains draft (to take account of further changes to be made as part of current reform work, as described below) – this and the wider issue of governance are discussed in more detail in the Governance chapter. Within the draft Framework, the most senior responsibility for IPC lies with the Board Medical Director, to whom the Chief Executive delegated the role of Executive Lead for IPC. In overseeing and providing assurance on behalf of the Chief Executive, the Medical Director:

- "is aware of their legal responsibilities to identify, assess and control risks of infection in the workplace;

[12] https://projectlift.scot/.

- has appointed an Infection Control Manager as required by HDL (2001)10 and HDL (2005)8 with sufficient resources to undertake this role;
- is aware of factors within services deliverer/NHS Boards which promote low levels of HAIs [Healthcare Associated Infections] and ensures that appropriate action is taken;
- has designated the prevention and control of infection as a core part of their organisation's clinical governance and patient safety programmes;
- ensures that there is progress towards appropriate provision of isolation facilities within their healthcare facilities; and
- ensures that IPC Teams work with nursing, medical staff and bed managers to optimise bed use, assess the infection impact of bed management policies, and implement changes to local policy to minimise the risks of infection."

The designation of the Medical Director as the Executive Lead is unusual within NHS Scotland – typically that role tends to sit with the Nurse Director in individual Health Boards – but there is no national specification. As IPC is a cross-cutting issue within Boards, arguably there is no 'natural' place for such responsibility to sit. What matters – and what the Oversight Board has focused on – is whether the nature of the responsibility is adequately set out and whether the supporting structure of leadership within the Health Board is appropriate for that responsibility.

80. The Oversight Board recognised the need for a dedicated senior role to lead change in IPC and address the IPC issues that have been highlighted by the infection incidents. That prompted the designation of a new Healthcare Associated Infections (HAI) Executive lead role, and eventually, the role of the Interim Director of IPC. This interim role has reported directly to the NHS GGC Chief Executive and has been positioned with the Senior Executive Group (not least as part of the COVID-19 pandemic emergency footing structures). The Interim Director of IPC attends Board meetings to present the HAI Reporting Template (HAIRT). From the outset, the Interim Director has had the brief from both the Nurse Director and the Board Chief Executive to direct all aspects of IPC, with the freedom and authority to identify system learning and improvement to ensure safe care for patients and to support staff across NHS GGC.

81. This is clearly an interim role, which Professor Wallace is fulfilling as part of a time-limited period to embed the work of transforming IPC. The Oversight Board understands that the Health Board, following publication of the Final Report, will put in place strengthened and permanent arrangements for the leadership and oversight of IPC within the Board.

<u>Senior IPC and Management Roles</u>

82. There are two other key roles that the Oversight Board reviewed: the Infection Control Manager; and the Lead Infection Control Doctor.

83. The draft Governance and Quality Assurance Framework described the responsibilities of the Infection Control Manager as follows:

- "coordinate IPC throughout the Board area;
- deliver the Board approved Infection Control Programme in conjunction with the Board Infection Control Committee and Senior IPC [Team];
- provide clear mechanisms for access to specialist infection control advice and support, including primary care (eg. general medical practitioners);
- assess the impact of all existing and new policies and plans on HAI, and make recommendations for change;
- challenge non-compliance with local and national protocols and guidance relating to prevention and control of infection, decontamination, antimicrobial prescribing and cleaning;
- report directly to the Director of Diagnostics;
- be an integral member of the organisations clinical governance structures; and
- produce the bi-monthly Healthcare Associated Infection Reporting Template (HAIRT) report for the NHS Board."

84. The Oversight Board endorses the description of the role, but would recommend that the role does not report to the Director of Diagnostics. Rather the relevant HDLs should be implemented to ensure clear and effective lines of reporting and accountability.

85. The Framework does not set out a description of the Lead Infection Control Doctor role – the Oversight Board recommends this role, and indeed, the role of Infection Control Doctors (ICDs) more generally, are clearly set out to present a complete picture of the key roles. The ICD role is much more complex than a label of 'ICD' – for a Health Board of NHS GGC's size, there should be numerous infection specialist roles covering ventilation, water, decontamination and surveillance and acute infection control (analogous with the Authorised Persons roles within Facilities and Estates).

86. At the same time, all microbiologists should have 'IPC' in their job plan given the potential urgent need for microbiologists to chair PAGs/IMTs at short notice. Similarly, work should be taken forward to ensure specialisation in the ICD role so that there is appropriate expertise in key microbiological issues – such as water and air ventilation – particularly for a Health Board of the size and complexity of NHS GGC. There is an imperative for national work to define these roles and expertise that should be taken forward by ARHAI Scotland.

87. The structure of IPC leadership was fluid throughout the period. For a prolonged period, several key leadership roles within IPC were being filled on an interim, rather than a permanent basis. While this may clearly address interim staffing issues, it may be indicative of difficulties in long-term recruitment to these posts and underlines a lack of stability about the roles. Similarly, the role of Lead ICD changed at several points over the period, and not always in a clearly planned manner: the illness of the incumbent led to temporary measures being put in place in the second half of 2017 was an examples of a point that would have presented challenges to clarity and continuity in IPC leadership when they were most needed.

The issues were highlighted by the Independent Review, which noted that: "the resilience of IP&C leadership eroded, and it was not capable of addressing adequately the series of further adverse events that then arose".

88. The Oversight Board recommends that interim arrangements for these senior roles should be resolved and permanent incumbents decided as soon as practicable. However, since escalation, significant work is already being put in place to support changing staffing roles and structures as part of the Silver Command workstream (as discussed in more detail below). This includes giving two of the ICD roles additional sessions to enable creation of a Deputy Lead ICD and an ICD with dedicated responsibility for the built environment. The Oversight Board endorses these actions.

3.4 Learning from the Experience

89. With such a prolonged series of incidents, expectations are that the Health Board would learn from the experience, developing new ways of addressing the issues that were arising and ensuring the 'lessons learned' reflection was systematically undertaken. Certainly, evidence of learning is apparent across the period. There is a notable commitment to codifying learning in SOPs that captured new issues and required changes to processes arising from the infection incidents, such as the list of new infection organisms to be part of regular surveillance and the range of SOPs in 2018 introduced to address specific issues in Facilities and Estates (for example, ventilation to ensure consistency in compliance). The development of a single governance and assurance framework for IPC and the review of water safety policy are treated in later sections, but should be highlighted as NHS GGC's response to address the requirement of the HIS report.

90. A good example is the work of the Facilities and Estates compliance team, which created an electronic compliance dashboard for senior managers and estates managers to allow instant visibility of the compliance level on a site/sector and Board level for all AE Audits, Water Risk Assessments, sustainability issues along with all action plans supporting these reports. Evidence to support completed actions would also be held. The work was completed in early 2020 and means that all compliance-related documents and action plans are now in a single place, allowing tracking and follow up on action plans. Other evidence of responding to the challenges of these infections can be found in the introduction of the Infection Control and Built Environment Group and the Clinical Review Group in 2019 (the latter brings together infection issues with clinical issues and estates and formally reports to the management team).

91. However, the evidence of explicit and systematic reflection has not been apparent across the period. While there were occasional 'hot debriefs' (retrospective reviews of incidents with an emphasis on the lessons learned) – notably in May 2018 after the first 'wave' of infection incidents association with the 'water incident' – they were not regular. There was little structured review of past incidents and handling within the Health Board. IMTs did not 'call back' to previous incidents and actions taken, even though by the second half of 2018, the risk of systemic water contamination was being regarded as sufficiently high enough to lead to the site-

wide chemical dosing solution. It is somewhat surprising that this was not more visibly considered by IMTs in the second half of 2019.

92. Similarly, there was no comprehensive review of the infection risks to the whole site from systemic water contamination. While there was some consideration of risks to other vulnerable patient groups – for example, by the Technical Water Group to guide the installation of point-of-use filters – there was no comprehensive review of the implications of this risk for the whole hospital. This is considered in more detail in the Governance section, but it meant that there may have been missed opportunities for full learning from these incidents. This seemed notably different from the approach taken to review the issues around the construction of the building, where the Chief Executive commissioned a comprehensive review of the building's defects, the hospital's capacity and flow, and the clinical outcomes for patients, which was presented to the Board at its meeting in December 2019.

93. Nevertheless, more recently there has been recognition of the need for a full-scale approach to reviewing IPC processes and structures. The recent work – put in place by Professor Angela Wallace – has been an encouraging step. Recently, the Health Board has launched a 'Gold Command' programme of work to address the different issues that gave rise to escalation to Stage 4 in the NHS Scotland Performance Framework. The 'Better Every Day' programme is chaired by the Chief Executive, and consists of four key strands of work:

- 'Better Performance', which addresses acute services performance, amongst other issues;
- 'Better Care and Experience', which covers the Quality Strategy's aims;
- 'Better Together', which aims to improve communication and engagement (and address issues discussed in the Oversight Board's Interim Report); and
- 'Better Safe, Clean and Clinical Environment' (under the banner of 'Infection Control is everybody's business'), in which improvements to IPC will be taken forward.

94. The latter 'Silver Command' workstream is jointly chaired by Professor Angela Wallace, the Director of Facilities and Estates and the Chief Operating Officer. It has several key elements with the following aims:

- Better Built Environment: "[to ensure] our Estate will support and enable safe, effective clinical care, irrespective of the care setting";
- IPC [Team]: "to provide expert IPC consultancy in order to deliver Quality – safe, effective, person-centred care to every person every time, and through a business partnering model that provides data, educates and supports the service to exceed the required standards";
- Microbiology: "to provide excellence in prevention, diagnosis and management of infection for every patient, every time"; and
- 'Everybody's business': "to ensure a Better, Safe, Clean Clinical Environment – a built environment to support and enable clinical excellence".

A work programme – rooted in the Organisational Development work discussed above – is being developed, and its key features are summarised below:

- IPC Team transformation and renewal work, including: internal 'best in class' benchmarking with stretch goals; redesign and reaffirming of IPC systems and processes; repositioning of the IPC Team as part of systems, roles and responsibility review work; and a transformation delivery plan informed by the above work incorporating external review recommendations;
- whole-system IPC improvement programme, including: a Board-wide IPC improvement collaborative; building capacity and capability in improvement skills; and the Organisational Development programme in support; and
- redefining system IPC roles and responsibilities, including: clarity on roles, responsibilities across the system in relation to IPC Team performance and delivery.

95. Detailed workplans and success measures are being put in place for this work by early 2021, and to date, key changes can already be seen.

- The new Whole Systems Infection Control Improvement collaborative is starting to focus on how to build improvement capacity within IPC, and will contain a workstream for the RHC.
- The North and South IPC Teams are developing a single-team approach to support shared learning and improvement.
- A weekly multi-disciplinary overview meeting on IPC is held to provide a form for early warning on issues and discussion of key reviews.

96. The Oversight Board commends this work, and suggests that the recommendations in its Interim and Final Reports are used to shape it going forward. This also applies to the Case Note Review, whose Overview Report also contains a number of key recommendations on the operation of IPC (some of which are noted in a later chapter). The Oversight Board also strongly suggests that success measures are set out and visibly used to track improvements as a way to strengthen assurance, not least with patients, family and the wider public.

97. There has also been discussion of how the experience of the Health Board can be used nationally to support NHS Scotland (and more specifically, NHS Assure), though the pandemic has delayed some of this work going forward. The Oversight Board welcomes this suggestion and urges it is taken forward when circumstances allow.

98. While the Oversight Board was primarily focused on the escalation of a single Health Board to Stage 4, the issues that led to escalation were not exclusively local. From a national perspective, the experience of NHS GGC provided two clear national 'lessons' for the Oversight Board. The first was the importance of ensuring the Health Board's experience of understanding and responding to potential environmental infections should be also used for national benefit. As the Scottish Hospitals Inquiry is committed to investigate in greater detail, the design and construction issues that have been linked to the potential for environmental infection may not have been unique to NHS GGC, and indeed, may continue to be a source of risk in health infrastructure policy in future.

99. Second, the experience highlighted a national gap in the understanding of how such unusual environmental-related infections can develop in hospital settings. NHS GGC's own research work will be of value here. The Oversight Board also determined there is a need for systematic national review of the limits of understanding and a research programme to address the gaps in IPC knowledge and practice.

100. At the same time, it is clear that NHS GGC did not receive sufficient external support to address these unusual challenges. Support was readily provided when requested but the provision of effective expert advice (and indeed, sustained challenge to what the Health Board was doing, or not doing) was not consistently forthcoming. The Health Board has noted that there was little national guidance for some of the issues relating to the infections, and there was tacit endorsement of the actions it did take. This reflects the lack of a strong set of dedicated institutions to provide that kind of specialist expertise – and where necessary, oversight and challenge – in how NHS GGC handled these issues. Put simply, there does not appear to have been a national organisation or process which could have pro-actively supported and assured NHS GGC in its IPC handling when these issues were becoming acute. The need for a strong national presence in this space will be returned to in the Final Report's last chapter.

101. The Oversight Board also noted that national recommendations in this area have been made in the past. The February 2019 HPS report noted key actions that should be taken forward nationally, including the following:

- HPS (supported by HFS) to undertake an urgent national water review of all healthcare premises built since 2013 to provide assurance that a similar incident has not and is not likely to occur elsewhere;
- HPS (supported by HFS) to establish a national expert group to review NHS Scotland current approach to water safety including as a minimum: review NHS Scotland current approach to water testing in healthcare settings, review NHS Scotland current surveillance and reporting of potentially linked water-related HAI cases, and based on findings develop risk based guidance on water testing protocols, results interpretation roles and responsibilities and remedial steps to be considered; and
- give consideration to the development of a best practice built environment manual which will be evidence based and cover, as a minimum, current and emerging evidence and the technical requirements from a clinical, patient safety and HAI perspective that will be adopted by all NHS Boards. This will include as a minimum: a review existing national and international guidance relating to water safety; development of robust requirements and guidance for all aspects of water safety; development of robust handover requirements in relation to water systems; review of the role of the IPC Team into the built environment, and produce clear guidance on roles and responsibilities; establishment of a risk-based approach to water testing and any remedial action required, including the roles and responsibilities that NHS Boards will adopt; review of the requirement for 100 percent en-suite single-side rooms and the number of clinical wash-hand basins per patient/bed; and review of the use of flow regulators across NHS Scotland and identify and associated risks and recommend any remedial actions required.

The Oversight Board understands that these recommendations are still being taken forward. They remain critical actions to be implemented, and are re-affirmed as national priorities in this Final Report.

4. Governance and Risk Management

102. In recent years, NHS Scotland has clearly articulated the principles and practice of good governance in Health Boards. In February 2019, DL (2019)2 was published, setting out requirements for Health Boards to adopt the Blueprint for Good Governance. The Blueprint drew on current best practice to ensure all Health Boards assessed and developed their corporate governance systems. As the Blueprint described: "Good governance is essential in addressing the challenges the public sector faces and providing high quality, safe, sustainable health and social care services depends on NHS Boards developing robust, accountable and transparent corporate governance systems."[13]

103. Amongst other responsibilities, good governance should:

- identify current and future corporate, clinical, legislative, financial and reputational risks; and
- oversee an effective risk management system that assesses level of risk, identifies mitigation and provides assurance that risk is being effectively treated, tolerated or eliminated.

This is reflected in the responsibilities of individual Board Members, which include:

- providing effective scrutiny, challenge, support and advice to the Executive Leadership Team on the delivery of the organisation's aims, objectives, standards and targets; and
- contributing to the identification and management of strategic and operational risks.

104. The principles outlined above are clearly essential with respect to IPC issues. In order for the Oversight Board to address one of its key questions – **is the governance structure adequate to pick up and address infection risks?** – it was necessary to consider how infection management and risk was addressed by the Health Board. Against this baseline of the Blueprint, the following sections in this chapter review:

- the **framework for governance around IPC** – in effect, how the system was set out 'on paper';
- how that system worked in action, by examining **key incidents in this period of escalation**; and
- **how the risks around these infection incidents were captured and managed**.

[13] https://learn.nes.nhs.scot/28418/board-development/blueprint-for-good-governance.

4.1 Principles of Governance and Risk Management for Infection Prevention and Control

105. It is vital for a Health Board to have a clear description of its governance and risk management. Such a description should not be expected to be static, but adapting to improve practice within a clear governance and assurance structure. Before examining whether NHS GGC practice in governance and risk management met national expectations in the context of these infection incidents, it is important to consider how the Health Board articulated its approach to management and escalation of incidents in general.

106. In implementing the Blueprint for Good Governance, NHS GGC explicitly set out its principles in the Governance and Quality Assurance Framework for Infection Prevention and Control Services (described in more detail in the box below). Moreover, the approach to IPC sits within a wider, robust approach to governance and risk management. Within NHS GGC, assurance on the structure of governance and risk has been actively sought by the Board: it has been reviewed by external organisations (such as Price Waterhouse Cooper and Scott Moncrieff).

Governance and Quality Assurance Framework for Infection Prevention and Control Services

NHS GGC's Governance and Quality Assurance Framework for IPC Services brought together a number of earlier documents to provide a complete statement of responsibilities and checks on IPC within the Health Board. It described how the Board sets and delivers its strategic aims, the risk management process and how it gives stakeholders and the public assurance that the service is delivering for patients, staff and the organisation. It also described how the Board uses information from the point of care to the NHS Board to improve outcomes for patients and how it reports incidents and outbreaks that may affect the health of patients, staff or visitors.

The framework clearly set out the role of the Chief Executive of the Health Board, which is to ensure that there is successful prevention and control of infection throughout the NHS Board area. The accountabilities of this role are outlined in the Healthcare Improvement Scotland Standards for HAI and have been further emphasised within the NHS HIS report on the second review of these standards. The framework included details on the structure and responsibilities of key elements of the governance structure and how escalation should take place, including: IPC Senior Management team; the sector-based IPC teams the NHS GGC Board Infection Control Committee; and the Acute Infection Prevention and Control Committee.

107. The Oversight Board welcomes the creation of this Framework document. The Framework has not yet been published, and has been maintained in draft form – 'version 5', dated November 2019, was shared with the Oversight Board and was clearly a work in progress. The document should be finalised as soon as possible and published to support transparency in the governance of IPC.

108. The IPC and Governance Subgroup reviewed the document. It found that IPC issues and escalation would be treated in the Health Board with clear lines of responsibility through the ICM through the HAI Executive Lead to the Chief Executive. In terms of Committees, the structure is also clear and logical, and there is evidence that it has been used appropriately throughout this period. In particular:

- Infection incidents (including actions taken) have been reported to the Acute Board Infection Control Committee (which has responsibility for supporting local infection control teams in their responsibilities and reporting upwards on IPC issues that have wider implications), and then onto the Board Infection Control Committee (chaired by the Medical Director, and which provides leadership and support to the IPC services 'from ward to Board').
- The Board Infection Control Committee has reported directly to the Chief Executive, and the Board Clinical Governance Forum, and regular HAI reports have been provided to the Board.

109. In addition, incidents have been reported through the Clinical and Care Governance Committee, which reports directly to the Board. Handling of infection incidents are relevant to the Committee, not least in the context of its remit to "ensure the clinical and care governance arrangements are effective, including interactions with other organisational arrangements, in improving and monitoring the quality of clinical care" and "provide assurance to the Board that NHS GGC meetings its statutory and mandatory obligations relating the NHS Duty of Quality". In effect, it allows an additional line for key incidents, risks and their handling to be addressed within the Health Board.

110. The IPC and Governance Subgroup did make a number of recommendations about this document which should be included as part of a final revision of the Framework.

- There is no mention of how IPC should be 'everyone's responsibility', a clear theme of the recent Silver Command work. It would be useful to see the service leads, senior managers and other key roles mentioned in terms of responsibilities for IPC.
- While escalation from the IPC Team is clearly described, there would be value in describing how escalation should take place within the Team as well.
- The role of Infection Control Nurses should be set out in the context of the full description of responsibilities.
- The IPC Senior Management Team would benefit from a clear description of the involvement of the Lead ICD and the new role of Director of IPC.
- Routine reporting of IPC activity and incidents/outbreaks should be explicitly set out, rather than just the escalation of issues.

- The document should be clear about other key links, particularly between the IPC Team and the Board Infection Control Committee with other key groups/functions, including the Water Safety Group, Decontamination Committee, Facilities and Cleaning, Built Environment and Ventilation.
- Linking with the discussion of how national IPC standards and practice are reflected in the Health Board, the Framework would benefit from a clear designation of responsibilities for monitoring and overseeing compliance with what is set out in the National IPC Manual, not least with respect to the IPC Team.
- The issues relating to how infection risks are captured as part of the Health Board's approach to risk management are detailed further below.
- As noted earlier, the Oversight Board believes governance would be strengthened if HAI Executive responsibilities for IPC were concentrated in a new permanent post (potentially the proposed Director of IPC). That individual should be clearly given the responsibility for overseeing the implementation of the Framework and any updating of its contents.

111. As part of the Gold Command work put in place by the Chief Executive, there has been recent review and revisions to the governance framework. These are set out in **Annex E**, and show how the Gold and Silver Command programmes of work fit into the IPC governance and assurance framework. The Oversight Board supports the changes and the new structure.

112. This structure has allowed for infection issues to be highlighted in a number of different places and for action to be taken and monitored, before being brought ultimately (and as appropriate) to the full Board to act in its role of providing assurance that the right steps have been taken. The Oversight Board found significant evidence that infection incidents were regularly brought before the relevant Committees, particularly from the 2018 'water incident' onwards. As the Executive lead on IPC for the Board, the Medical Director actively led on the reporting of infections to these Committees, and indeed the full Board itself. HAIRTs (and outbreak reports) were systematically provided to the Board Infection Control Committee and the Board. The issues were clearly being made visible to senior governance as soon as their seriousness appeared to be recognised through IMTs.

