

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

HOSPITAL ONSET COVID-19 INFECTIONS – LEARNING FROM OUTBREAKS AND DEATHS IN CARE

Presented by	Dr Ray Smith Chief Medical Officer Karen Dawber Chief Nurse		
Author	Liz Tomlin Head of Quality Improvement and Clinical Outcomes		
Lead Director	Dr Ray Smith Chief Medical Officer Karen Dawber Chief Nurse		
Purpose of the paper	To advise the Board about key learning points and recommendations from two serious incident investigations related to hospital onset COVID-19 infections.		
Key control			
Action required	To note		
Previously discussed at/informed by	The Quality Academy		
Previously approved at:	Academy/Group	Date	
	Executive Team Meeting	13.09.2021	

Key Options, Issues and Risks

The COVID-19 pandemic continues to challenge health and care services, organisations and all of us as individuals¹. During the early phases of the COVID-19 pandemic there was a growing concern about hospital onset COVID-19 infections in NHS hospitals². A recently published study for the Getting It Right First Time Programme found that 26.6% of patients with a confirmed diagnosis of COVID-19 died in hospital with COVID-19 identified as the primary cause of death³. A survey undertaken by the Health Service Journal⁴ also looked at cases from 32 NHS Trusts of patients that had died of hospital onset COVID-19 infections. It was reported that more than 20% of COVID-19 deaths at some trusts were likely to be nosocomial.

Understanding how and why this disease spreads has been a foremost consideration at Bradford Teaching Hospitals NHS Foundation Trust (BTHFT/the Trust) in order to respond to and contain the coronavirus. However, despite measures to prevent transmission of COVID-19 the Trust has seen a number of outbreaks and patients have died with hospital onset COVID-19 infections.

In line with current NHS England guidance⁵, two serious incident investigations have been undertaken to explore themes related to COVID-19 outbreaks and to examine the quality of care for patients that have died with a definite hospital onset COVID-19 infection. It is recognised that when considering mortality data related to COVID-19, that every number represents a life lost, as well as, families and friends and NHS staff experiencing the consequences of their death.

Definitions

Hospital onset COVID-19 infections (HOICs) have been categorised by NHS England as⁶:

- Probable hospital onset COVID-19 infections – First positive swab 8-14 days after admission.
- Definite hospital onset COVID-19 infections – First positive swab 15 days or more after admission.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

NHSE outbreak definition:

- When two or more persons have the same/similar symptoms and are linked by time place and/or person association)

Analysis

At BTHFT from August 2020 to August 2021, there have been a total of 3269 patients admitted with or diagnosed with COVID-19. When examining all deaths related to COVID-19 (n=743) at BTHFT, 7.25% (n=54) were owing to a nosocomial COVID-19 infection. In regard to definite hospital onset COVID-19 infections when compared to all COVID-19 related deaths the percentage was 2.8% (n=21) and for probable nosocomial infections was 4.4% (n= 33). There is no published national or regional comparison for nosocomial Covid 19 deaths; however a recent article following freedom of information requests have indicated that the national percentage of nosocomial Covid19 deaths were reported as 17% of all hospital Covid19 deaths.(Ref: HSJ 7030819 6.9.21)

Key learning points investigating quality of care for patients that died with a definite hospital onset COVID-19 infection:

- There were 16 patients included within the serious incident investigation.
- A high standard of care was delivered throughout the patient's journey despite unprecedented challenges to healthcare delivery.
- Many of the patients that contracted a definite hospital onset COVID-19 infection had one or more co-morbidities and were often frail and very unwell on admission with noted recent decline in health by family and carers.
- Areas for improvement include, reviewing GP discharge summaries and understanding delays to medicine prescribing.
- Using Structured Judgement Reviews to inform learning and improvement has been a useful way to review the quality of care for a cohort of patients over time.

Key learning from investigating COVID-19 outbreaks:

- There have been 20 cases from June 2020 to May 2021.
- Owing to the atypical presentation of COVID-19 in hospitalised older adults i.e. patients presenting with