113. This can be clearly seen in the meetings that took place in 2018. For example:

- the Board Infection Control Committee was informed at meetings on 28 March (including a paper discussing the water testing results and the draft terms of reference of the new Technical Water Group), 23 May and 25 July (when it was notified of the closure of the incident and the plans for widespread chemical dosing);
- the Clinical and Care Governance Committee was updated on the 'water incident' at its 12 June meeting through a paper that set out the incidents in wards 2A and 2B, the steps taken to address and the risk of wider water contamination, and the closure of the incident at its 4 September meeting; and

- the full Board was appraised of the incident and developments on 17 April, 19 June and 21 August – as noted in the 19 June minutes:

  "Dr Armstrong advised that following the bacteria in the water system incident at Queen Elizabeth University Hospital (QEUH) and the Royal Hospital for Children (RHC), a number of immediate actions had been undertaken to address the issue including domestic cleaning, cleaning of equipment, hand hygiene, the installation of end of tap filters and the installation of new drain spigots. The longer term plan was to chemically dose the water supply and then replace taps in high risk units."

In addition, the full Board received a regular update on infection matters via the Medical Director's HAIRT reports.

4.2 Key Incidents in Escalation

114. The Blueprint emphasises an active role in good governance for senior leaders to show prioritisation, challenge and assurance of what the organisation as a whole is doing. In the context of infections, this raises a series of fundamental questions: when did different parts of the relevant part of the governance structure know about the infections (and were these the right points for escalation); was their understanding of the implications of the infections (and any pattern) appropriate and timely; and did they provide the right challenge and enforce the right accountability about the actions being taken in response.

115. An important way to understand these issues is to review the organisation's response when evidence of potentially significant risks associated with the infections were appropriately raised in line with guidance and good practice. It is important to acknowledge that the infection issues presented a complex, not easily comprehensible set of challenges, though that complexity was itself a risk that was not captured in risk registers. Over the period under review, there were a myriad of meetings and issues that can be traced in terms of incident response and review. To illuminate the effectiveness of governance, the Oversight Board has examined a handful of key points in that period in greater detail. Significant shortcomings of governance at these points would raise critical issues about governance as a whole in the context of the escalation of the Health Board to Stage 4. In effect, the test is whether these specific issues, once identified by staff (or raised by families), were reviewed and, given their significance, escalated, scrutinised and acted upon appropriately at the right level of governance.

116. The Oversight Board considered several relevant instances in the period under review:

- the 2015 DMA Canyon water testing report (one of the clearest early indications of potential water contamination);
- the October 2017 SBAR by a number of clinicians and microbiologists at the QEUH (the point at which a number of concerns about environmental risk were formally raised);

- the development of the 'water hypothesis' through IMTs and the Technical Water Group in 2018 (the point at which an understanding of environmental risk prompted a range of major actions by the Health Board, including installation of a comprehensive water dosing system); and
- the decision to de-cant Wards 2A and 2B in 2018 (a major milestone in how the issues were addressed, with huge implications for the affected children, young people and families).

2015 DMA Canyon Report

117. In April 2015, a water specialist consultant (DMA Canyon Ltd) undertook a water risk assessment of the QEUH for the handover of the water system, with a particular focus on the risks associated with Legionella. The report highlighted a number of significant concerns with the system at that point, including temperature control of the water system, installation of flexi-hoses (and the risks associated with bacterial growth) and the lack of effective management, notably with respect to the communication and control of contractor activity at the point of handover. The risks clearly had significant implications for IPC within the new hospital complex, and given the serious issues outlined, it would have been expected to have not only been actioned 'locally' but that higher levels of governance would have been alerted in line with the principles of the committee structure and infection risk management set out above. Indeed, it is exactly the kind of scenario that the governance/risk management structure for IPC was designed to address to ensure that relevant action and assurance is taking place within the Health Board.

118. The report was an internal Health Board report, commissioned of an external company, and was not disclosed publicly until November 2019. What was a particular concern was the absence of action on this report until 2018 – indeed, the lack of record of how the report was received and considered. Action was not taken within the Health Board on the report between 2015 and 2018, and that the report was not considered by the relevant committees. It did not seem to have been brought to the attention of relevant staff within IPC, particularly through the relevant IMTs through 2018. Indeed, when the external company undertook a follow-up report in 2017, the same issues and recommendations – and similar high risks – were identified.

119. The Oversight Board understands that the reports only 'surfaced' as part of the review of historical documentation to be provided to HPS and HFS for their reviews of water system and infection issues in March 2018. At that point, the Health Board took rapid action with an action plan drawn up and monitored to address the specific issues set out in the reports, as well as an internal investigation into how the report had not been picked up before. Mitigating actions to address both 2015 and 2017 reports were subsumed within action plans addressing issues arising from the HPS reports (and as of September 2019, had all been completed).

120. While it is clear that these reports were taken 'seriously' at that stage – admittedly in the context of more recent assessments and surveys of water issues, such as the HPS and HFS reports – it was not clear to the Oversight Board the extent to which the implications for governance were shared with IMTs or discussed by the relevant committees, although an internal review was conducted by the Health

Board in 2018 on what had happened to the 2015 report (and later in 2018, a new SOP was introduced on how to handle DMA reports). Moreover, issues of transparency remained even on the 'discovery' of the reports during 2018, as the Oversight Board understands that the reports were not shared with relevant IPC staff and microbiologists or IMTs at that stage– somewhat surprising given that the reports were provided to the external review bodies, HFS and HPS. As the contents of the report seemed directly relevant to considering the source of infections during 2018, this apparent omission raises questions about the rationale for withholding this material and what consideration was given to the implications for IPC staff and microbiologists to fulfil their responsibilities for patient safety and care.

121. The Independent Review has addressed the issues with respect to the handover of the building following completion of work, and so this aspect of this issue is not reviewed by the Oversight Board. Nevertheless, the receipt of the 2015 DMA Canyon report should have alerted senior management within the Health Board at that time to the fact that there were potentially serious issues with the water system with respect to infection risks. The report seemed to be lodged within the Facilities and Estates service at a local level and not properly considered, nor was it escalated through the appropriate governance. The failure was a local one and relevant managers – not least in IPC – did not seem to have been made aware of the report.

122. Such reports would not normally be considered by the higher levels of governance; there were intended to be considered and acted upon by those with local operational responsibilities. However, that failure to consider and act should have been a matter of concern at different levels of governance when the reports came to light. While the steps to redress that operational failure within Facilities and Estates were monitored appropriately in the Health Board – notably by the Facilities Planning and Performance Committee – a more systematic questioning of how such relevant environmental information was being conveyed within the organisation (and indeed, escalated) seems warranted, but absent. In essence, this can be characterised by the question: was the right information being provided to the right point in the governance of IPC to allow assurance to take place?

123. The failure in governance is a significant oversight. Wider awareness and consideration of the 2015 report – in conjunction with the issues raised by a number of staff, as described below – would most likely have raised the level of urgency around potential environmental risks at an earlier stage and more forcefully. It would have presented a different context to the isolated infection incidents that occurred before 2018 and may have resulted in preventative course of action being pursued earlier.

124. While the failure to escalate the reports may have largely arisen from limited, and by now, historical, weaknesses in Facilities and Estates, the later discovery of the reports should have prompted more formal and visible reflection by relevant committees, and indeed, by the full Board itself. As noted, the Chief Executive commissioned a series of reports as part of a review of a number of concerns at the QEUH, which were presented to the full Board in December 2019 – an exercise that the Oversight Board commends. However, a 'lessons learned' exercise that ensured all the key failures in governance related to the 2015 DMA Canyon report had been

identified and addressed has not taken place, not least the impact of not being pro-active in sharing the reports with relevant services internally. There is a need for such learning to be transparent and comprehensive to provide suitable assurance about appropriate information sharing and escalation.

2017 SBAR on Potential Environmental Risks

125. From before the formal handover of the new building, concerns had been raised by some clinicians about emerging environmental risks arising from its design and construction. The history of concerns – particularly among microbiologists at the QEUH – is not detailed here, but provides an important backdrop to the second spotlight incident considered in the context of governance: the October 2017 SBAR. While the raising of concerns was not new, the manner in which it was raised and considered within IPC governance was.

126. This SBAR was produced by several clinicians and microbiologists in the QEUH at the request of the Medical Director. It drew attention to a range of risks to patients arising from infection control issues in the hospital. The issues were drawn from discussions with colleagues as well as weekly meetings among the consultants. They included:

- delays and scope of water testing;
- lack of consistent reporting of sewage leakage issues (in the Institute of Neurosciences and Spinal Unit);
- lack of remedial action to address inadequate decontamination facilities in paediatric and adult respiratory clinics;
- the insufficient standard of the Positive Ventilated Lobbied rooms, as they did not provide appropriate airborne protection to patients and the absence of HEPA filters in key locations, as well as other ventilation issues;
- concerns around some cleaning arrangements;
- roles within the IPC team being unclear, including ICDs not being informed of HAI-SCRIBE meetings and incidents in a timely manner; and
- lack of resources to investigate infection outbreaks, and a particular gap in experience and knowledge arising from the then-Lead ICD's absence at the time.

The SBAR was accompanied by several clinicians and microbiologists raising their concerns through Step 1 of the whistleblowing process.

127. In this instance, action was quickly taken. A meeting was held that same month with the Medical Director to discuss these concerns, and an action plan was produced. The action plan was ratified by the Clinical and Care Governance Committee at its 5 December 2017 meeting, demitted to the Board Infection Control Committee for ongoing oversight and noted by the full Board in February 2018. The Oversight Board has been informed that work has been substantially completed on the action plan, but the most recent version of the action plan seems to be dated to January 2019 (with several actions shown as still in progress); a further update (and

closure) of the action plan should be put forward and reviewed by the Clinical and Care Governance Committee.

128. It is unclear how (and indeed, whether) all of the original authors of the SBAR were fully engaged in the development of the action plan, as differing accounts were presented to the Oversight Board about the quality of this engagement. Nevertheless, the incident does show the Health Board taking action in response to the raising of concerns – even if the effectiveness of the response remains disputed –and appropriate governance being applied in that context.

Development of the 'Water Hypothesis'

129. The cluster of infection incidents in 2018 prompted a prolonged search for the sources of infection, drawing in concerns that had been raised by some clinicians and microbiologists previously and resulting in continuing debate and review of the overall environmental risks of the QEUH by the IPC service and microbiologists through 2019 to the present. This was not the first time a supposition of water contamination was considered within the Health Board, but the cluster brought a more sustained and widespread focus on water contamination as a potential source, and a move towards supplementing existing infection strategies focused on endogenous bacteria towards actions that targeted the environment, particularly the water system.

130. The earlier section on IPC discussed how an understanding of water contamination emerged and evolved through IMTs by 2018. This section focuses on how the implications of the 'water hypothesis' were considered within NHS GGC governance, not least as those implications had major consequences not just for the paediatric haemato-oncology patient group, but potentially the hospital as a whole. That the source of infections related to water was evident in the succession of hypotheses examined by IMTs and followed through with the actions, including the presence of biofilm in taps and other elements of water infrastructure and the testing undertaken by Intertek in 2018 on taps, sinks and drains in Wards 2A and 2B. However, the extent to which this contamination was lodged within the wider water system – and could have arisen from issues relating to building and handover of the hospital – remains a hypothesis over which different views continue to be held. As the Health Board set out for the Oversight Board: "after investigation, various hypotheses may be considered, with certain findings informing what might be considered the most probable source of contamination, but it is simply not possible to prove beyond doubt what the exact source might have been." Indeed, in its response to a series of questions on the environmental risks of the hospital, posed by families of paediatric haemato-oncology patients in July 2020 on the 'closed Facebook page' (which is described in more detail in the Interim Report), the Health Board cited the HPS reports not finding a single source for the infection and that any more systemic contamination of the water system had not been proven, as well as the Independent Review's overall conclusion that there was no conclusive evidence that failures of the environment could be directly attributable to deaths arising from the infection incidents. However, as the Independent Review also noted: "the design, construction, stewardship and early maintenance of the water system is of sufficient concern to make strong enough links, merit decisions and actions that have resulted

in taking substantial precautionary measures to repair and replace parts of the water and drainage systems, maintain the water system with extra chlorination."

131. One important milestone was the HPS report in November 2019. The retrospective analysis of infection data by HPS has been seen by the Health Board as an important document in supporting the view that what was happening was not 'unusual' when compared to other hospitals. Of course, the report would not have directly influenced actions being taken or analysis by the Health Board before that date. However, it has been cited as supporting the Health Board view about assumptions about what might be taking place in the QEUH and RHC.

132. In October 2019, HPS was asked to provide independent support to review the data being used to inform their risk assessment and decision making in relation to Wards 6A and 4B at the QEUH and RHC. This request resulted in the HPS report, 'Review of NHSGG&C paediatric haemato-oncology data'[14]. The report concluded that there was no evidence of a single point of exposure causing the bloodstream infections. For the period June 2015 to September 2019 as a whole, it compared the rate of positive blood cultures with those in two other hospitals – the Royal Aberdeen Children's Hospital (NHS Grampian) and Royal Hospital for Sick Children (NHS Lothian) – and found that there was no difference in the rates of the Gram-negative group. Moreover, internal work was done to examine infection rates and was presented to the December 2019 meetings of the Clinical and Care Governance Committee and the Board, concluding that: "in the last year following the move to QEUH (October 2018 – September 2019), there was no difference in the rate for Gram-negative group, environmental including the enteric group or environmental group [and] no single source of 'exposure' to specific micro-organisms which may cause infections had been identified across the six year period." At that Clinical and Care Governance Committee meeting, it was concluded that infection rates were within range or better than other Health Boards, and that the steps being taken had been sufficient.

133. However, the Oversight Board does not believe the HPS analysis demonstrates that there was nothing 'unusual' occurring with infection incidents in the RHC and QEUH. The report principally focused on a review of data quality and datasets. While it clearly set out some findings on comparisons with other hospitals, it equally caveated its work by noting the different sample sizes of the patient groups in each hospital (for example, the Aberdeen and Edinburgh hospitals did not have bone marrow transplant units in this analysis). There were numerous 'breaches' of the upper control limits, showing spikes in infection rates throughout the period. Ultimately, the report did not comment on the issue of water contamination, or offer a view about what kind of action should or should not have been taken in response to the infection incidents being identified.

134. Moreover, the Case Note Review – undertaken in parallel with this Oversight Board's work (and published at the same time) – concluded that there was a likelihood of links between infection and the environment in several cases. It found that 28 percent of the infection episodes it examined were 'probably' or 'strongly

[14] www.hps.scot.nhs.uk/web-resources-container/review-of-nhsggc-paediatric-haemato-oncology-data/.

probably' linked to the environment, and a further 50 percent were 'possibly' or 'strongly possibly' so. This was on the basis of the existing documentation and case note files within the Health Board. Indeed, the Case Note Review concluded:

> "We are surprised that the evidence for an excess of Gram-negative environmental bacteraemia in the Paediatric Haematology Oncology patients was challenged by some within the organisation. By 2018, we suggest that simple observation should have identified a disturbing pattern characterised by the occurrence of bacteraemias caused by some very unusual microorganisms and apparent clusters of some of those more commonly encountered. The widespread contamination of the water system seems to have been accepted and NHS GGCs response, notably its decision to close and relocate an entire clinical unit in September 2018, must be interpreted as evidence of the organisation's acceptance that the environment presented a risk of serious infection to a vulnerable group of patients. Although the investigations undertaken to that date had failed to identify a single cohesive hypothesis for the origin of many of the infections, the approach taken to surveillance thereafter did not appear to match the severity of what had already occurred."

135. What this should demonstrate is the significant uncertainty that the Health Board faced in examining for a pattern of infection. The lack of a consensus view suggests that what may be more important in this context is the balance of risk and how that informs decisions, not certainty regarding source. Indeed, within the Health Board itself, grounds for urgency were being raised about the need to respond to the risks of water contamination. Clinical staff in the March IMTs were questioning whether the IMT was able to cope with the apparently escalating environmental risks. The 'water hypothesis' was being raised internally throughout 2018:

- On 23 March, the possibility of contamination of water points at the time of commissioning was explicitly noted by Facilities staff at the IMT meeting.
- On 28 March, the Board Infection Control Committee (minutes and special paper) noted the hypothesis that the problem could have originated in water outlet commissioning actions.
- On 27 April, the Acute Infection Control Committee noted the hypothesis that biofilm could have been present in the water system since the building's commissioning and dispersed by outlet flushing.
- By May 2018, in a paper to the Clinical and Care Governance Committee, IPC staff were highlighting that "it became evident from further water testing that the problem with water contamination was more extensive and involved both RHC and QEHU".
- On 21 August, the full Board was updated on the actions being taken and noted that a possible link to contaminated water system was made early in the incident.

Lastly, as well as the HPS February 2019 report, the accompanying HFS technical report – 'Water Management issues Technical Review: NHS Greater Glasgow and Clyde – Queen Elizabeth University Hospital and Royal Hospital for Children' – which was available in final draft by August 2018, noted the probability of a system-wide contamination of the water from 2015 onwards.

136. As has already been noted, significant action was being taken on what appears to be the presumption of widespread water contamination, notably the installation of point-of-use filters and the water dosing system. What is not apparent is any systematic investigation of the implications of the 'water hypothesis' for the hospital as a whole. While the introduction of point-of-use filters was applied to other vulnerable groups as well as the paediatric haemato-oncology group and water testing was conducted throughout the complex, the focus remained on addressing the immediate issues in the affected wards rather than a more comprehensive review of what this might mean to different parts of the hospital and different patient groups. The risk of water contamination has several different dimensions:

- clinical risk to the range of different patient groups (not just those in the paediatric haemato-oncology service);
- infrastructure implications, not just in terms of the short-term actions such as the use of filters, but wider ones about a programme of remedial work to identify and resolve problems through the hospital's water infrastructure;
- a thorough approach to water sampling and testing based on the water contamination risk;
- the financial and public assurance consequences arising from this; and
- the implications for staff working in such an environment and addressing patient and family concerns.

While many of these actions were taken forward, there did not appear to be a strategic overview that considered all these risks and responses to water contamination as a whole, not least their inter-dependencies. Such an approach would have necessarily spanned the whole governance framework of the Health Board.

137. This kind of approach was not being requested of the Health Board by those working with it nationally, but it seems equally clear that it was not actioned internally. Throughout the period, the governance system was active in addressing and containing the individual incidents, taking impressive actions of redress, but there did not appear to be consideration of the wider risks that the incidents suggested and which the succession of outbreaks demanded. It was not just a question of the 'long view' of the succession of incidents, but the 'wider view' of what that might mean across the Health Board's operations. Again, there is learning here not just for NHS GGC, but for all Health Boards.

<u>Decision to De-cant Wards 2A and 2B</u>

138. The decision to de-cant Wards 2A and 2B in 2018 remains one of the most significant actions taken by the Health Board in response to the series of infection incidents. Moving children and young people into the QEUH building itself allowed substantial works to be undertaken on the RHC wards. To date, refurbishment work has not been completed and paediatric haemato-oncology patients continue to be treated in Wards 6A and 4C within the QEUH.

139. The decision was taken relatively quickly. At the Board meeting on 21 August 2018 and the Clinical and Care Governance Committee meeting on 4 September, the minutes do not show that there might be a need to de-cant, reflecting the understanding that the issues were under control following the closure of the earlier incident and the actions set in motion as a result. The de-cant took place on 26 September. How communication of the event took place with children, young people and families has already been reviewed in the Interim Report. The relevant wards were inspected and made ready for patients with a programme of repairs and full deep cleans. Weekly IMT meetings continued to monitor the de-cant, and no issues were initially raised about the move. An update on the de-cant was provided to the Board Infection Control Committee, where some concerns at the clinical risks of the move were expressed. The full Board was updated at its meeting on 26 October, where the decision to close the RHC wards was formalised.

140. The rapid decision and follow-up action here shows that NHS GGC was capable of responding quickly when urgent action was required. However, the move was not without its own series of risks, given that the children and young people were being transferred to wards that had not been specifically designed for their needs. While a risk assessment of different options was undertaken, concerns were brought forward by clinicians and microbiologists when a new series of infection incidents occurred in Ward 6A and a new IMT was established in June 2019. This led to a SBAR in August, produced by seven microbiologists, outlining a number of concerns including: issues about air changes and pressure; use of HEPA filtration; infection risks from chilled beam technology; existence of pathogenic fungi; exposure of the children and young people to unfiltered water; risk from toilet plume; the absence of 'solid' ceilings; and the lack of play area. This SBAR argued that what was originally considered a short-term de-cant had become longer term, owing to the greater scale of issues uncovered in the original wards as part of the refurbishment; as a result, it was necessary for a new, longer-term risk assessment and appraisal to be carried out of the 'temporary' wards, particularly 6A. Indeed, the SBAR concluded that this was a matter of significant public safety, as it concluded: "6A should be considered to have significant unacceptable levels of infection risk for the immune compromised patients due to the built environment."

141. What gives particular significance to the August 2019 SBAR was not just the number of microbiologists who set out their concerns, but the implications for NHS GGC senior managers of an argument that Ward 6A (in particular) was not a 'safe' place for this patient group. In many respects, the alternative choices facing the Health Board were more limited and stark than those in the original decision to de-cant from the RHC, so this provides a significant test of how the issues were assessed and addressed within the governance structure. While the evidence is strong throughout 2019 that there was considerable discussion and reporting of the measures being taken to mitigate the infection issues in Wards 6A and 4B, including discussions at the Clinical and Care Governance Committee and the Board itself (via the regular HAI reports), it is important to understand how these more fundamental concerns about the long-term appropriateness of the QEUH wards were being considered.

142. The issues and responses to the August 2019 SBAR was discussed at the first IMT meeting in September, but it was not clear what further action/consideration

was to be taken forward. The Oversight Board was aware that several of the authors of the SBAR sought a formal response to their SBAR, but there is no indication that a formal action plan was created (or that the issues were incorporated into an existing action plan). Indeed, IMT minutes in September following the internal discussion on the SBAR's points held an action point for the IMT's views and responses to be communicated back to the authors of the SBAR; this was raised again at a subsequent meeting, where it was confirmed that such a response had been provided. Nevertheless, several of the SBAR's authors have reported that no such confirmation was made.

143. The Oversight Board is not aware that the issue was formally raised or discussed with any of the relevant committees/groups in the subsequent period. The December 2019 meeting of the Clinical and Care Governance Committee noted that whistleblowing concerns had been raised by some clinicians and microbiologists and noted that the relevant processes were being followed. It also set out actions that addressed some of the issues raised in this SBAR, such as cleaning focused on the chilled beams. The lack of clarity and formal recording of considering and acting on the SBAR is surprising in light of the continuing issues with infection at the QEUH.

144. Alongside these concerns about the appropriateness of Ward 6A for this vulnerable group of patients, there was internal speculation on why Gram-negative bacterium were continuing to appear despite the chemical dosing regime. Such actions can take significant periods of time to prove effective (and indeed levels of bacteria had reduced, as seen by the water testing results), but questions were raised about whether resistance to chlorine dioxide might be present. At its meeting on 16 July 2019, the Acute Infection Control Committee was informed that while the QEUH chlorination system had been fully fitted and Gram-negative counts had fallen, the mycobacteria issue had recently re-emerged despite the dosing. Such concerns posed risks to the strategy being pursued by the Health Board to addressing potential environment risks. On 29 July, similar concerns were noted at the Board Infection Control Committee, but no specific action seems to have been taken.

145. While such discussions may have taken place among senior managers, these risks do not seem to have been discussed at formal meetings. Instead, the emphasis seems to have principally been on assurance that immediate measures to address concerns – such as the provision of taps or cleaning regimes – were in place. The high level of uncertainty over continuing safety to the children and young people, environmental risk did not make decision and action easy. However, the complexity of these issues did not seem reflected fully to more senior levels of governance, and there was insufficient recognition of the concerns around environmental risks – not least with respect to the de-canted wards in the QEUH – continually raised by some clinicians.

146. Issues about escalation were also apparent in the handling of Mycobacterium Chelonae cases within the hospital – Gram-positive bacterium, but related to the environment and just as potentially threatening to this vulnerable patient group. The National IPC Manual does not refer specifically to MC in its list in Appendix 13, and it is an unusual organism. It was reported in May 2018 in Ward 2A in the RHC, although it did not feature in the HAIRTs provided later to the full Board. A second

incident occurred in June 2019 in Ward 6A in the QEUH; that incident was reported to the full Board's October meeting in the HAIRT, but there was no reference to the earlier 2018 incident in that report. While the issues were discussed in other Committees (and reported to HPS, including the earlier 2018 case), it may have been useful if this had been reported to the full Board for consistency and to give an adequate profile to the occurrence of an unusual organism (again in the context of the risks of water contamination). The Board did report this to HPS at the time and following active consideration by the ICD, the organism was excluded as not meeting the case definition. Further national guidance on reporting would be helpful to support Health Boards in future.

147. In the Oversight Board's view, both instances warranted being brought to the full Board's attention in a consistent manner that noted the issue of apparent recurrence. IPC governance in a Health Board as large and complex as NHS GGC depends on issues being addressed at the appropriate place and relevant reporting being undertaken to higher levels of governance. In the view of the Oversight Board, this was not consistently done in the period under review.

148. IPC governance also depends on higher levels of governance seeking assurance of the system as a whole. The Oversight Boarded noted that targeted internal audits of IPC governance did not appear to take place during the period under review. Such action should also be considered as part of wider work on reviewing governance within the Health Board described below (and indeed, as part of wider work on audit and governance for NHS Scotland as a whole).

Summary

149. In reviewing how IPC governance handled the infection incidents, the Oversight Board found governance as a whole was fulfilling many of its primary responsibilities. No obvious 'weak links' in a chain of good IPC governance were identified. Infection incidents were, for the most part, reported at different committees, up to and including the full Board, and actions were reported and largely monitored and followed up. Indeed, there are several examples of good governance in action. For example, following reporting of the Cryptococcus incident in January 2019, the Board requested regular updates on air sampling at subsequent meetings. Improvements in Wards 2A and 2B. The improvements in Facilities and Estates operations were given proper and commendable attention by the Facilities Planning and Performance Committee through 2019. In this, the different Committees were fulfilling a clear role on assurance, particularly of the infection issues being raised and the actions taken.

150. However, the Oversight Board is not satisfied that the full Board was appraised of all the relevant issues. In part this may reflect what was presented to these Committees, and the absence of important information (such as the loss of the DMA Canyon reports). There was also no systematic review of the implications of water contamination presented to – or indeed, requested by – the full Board. Arguably these are issues that can only have been brought together at the level of the full Board, where the work of different Committees looking at different dimensions to the QEUH issues came together. The lack of some information and of a cross-cutting review of the implications of water contamination may have hindered

the Board's ability to fulfil the key elements of its role in assurance: seeing the 'big picture' in full; and providing challenge. It also highlights another key aspect of how IPC governance should have addressed the infection incidents: risk management.

4.3 Risk Management

151. Risk is not the responsibility of any one part of the organisation; while more senior parts of the governance system have clear roles on overall oversight, it should be mainstreamed through all levels and services. As stated to the Oversight Board: "[NHS GGC] believe that the provision of high standards of health, safety and welfare within a risk management framework is fundamental to the provision of high standards of health care". The Board itself retains ultimate corporate responsibility for the risk management strategy and ensuring that corporate risks are properly captured and addressed, as well as assuring itself that all parts of the organisation are managing risk appropriately.

152. Relevant risk registers – not least the Corporate Risk Register – do reflect infection risks, and are necessary to ensure there is a systematic approach to considering and taking action on the right issues. However, the environmental infection risks increasingly apparent from 2018 onwards were not reflected in the Health Board's risk record. While infection incidents were reported individually to oversight committees within NHS GGC (as noted above), the significance of potentially widespread water contamination was not quickly raised within the governance structure.

153. As risk should be mainstreamed throughout the organisation, an appreciation of risk management should not be limited to what was and was not discussed at formal meetings. In its discussions with the Oversight Board, the Health Board noted that issues of risk were consistently being discussed and addressed by senior managers outside of formal meetings, and indeed, for some groups, such as the Technical Water Group, it clearly shaped the urgency and work programme to address risks. However, the abiding impression from the formal reflection on these matters within NHS GGC – not least by the Board itself – was of the senior levels of governance simply noting actions and not demonstrating a more active approach to seeking assurance around the risks. This is a view echoed by the Independent Review, which concluded: "There is little evidence in the [Board Infection Control Committee] or Board papers of a strategic approach to IP&C but rather of a responsive approach to exceptions that otherwise demonstrates good compliance with activities and standard."

154. Recording of risk is a key part of risk management. As the Blueprint for Good Governance sets out: "Assessing risk requires that the Board should… identify current and future corporate, clinical, legislative, financial and reputational risks [and] oversee an effective risk management system that assesses level of risk, identifies mitigation and provides assurance that risk is being effectively treated, tolerated or eliminated." The Oversight Board found that capture of the infection risks relating to the QEUH was scant.

155. A dedicated IPC risk register exists, which has been regularly reviewed and submitted to the Board Infection Control Committee for approval – its highest rated risks are then submitted to the Corporate Risk Register. The risk register for 2019 noted key risks that are clearly of relevance to the incidents in the QEUH, for example: "failure to provide appropriate infection control advice and support in the assessment and reduction of risks associated with new builds and renovation projects" (rated in the 2019 document as 'moderate'); and "failure to adequately engage with public and service users" (rated in 2019 as 'low'). However, the description of the risk and mitigation focuses on improved processes – such as the links with key groups and the production of relevant SOPs – rather than any operational set of risks arising from the continuing infection issues in the QEUH.

156. Moreover, the risks of water contamination were not reflected in the Corporate Risk Register. The latter did include a recurring risk of "failure to comply with recognised policies and procedures in relation to infection and control", but this does not relate specifically to the environmental and other associated risks. Indeed, the only reference in the Corporate Risk Register was in June 2019: "there is a reputational risk in respect of the recent issues and concerns expressed to the QEUH, including facilities and environmental issues, capacity flow across the south sector, and intense media scrutiny regarding patient care." This focus on 'reputational risk' does not include a wider sense of the patient safety and financial consequences of systemic water contamination.

157. Apart from a reference to the issue of cladding in the QEUH in the Corporate Risk Register, facilities/environmental risks did not feature significantly. This might reflect the way that risks are phrased and an assumption that more 'operational' risks are captured elsewhere (though where infection does feature, it does reflect operational granularity, as in the focus on maintaining good hygiene strategies to reduce MRSA/MSSA (Methicillin-resistant Staphylococcus aureus/ Methicillin-sensitive Staphylococcus aureus) rates). Given that these issues have proven so damaging to the affected children and young people and families, as well as staff and indeed, the Health Board itself (not least with the escalation to Stage 4), risk management in NHS GGC – at least with respect to IPC and in the context of corporate risks – had not prepared the Health Board properly. This is not to suggest that more visible and systematic capturing of these risks in relevant risk registers would have necessarily led to different courses of action – the lack of reference in the Corporate Risk Register, for example, did not affect the commendable approach to implementing the water dosing system in 2018. But risk management must aim at providing systematic assurance that such responsiveness is neither assumed nor simply dependent on local competence or expertise. Indeed, this does raise difficult questions about whether risk management in NHS GGC as a whole is performing its required role in enabling the Health Board to fulfil its duties, at least with respect to infection issues.

158. Overall, it presents a picture of a Health Board that did not fully – or at least overtly – appreciate the risks and issues arising from the QEUH incidents and act appropriately to address the issues as a result. Such a picture may not, of course, do justice to the commitment and actions of individual staff and services in addressing the huge challenges of the infection incidents. However, at the very least, it should represent a key challenge that the full Board itself should review, not least in the

context of the review of governance and assurance in IPC captured in the Gold and Silver Command programme of work.

159. The Oversight Board recognises that the full Board has initiated work to address wider governance, and that this work has the potential to improve some of the issues identified here. As part of work to embed the Blueprint of Good Governance in the Health Board, it is taking forward a three-stage project to improve its governance and assurance. It has adopted the national principle of ‘‘Active Governance’, which requires NHS Boards to have not only a clear and accurate picture of what is happening within the organisation at a given point in time, but also regard to the wider strategic and policy context in which the Board operates. This is described as:

- ensuring the right things are being considered by the correct individuals/committees;
- ensuring there is a review of the right information and support given to ensure understanding and context; and
- facilitating an appropriate response by committees/Board and thus assessment of scrutiny and assurance can be elicited and governance active ensured.

160. The application of these principles to IPC is not clear at this stage, but early indications show that such links are being made. One of the early steps in this work is defining corporate objectives and allocating them clearly within the governance structure: there is a clear designation of the corporate objective “to provide safe and appropriate working practices that minimise the risk of infection, injury or harm to our patients and our people” to the Clinical and Care Governance Committee as lead. Moreover, in his letter of 3 December 2020 to the Cabinet Secretary for Health and Sport, the Health Board Chair noted that the Health Board’s 2020/21 winter priorities included “the issues around the design, build and maintenance of the QEUH campus, including the legal case and the liaison with the Oversight Boards and the Public Inquiry”. He also noted that a comprehensive review of the existing risk management system has now been commissioned, which will include both corporate and operational risk management. A Senior Risk Officer has been appointed as part of this activity.

161. The Oversight Board welcomes the approach and recommends that the principles are applied to ensuring that IPC strategic and operational risks are captured within this system, and relevant information escalated more effectively, as soon as possible.

162. In addition, the Oversight Board draws attention to whether the Gold and Silver Command programme of work has been considered under the Health Board’s obligations under Part 1, Section 2 of the Children and Young People (Scotland) Act 2014. This places obligations on organisations such as Health Boards to report every three years on the steps they have taken to secure better or further effect of the requirements of the United Nations Convention on the Rights of the Child (UNCRC). Typically this would entail the use of children’s rights and wellbeing impact assessments on key policy and service changes that affect children and young

people.[15] Given the range of UNCRC rights likely to have been engaged by this work, the use of an impact assessment and highlighting of the results in the next three-yearly report would be strongly advised, not least as an active part of risk management going forward.

[15] Children's rights and wellbeing impact assessments: guidance - gov.scot (www.gov.scot).

5. Technical Review

163. Given the prominence of the physical environment in responding to and understanding the infection incidents, the Health Board's systems of assurance, particularly around water safety, are critical. The Technical Issues Subgroup focused on these technical issues of assurance. In the Interim Report, an update was given on progress on the refurbishment and reopening of Wards 2A and 2B in the RHC, following its closure in September 2018. The Final Report focuses on the following remaining issues:

- **NHS GGC's water safety policy**, with specific attention given to its water testing regime and how testing results are being used as part of IPC and the key water and ventilation infrastructure in light of the infections across the hospital site; and
- **NHS GGC's plans to monitor infrastructure improvements** required in response to the issues around the building of the hospital as well as the impact of the chemical dosing system introduced from late 2018 to address water system contamination.

5.1 Review of Water Safety Policy

164. Water safety policy in NHS GGC is governed by a Board-wide policy document, with specific issues covered in a written scheme for the QEUH site. In particular, the written scheme document outlines the specific roles, responsibilities, training requirements and regular maintenance procedures to be followed in order to ensure compliance with statutory and mandatory guidance. Given the heightened importance of water testing against a backdrop of water contamination issues, the policy has a particular significance in providing assurance of the Health Board's ability to handle outbreaks.

165. At the request of the Oversight Board, HFS reviewed the Health Board's water policy and the NHS GGC QEUH campus water systems written scheme. This involved reviewing Health Board documents against national guidance and expectations including:

- SHTM 04-01;
- HSE ACOP L8;
- HGS 274 Part 2;
- BS 7592:2008 Sampling for Legionella bacteria in water systems. Code of practice;
- BS 8580-1:2019 Water quality. Risk assessments for Legionella control. Code of practice; and
- BS 8680:2020 – Water Quality – Water Safety Plans – Code of Practice.

166. HFS concluded that the documents set out a sufficient and appropriate description of the water policy. A number of areas for further improvement were

suggested for the two key documents – the water safety policy and the QEUH written scheme – to add resilience.

- For the QEUH written scheme:
    - point-of-use filter installation and management was not identified, and should be enhanced given the heightened maintenance needs around this in the QEUH;
    - there should be clear patient cohort susceptibility and risk assessments relating to various organisms, particularly environmental ones, to demonstrate that there is a clear recognition of addressing the vulnerability of certain patient groups, given the water contamination risks: those risk assessments should be explicitly referenced (and summarised where useful) and a process for triggering and considering such risk assessments in future should be included in the scheme;
    - a chlorine dioxide management and strategy was not identified – the whole-site dosing system brings additional infrastructure and maintenance issues for the Health Boards which need to be explicitly acknowledged;
    - dental, hydrotherapy and scalding risks should be detailed as appropriate; and
    - it would be prudent to update the formatting of the documents to reflect recent changes, such as BS 7592, BS 8580 and BS 8680 (2020).
- For the water policy: the Health Board should consider a shorter policy document with all detail placed in the QEUH written scheme.
- It is also recommended that there is explicit reference in the documents to who interprets the testing results. From the Facilities and Estates perspective, the renewed focus on the use of Authorised Persons is welcomed, and this would be strengthened with clear links to microbiologists – especially ICDs – in the formal and systematic consideration of results for the site.

167. Sampling procedures are explicitly set out in accompanying documents. Gram-negative bacteria are checked at different frequencies throughout the QEUH, but in targeted locations. For example, regular samples have been carried out in Ward 6A in the QEUH since December 2019, including Pseudomonas and a variety of Gram-negative bacteria; a quarter of outlets are sampled weekly on a rotational basis so the whole ward is covered each month. This would also appear to be proportionate.

168. The governance around flagging any ‘out of specification’ results should be strengthened. There should be a clearly expressed route for raising these results within the IPC governance structures and relevant committees having explicit oversight of high-TVC results with accompanying advice from appropriate Facilities and Estates, IPC and microbiologists presented for consideration.

169. However, the Oversight Board also notes the criticisms of water sampling and testing practice identified in the Case Note Review, particularly in how environmental results were used to support IPC. As recommended in its Overview Report:

> **"**A systematic, fit for purpose, routine, microbiological water sampling and testing system is required to provide assurance going forwards. How the results from such sampling/testing are recorded, accessible and used to highlight concerns should be reviewed, including to ensure that investigations of possible links between clinical isolates and water/environment sources can be informed in a timely way."

5.2 Plans for Infrastructure Review

170. An enhanced approach to infrastructure maintenance, particularly with respect to water systems, is an inevitable expectation of the Health Board against a context of continuing problems with the building. The site-wide chemical dosing system introduces new maintenance challenges, while the Independent Review set out a number of recommendations which had implications for remedial work on the building. Assurance that actions are being taken to address the identified problems and risks and monitor them going forward is an important consideration for the Oversight Board.

171. With respect to the Independent Review, a detailed action plan is currently being developed in accordance with the methodology set out in the NHS Scotland 'Improvement Focused Governance' guidance document[16]. Each action has a nominated lead executive. The NHS GGC Gold Command Steering Group, 'Better Every Day', will review, monitor and report progress against the action plan to the executive management team and onward to the Finance Planning and Performance Committee.

172. One other issue that the Oversight Board specifically considered was the programme for addressing water taps across the hospital. At the height of the 'water incident' in 2018, it was recognised that taps and flow straighteners were harbouring biofilm and work commenced on swapping the Horne taps with an alternative. However this was halted following the chemical dosing system's installation. Further to the introduction of chlorine dioxide it was demonstrably evident that biofilm was no longer within the flow straightener. This issue will remain under constant review by the Water Technical Group. It has been agreed, however, that during any future upgrading works that the Marwick taps will be installed.

[16] Improvement focused governance: guidance for non-executive directors - gov.scot (www.gov.scot).

6. Communication and Engagement

173. Communication and engagement issues related to the escalation of the Health Board were extensively discussed in the Interim Report, and findings and recommendations were put forward (and set out again in the Summary above). The Final Report is considering another dimension of communications and engagement in the context of the infections: the Health Board's responsibilities (and duties) to review incidents where death or harm has occurred or could result from incidents.. Engagement is not simply about communications during an incident, but how the Health Board had reviewed what happened, its own actions and how patients and families are involved in such reviews of contributory factors. As the Scottish Government's guidance on the organisational duty of candour[17] notes:

> "Openness and honesty should be central to the actions of those providing care to others. It should be at the heart of every relationship between those providing, receiving and/or experiencing treatment and care. Trust and effective communication can be difficult to maintain and easy to lose when things have gone wrong."

174. The Oversight Board has a particular focus on the **organisational duty of candour** with respect to the infection incidents. Parents of some affected children and young people expressed concerns about the Health Board's duties and commitment to a person-centred approach to decision-making on reviews and the associated involvement, engagement and support provided to the children, young people and families through very difficult circumstances. It is important to understand how the Health Board deployed other review processes during these infection incidents, notably **Significant Adverse Events Review** and **Mortality and Morbidity Reviews**. They all form a critical part of NHS Scotland's strategic commitments to quality and improvement, both reflecting statutory and strategic obligations set out in underpinning legislation for NHS Scotland.

6.1 Organisational Duty of Candour

175. The organisational duty of candour procedure is a legal duty to support the implementation of consistent responses across health and social care providers where there has been an unexpected event or incident that has resulted in death or harm, or could result in death or harm, that is not related to the course of the condition for which the person is receiving care. Provisions in the Health (Tobacco, Nicotine etc. and Care) (Scotland) Act 2016 and the Duty of Candour Procedure (Scotland) Regulations 2018 set out the procedure that organisations providing health services, care services and social work services in Scotland are required by law to follow when such an incident has occurred. The provisions were enacted on 1 April 2018, and applied to information considered about earlier incidents that became available after enactment. Guidance setting out how those provisions should be implemented was published in 2018.

[17] Organisational duty of candour: guidance - gov.scot (www.gov.scot).

176. The organisational duty of candour legislation places a legal requirement on health and care providers, including Health Boards, to: review certain types of adverse events; meet personally with those affected to provide an account of the incident; provide an apology on behalf of the organisation; and provide an explanation of the actions that the organisation will take as part of the procedure. Under the duty of candour legislation, organisations must provide their employees with details of any services or support which may be able to provide assistance or support, taking into account the circumstances relating to the incident. Furthermore, organisations must provide patients and/ or their families with details of needs-based services or support, and through meetings and discussions, organisations should determine the impact of the incident on their health and wellbeing.

177. Organisations are required to apologise and to meaningfully involve patients and families in a review of what happened. When the review is complete, the organisation should agree any actions required to improve the quality of care, informed by the principles of learning and continuous improvement. They should tell the person who appears to have been harmed (or those acting on their behalf) what those actions are and when they will happen.

178. Given the vulnerability of the patient group who experienced these infections, the organisational duty of candour would be a highly relevant consideration here. It was actively considered by NHS GGC with respect to patients of the paediatric haemato-oncology service during the period under review. However, it was not formerly activated for any of the specific instances of infection, a concern raised by some of the families.

179. The decision not to activate was in line with NHS GGC policy in support of the organisational duty of candour, which the Oversight Board reviewed. However, the Health Board's policy does not fully reflect the legislation and guidance – primarily in respect of the reliance placed upon harm being viewed to be avoidable and/or related to acts of omission/commission by the organisation. It was focused on the concept of a 'patient safety incident' – which is not a concept set out in the legislation – and did not fully consider the legislative requirement to consider an unintended or unexpected incident that could result in harm (including actual or potential psychological harm). By this definition, a number of the incidents under review were clearly within the scope of the organisational duty of candour.

180. Work on developing how the organisational duty of candour should be implemented in relation to HAI had been initiated by ICDs in NHS GGC. This had identified the need for further action to consider complex interactions relating to the professional duty of candour obligations of clinicians, the organisational duty of candour and balancing related organisational duties relating to confidentiality. NHS GGC should identify the further actions required to address the issues identified by the Oversight Board relating to HAIs and organisational decision-making where concerns are expressed in respect of balancing organisational duties on candour and confidentiality.

181. While implementation of the organisational duty in these circumstances has particular challenges, it is clear that the legislation does not require a view on causation to be determined in deciding whether to activate the duty. This includes

provision for unexpected or unintended events that have resulted or could result in outcomes included in legislation (including increases in treatment) to activate the relevant procedures. National work is progressing on this issue, and some of the issues faced by the Health Board are likely shared by other Health Boards. This work should inform the continuing improvement of the Health Board's policy, but steps should be taken sooner to address the issues set out here.

6.2 Significant Adverse Events Review Policy

182. In the complex systems and practices that underpin much of health and social care, adverse events can be expected to occur, despite the continuing efforts of staff and organisations to provide safe care. When such events do take place, it is essential that those affected most by those events – particularly patients and families – are given the opportunity to understand how they came about. It is equally essential that such events become opportunities for reflection to ensure that there is learning and improvement as a result.

183. For that reason, there is a national approach to reviewing significant adverse events across NHS Scotland. Guidance is provided through the National Framework by HIS[18], ensuring consistency in how they are conducted, recorded, how they are communicated, and how learning can be gathered and disseminated. As the Framework notes: "the national approach seeks to ensure that no matter where an adverse event occurs in Scotland: the affected person receives the same high quality response, organisations are open, honest and supportive towards the affected person, apologising for any harm that occurred."

184. Within NHS GGC, judgements are made on a case-by-case basis. For the patients affected by infection in the paediatric haemato-oncology services, incidents were reviewed by the local clinical teams as well as retrospectively by senior medical colleagues in a few instances.

185. NHS GGC recently updated its policy on how to handle these events in August 2020 (when it was approved by the Board). HIS was commissioned by the Oversight Board to review this policy in line with national guidance as part of its focus on communication and engagement issues.[19]

186. The HIS review found that the revised policy was generally in line with national guidance. The definition and categorisation of adverse events was appropriate, and the system for conducting a review and reporting to the right parts of the governance structure were clear. Overall, the policy was robust, though there were areas of improvement that were highlighted, and which the Oversight Board recommends the Health Board addresses in reviewing its policy.

[18] Learning from adverse events through reporting and review - A national framework for Scotland: December 2019 (healthcareimprovementscotland.org).
[19] Adverse events management within NHS Scotland - gov.scot (www.gov.scot).

- The NHS GGC policy states that there is no requirement for the investigation team to be independent of the service in question. HIS recommends that this wording be reviewed in line with the National Framework which states that "the review team should be sufficiently removed from the event, have no conflict of interest (real or perceived) to be able to provide an objective view". It may be difficult to find the expertise to review cases appropriately in some smaller specialties – including the paediatric haemato-oncology service – but it remains important for Health Boards to strive actively for independence and objectivity as much as is possible.
- The involvement of patients and families in the process should be set out more clearly and explicitly. In particular, it would be helpful to include information in the policy about how patient/family feedback can be used to develop and improve the process. Moreover, families need to be clearly involved in the reviews.
- Further work in relation to assurance of the policy through clinical governance and committees/groups is worth testing to ensure that the right learning and communication to families is being undertaken.
- The language of adverse events is slightly out of alignment, in that NHS GGC refer to 'serious events', rather than the national practice of 'significant events', as instructed by the Cabinet Secretary for Health and Sport. This presents some scope for confusion given the mobility of patients and staffs across NHS Scotland.

6.3 Mortality and Morbidity Reviews

187. Mortality and Morbidity Reviews are key opportunities for learning from experience. In the Mortality and Morbidity Practice Guide[20] produced by HIS, it states that such a review can be:

> "a unique opportunity for caregivers to improve the quality of care offered through case studies. They provide clinicians and members of the healthcare team with a routine forum for the open examination of adverse events, complications, and errors that may have led to illness or death in patients."

They provide a systematic means to reviewing patient deaths or care complications with a view to improving patient care and professional learning. As has been stressed throughout the Oversight Board's reports, the complexity of the challenges arising from the infection incidents has given significant opportunities for such learning to be gathered.

188. Seventeen of the 19 cases examined in the Case Note Review were subject to the Morbidity and Mortality review process within NHS GGC. The other two cases were not reviewed locally as the patients had died in other Board settings – but in 2018, the review team changed its process so that all such cases would be discussed going forward.

[20] Mortality and Morbidity Reviews Practice Guide – Working Version: July 2018 (healthcareimprovementscotland.org).

189. NHS GGC has a number of key documents to support mortality and morbidity reviews. These include the following guidance and practice materials:

- Guidelines for Morbidity and Mortality Review Meetings;
- GG&C M&M Review Process;
- Morbidity and Mortality Meeting Analysis Prompts; and
- Morbidity and Mortality Principles for Practice/Code of Conduct.

190. NHS Education in Scotland (NES) was commissioned by the Oversight Board to review the Board's key documents against national practice guidance (though not the individual cases here). Overall, the NES review concluded: "the guidance content and learning approach advocated are good and are to be commended." Indeed, the Health Board demonstrated that "the importance of these meetings and processes in contributing to effective governance and improvement in care." Where comments were made, they were with a view to improving the approach in NHS GGC.

- In line with modern safety science approaches, it is advised that the concept of 'systems thinking' should be more explicitly incorporated within the guidance. The visible aim should be to better support recommendations for improvement of patient care and working practices at the systemic level rather than simply the individual level – in other words, individual actions and performance should not distract from opportunities for learning across the wider organisation.
- Given the time available, the selection of cases for review at meetings should arguably be informed by the greatest potential for learning and improvement – indeed, 'near-miss' events can often be overlooked but be equally and sometimes more important.
- Consideration should be given to weekly one-hour meetings to support up-to-date review of cases (including what works well and how it can be shared) and prevent backlog.
- Whilst the guidelines are noted for Morbidity and Mortality Review Meetings, there can be further emphasis in describing how these meetings are integrated into NHS GGC's wider governance process. Greater visibility of the learning arising from these meetings – particularly for the wider organisation – should be considered for relevant clinical oversight committees within the Health Board, with a particular view to considering standardising their format.

191. The Oversight Board also notes the Case Note Review comments on these Reviews with regard to infection incidents.

> "The Paediatric Haematology Oncology service should ensure that Morbidity and Mortality reports are not restricted to a review of patients who die. Future Gram-negative environmental infections should be used as a trigger for an M&M (Morbidity and Mortality) review."

7. Case Note Review

192. A Case Note Review was established in January 2020 to examine individual cases of infections. Undertaken by a Panel of independent external experts, the Case Note Review team has examined the case notes of those children and young people in the paediatric haemato-oncology service in the RHC and the QEUH from 2015 to 2019 who had a bacteraemia caused by a Gram-negative environmental microorganism (and selected other bacteria, as identified in laboratory tests). The terms of reference are set out in **Annex B**. While its Overview Report is published separately to this Final Report, the following digest summarises its findings on several of the wider, systemic issues relating to IPC in NHS GGC, and has been prepared for inclusion in this report.

193. As part of its work, the Panel confirmed that 84 patients, with 118 infection episodes, fell within the scope of its review. This included the following:

- One patient had two episodes of infection, the first of which was a Stenotrophomonas spp. bacteraemia, but this was excluded as it occurred prior to the transfer of the hospital to its new site in 2015. This patient remained in the Review because of a second eligible episode.
- One patient had a single episode of bacteraemia within the period of the review, but this was not caused by a Gram-negative environmental (GNE) microorganism; on that basis, both the patient and the episode were excluded from the analysis.
- There was one further patient, who experienced four infection episodes, whose parents did not wish their child to be included in the Review.

194. The Case Note Review final report will review these issues and the individual cases in more detail. This chapter draws out key Expert Panel findings as they relate to the Oversight Board's scope of work, focusing particularly on the availability and use of data within the Health Board, and how potentially hospital (environment) related infections were identified, mapped and responded to.

7.1 Data Issues

195. In examining the microbiological, environmental and clinical data relating to the individual cases, the Expert Panel reached conclusions on a number of issues relating to how NHS GGC has collected, organised and use key data in the infection incidents.

196. Environmental data did not appear to be organised as well as it should have been. The data initially provided to the Expert Panel by the Health Board about water and surface samples were incomplete and without adequate place location identifiers. Samples and their locations were inconsistently labelled and the format in which they were presented rendered cross tabulation with individual patient records almost impossible. This raised questions about how the Health Board was able to make use of such data in its continuing investigation of the bacteraemias.

197. Typing of bacterial organisms is key to understanding whether or not isolates from different patients or from the environment may be closely related/ indistinguishable (ie. evidence for potential common/environmental sources). Reference was found in clinical notes for individual cases in IMT records and in the ICNet and Telepath systems to samples being sent from the isolates identified in patients in the review to a reference laboratory (normally outside NHS GGC). However, this was not done consistently and on many occasions no results were recorded or only a simple statement provided that the bacterial strain in question was described in the lab report as 'unique'. This latter statement is meaningless unless it is clear to how many and which other strains the index strain has been compared.

198. Following discussion with NHS GGC, it became apparent that a database recording all typing data for the cases included in the Review, and contemporaneous environmental samples, did not exist. Indeed, an electronic laboratory record system for typing data appears to have been created only towards the end of the period covered by the Review; prior to this, reports had been received from the reference lab as individual pdf files and filed as such. In order to provide this information to the Panel, NHS GGC had to request resubmission of original data from the external laboratory (Public Health England (PHE) Colindale). In the process of discussing the availability and format of these data with NHS GGC, the Panel reached the conclusion that, notwithstanding concern about, and investigation of GNE bacteraemias in paediatric haemato-oncology patients within NHS GGC over a period of five years, and even by 2020, systems had not been created for the collection, collation, storage or analysis of data in a manner readily available to optimise internal investigations and decision making, either in real time or retrospectively.

Use of Data Systems

199. Telepath is the laboratory information management system used in NHS GGC. The Panel found that it generally provided good evidence of frequent engagement between the microbiology and clinical teams in sharing information, including about the identification of infecting organisms and their susceptibility profiles to guide optimal antibiotic therapy choices.

200. The ICNet system relies on data being transferred from Telepath when an organism is identified for which a pre-set alert exists. The National Infection Prevention and Control Manual (NIPCM) provides a nationally-agreed minimum list of alert organisms/conditions. The purpose of this list is to alert NHS Boards of the occurrence of these organisms/conditions, which may require further investigation. The guidance states: "the list is not exhaustive and specialist units, for example those managing patients with Cystic Fibrosis, will also be guided by local policy regarding other alert organisms not included within these lists". However, the Panel found little evidence, even as late as 2019, that the NHS GGC alert list had been modified in light of the evolving experience with GNE bacteraemias. This resulted in frequent absence of alerts being triggered within ICNet, and the subsequent absence of IPC input in episodes of GNE bacteraemia in the cases reviewed.

Patient Location Records

201. The locations of patients during hospital attendance and inpatient stays were obtained from Trackcare. Whilst a specific bed was identified for almost all inpatient stays, the system did not provide locations to the level of a specific bed space when patients were receiving day care in Ward 2B or, subsequently, in Ward 6A. This limited the capacity of the Panel to assess specific locations of care as risk factors for infection.

202. One unexpected issue was the continuing coding of haemato-oncology day care patients as attending Ward 2B after the date both Wards 2A and 2B were closed in September 2018. This occurred inconsistently within individual records and, although the Panel was made aware that Ward 2B was used for the RHC pre-assessment service from 29 April 2019 to 15 November 2019, it was assured that no haemato-oncology patients attended that area during this period. It seemed self-evident for the benefit of tracking purposes that patients should never be coded to an area other than that which they physically attended.

203. It was often difficult to identify from the clinical records in which operating theatre surgical procedures took place. It was also likely that procedures (for example, bone marrow sampling and lumbar puncture procedures) were undertaken in anaesthetic rooms, also without a record of the location.

Clinical Records

204. The NHS GGC Clinical Portal stored scanned copies of written inpatient medical notes which should be dated to the day of discharge. For the episodes included in the Review, complete written notes were found for 65 percent of cases, incomplete notes for 18 percent and no written notes for 16 percent. Of the episodes identified with written notes, 61 percent were filed under the date of discharge, but written notes for other episodes were found to have been filed up to 14 months after the date of discharge.

205. The Clinical Portal also contained digital inpatient medical records for some patients. These records include Generic Continuation notes. These were not linked to specific admissions and contained diverse inpatient and outpatient records from different professions and specialties. If the Generic Continuation was labelled Paediatrics, then it usually contained digital inpatient medical notes. These were detailed and fully electronic, which enabled word searching. However, these notes might cover several admissions and the median length of records for patients in the review was 12 months (maximum 35 months). These structural issues made the searching for data from records in the clinical portal very difficult at times.

7.2 Addressing Bacteraemia Clusters

206. The Panel also examined how bacteraemia clusters (possible outbreaks) were investigated. In the initial stages of investigation, thresholds for calling a PAG or subsequently proceeding to an IMT did not appear to evolve during the period of the review, despite the continuing existence of concern about GNE bacteraemias over

several years. There seemed to have been little recognition that the use of standard definitions of an outbreak may be less useful in a situation where unusual infections emerge in relatively small numbers within a small subset of the overall hospital population (as was the case in paediatric haemato-oncology). Some IMT minutes and other internal reports seen by the Panel that have analysed data about infection trends may also have provided inappropriate reassurance from the use of SPC methodology without accurate ascertainment of an appropriate baseline.

207. There were examples of PAG meetings being called separately for clusters/outbreaks of different microorganisms despite the fact that they were all GNE bacteria occurring within a closely-related timeframe. There were also examples where, contrary to the Panel's expectation, an IMT appeared to be either never called or terminated prematurely. In other situations, IMTs were called to investigate bacteraemias caused by specific organisms, but did not always recognise and document the concurrent emergence of other GNE infections. Opportunities for seeing the wider picture were likely lost by this approach.

208. Distinctions between hospital-acquired and healthcare-associated infections sometimes appeared to have been considered important in discussion of the significance of a reported bacteraemia. Yet it was clear that the utility of these definitions was less informative in a clinical setting where patients are attending for day care or outpatient appointments at the very high frequency seen in this patient group.

209. Root Cause Analysis (RCA) methodology was only agreed as the basis for future IMT investigation in late 2019 and applied prospectively in two patients in the Review. The template subsequently created to support RCA goes beyond the HPS Outbreak/Incident Data Collection Tool provided as an appendix to the NHS GGC outbreak SOP.

210. A requirement (or even recommendation) for the use of RCA did not feature in the NHS GGC 2020 Outbreak SOP and it is hard to see why, given the experience of repeated GNE bacteraemias over five years, this would not have been introduced earlier or more generally. The Panel noted, however, that recommendations for use of a structured approach to the investigation of infection using RCA methodology did not feature nationally in the NIPCM.

211. IMT minutes were not always easy to understand in retrospect – patients may not have been identified in a way that would allow them to be tracked across a series of meetings; staff were not identified by their role; the structure of the documents varied and the style was sometimes informal; actions were not presented or summarised in a consistent way; and recording of progress in following up on previously agreed actions was inconsistent (including whether these were implemented and/or sustained).

212. IMT action logs were rarely apparent either within the minutes or separately, which must have limited the ability to track completion or evolution of actions from one meeting to the next either within an IMT sequence or between consecutive IMT sequences. This suggested a fragmentation of approach and risked lack of learning for the future.

213. The Panel did not see 'hot debrief' or full reports at the close of a series of IMT meetings relating to cases included in the review despite this being mandated in the NHS GGC outbreak SOP. Examples of such documents had been provided to the Panel from IMTs in other clinical areas within NHS GGC, raising questions about consistency in practice across the organisation.

214. The SOP also indicated that these reports should be signed off by members of the IMT and sent to the Acute Infection Control Committee from where upward reporting was expected to the Board itself. There was little or no documented evidence that IMT members were asked to approve such reports, even if they existed.

215. Whilst it was evident from NHS GGC Board papers that reports about the problems encountered within Wards 2A/B and subsequently 6A were provided at Executive level, the significance and scale of what was happening might not have been adequately expressed. By way of example, the HAIRT report made to the NHS GGC Board on 17 October 2017 stated only the following:

> "Two cases of Stenotrophomonas maltophilia bacteraemia were identified over an 8-day period in July. A Problem Assessment Group (PAG) was held on the 26.07.17. HPS were notified and a Healthcare Incident Infection and Outbreak Reporting Template (HIIORT) was completed. No further cases were identified and the two cases were later confirmed to be different types".

It was not why it was important for the Board to hear that there had been two infections, that they had been appropriately reported and that they were considered to be of different types but not to be told that one of the children had died. The Expert Panel was told by NHS GGC that the infections and the death were reported at the Board Infection Control Committee but that, as the full Board was a public meeting, there was a need to ensure awareness of infections but no requirement to discuss individual patient details (for patient confidentiality and Data Protection reasons). However, the Expert Panel noted that the occurrence of another bacteraemia, caused by the same organism, earlier in the same year, following which the child also died, was not reported to the Board. This showed an inconsistency in the process and purpose of reporting and could represent an organisational culture which promoted a focus on process (ie. that a report was received) rather than being clear what the cause or consequences were.

216. There were occasions when the minutes record that clinicians presented at an IMT directly questioned if the environmental risks had been reported to senior management within NHS GGC; this was mainly in 2018 and 2019, but there was also an unsubstantiated suggestion that this could also have been in 2017 (the Panel did not see written evidence for this). It was interesting to hear, at a meeting with RHC clinicians in February 2020, the IMT process described as "lacking integration and fails to recognise patterns". This simple statement reflected the overall impression of the Panel.

217. The Expert Panel was less able to form a view of the overall effect on the clinical service although it was obvious that disruption was substantial, particularly in relation to the decisions to close Ward 2A and 2B in September 2018, to move patients out of Ward 6A for a short period at the beginning of 2019, and to limit admissions to Ward 6A in the summer and early autumn of that year. Throughout the Review, the Expert Panel saw few documents prepared by the clinical team, NHS GGC management or the Managed Service Network that set out an analysis of how these decisions affected the overall delivery of paediatric haemato-oncology care. Measures that would have been of interest were, for example: timeliness in delivering planned chemotherapy; deferral of planned treatment (eg. surgery, radiotherapy, stem cell transplantation); use of shared care; and transfers to other units.

218. Two documents were provided. One was an audit of admissions with bacteraemia from 1 July 2017 to 31 August 2018, which looked at characteristics of patients affected by age, gender, diagnosis and the profile of the microorganisms causing infection and their antibiotic sensitivities. The main focus of the audit seemed to be on defining the optimal choice of empirical antibiotics: it did not attempt to look at the observed frequency of bacteraemia against that which might have been expected. The second document was an analysis of episodes of care transferred to other wards/hospitals/Health Boards for delivery of chemotherapy. It related to data collected from 29 July 2019 to 4 November 2019, during the period when there were restrictions on admission to Ward 6A. Short-term adjustment to patient flow is expected under such circumstances and it was good that these transfers were able to take place to limit delay to treatment. It seems, however, that there may also have been some more permanent change to shared care activity as a result of the impact of these infections. The wider development of shared care with local hospitals may have been helpful to individual families in offering more care closer to home, but appropriate structures and processes are needed to ensure that a shared care network is both supported and safe. Evidence was not provided that the issues that arose at NHS GGC were supported by any action from the Managed Service Network.

8. Conclusions

219. The core of the Oversight Board's work has been the issue of assurance. Escalation arose from a history of complex issues that the Health Board had been experiencing since at least the opening of the QEUH, but the primary matter that gave rise to Stage 4 was a question of the 'fitness of purpose' of NHS GGC with respect to how IPC has been conducted in the QEUH, the way that governance has operated in relation to these infection incidents and the communication and engagement approach that has been placed under scrutiny by these events. Understanding the history of what has happened to the group of paediatric haemato-oncology patients and their families has been essential for the Oversight Board, but providing the full narrative and conclusions to be drawn on that history has properly been the prerogative of the Independent Review (and will be that of the Scottish Hospitals Inquiry). History is critical in ensuring that the right lessons are learnt. However, this Final Report has not sought to provide a complete account of what has happened, and by extension, an analysis of the individual and collective failures that have occurred.

220. In setting out this series of recommendations, the Oversight Board acknowledges that several are based on steps NHS GGC has already taken in recognition of these shortcomings. Throughout the period of the Oversight Board's work, significant improvements have been proceeding in parallel – indeed, some pre-date the decision to escalate, such as the substantial improvements that have been introduced in the operations and governance of Facilities and Estates, but clearly accelerated through the current Gold and Silver Command programmes. The Oversight Board has seen a clear commitment by the Health Board to start making the necessary improvements, a willingness that has underpinned the Health Board's engagement with this process.

221. In that spirit of cooperation, and on the basis that this is part of a wider trajectory of improvement for the Health Board, the Oversight Board believes the following changes are necessary to embed new improvements and accelerate improvement. This final chapter starts with the **findings** of the Oversight Board on the set of questions set out at the start of this report, then under each of the headings for the issues that led to escalation, a set of **recommendations** is described. Lastly, the next steps and **way forward** are set out.

8.1 Findings

222. In reviewing the material through the work of the Subgroups and the other commissioned work, the Oversight Board's investigation of the issues for escalation have crystallised around four key questions. As already noted, they link together, each contributing to a web of issues that have not always been easy to separate or understand the inter-linkages. The first question represents the fundamental challenge faced by the Health Board; the next three focus on how NHS GGC responded to this fundamental challenge, in line with the issues that gave rise to escalation.

i. To what extent can the source of the infections be linked to the environment and what is the current environmental risk?

ii. Are IPC functions 'fit for purpose' in NHS GGC, not least in light of any environmental risks?

iii. Is the governance and risk management structure in NHS GGC adequate to pick up and address infection risks?

iv. Has communication and engagement by NHS GGC been sufficient in addressing the needs of the children, young people and families with a continuing relationship with the Health Board in the context of the infection incidents?

(i) To what extent can the source of the infections be linked to the environment and what is the current environmental risk?

223. This has become a key question over the last few years. It is clear to the Oversight Board that the infections have taken place against a background of systemic water contamination. As the HPS report in 2019 stated:

> "Between the period of 29th January and 26th September 2018, 23 cases of blood stream infections (11 different organisms) with organisms potentially linked to water contamination were identified. As a result further testing of the water supply was undertaken across both hospital sites early in the investigation. This testing identified widespread contamination of the water system."

However, what is less clear is the extent to which these environmental issues can be linked with specific infections. As the Independent Review concluded:

> "In the course of the Review, through examination of documentation, listening to witnesses, discussion with experts and input from the Review's expert advisers, and site visits, we have not established a sound evidential basis for asserting that avoidable deaths have resulted from failures in the design, build, commissioning or maintenance of the QEUH and RHC."

224. Pathways between water contamination and specific infection incidents have proven very difficult to establish by the Health Board itself, as the succession of hypotheses looking for sources of infection in the individual incidents has shown. However, in the absence of definitive sources, the strong possibility of a link has been – in the Oversight Board's view – undeniable. The Case Note Review concluded that a link was 'most likely' in 31 percent of the cases (ie. 'strongly probable', 'probable' and 'strongly possible' cases), noting that "by 2018, we suggest that simple observation should have identified a disturbing pattern characterised by the occurrence of bacteraemias caused by some very unusual microorganisms and apparent clusters of some of those more commonly encountered." In parallel, by 2018, there was significant evidence coming from clinicians and micro-biologists drawing attention to a succession of environmental defects within the hospital which could be typically linked with infection risks.

225. The question arises did the Board take the right actions at the right time in face of the balance of probability of water contamination. In reviewing this question,

the Oversight Board acknowledges the exceptional challenges of the situation presented to the Health Board and the difficulties in establishing a clear picture of what was happening. The cases themselves did not necessarily suggest a pattern at first. Before 2018, water testing results did not provide evidence of water contamination (although the evidence of the DMA Canyon reports suggests that this evidence may be mixed). However, this is less a matter of numbers and whether infection rates were significantly different from other locations, but a reflection of the timing and sharp increase in infections, the diversity of organisms encountered, and the fact that a modern hospital should not be expected to see a sequence of infections like this.

226. A key moment of reflection was before the 'water incident' in 2018. Hindsight can only be partially helpful in this instance, but it is impossible not to speculate what action might have been taken, for example, had the DMA Canyon water report of 2015 (or indeed, 2017) been escalated to relevant staff and senior managers at an earlier stage. It is hard not conclude that this was a missed opportunity.

227. Through 2018 and beyond, it is clear that the Health Board accepted there was environmental risk by the actions it took in response, including the de-canting of Wards 2A and 2B, the introduction of chemical dosing, and in 2019, the temporary closure of Ward 6A. However, environmental risk has not featured more systematically and consistently in the consideration and actions across the Health Board. Much of the Health Board's response has been reactive – understandable in terms of immediate action to address individual incidents, but with a limited longer-term perspective and framework for action over the period as a whole. There is a strong record of IMTs focusing appropriately and effectively on specific incidents, often with a comprehensive set of measures to address the relevant issues, including cleaning regimes and programmes to replace parts of the water infrastructure. However, there has not been a comprehensive review of the potential risks across the hospital and all patient groups and how to address them across the period – one that considers the clinical, environmental, financial and public assurance risks of water contamination holistically and for the site as a whole. Applying the risk of water contamination in a consistently predictive and pro-active way was not evident. As the Case Note Review noted in its chapter in this report, there seems to have been a greater concern with process rather than risk and impact.

228. Strong remedial action has been taken by the Health Board. Given the water testing results, the chemical dosing system appears to have proven effective, Nevertheless, it is clear from the work of the Independent Review that there are significant problems associated with the building that will take time to unpick and fully rectify. The Oversight Board notes that there continue to be unusual environmental bacteria incidents at different points in the site. Whilst unusual environmental bacteria occur in all healthcare settings, the risk must continue to be monitored, evaluated, mitigated and reported. In light of this, ongoing vigilance is required with regards to effective control measures, good IPC, surveillance and risk escalation to maintain patient safety. The actions that the NHS Board has already taken, along with implementation of these recommendations, will ensure appropriate management of a safe and effective environment for patients.

229. The national dimension is highlighted by this question as well. While the Health Board had clear responsibilities and duties here, they turned for support and advice at different points to national bodies and the Scottish Government. The complexity of the issues faced by the Health Board was equally faced by these national bodies. Although the circumstances leading to the decision to escalate the Health Board reflected the specific problems and actions of NHS GGC, the incidents should be reviewed as a point of national rather than simply local Health Board concern. If there are shortcomings found by the Oversight Board now in how the Health Board was applying a strategic understanding to the implications of water contamination, they were not shortcomings highlighted nationally to the Health Board at the time. The Health Board has an acute need to learn from this, but the benefits of the learning will be for NHS Scotland as a whole.

230. The environmental risks associated with hospitals and infection control are increasingly better understood – not least through the efforts of NHS GGC in the course of these incidents – but there is more that could be done nationally, and arguably, should have been done before now, in terms of understanding the nature of those risks and developing and putting in place recognised good practice in how to address those risks. The Scottish Hospitals Inquiry will shed further light on these issues, but the Oversight Board believes that there is need for national action in advance of this. The recommendations below reflect on areas of national improvement and common, if not standard approaches, not least with respect to water testing and the collating and sharing of results.

(ii) Are IPC functions fit for purpose in NHS GGC, not least in light of any environmental risks?

231. The Oversight Board has already commented on aspects of IPC within NHS GGC in the Interim Report. That report noted that throughout the series of outbreaks, the Health Board was quick to react to individual incidents with clear IPC actions, and indeed showed capacity to learn and improve. For example, this was demonstrated by the establishment of the Technical Water Group in 2018 to provide a multi-disciplinary focus on the risks of water contamination and the options for addressing these across the site. IMTs were regularly held and responded systematically to trying to understand the source of infections and taking steps to mitigate the risks. Moreover, the willingness to take steps that were highly challenging, but justified by the risks to care and safety, was notable, not least in the decision to close Wards 2A and 2B in September 2018.

232. However, as the Interim Report detailed, these instances were not sufficiently consistent to provide full assurance. When examining a number of the key processes of IPC – such as the use of HAIRTs and the approaches to audit and surveillance – the Oversight Board concluded that there were necessary improvements to be made, and these were set out in the Interim Report recommendations. The Interim Report found that the IPC Team was still working in silos and not fulfilling its role as the service that embeds improvement and mainstreams good IPC across the Health Board. Moreover, work across different IMTs was hampered by the lack of systems for tracking actions and reviewing data.

233. Reviewing the history of how IPC in the QEUH responded to the incidents in detail, the Oversight Board would add a number of other findings.

- IPC's approach to the challenges was dominated by an incident-based, reactive approach. Imagination and determination were evident in how specific issues and incidents were addressed – especially in 2018 – but the ability to see and act on a wider perspective framed by the environmental risks and the infection incidents was not apparent. By 2019, the presumption of a water contamination risk should have been more explicitly considered. There also was no thorough and systematic consideration of the wider risks across the site of water contamination in terms of patient safety and environmental impact, or at least, it was not explicit. Apart from the introduction of the water dosing system – which the Oversight Board commends in terms of how this was put in place – a strategic approach to addressing these IPC risks was not evident.
- This reactive approach has been further hampered by the lack of systematic processes to examining infections and recording and following through key actions. The absence of data systems that bring together microbiological and environmental testing across the period suggests that the Health Board has not been in a position to examine these outbreaks as effectively as it should. As the November 2019 HPS report noted: "the microbiological and clinical data should be set in the environmental context including the environmental microbiology results such as water and ventilation sampling." The absence of continuing recording and monitoring of actions across different IMT meetings suggests that the Health Board has been taking short-term and reactive approaches to addressing the incidents (with the exception, as noted, of more exemplary decisions such as the introduction of chemical dosing). Moreover, as the review of HIIORTs in the Interim Report underlines, there are questions over whether the Health Board has been reviewing the risks associated with particular infection risks in a satisfactory way.
- As noted by the Case Note Review, there was little change in the thresholds for calling a PAG or proceeding to an IMT across the period. Given the recurrence of incidents, there should have been more active consideration of whether the standard definitions of an outbreak (as set out in the Health Board's own SOP) might need to alter to address a situation where unusual infections emerge in relatively small numbers.
- The Oversight Board received assurance on both the water safety/testing policy of the Health Board and its arrangements for addressing the building issues that have been exposed in recent years. Nevertheless, it notes the recommendations by the Case Note Review for improvements in how water testing and sampling are taken forward and the results used to support IPC.

- IPC requires active and strong relationships between a variety of staff and Health Board functions. These relationships were weak throughout much of this period. This was particularly mirrored in the poor links that have existed between IPC and key services, especially Facilities and Estates. The failure to act on the 2015 DMA report has already been discussed, and there were related issues with the provision of water testing results to IPC on a timeous and jointly cooperative basis. Moreover, some relationships between and among microbiologists and IPC were fraught within the QEUH and allowed to compromise effective working of services. It is clear that building better cooperation has been a priority within the Health Board through the recent Organisational Development work (and earlier, the changes introduced into Facilities and Estates), and the Oversight Board welcomes this focus on resolving these issues.
- The scale and intensity of the IPC issues facing NHS GGC strongly suggest the importance of adapting the leadership structure of IPC. The need for more dedicated roles to support IPC and a long-term solution to the Executive responsibilities for IPC has become increasingly clear through the continuation of these incidents. The Oversight Board welcomes the Health Board's recognition of this and the strengthening of leadership and management within IPC through the Silver Command work.

234. The Oversight Board recognises the significant work undertaken by the Health Board to address these issues. Once the Recommendations set out here (and in the Case Note Review) are being implemented, the Oversight Board will have the necessary assurance that the IPC issues that led to escalation will have been sufficiently addressed.

235. These findings also echo some of the findings in Lord Maclean's 2014 report from the Value of Leven Inquiry[21]. Since it was published, NHS GGC has set out its implementation of that report's recommendations in full. The findings suggest a continuing need for the Health Board to be vigilant so that there is no recurrence of some of the problems identified by Lord Maclean. This seems to be particularly evident around the importance of strong, functioning IPC Teams, effective surveillance systems and robust channels for escalating and acting on key IPC issues. As already noted above, while the focus of any shortcomings are on NHS GGC, the implications of these issues must be recognised as national in scope, and demand national attention and action (as the recommendations will emphasise below).

(iii) Is the governance structure and risk management in NHS GGC adequate to pick up and address infection risks?

236. Leadership within a Health Board does not simply rely on the quality of key individuals, but how the organisation's governance systems are designed and operated in providing assurance and ensuring fidelity to organisational aims and decisions and NHS Scotland values. How that governance worked with respect to

21 https://webarchive.nrscotland.gov.uk/20170401011220/http://www.valeoflevenhospitalinquiry.org/report.aspx.

these incidents was a critical question for the Oversight Board. The reasons that gave rise to escalation were not sudden developments, and elements of them were arguably 'predictable' in light of the continuing problems with the QEUH given the prolonged problems and the increasing anxiety of the children, young people and families. It is legitimate to ask how senior levels of governance were made aware of the nature and scale of the problems over different points of the period and their responses.

237. As already noted, this leads to some overlap with the work of the Independent Review, and indeed, there is an artificial distinction to be applied to looking at the troubling history of the commissioning, design and handover of the building from an IPC perspective and how the incidents that arose thereafter were addressed. The events do not separate themselves neatly into distinctive bundles of issues, not least in terms of how the staff in the Health Board and the children, young people and families experienced them. But the Oversight Board has maintained a primary focus on responses to the infection incidents and understanding what took place, rather than how any shortcomings or issues with the building itself.

238. The Blueprint for Good Governance NHS Scotland has articulated the principles and practice of good governance in Health Boards. As the Blueprint sets out: "good governance is essential in addressing the challenges the public sector faces and providing high quality, safe, sustainable health and social care services depends on NHS Boards developing robust, accountable and transparent corporate governance systems." Amongst other responsibilities, good governance should identify current and future corporate, clinical, legislative, financial and reputational risks.

239. Against this test, there were significant failings in governance at key points. The receipt of the 2015 DMA Canyon report should have alerted NHS GGC at its most senior level to the fact that there were potential issues with the water system – but this report was 'lost' by Facilities and Estates at the time. Indeed, the DMA Canyon report of 2017 contained most of the same recommendations, suggesting that little or no action was taken with the 2015 report. Early and widely-broadcast warning of these issues would almost certainly have resulted in an accelerated focus and attention on what was going on (though it may not have avoided the same problems with identifying a source of infection in the incidents). This breakdown of responsibilities was a critical failure within the Health Board in the early stages of these incidents.

240. With respect to its role in assurance of the current systems, some of the issues that caused that breakdown have been addressed, particularly within Facilities and Estates. This has become part of the systematic review of IPC governance and procedures captured in the Gold Command work, and which are summarised in the governance and assurance description in **Annex E**. However, the Oversight Board is not yet assured that the wider weaknesses in governance this exposed have been fully addressed. The steps towards developing a clear description of IPC assurance and accountability have been welcomed, not least through the wider work on governance being led by the Chair. This should be accelerated with respect to IPC governance.

241. In many respects, the problems with governance can be presented as a series of breakdowns in parts of the Health Board (such as Facilities and Estates): in other words, the right channels for reporting and escalation were in place, but specific areas were not using them to draw sufficient attention to higher levels of governance. Nevertheless, while there was good evidence of assurance on the actions being taken, challenge was not apparent from minutes of meetings, and questions can be raised about whether the succession of incidents was sufficiently interrogated. Relevant committees and the Board were updated on developments, but the absence of more explicit direction and inquiry is not apparent from the record.

242. The review of escalation also underlines the difficulties of key IPC issues being raised by key IPC staff within IPC governance. The Oversight Board notes that some Health Boards facilitate the ability of Lead ICDs – for example – to raise particular concerns more easily and directly with relevant oversight committees. That approach might not be easily applied for a Health Board of the size and diversity of NHS GGC, but it is important that escalation processes are reviewed in light of the experience of the incidents.

243. These issues were further reflected in the absence of the infection incidents in risk management. The lack of full consideration of environmental risks is notable through this period. The approach to infection risk management needs to reviewed by NHS GGC, given the significant clinical, financial and ultimately, reputational damage that the infection incidents have caused. Governance cannot be expected to operate properly without the backbone of strong risk identification, analysis, recording and monitoring.

244. The incidents suggest the need to bring together the work of different parts of the governance structure for a more comprehensive overview, notably that covered by the Facilities Planning and Performance and the Clinical and Care Governance Committees. In a Health Board as large as NHS GGC, there is always a challenge of improving how cross-cutting issues can be addressed by the governance system as a whole. The work being put in place by the Health Board is a commendable step towards making the necessary changes. With good progress in implementing the relevant Recommendations below, the Oversight Board will have the necessary assurance that the issues giving rise to escalation will be addressed.

(iv) Has communication and engagement by NHS GGC been sufficient in addressing the needs of patients and families in the context of the infection incidents?

245. The Interim Report has already set out the Oversight Board findings with respect to communication and engagement issues. The Interim Report found the following.

- Within the paediatric haemato-oncology service, families were experiencing the prolonged impact of the potential problems in the clinical environment on their children, with significant disruption and uncertainty. Clear and regular communication and engagement was particularly vital.

- In that context, there was substantial evidence of a compassionate approach to communication by frontline staff. Transparency and sensitivity were regularly balanced in a way that families regarded positively.
- However, such an approach was found to be inconsistently applied across the Health Board. Too many patients and families felt that communication was not timely or fulsome, particularly from more 'corporate' services (as opposed to frontline staff); they felt they were too often the last to know and an impression deepened over the years of not being presented with a full and accurate picture of what was happening in relation to the incidents which has left a legacy of distrust among some families.

246. Another critical aspect of engagement is how the Health Board carried out its legal responsibilities to investigate and share information where deaths or serious failings have occurred. In this final report, the Oversight Board examined this with respect to the organisational duty of candour and the policies on SAERs and mortality/morbidity reviews.

- The organisational duty of candour was not activated for the infection incidents under review. The Health Board did not fully consider the legislative requirement to consider these cases in terms of how they could have resulted in harm, including actual or potential psychological harm. By this definition, a number of these incidents were within the scope of the organisational duty of candour. Concerns about competing organisational duties of confidentiality could have been addressed through more proactive engagement and involvement with the affected families and clinicians.
- However, with respect to the policy for SAERs and mortality/morbidity reviews, while noting areas for improvement, there are robust policies in place for these review processes within NHS GGC.

247. Through the Gold Command work, the Oversight Board understands that many of these issues are being addressed within the Health Board. Again, progress in taking forward the Recommendations here and in the Interim Report, the Oversight Board believes that the issues that gave rise to escalation will be addressed.

8.2 Recommendations

248. The recommendations of the Oversight Board are rooted in these findings. As already noted, the Interim Report has already set out recommendations on a number of issues – these have been included again in the Summary section at the start of this Final Report.

249. The recommendations note that there are important lessons for NHS Scotland as a whole as well as specifically for NHS GGC – indeed, the unusual experiences of the Health Board could provide important lessons for Scotland as a whole. The recommendations are based on what is required by the Health Board to provide assurance to justify de-escalation from Stage 4. In terms of the Key Success Indicators of the Oversight Board, set out in **Annex D**, they identify the changes that

would be required to ensure that these success indicators can be met and assurance restored.

250. The recommendations are grouped according to each set of escalation issues – IPC, governance, and communication and engagement – as well as a more general group of recommendations at the end. National recommendations are set out in the **green** boxes below.

Infection Prevention and Control

251. Some recommendations for IPC have already been set out in the Interim Report. These are not repeated here.

252. The Final Report recommendations address the remaining IPC issues: the responsiveness of the Health Board's IPC to the infection incidents; the effectiveness of joint working in support of IPC in the QEUH; the strength and organisation of leadership in IPC; and the national dimension to improvement in these areas.

Recommendation 1: ARHAI Scotland should lead in developing and implementing a research programme to address any current gaps in the understanding of environmental infections and how hospitals can address them.

253. The lack of research and guidance that was available for the infection issues associated with the QEUH hindered NHS GGC's response. Much of its approach was necessarily reactive but given the lack of policy and guidance this should not have been wholly unexpected. Now that this experience has been gained, both the Scottish Government and the Health Board should consider how best this knowledge can be retained and utilised going forward – nationally, with respect to NHS Assure, the new national Centre of Expertise, and locally, in relation to how NHS GGC can respond better to any future such incidents – to ensure that investigation of any further incidents can be resolved much more quickly and effectively.

254. It is particularly clear that there are continuing gaps in the research and guidance available when it comes to managing an infection or outbreak suspected to be associated with the water supply. Further research needs to be undertaken to gain a detailed understanding of how unusual environmental bacteria can develop within a water system and how they can be transmitted from water systems to patients. Similarly, further work is needed on understanding how biofilm can grow, the time it takes, how it impacts on the growth of such bacteria and how such organisms mutate. It is important that future research takes account of the conditions in a sealed water system so that it is applicable to both new and existing hospitals.

255. The research should also take into account the occurrence of unusual environmental bacterial and fungal infections and outbreaks so that a baseline can be established on what should trigger consideration of 'unusual' levels of such infections, especially with respect to patients with suppressed immune systems.

256. Consequently, in collaboration with NHS GGC and other relevant bodies, ARHAI Scotland should set out a research programme identifying where the research and practice gaps are where further understanding is required and how such research can enhance the practical guidance available for Health Boards nationally. This should be set out by September 2021.

Recommendation 2: There are a number of existing national recommendations that were made in the 2018 Health Protection Scotland report that have yet to be fully implemented. ARHAI Scotland should provide an update and time-bound action plan for implementing these.

257. The national implications of what has happened at the QEUH have been raised at different points in the past, and indeed, clear recommendations have already been made historically (such as the Independent Review). These recommendations remain critical priorities for national action. The Oversight Board recognises that there has already been learning arising from the experience of the QEUH, but there is an urgency to ensuring that these lessons are mainstreamed across NHS Scotland as a whole.

258. The experience strengthens the existing recommendations for a national review of water infrastructure across the NHS Scotland estate, the establishment of a single, clearly-authorised national water review group and relevant changes to national guidance. An update and action plan (with clearly set and bound timescales) for implementing these recommendations, taking into account what has been set out in the Interim and Final Reports of the Oversight Board, should be provided to the Scottish Government by ARHAI Scotland by June 2021.

Recommendation 3: Strengthened arrangements for IPC, commensurate with the complexity and size of the Health Board, should be put in place in line with relevant national guidelines.

259. As part of strengthening the IPC arrangements within the Health Board, the Oversight Board recommends that consideration is given to securing a more dedicated Executive role for IPC. Such a role has emerged from the work of Professors Bain and Wallace, and the Oversight Board recognises the improvements that have taken place in IPC in NHS GGC as a result of their efforts. This role should have several overarching goals: it should provide a clear operational remit for IPC and dedicated senior-level oversight of emerging infection issues; it should be responsible for strategic forward planning, not least with respect to pursuing a continuing improvement agenda for NHS GGC, but also in ensuring the implementation of recommendations made by successive reports are embedded across the organisation; and the post-holder should be part of the Board and provide regular updates and lead Board-level consideration of infection issues and risks as appropriate.

260. It is recommended that the Health Board takes forward a long-term, permanent recruitment for this role as soon as practicable. It also recommends that

particular attention is given the level of expertise and IPC knowledge required of candidates for this role.

261. An early priority for this role should be ensuring that the resourcing, expertise and structure of IPC – particularly with respect to the QEUH – is sufficient (within the context of the existing Silver Command work), and that the recommendations set out here are taken forward as quickly as possible.

Recommendation 4: **The structure of IPC should reflect the continuing need to address the complex and continuing issues within the QEUH. IPC resourcing and skills should be reviewed, and active consideration given to whether there should be appointment of specific IPC roles with QEUH responsibility.**

262. The expertise and resourcing of the IPC Team at the QEUH should be reviewed as part of the Silver Command work currently underway. Interim roles should be filled permanently as soon and as appropriately as possible. Potential new roles to support capacity should include consideration of additional capacity to support any further work that might be required, such as driving the key improvement programmes and work being set out as part of Silver Command action plans (and not least with respect to the recommendations presented here).

263. The skills and knowledge required to deal with the complex issues facing the Health Board such as water and ventilation expertise should also be developed within the current workforce where absent. Workforce planning for IPC – particularly in the QEUH – should ensure that there is sufficient expertise and specialisation in key areas (such as water and ventilation) and ensure it is accessible among ICDs across the whole of NHS GGC. The Oversight Board notes that the Independent Review recommended that those with IPC as part of their job role should undergo regular performance appraisal; this should be considered as part of this work, both by NHS GGC and ARHAI Scotland as part of wider work referenced in other recommendations made here.

Recommendation 5: NHS GGC should ensure that there is a full, effective and standardised approach to the relevant microbiological, water testing and other information regarding the QEUH outbreaks. Relevant data should be integrated in a way that allows effective collecting, recording and analysis of information relating to the incidents, which will be reported through the IPC governance system.

264. There was no readily available, clearly organised and accessible database in NHS GGC for recording microbiological typing results to ascertain links between patient and environmental isolates. Such a database would have been valuable in supporting more systematic and longitudinal analysis of the infection outbreaks to support IMTs and any oversight role by the relevant committees. Data has been specifically used and stored with respect to individual incidents and not brought together in a way that would support wider assessments.

265. It is recommended that the Health Board develops a means of bringing the relevant data together for the QEUH and for the period since 2015, to be used going forward. This work should complement the recommendations of the November 2019 HPS report which the Oversight Board understands the Health Board are already implementing. This should be done in conjunction with ARHAI Scotland and HFS with a view to producing a potential exemplar for how to collect and consider such data for future outbreaks experienced by other Health Boards. These bodies should give consideration on how this exemplar can drive change in practice in other Health Boards. Within NHS GGC, the work should be completed by September 2021.

Recommendation 6: IMTs in NHS GGC should be more rigorous in developing and making accessible key documentation to support records and analyses of a series of outbreaks over a prolonged period. This should be implemented by NHS GGC, with support from ARHAI Scotland who can identify best practice and make changes to national guidance if this is required.

266. A lack of systematic development and storage of key documentation for IMTs characterised the period of incidents. This may well have hindered the capacity of the Health Board to recognise and act upon the risk of a pattern of systemic contamination. In particular, there is a need for:

- regular and standardised action logs for IMTs with clear designation of action owners, timescales and active recording of updates;
- a more standardised approach to IMT minute taking with a more rigorous approach to noting and recording key decisions and their reasons (potentially including a Decision Log);
- more regular development, recording and escalation of hot debriefs following IMTs; and
- more regular consideration of whether a full IMT report or SBAR is required for the Acute Infection Control Committee with a view to specific review and application of any lessons learned and recommendations to prevent or better respond to further incidents.

267. It is important that this more comprehensive approach to lesson learning is reflected nationally. ARHAI Scotland should work with other Health Boards and relevant national bodies to consider guidance and systems to support a central repository for IMT and SBAR reports and/or hot debriefs for these (and potentially other) public health incidents through the existing Scottish Health Protection Information Resource (SHPIR) web site. Learning points could be extracted and collated nationally from submitted reports/debriefs to inform future guidance and service improvement, potentially as a regular publication.

268. These actions should be implemented by September 2021.

Recommendation 7: **Where there are a number of successive infection incidents in the same or a related location, NHS GGC should work with ARHAI Scotland to pilot a process that goes beyond the current IMT focus on individual incidents on behalf of NHS Scotland.**

269. The IMT process lends itself to rapid and effective response to individual incidents, but potentially not to a series of potentially linked incidents. While other parts of IPC governance should provide that wider strategic view, the QEUH experience provides a strong argument for considering other longer-term approaches to addressing such incidents. NHS GGC has already shown the value of this kind of approach with the establishment of the Technical Water Group.

270. A new mechanism may be needed to support better analysis of the results of epidemiological, microbiological and environmental investigations in the round. While there is still a need for IMTs to exert specific controls on individual incidents, a new mechanism could be triggered in particular situations to allow better linking to what was known previously of the infection involved and wider local circumstances. Such a mechanism should review associations which may be considered causal and assess whether there is evidence of bias in the investigation and/or the strength of a specific association. As the Independent Review recommended, IMTs should allow for candid and confidential material to be discussed with a view to continuous improvement.

271. NHS GGC has developed significant experience to be in a position to support the development of such a mechanism. It should work with the Scottish Government and ARHAI Scotland to advise on a process that could be applied across NHS Scotland as a whole. A plan for such work should be developed and presented to the Scottish Government for September 2021.

Recommendation 8: **Building on work already in place, there should be further visible and systematic planning for strengthening coordination between IPC and Facilities and Estates, particularly with respect to forward planning in addressing continuing infection risks with the QEUH and specifically in relation to water testing.**

272. A key reason for the apparent 'loss' of the DMA Canyon report was the structure and conduct of Facilities and Estates at that time, not least the apparent lack of clarity over the roles and responsibilities within the team. The issues here have been rehearsed in the Independent Review report, and the Oversight Board acknowledges that the structure of the Facilities and Estates team has since changed. There is assignment of specific roles and responsibilities, and with the appointment of the new Director of Facilities and Estates, a greater level of formal compliance systems was introduced within the organisation and formal training and appointment of Approved Persons, not only for water, but for other systems as well.

273. Nevertheless, there are still areas where scope for improvement can be highlighted. For example, the Interim Report noted that the evidence that HAI-SCRIBEs for low-risk/maintenance projects were systematically being reviewed by

both Facilities and Estates and IPC colleagues was not apparent. Building on the notable improvement in how Facilities and Estates supports IPC across the organisation, NHS GGC should develop a more systematic approach to reviewing and deepening the coordination between IPC and Facilities and Estates functions, particularly with respect to the QEUH. The Health Board should ensure this approach is consistently reflected in the membership and joint working of key groups and oversight committees that focus on IPC and Facilities and Estates functions. Moreover, it should feature explicitly in the work programmes being developed to support the Silver Command strand of work.

Governance and Risk Management

274. Recommendations are set out here with respect to how IPC governance and risk management within NHS GGC should be improved.

Recommendation 9: The experience of NHS GGC in addressing the unique challenges of the QEUH should be systematically used to shape NHS Assure as early as possible. This should be part of a comprehensive process of developing a template for a 'ward-through-Board' governance system that ensures risks of this nature are appropriately escalated and de-escalated.

275. The knowledge and experience gained by NHS GGC staff, especially those who were involved in the IMTs that investigated the infection incidents, should not be lost. Their knowledge and experience should be retained, capitalised on and utilised in future, not just for local improvement but for national benefit. Particular consideration should be given to establishing a specialist group within the Health Board, with relevant, experienced staff invited to join. If further incidents did occur, the group could provide advice, support and expertise in investigation and action. This could quicken the process of any future investigations as the group would have the benefit of 'hindsight' from previous experience, potentially having a better idea of what to look for and what to consider in these circumstances. This should also take account of the Independent Review's recommendation that governance ensures that hypotheses are sound, contestable and the debate that strengthens or removes hypotheses is respectful and transparent.

276. In addition, as soon as appropriate, the Scottish Government should facilitate an effective transfer of relevant learning from NHS GGC to the new national Centre for Expertise and ensure that the maximum use is made of that learning. This could take the form of working with the specialist group above or formal engagement with the Health Board on 'lessons learnt' on particular infection issues to inform the early priorities of the new Centre's work programme. In preparation, NHS GGC should be invited to capture good practice and learning from its handling of the infection incidents to inform both local and national practice, taking account of these findings and recommendations and the work of the Independent Review.

Recommendation 10: The Health Board should finalise and implement its IPC Assurance and Accountability Framework.

277. The Oversight Board welcomed the Health Board's creation of the IPC Assurance and Accountability Framework and found it a very useful compilation of key documents fashioned into a single appropriate collection of guidance. That document has not been finalised, in part in anticipation of the outcome of the Oversight Board process. NHS GGC should revise the document to take account of changes arising from its Silver Command work and the recommendations set out here and in the Interim Report, and put it into operation by September 2021. That should include a clear governance structure for IPC and the escalation of issues.

Recommendation 11: A review should be undertaken of how the environmental risk of significant water contamination within the QEUH is being assessed and managed in the Health Board's approach to risk management, and changes made to relevant risk registers and risk management planning as a result.

278. As risks are conveyed up the governance structure, they are bound to be compressed in ways that may result in risks becoming less specific. Given the size of NHS GGC, it should not be surprising that capturing such risks with sufficient specificity can be particularly difficult. However, the lack of a clearly-articulated risk associated with the QEUH environmental situation has been notable. Indeed, it would be prudent to expect that the risks may continue in light of the significant issues uncovered in the building. These should be articulated clearly within the Corporate Risk Register as a potential risk to patient safety.

279. NHS GGC should set out how the risk of water contamination in the QEUH, as described in key external reports, will be captured on the governance and risk management systems to allow for early identification, monitoring and management of increased risk. Consideration should be given to conducting further review to gain a greater practical understanding of the risk process. This should include how in practice risks are identified at the ground level and fed up the risk process through the various committees to the Corporate Risk Register, specifically with reference to infection issues. This review of the treatment of such environmental risks should be completed by September 2021.

280. Related to this work, NHS GGC should ensure that the Gold and Silver Command work is subject to children's rights and wellbeing impact assessment processes and their results noted in the next three-yearly report required by relevant legislation.

Recommendation 12: The Health Board should set out a clearer, more targeted focus on the corporate risk process.

281. In terms of risk, there was a lack of transparency as to how environmental risks were escalated within the structure of IPC governance. There is a disconnect between the concerns expressed by many at the 'ground level' with those articulated in the Corporate Risk Register.

282. One way to strengthen the approach to risk would be a clearer designation of responsibility within the governance structure. The Oversight Board understands that a Senior Risk Officer has been appointed – it is hoped that this will achieve a more dedicated focus on the risk process. The aim of such an appointment would be to ensure that each risk area receives the appropriate individual focus that is required within the organisation with direct reporting to the Board itself. The transparency of the risk process needs to be clearer and the role of a chief risk officer would be to ensure that this transparency is achieved. Across the pillars of governance (clinical, financial and staff), it would provide assurance that where required, risks would be escalated quickly to the Board to ensure issues are addressed appropriately and without delay. This should be considered as an early priority in the wider Governance work being led by the Board Chair.

283. The Health Board should set out its plans for this role by June 2021.

Recommendation 13: The Health Board should review how concerns raised about environmental risks are communicated to senior Committees and the Board, and the procedures to ensure that such concerns are addressed. Moreover, it should also ensure the responses are communicated appropriately to those raising concerns.

284. While the Oversight Board did not review how individual concerns and addressed internally within the Health Board – as these have been addressed through separate whistleblowing processes – there are more general points that should be made about how significant concerns of environmental and IPC risks can be raised within the governance structure.

285. One approach is to consider whether there should be more formal and regular updating of the Board Infection Control Committee and the Clinical and Care Governance Committee by the Lead ICD. This happened periodically through the set of infection outbreaks, but a regular reporting to these committees would facilitate how these committees can fulfil their oversight roles and ensure relevant escalation of issues.

Communication and Engagement

286. Some recommendations for communications and engagement have already been set out in the Interim Report. These are not repeated here.

287. The Final Report recommendations address the remaining issues, particularly how the organisational duty of candour policy has been applied by the Health Board.

Recommendation 14: Given that organisational duty of candour was considered, but not formally activated, NHS GGC should review its approach to ensure that it is not simply focused on patient safety incidents and circumstances where causality is clear. There should be greater consideration of the duty where events could result in death or harm. There should also be improved guidance on how the Health Board will balance with other duties perceived as barriers to meeting the organisational duty of candour obligations.

288. NHS GGC undertook benchmarking of its organisational duty of candour response to the infection incidents, which was done on what appeared to be an informal basis. The Health Board is asked to undertake a review of its supporting policy and procedures to support implementation of the organisational duty of candour, outline the interface with the professional duty of candour and support decision-making when there are concerns about competing organisational duties of confidentiality with respect to incidents involving more than one relevant person. It should provide feedback to the Scottish Government on how this is addressed and any areas where revisions to national non-statutory guidance would be helpful. This should include how revised implementation support materials regarding the duty and multiple instances of HAI might be developed through HIS. This should be completed by September 2021.

Recommendation 15: The findings of the Oversight Board in respect of the application of the organisational duty of candour in NHS GGC should be considered by the Scottish Government and Healthcare Improvement Scotland in order that further implementation support and guidance can be developed around the issues noted.

289. NHS GGC suggested that they might not be alone in their ambiguous approach to applying the organisational duty of candour in situations where causality is not easily understood, and other Boards might be experiencing similar challenges in interpreting the legal duty. The Oversight Board could not explore this in detail within the scope of its work, but have asked teams in the Scottish Government and HIS to consider ways in which national guidance and implementation support plans take account of this feedback from NHS GGC. It notes that similar recommendations about the opportunity for national learning were made by the Independent Review in this area, and endorses those recommendations.

General Issues

290. The final set of recommendations relate to technical matters arising from the infection incidents and other more general matters.

Recommendation 16: The Health Board should expedite the refurbishment of Wards 2A and 2B in the RHC as safely and quickly as possible, and keep affected children, young people and families fully informed of the developments.

291. The Interim Report noted that work on refurbishing Wards 2A and 2B had been delayed owing to the impact of the pandemic and the extent of work needing to be undertaken. It is essential that children and young people are returned to the clinical environment specifically designed to support their care as soon as can be safely done. Any further delays should be clearly and readily explained to patients and families.

Recommendation 17: A programme of testing and review should be put in place to assess any potential impacts of the chemical dosing water solution on infrastructure.

292. NHS GGC should ensure that there is monitoring of the potential impact of the chemical dosing system on the existing building and infrastructure of the QEUH site. The Oversight Board is assured of the diligence of the Technical Water Group and the Health Board more generally to ensuring that the system would not put any undue pressure on the integrity and quality of the water infrastructure. Nevertheless, the solution is a radical one that should continue to be monitored, not just with respect to its outcomes (through water testing), but any potential unintended consequences on the infrastructure.

Recommendation 18: The various action plans and reviews attached to these recommendations should be compiled into a single response to the Oversight Board, and implementation overseen by NHS GGC and the Scottish Government.

293. The recommendations set out here (and in the Interim Report) call for a number of actions. These should be compiled into a single plan, integrated into and fully complementing the work of Silver Command. It should be jointly reviewed by NHS GGC and the Scottish Government at appropriate intervals.

8.3 The Way Forward

294. The recommendations signal that the Oversight Board does not think the Health Board can be de-escalated from Stage 4 at this point. NHS GGC is embracing the need and opportunity for improvement and taken a number of decisive steps in IPC and governance. Its energy and commitment is laudable in this context. Nevertheless, the Oversight Board has identified a number of areas where improvement needs to take place before de-escalation can be recommended. Progress in addressing the recommendations will be essential for the Oversight Board to take a final view on advice for de-escalation (and for the national recommendations, to ensure that NHS Scotland learns and acts on the relevant lessons).

295. Ultimately, it is not a question of a checklist of recommendations, but an understanding of 'what good looks like'. The Health Board should embrace this spirit of improvement, and its work to restore confidence and assurance should be measured against achievement of a set of measures of what good IPC should look like. The Oversight Board has set out its view of this in the Key Success Indicators presented in the annex, and invites the Health Board to consider – and build – on these to create a culture of continual improvement, sensitivity to risk, openness and respect in its communications and engagement, and challenge and rigour in facing the unusual public health challenges it faced in these incidents.

296. The Oversight Board has concluded this phase of its work. The Scottish Government will put in place continuing arrangements to ensure oversight of this work going forward. It is proposed that the Chief Nursing Officer and the Chair of NHS GGC jointly agree on an appropriate point when a review can be conducted and a further view on escalation can be taken.

Annex A: Terms of Reference for the Oversight Board and its Subgroups

Oversight Board

Authority

The Oversight Board for the Queen Elizabeth University Hospital (QEUH) and the Royal Hospital for Children (RHC), NHS GGC (hereinafter, "the Oversight Board") is convened at the direction of the Scottish Government Director General for Health and Social Care and Chief Executive of NHS Scotland (NHS Scotland), further to his letter of 22 November 2019 to the Chairman and Chief Executive of NHS GGC. These terms of reference have been set by the Director General, further to consultation with the members of the Oversight Board.

Purpose and Role

The purpose of the Oversight Board is to support NHS GGC in determining what steps are necessary to ensure the delivery of and increase public confidence in safe, accessible, high-quality, person-centred care at the QEUH and RHC, and to advise the Director General that such steps have been taken. In particular, the Oversight Board will seek to:

- ensure appropriate governance is in place in relation to infection prevention, management and control;
- strengthen practice to mitigate avoidable harms, particularly with respect to infection prevention, management and control;
- improve how families with children being cared for or monitored by the haemato-oncology service have received relevant information and been engaged with;
- confirm that relevant environments at the QEUH and RHC are and continue to be safe;
- oversee and consider recommendations for action further to the review of relevant cases, including cases of infection;
- provide oversight on connected issues that emerge;
- consider the lessons learned that could be shared across NHS Scotland; and
- provide advice to the Director General about potential de-escalation of the NHS GGC Board from Stage 4.

Background

In light of the on-going issues around the systems, processes and governance in relation to infection prevention, management and control at the QEUH and RHC and the associated communication and public engagement issues, the Director General for Health and Social Care and Chief Executive of NHS Scotland has concluded that further action is necessary to support the Board to ensure appropriate governance is

in place to increase public confidence in these matters and therefore that for this specific issue the Board will be escalated to Stage 4 of the Performance Framework. This stage is defined as 'significant risks to delivery, quality, financial performance or safety; senior level external transformational support required'.

Approach

The Oversight Board will agree a programme of work to pursue the objectives described above. In this, it will establish subgroups with necessary experts and other participants. The remit of the subgroups will be set by the chair of the Oversight Board, in consultation with Board members. The Board will receive reports and consider recommendations from the subgroups.

In line with the NHS Scotland escalation process, NHS GGC will work with the Oversight Board to construct required plans and to take responsibility for delivery. The NHS GGC Chief Executive as Accountable Officer continues to be responsible for matters of resource allocation connected to delivering actions agreed by the Oversight Board.

The Oversight Board will take a values-based approach in line with the Scottish Government's overarching National Performance Framework (NPF) and the values of NHS Scotland.

The NPF values inform the behaviours people in Scotland should see in everyday life, forming part of our commitment to improving individual and collective wellbeing, and will inform the behaviours of the Oversight Board individually and collectively:

- to treat all our people with kindness, dignity and compassion;
- to respect the rule of law; and
- to act in an open and transparent way.

The values of NHS Scotland are:

- care and compassion;
- dignity and respect;
- openness, honesty and responsibility; and
- quality and teamwork.

The Oversight Board Members will endeavour to adopt the NPF and NHS Scotland values in their delivery of their work and in their interaction with all stakeholders.

The OB's work will also be informed by engagement work undertaken with other stakeholder groups, in particular family members/patient representatives and also NHS GGC staff.

The Oversight Board is focused on improvement. Oversight Board members, and subgroup members, will ensure a lessons-learned approach underpins their work in order that learning is captured and shared locally and nationally.

Meetings

The Oversight Board will meet weekly for the first four weeks and thereafter meet fortnightly. Video-conferencing and tele-conferencing will be provided.

Full administrative support will be provided by officials from CNOD. The circulation list for meeting details/agendas/papers/action notes will comprise Oversight Board members, their Personal Assistants and relevant CNOD staff. The Chairman and Chief Executive of NHS Greater Glasgow and Clyde will also receive copies of the papers.

Objectives, Deliverables and Milestones

The objectives for the Oversight Board are to:

- improve the provision of responses, information and support to patients and their families;
- if identified, support any improvements in the delivery of effective governance and assurance within the Directorates identified;
- provide specific support for infection prevention and control, if required;
- provide specific support for communication and engagement; and
- oversee progress on the refurbishment of Wards 2A/B and any related estates and facilities issues as they pertain to haemato-oncology services.

Matters that are not related to the issues that gave rise to escalation are assumed not to be in scope, unless Oversight Board work establishes a significant link to the issues set out above.

In order to meet these objectives, the Oversight Board will retrospectively assess issues around the systems, processes and governance in relation to infection prevention, management and control at the QEUH and RHC and the associated communication and public engagement; having identified these issues, produce a gap analysis and work with NHS GGC to seek assurance that they have already been resolved or that action is being taken to resolve them; compare systems, processes and governance with national standards, and make recommendations for improvement and how to share lessons learned across NHS Scotland. The issues will be assessed with regards to the information available at the particular point in time and relevant standards that were extant at that point in time. Consideration will also be given to any subsequent information or knowledge gained from further investigations and the lessons learned reported.

Governance

The Oversight Board will be chaired by the Chief Nursing Officer, Professor Fiona McQueen, and will report to the Director General for Health and Social Care.

Membership

Member	Job Title
Professor Fiona McQueen (Chair)	Chief Nursing Officer, Scottish Government
Keith Morris (Deputy Chair)	Medical Advisor, Chief Nursing Officer's Directorate (CNOD), Scottish Government
Professor Hazel Borland	Executive Director of Nursing, Midwifery and Allied Health Professionals and Healthcare Associated Infection Executive Lead, NHS Ayrshire and Arran
Professor Craig White	Divisional Clinical Lead, Healthcare Quality and Improvement Directorate, Scottish Government
Dr Andrew Murray	Medical Director, NHS Forth Valley and Co-chair of Managed Service Network for Children and Young People with Cancer (MSN CYPC)
Professor John Cuddihy	Families representative
Lesley Shepherd	Professional Advisor, CNOD, Scottish Government
Alan Morrison	Health Finance Directorate, Scottish Government
Sandra Aitkenhead	CNOD, Scottish Government (secondee)
Greig Chalmers	Interim Deputy Director, CNOD, Scottish Government
Jim Dryden Carole Campariol-Scott Calum Henderson Phil Raines (Secretariat)	CNOD, Scottish Government

The Co-chair of Area Partnership Forum and the Chair of the Area Clinical Forum will be in attendance at the meetings. In addition to these members, other attendees may be present at meetings based on agenda items, as observers: senior executives and Board Members from NHS GGC including, Medical Director, Nurse Director, Director of Estates and Facilities, Director of Communications, Board Chair and Chief Executive; and representatives from HPS, HFS, HIS, HEI and HSE.

Stakeholders

The Oversight Board recognises that a broad range of stakeholder groups have an interest in their work, and will seek to ensure their views are represented and considered. These stakeholders include:

- patients, service users and their families;
- the general public;
- the Scottish Parliament;
- the Scottish Government, particularly the Health and Social Care Management Board;
- the Board of NHS GGC and the senior leadership team of NHS GGC; and
- the staff of NHS GGC and Trade Unions.

Special focus will be given to patients of the haemato-oncology service and their families, as highlighted by their direct involvement in the Communication and Engagement Subgroup.

Infection Prevention and Control, and Governance Subgroup

Purpose and Role

The Infection Prevention and Control Governance (IPCG) Subgroup for the NHS GGC Scottish Government Oversight Board is a time-limited group which has been convened to work with NHS GGC to:

- determine whether appropriate Infection Prevention and Control Governance is in place across the organisation to increase public confidence; and
- make recommendations, if required and where appropriate, to strengthen current approaches to mitigate avoidable infection harms

The IPCG Subgroup directly reports to the Oversight Board, which is chaired by the Chief Nursing Officer, Professor Fiona McQueen. It has specific responsibilities for supporting the Oversight Board to ensure, where necessary and appropriate, improvements are made in the delivery of effective governance and provide assurance relating to infection prevention and control within and across NHS GGC.

Background

In light of the on-going issues around the systems, processes and governance in relation to infection prevention, management and control at the QEUH and RHC and the associated communication and public engagement issues, the Director General for Health and Social Care and Chief Executive of NHS Scotland has concluded that further action is necessary to support the Board to ensure appropriate governance is in place to increase public confidence in these matters and, therefore, that for this specific issue the Board was escalated to Stage 4 of the performance framework. This stage is defined as ‘significant risks to delivery, quality, financial performance or safety; senior level external transformational support required.’

The IPCG Subgroup will focus on issues relating to infection prevention and control and associated governance that gave rise to escalation to Stage 4.

Approach

The IPCG Subgroup will take a values based approach in line with NPF and the values of NHS Scotland.

The NPF values inform the behaviours people in Scotland should see in everyday life, forming part of our commitment to improving individual and collective wellbeing, and will inform the behaviours of the Oversight Board individually and collectively:

- to treat all our people with kindness, dignity and compassion;
- to respect the rule of law; and

- to act in an open and transparent way.

The values of NHS Scotland are:

- care and compassion;
- dignity and respect;
- openness, honesty and responsibility; and
- quality and teamwork.

These values will be embedded in the work of the IPCG Subgroup and will be informed by engagement work undertaken with key stakeholder groups.

The Subgroup is focused on improvement and as such the Subgroup members will ensure an evidence based, risk based, lessons-learned approach underpins their work in order that assurance can be articulated and learning is captured and shared both locally and nationally.

Meetings

The Subgroup will meet frequently for the first four weeks, with frequency thereafter to be determined as required. Video-conferencing or tele-conferencing will be provided.

Full administrative support will be provided by officials from CNOD. The circulation list for meeting details/agendas/papers/action notes will comprise Subgroup members, their PAs and relevant CNOD staff.

Objectives

The objectives for the Subgroup are to:

- carry out a system wide review of current systems and processes relating to the infection prevention and control and associated governance scheme of delegation and escalation mechanisms against relevant national standards and guidance;
- determine if there are any gaps when mapped against national standards and guidance and, if so, identify areas for improvement and shared learning with respect to IPC risk management, audit, performance, compliance and assurance;
- provide support to the IPC Team within NHS GGC in the identification of measures for assurance as part of the review process and for future improvement/implementation; and
- make recommendations where appropriate to the Oversight Board on areas of learning for other Health Boards

In Scope

In order to meet these objectives, the Subgroup will retrospectively assess systems, processes and governance arrangements in relation to IPC management and control across the whole of NHS GGC. It will do so by reviewing:

- alignment of IPC and wider Board structures within the span of influence of NHS GGC; and
- a range of reports considered by the Board Corporate Governance Committees and the network of Operational Governance Groups and Committees including those reports presented to the associate Integrated Joint Boards.

Deliverables will be agreed in the early meetings of the Subgroup and with the Oversight Board.

Out of Scope

The Subgroup will not review:

- roles and responsibilities of individual staff members within NHS GGC; and
- aspects covered by either the Communication and Engagement or Technical Subgroups of the Oversight Board.

Governance

The Subgroup will be chaired by Diane Murray, and will report to the Chair of the Oversight Board.

Member	Job Title
Diane Murray (Chair)	Deputy Chief Nursing Officer, Scottish Government
Hazel Borland	Executive Director of Nursing, Midwifery and Allied Health Professionals and Healthcare Associated Infection Executive Lead, NHS Ayrshire and Arran
Professor Angela Wallace	Nurse Director, NHS Forth Valley
Professor Craig White	Divisional Clinical Lead, Healthcare Quality and Improvement Directorate, Scottish Government
Frances Lafferty	Infection Control Nurse, NHS Ayrshire and Arran
Martin Connor	Infection Control Doctor, NHS Dumfries and Galloway
Helen Buchanan	Executive Director of Nursing, Midwifery and Allied Health Professionals and Healthcare Associated Infection Executive Lead, NHS Fife
Christina Coulombe	Infection Control Manager, NHS Lanarkshire
Lisa Ritchie	Nurse Consultant, Health Protection Scotland, NHS National Services Scotland
Professor Marion Bain	Director for Infection Prevention and Control, NHS GGC (secondee)
Phil Raines	Chief Nursing Officer's Directorate (CNOD), Scottish Government

Sandra Aitkenhead	CNOD, Scottish Government (secondee)
Lesley Shepherd	Professional Nurse Advisor, CNOD, Scottish Government
Jim Dryden Carole Campariol-Scott Calum Henderson (Secretariat)	CNOD, Scottish Government

Associated Participant	Job Title
Sandra Devine	Infection Control Manager, NHS GGC
Pamela Joannidis	Infection Control Nurse, NHS GGC
Dr. A Leonard	Infection Control Doctor, NHS GGC
Dr. J Armstrong	Medical Director, NHS GGC
Elaine Vanhegan	NHS GGC Board Governance Lead

NHS GGC may have other officers in attendance dependant on the issue being discussed and agreed through the chair.

Technical Issues Subgroup

Authority

The Oversight Board for the QEUH and RHC, NHS GGC has been established at the direction of the Scottish Government Director General for Health and Social Care and Chief Executive of NHS Scotland, further to his letter of 22 November 2019 to the Chairman and Chief Executive of NHS GGC.

A technical subgroup of the Oversight Board has been established to provide technical review, advice and assurance on the relevant technical matters relating to the built environment of the hospitals.

Purpose and Objectives

The purpose of the Technical Subgroup is to support the work of the Oversight Board, with a particular focus on the technical workings of the hospitals and any related technical reviews or reports. In particular the Technical Subgroup will:

- confirm that relevant environments at the QEUH and the RHC are and continue to be safe;
- oversee progress on the refurbishment and reopening of Wards 2A/B at the RHC and any related estates and facilities issues as they pertain to haemato-oncology services, such as Ward 6A at the QEUH;
- ensure that there are appropriate action plans in place to address any technical issues highlighted by competent authorities such as the Health and Safety Executive, Health Protection Scotland or Health Facilities Scotland and that these action plans are being delivered and provide oversight on connected issues that emerge;
- consider the lessons learned that could be shared across NHS Scotland; and

- provide advice to Oversight Board about potential de-escalation of the NHS GGC Board from Stage 4, in relation to these issues.

Background

In light of the on-going issues around the systems, processes and governance in relation to infection prevention, management and control at the QEUH and RHC and the associated communication and public engagement issues, the Director General for Health and Social Care and Chief Executive of NHS Scotland has concluded that further action is necessary to support the Board to ensure appropriate governance is in place to increase public confidence in these matters and therefore that for this specific issue the Board will be escalated to Stage 4 of the Performance Framework. This stage is defined as 'significant risks to delivery, quality, financial performance or safety; senior level external transformational support required'.

Approach

The Oversight Board is required to establish subgroups with necessary experts and other participants; this subgroup will address the requirement to ensure that relevant environments at the QEUH and RHC are and continue to be safe. To ensure delivery of that overarching objective, the Technical Subgroup will agree a programme of work to ensure that it complies with the purpose and objectives of the group described above.

The Oversight Board, and its subgroups, is focused on improvement. Members of this subgroup, will ensure a lessons-learned approach underpins their work in order that learning is captured and shared locally and nationally.

Meetings

The Technical Subgroup will meet every three weeks, but if necessary more regular meetings will be arranged.

Full administrative support will be provided by officials from CNOD in the Scottish Government.

Governance/Accountability

The Subgroup will be chaired by the Alan Morrison, Health Finance and Infrastructure, Scottish Government and will report direct to the Oversight Board.

Membership

Member	Job Title
Alan Morrison (Chair)	Health Finance Directorate, Scottish Government
Tom Steele	Director of Estates, NHS Greater Glasgow and Clyde
Gerry Cox	Deputy Director of Estates, NHS Greater Glasgow and Clyde
Ian Storrar	Principal Engineer, Health Facilities Scotland
Lisa Ritchie	Nurse Consultant, Health Protection Scotland, NHS National Services Scotland
Sandra Aitkenhead	Chief Nursing Officers Directorate (CNOD), Scottish Government (secondee)
Phil Raines	CNOD, Scottish Government
Calum Henderson (Secretariat)	CNOD, Scottish Government

Additional involvement will be requested as necessary.

Communication and Engagement Subgroup

Purpose and Role

The Communication and Engagement Subgroup the QEUH and the RHC, NHS GGC, is a time limited group to offer advice and assurance working with Scottish Government and NHS GGC on:

- effective communication and engagement with patients and families; and
- robust, consistent and reliable person-centred engagement and communication.

Background

In light of the on-going issues around the systems, processes and governance in relation to infection prevention, management and control at the QEUH and RHC and the associated communication and public engagement issues, the Director General for Health and Social Care and Chief Executive of NHS Scotland has concluded that further action is necessary to support the Board to ensure appropriate governance is in place to increase public confidence in these matters and therefore that for this specific issue the Board will be escalated to Stage 4 of the performance framework. This stage is defined as ‘significant risks to delivery, quality, financial performance or safety; senior level external transformational support required.’

Approach

The Communication and Engagement Subgroup will take a values based approach in line with the NPF and the values of NHS Scotland. The NPF values inform the behaviours people in Scotland should see in everyday life, forming part of our

commitment to improving individual and collective wellbeing, and will inform the work of the Subgroup individually and collectively:

- to treat all our people with kindness, dignity and compassion;
- to respect the rule of law; and
- to act in an open and transparent way.

The values of NHS Scotland are:

- care and compassion;
- dignity and respect;
- openness, honesty and responsibility; and
- quality and teamwork.

These values will be embedded in the work of the Communication and Engagement Subgroup, and this work will also be informed by engagement work undertaken with other stakeholder groups, in particular family members/patient representatives, respecting the importance of specific values informed actions linked to personal context and experiences.

The Communication and Engagement Subgroup is focused on improvement. Subgroup members, will ensure a 'lessons learned' approach, as well as respecting the experience of families must underpin and inform the identification of improvements for dissemination both locally and nationally.

Meetings

The Communication and Engagement Subgroup will meet fortnightly initially and then at a frequency to be determined thereafter. Tele-conferencing will be provided. A range of communication and engagement mechanisms will be agreed to enable patients and families to feed into the work of the Communication and Engagement Subgroup.

Full administrative support will be provided by officials from Scottish Government. The circulation list for meeting details/agendas/papers/action notes will comprise Oversight Board members, their PAs and relevant CNOD staff.

Outcomes

The Outcomes for the Communication and Engagement Subgroup are to:

- positively impact on patients and their families in relation to how complex infection control issues and all related matters are identified, managed and communicated;
- demonstrate a proactive approach to engagement, communication and the provision of information; and

- identify what has worked well and where the provision of information, communication and engagement could have been and could be enhanced and improved.to ensure that the outputs from the group are disseminated to key stakeholders and any wider learning points or recommendations are shared nationally.

In order to achieve these outcomes, the Communication and Engagement Subgroup will retrospectively assess factors influencing the approach to communication and public engagement associated with the infection prevention and control issues and related matters at the QEUH and RHC.

Having identified these issues, the Subgroup will work with NHS GGC to seek assurance that they have already been resolved or that action is being taken to resolve them; compare systems, processes and governance with national standards, and make recommendations for improvement and good practice as well as lessons learned across NHS Scotland.

Deliverables

The Deliverables for the Communication and Engagement Subgroup are:

- a prioritised description of communication and information to be provided to families, with a focus on respect and transparency (with an initial focus on ensuring that all outstanding patient and family questions raised are answered);
- development of a strategic Communication and Engagement Plan with a person-centred approach as key. This should link to and be informed by consideration of existing person-centred care and engagement work within the Board, to ensure continued strong links between families and NHS GGC. Specific enhancements and improvement proposals should also be clearly identified and should consider how the proposals from parent representatives on an approach that identifies and supports the delivery of personalised actions through the 'PACT' proposal can inform further work;
- a description of findings following a review of materials, policies and procedures in respect of existing practices with regards to communication, engagement and decision-making arising from corporate and operational communication and engagement, linked to infection prevention and control and related issues. This will include consideration of organisational duty of candour, significant clinical incident reviews, supported access to medical records (including engagement, involvement and provision of information to families in relation to these processes); and
- a description of findings and recommendations to: (a) NHS GGC; (b) Health Protection Scotland; (c) NHS Scotland; and (d) Scottish Government on learning to support any required changes and improvements for communication and public engagement relating to the matters considered by the Subgroup.

Governance

The Communication and Engagement Subgroup will be chaired by Professor Craig White, and will report to the Oversight Board. The Oversight Board is chaired by the Chief Nursing Officer, Scottish Government and reports to the Cabinet Secretary for Health and Sport. Members and those present at Subgroup meetings should ensure that they circulate information about the work of the Subgroup to colleagues and networks with an interest, contribution and perspective that can inform the work to be undertaken. This must include clinical and care staff within relevant operational services, as well as senior management and corporate staff within NHS GGC.

Membership

Member	Job Title
Professor Craig White (Chair)	Divisional Clinical Lead, Healthcare Quality and Improvement Directorate, Scottish Government
Lynsey Cleland	Director of Community Engagement, Healthcare Improvement Scotland
Andrew Moore	Head of Excellence in Care, Healthcare Improvement Scotland
Professor Angela Wallace	Nursing Director, NHS Forth Valley
Jane Duncan	Director of Communications, NHS Tayside
Professor John Cuddihy	Families representative
Suzanne Hart	Communication, Scottish Government
Phil Raines	Chief Nursing Officer's Directorate (CNOD), Scottish Government
Jim Dryden Calum Henderson (Secretariat)	CNOD, Scottish Government

In addition to these members, other attendees may be present at meetings based on agenda items, for example: Chair of Infection Prevention and Control and Governance subgroup; relevant Directors and senior staff from NHS GGC and communication staff from Scottish Government.

Stakeholders

The Communication and Engagement Subgroup recognise that a broad range of stakeholder groups have an interest in their work, and will seek to ensure their views are represented and considered. These stakeholders include:

- patients and their families;
- the general public;
- the Scottish Parliament;
- Scottish Government, particularly the Health and Social Care Management Board;
- the staff of NHS GGC, Trade Unions and professional bodies; and
- the senior leadership team of NHS GGC and the Board.

Annex B: Terms of Reference for the Case Note Review

Introduction

1. As a result of continuing problems arising from infection incidents on the Queen Elizabeth University Hospital (QEUH) campus, on 22 November 2019, the Scottish Government's Health and Social Care Management Board escalated NHS Greater Glasgow and Clyde to 'Stage 4' of its escalation ladder. That stage represents a level where there are "significant risks to delivery, quality, financial performance or safety, and senior level external transformational support [is] required." As a result, a new Oversight Board under the chair of the Chief Nursing Officer, Professor Fiona McQueen, has been set up to address two specific sets of issues that led to escalation: infection prevention and control and associated governance with respect to the QEUH; and communication and engagement with affected families.

2. As part of the work of the Oversight Board, the Cabinet Secretary for Health and Sport set out plans for a Case Note Review in Parliamentary statement on 28 January 2020. The Case Review team would review the case notes of paediatric haemato-oncology patients in the Royal Hospital for Children (RHC) and the QEUH from 2015 to 2019 who have had a Gram-negative environmental pathogen bacteraemia (and selected other organisms) identified in laboratory tests. The following note sets out the terms of reference for this work, specifically:

- its purpose and authority;
- the outputs/deliverables;
- key elements of its methodology, particularly the identification of cases for review, the use of the Paediatric Trigger Tool and the epidemiological review;
- communication and engagement of the Review and its outputs;
- key responsibilities;
- timelines for different phases of work; and
- risk management.

Purpose

3. The Case Note Review will review the medical records of all children diagnosed with qualifying infections (see definition below) and who were cared for at RHC between 1.5.15 and 31.12.19 to establish several key issues: the number of children – in particular, immunocompromised children – who were likely to have been put at risk because of the environment in which they were cared; and how that infection may have influenced their health outcomes. Such work will be vital in determining the number and nature of the children affected, providing assurance and identifying improvement actions, not just for NHS GGC, but more widely across NHSScotland, including Health Protection Scotland (HPS), and the Scottish

Government.. It is also an important element in improving the communication and engagement with families and affected patients.

4. The Review will consider the following set of specific questions:

- How many children in the specified patient population have been affected, details of when, which organism etc?
- Is it possible to associate these infections with the environment of the RHC and the QEUH?
- Was there an impact on care and outcomes in relation to infection?
- What recommendations should be considered by NHS GGC – and, where appropriate, by NHS Scotland, more generally – to address the issues arising from these incidents to strengthen infection prevention and control in future?

5. Through Professor Marion Bain (see below), the Review will report directly to Professor Fiona McQueen as Chair of the Oversight Board.

Outputs/Deliverables

6. There are two specific sets of outputs, described in more detail below:

- reporting to the Oversight Board; and
- specific feedback to patients and families.

Reporting to the Oversight Board

7. The Expert Panel (see below) will be responsible for providing a Final Report to Professor Bain and the Oversight Board, which should include:

- a description of the approach and methodology to the Review;
- a description of the patients included in the Review;
- a description of the cases according to specified data types;
- analysis to answer the questions set out in the Purpose section above; and
- recommendations for NHS GGC and NHS Scotland, based on this analysis.

Individual case details will not be set out in the Report and the cases will be anonymised. The Final Report will be provided to the Cabinet Secretary for Health and Sport thereafter. The Final Report will be published by the Scottish Government.

8. Reporting on progress to the Oversight Board will be undertaken by Professor Marion Bain, which may include the provision of an interim report, subject to agreement between her and the Chair.

Reporting to Patients and Families

9. The Expert Panel will provide individual reporting to patients and families that request a description of the results of their individual patient case review. Patients and families will be invited to take up the offer of engagement with the Panel through Professor Craig White, Chair of the Oversight Board's Communication and Engagement Subgroup. The format of reporting will accommodate, as far as practicable, the wishes of the family, and will be decided in conjunction with the Expert Panel. All reporting will be carried out within three months of the submission of the Final Report to the Oversight Board.

10. Arrangements for engaging with patients and families, the format of individual reporting and the timetabling of any meetings will be determined by the Expert Panel with Professor Bain and Professor White.

Methodology

11. In its overall approach to developing a methodology for the Case Note Review, these terms of reference set out key elements for how the Review should be conducted. Its overarching principles will be:

- respect and sensitivity to individual patients and their families in the handling of data and the conduct and reporting of results;
- rigorous handling, recording and storage of data, respecting patient confidentiality and family sensitivity; and
- use of internationally-respected and clearly-explained methodological tools and data sources, which will be documented for the Final Report.

12. A range of information will need to be gathered for the Expert Panel analysis and reporting. This includes several key elements, described in more detail below:

- the epidemiological and clinical outcomes review;
- the use of the Paediatric Trigger tool; and
- the gathering of other key data.

Identification of Cases

13. HPS has undertaken an analysis of a variety of options to define the sample. The Expert Panel has agreed the following cohort definition, but will continue to review the sample as the Review progresses.

14. The cohort currently consists of 85 patients (and a larger number of infection episodes):

- patients with blood cultures of a Gram-negative environmental pathogen (including enteric pathogens associated with the environment) (there are 81 patients that meet this inclusion criteria);

- patients with a M. chelonae (Acid Fast Environmental) infection (there are 3 patients that meet this criteria – only 2 with bacteraemia, and 1 with a skin infection); and
- patients included for other reasons: this includes one child with a Gram-negative infection (not blood stream detected) and Aspergillus

Epidemiological and Clinical Outcomes Review

15. An epidemiological and clinical outcomes review of the cases is required to collect patient, outcome and risk data systematically using agreed definitions and for the findings to support the incident investigation. The objectives of this epidemiological investigation are to:

- determine a timeline for each of the cases;
- characterise the cases in terms of time, place and person:
    - time: describe the episodes of BSI over time and create a timeline for outbreak, including plotting of control measures against number of cases,
    - place: describe the location of patients (hospital, ward, bed/bay) and describe their movements in the hospital, and
    - person: characterise the patients with infection in terms of intrinsic and extrinsic risk factors; outcomes; antimicrobial prophylaxis and treatment; and individual infection prevention and control measures in place; and
- describe the cases in the context of environmental risks and incidents (where possible).

The epidemiological components of the review will be carried out by HPS staff and data items to inform clinical outcomes will be extracted in collaboration with the Clinical Team responsible for the Paediatric Trigger Tool work (see below). A full description of the agreed data set is provided in the separate Epidemiological and Clinical Outcomes Protocol.

Paediatric Trigger Tool

16. The review of the case notes is set against the background of Healthcare Improvement Scotland's document, 'Learning from adverse events through reporting and review – A national framework for Scotland: July 2018'. The aims of the national approach to learning from adverse events are to:

- learn locally and nationally to make service improvements that enhance the safety of the care system for everyone;
- support adverse event management in a timely and effective manner;
- support a consistent national approach to the identification, reporting and review of adverse events, and allow best practice to be actively promoted across Scotland;
- present an approach that allows reflective review of events which can be adapted to different settings; and

- provide national resources to develop the skills, culture and systems required to effectively learn from adverse events to improve health and care services across Scotland.

The national approach seeks to ensure that no matter where an adverse event occurs in Scotland:

- the affected person receives the same high quality response;
- organisations are open, honest and supportive towards the affected person, apologising for any harm that occurred;
- any staff involved are supported in a consistent manner;
- events are reviewed in a consistent way; and
- learning is shared and implemented across the organisation and more widely to improve the quality of services.

17. The intention of using an adapted Paediatric Trigger Tool (PTT) in the study of NHS GGC is not to determine preventable or non-preventable harm but to create opportunities to learn from the triggers and adverse events identified. It forms only part of the overarching case review process and it is anticipated the information from the PTT will underpin the epidemiological and clinical outcome review and the contextual organisational data and reports. The PTT methodology will examine harm in the processes of healthcare in the group of patients selected for case note review and its objectives are to contribute to the overall aim of the case note review by:

- identify all triggers and adverse events in the cohort of patients identified by the epidemiological review using an adapted PTT; and
- describe the rate and severity of harm occurring in hospitalised children in the cohort group.

18. Dr Pat O'Connor is adapting the PTT for use for this patient population, in coordination with Dr Peter Lachman, one of the Tool's creators.

Other Data Collection

19. The Epidemiological and Clinical Outcomes Review and the PTT may not provide all the data that the Expert Panel requires to conduct its work. The Expert Panel will review its data requirements on a continuing basis and request these through the Clinical and Support Team leads as well as Professor Bain as required.

Communication and Engagement

20. Communication and engagement is distinct from reporting, as described above. There are key 'audiences' whose communication needs should be supported through the work of the Case Note Review. Key among these are:

- patients and families, both those who will be part of the Case Note Review and those who may want to know more, or feel they should be part of the Review; and

- the staff of the relevant parts of the RHC and the QEUH.

More detailed work on communication and engagement will be reflected in the Programme Plan for the work.

Patients and Families

21. Initial communication with patients and families – setting out which cases would be reviewed – has now taken place. That set out the purpose and details of the Case Note Review, and invite any questions and issues to be raised through the signatories of the letters, Professor Bain and Professor McQueen.

22. Progress reporting on the Case Note Review as a whole will be conducted through the NHS GGC web pages and 'closed' Facebook page to the affected families.

23. Specific engagement with families wishing to discuss their particular cases will be handled on a case-by-case basis through Professor Bain and Professor White.

Staff

24. The medical, nursing and other relevant staff of the relevant parts of the RHC and the QEUH (including the NHS GGC Board and relevant committees) will want to be kept appraised of the progress of the Review. Professor Bain will organise:

- an initial overview session of the methodology/approach of the Review to reviewing the cases;
- regular progress reports from representatives of the Expert Panel, ideally delivered in face-to-face meetings; and
- a final 'debrief' of the key results and recommendations of the Final Report.

Key Responsibilities

25. As Executive Lead for infection prevention and control within NHS GGC, as appointed by Professor McQueen, Professor Bain will have oversight of the project as a whole. She will be responsible for its progress and reporting to Professor McQueen, including advice – provided by the Expert Panel and other members of the team below – for any necessary change in key elements of these Terms of Reference.

Expert Panel

26. The Expert Panel will be responsible for:

- agreeing, within the scope of these Terms of Reference, the definitions used to select patients for the review; the scope and direction of the data collection; and the methodological tools required;

- overseeing and interpreting the analysis of data obtained and developing the Final Report (and, in discussion with Professor Bain, the provision of any agreed interim reporting);
- progress reporting to relevant audiences, including the RHC/QEUH staff; and
- providing reporting to individual patients and families.

27. The Expert Panel consists of:

- Professor Mike Stevens (Emeritus Professor of Paediatric Oncology at the University of Bristol), who will be head of the Expert Panel and report to Professor Bain;
- Gaynor Evans (Clinical Lead for the Gram-negative Bloodstream Infection Programme at NHS Improvement England); and
- Professor Mark Wilcox (Professor of Medical Microbiology at the University of Leeds).

Clinical Team

28. The Clinical Team will be responsible for:

- undertaking the data collection, storage and submission of case note review material to the Expert Panel;
- resolving data/sampling issues with Professor Bain, the Support Team and the Expert Panel; and
- supporting the analysis and reporting of the Case Note Review through the Expert Panel.

All handling of patient data will be covered by relevant data-sharing agreements and protocols.

Epidemiology and Clinical Outcomes Review Team	
Dr Fiona Murdoch, Epidemiology and Clinical Outcomes Review Lead	March 2020-end of Review
Jane McNeish, Epidemiology and Clinical Outcomes Review	May 2020-end of Review
Shona Cairns, Epidemiology and Clinical Outcomes Review	January-March 2020
Paediatric Trigger Tool Review Team	
Dr Pat O'Connor, Paediatric Trigger Tool Review Lead	February 2020-end of Review
Professor Peter Davey, Paediatric Trigger Tool Review	April 2020-end of Review
Advisers to Expert Panel	
Hayley Kane, Infection Control Manager, IPC (ICNet and Telepath) Review	September 2020-end of Review
Dr Julie Aitken, Clinical Adviser to Expert Panel	September 2020-end of Review
Linda Dempster, IPC Adviser to Expert Panel	October 2020-end of Review

Support Team

29. The Support Team will be responsible for:

- resolving practicalities and resourcing issues with Professor Bain, Professor Stevens and Dr O'Connor;
- undertaking key communication and engagement functions with Professor Bain;
- developing and maintaining the Review workplan;
- providing secretariat and related functions to the Expert Panel; and
- ensuring submission of Final Report to the Cabinet Secretary and publication.

30. The Support Team consists of:

- Diane Murray (Deputy Chief Nursing Office for Scotland), who will lead the Support Team;
- Lesley Shepherd (Professional Nurse Advisor to the Scottish Government), who will provide expert methodological advice and work with HPS;
- Professor Craig White (Chair of the Communication and Engagement Subgroup of the Oversight Board), who will work with Professor Bain in handling the communication and engagement with patients and families and provide the 'families' voice' in the development of key elements of the Review;
- Marie Brown (seconded Programme Manager from NHS National Services Scotland), who will develop and maintain the workplan and advise Diane Murray and Professor Bain of key delivery issues (role to be confirmed);
- Emma Mackay (seconded from NHS National Services Scotland); and
- Jim Dryden, Carole Campariol-Scott and Phil Raines: (QEUH Support Unit, Scottish Government), who will provide policy and practicalities support, and ensure timely progress updating to the Oversight Board and the Cabinet Secretary.

31. Additional key support will be provided by:

- Shona Cairns (Health Protection Scotland), who will head up the team responsible for final identification of patients to be included in the Case Note Review and leading the epidemiological component of the Epidemiology and Clinical Outcomes Review, working with Lesley Shepherd and reporting to the Expert Panel; and
- Professor Peter Lachman, who will supply consultancy advice on adapting the PTT for the particular patient population as one of the creators of the Tool, working with Dr Pat O'Connor.

Timelines

32. The timelines for the Review will be reviewed on an ongoing basis by Professor Bain in conjunction with the heads of the Expert Panel, the Clinical and Support Teams, and Professor McQueen. They will be encapsulated in the workplan to be developed and maintained by the Support Team. The Review is currently anticipated to provide a final report to the Oversight Board in 2020, but timelines will necessarily continue to be reviewed in light of the impact of Covid-19.

Annex C: Description of Interim and Final Report Coverage

Escalation Issue	What Is Covered in the Interim Report	What Is Covered in the Final Report
Infection prevention and control	• Assurance on a selection of IPC processes/systems in NHS GGC following Peer Review • Review of approach to improvement in IPC in NHS GGC • Findings and recommendations on the above set of issues	• Review of how the infection incidents were addressed by NHS GGC and wider mitigation/responses • Review of how different staff have worked together in support of IPC in the QEUH • Review of the organisation of IPC leadership • Findings and recommendations on the above set of issues and the overarching question of the 'fitness for purpose' of IPC within the Health Board
Governance	• Update on work of IPC governance	• Review of how infection incidents were escalated and addressed by the NHS GGC governance structure • Assurance on how IPC issues are currently escalated and addressed within NHS GGC • Review of NHS GGC risk management in light of the infection incidents • Findings and recommendations on IPC governance issues, and the overarching question of the 'fitness for purpose' of IPC governance within the Health Board
Related technical issues	• Update on refurbishment of Wards 2A/2B in the RHC	• Assurance on NHS GGC's water testing and safety policy in the RHC/QEUH • Assurance on plans to address any remedial works relating to infection arising from infrastructure issues on the QEUH site
Communication and engagement	• Review of how communication and engagement was undertaken by NHS GGC with the children, young people and families affected by the infection incidents – including findings and recommendations	• Review of how the organisational duty of candour, the Significant Adverse Events Policy and related review processes operated for these infection incidents – including findings and recommendations

Escalation Issue	What Is Covered in the Interim Report	What Is Covered in the Final Report
Case Note Review	• Update of the work of the Case Note Review	• Summary of findings and recommendations of the Case Note Review
Review of escalation to Stage 4		• Advice on whether/how de-escalation should take place

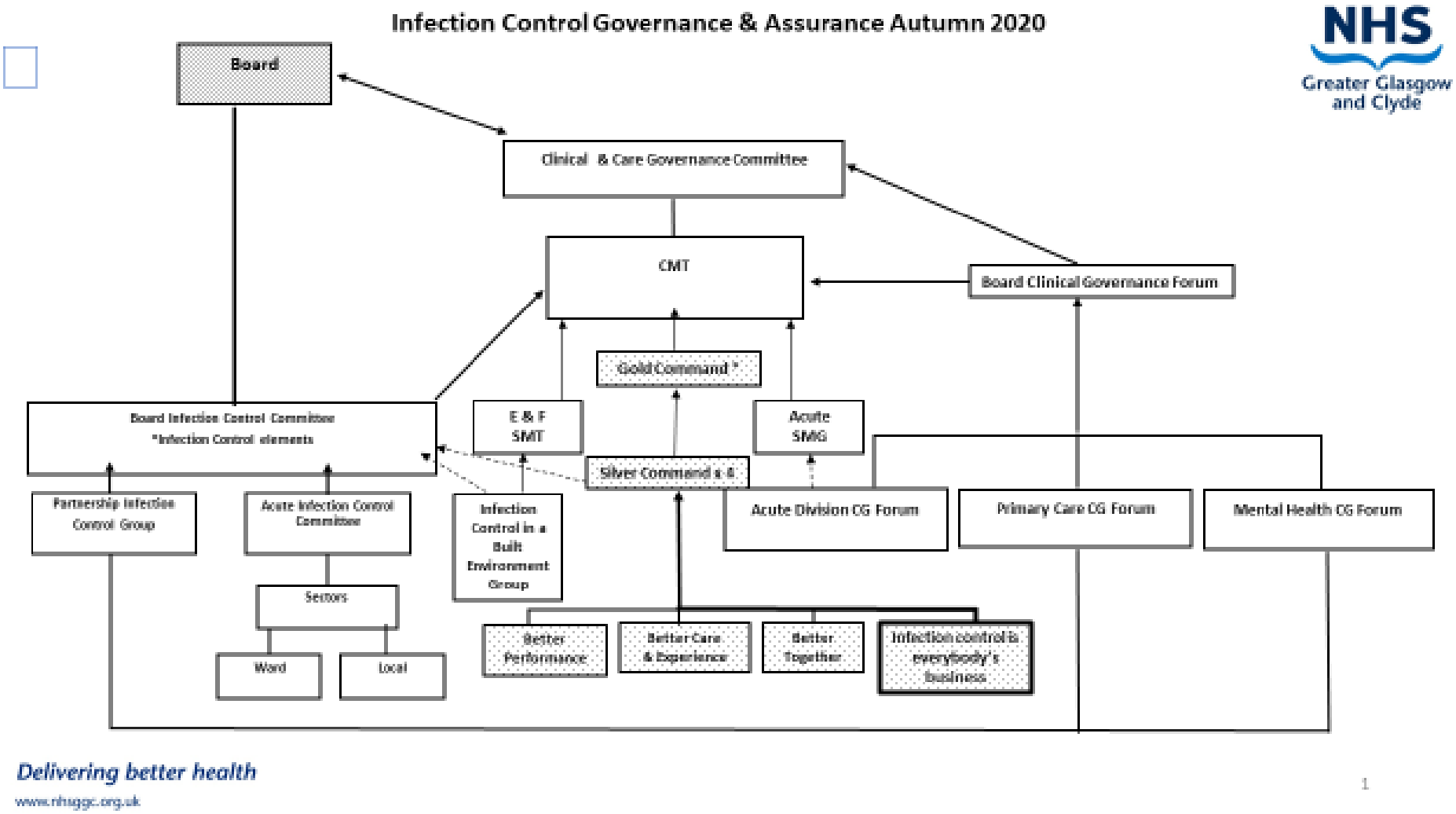
Annex D: Key Success Indicators of the Oversight Board

Outcome	Action	Example of Evidence
Infection Prevention and Control and Governance		
There is appropriate governance for infection prevention and control (IPC) in place to provide assurance on the safe, effective and person-centred delivery of care and increase public confidence.	Carry out a system wide review of current IPC systems and processes and associated governance scheme of delegation and escalation mechanisms against relevant national standards and guidance.	• Confirmation of current/sustainable effective governance with respect to: HAIRT Reports; Clinical and Care Governance Committee and Audit and Risk Committee Reports; AOP and Corporate Objectives and Performance Reports; IPC Inspection and Escalation Reports; IPC Audit Reports and Action Plans; relevant Antimicrobial Management/ Infection Control/ Decontamination/ Water Safety/ Education and Training/ Surveillance/ Outbreak Preparedness and Management/ Audits/ Policy and Procedures/ Inspection and Action Plans/ IPC Escalation Reports/ SBARs/ Research and Development and Voluntary Action Plan Updates; and IPC Risks. • Active action plans to address recommendations/action on relevant HPS/ HEI/ Internal reports since 2015 with clear timelines, monitoring, action responsibility and appropriate oversight.
	Determine if there are any gaps when mapped against national standards and guidance and, if so, identify areas for improvement and shared learning with respect to IPC risk management, audit, performance, compliance and assurance.	• Report setting out gaps in national standards/guidance and provision of NHS GGC action plan to address issues and monitoring arrangements for action plan. • Report setting out wider learning with regards to IPC risk management, audit, performance, compliance and assurance for consideration by DG Health and Social Care, SG Ministers, and NHS Chairs and NHS Chief Executives fora (as part of wider Oversight Board reporting).

Outcome	Action	Example of Evidence
The current approaches that are in place to mitigate avoidable harms, with respect to infection prevention and control, are sufficient to deliver safe, effective and person-centred care.	Conduct a detailed review of relevant individual instances of infection and identify actions on individual cases and systemic improvements.	• Clear methodology for identifying and undertaking review of all relevant cases, validated by external experts. • Identification of general issues relating to the IPC governance issues and provision of NHS GGC action plan to address issues and monitoring arrangements for action plan. • Identification of individual issues relating to specific cases and NHS GGC action plan to communicate and engage with relevant families/patients and monitoring arrangements for action plan.
	Ensure that the physical environment to the relevant wards in QEUH and RHC support the delivery of safe, effective and person-centred care with respect IPC, particularly in the delivery of any refurbishments/physical improvements.	• Action plan setting out identification of key issues in Ward 6A in QEUH and implementation of how they have been dealt with. • Assessment setting out completion of refurbishment works in Wards 2A/2B in RHC and how identified issues were addressed. • Confirmation of action plan and assessment above by HPS.
	Determine if there are any gaps when mapped against national standards and guidance and, if so, identify areas for improvement and shared learning with respect to operational delivery of IPC, including staffing/ resourcing, minimum skills and joint working between relevant units.	• Evidence of full implementation of mandatory national HCAI and AMR policy requirements as set out in DL (2019) 23. • NHS GGC action plan to identify staffing/ resourcing gaps in IPC operations with respect to putting in place policy requirements in DL (2019) 23, address the identified gaps with clear actions/ timetables and monitoring arrangements for delivery.

Outcome	Action	Example of evidence
Communication and Engagement		
Families and children and young people within the haemato-oncology service receive relevant information and are engaged with in a manner that reflects the values of NHS Scotland (NHSS) in full.	Prioritise communication and information provided to families and patients with a focus on respect and transparency (with an initial focus on ensuring that all outstanding patient and family questions raised are answered).	• Compilation of outstanding questions by families and publication of responses on NHS GGC website. • Published process for responding to questions in future as part of NHS GGC Communication strategy. • All additions/revisions/updates to questions previously answered have been made as soon as additional information has been received and/or reviewed.
Families and children and young people within the haemato-oncology service are treated with respect to their rights to information and participation in a culture reflecting the values of the NHSS in full.	Develop and implement a strategic NHS GGC Communication strategy with a person-centred approach, including a clear Executive Lead for implementing and monitoring.	• Publication of relevant NHS GGC Communication strategy with evidence of co-production with families. • Identification of Executive Lead to implement strategy with monitoring arrangements and measures of implementation and measures of effectiveness in place.
	Review key materials, policies and procedures in respect of existing practices with regards to communication, engagement and decision-making regarding consideration of the organisational duty of candour similar reviews (including engagement, involvement and provision of information to families in relation to these processes), and identification of any national learning/ lessons learnt.	• Report setting out gaps in compliance, opportunities for improvement, recommendations for action and provision of NHS GGC action plan to address issues and monitoring arrangements for action plan. • Identification of individual issues relating to specific cases and NHS GGC action plan to communicate and engage with relevant families/patients. • Reporting setting out wider learning with regards to organisational duty of candour and other review processes and management of IPC activities for consideration by DG Health and Social Care, SG Ministers, and NHS Chairs and NHS Chief Executives fora (as part of wider Oversight Board reporting). • Clear description of how communication, engagement, information provision and support dimensions of Oversight Board case reviews will integrate family involvement and engagement in accordance with best practice case reviews and individual family preferences.

Annex E:


Infection Control Governance & Assurance Autumn 2020
NHS
Greater Glasgow and Clyde
Board
Clinical & Care Governance Committee
CMT
Board Clinical Governance Forum
Gold Command *
Board Infection Control Committee
*Infection Control elements
E & F SMT
Acute SMG
Silver Command x 4
Partnership Infection Control Group
Acute Infection Control Committee
Infection Control in a Built Environment Group
Acute Division CG Forum
Primary Care CG Forum
Mental Health CG Forum
Sectors
Ward
Local
Better Performance
Better Care & Experience
Better Together
Infection control is everybody's business
Delivering better health
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1

Annex F: Timeline of Infection Incidents in the Queen Elizabeth University Hospital 2015-19

This can be found as a supporting file, published alongside this report.

This publication is available at **www.gov.scot**

Any enquiries regarding this publication should be sent to us at
The Scottish Government
St Andrew's House
Edinburgh
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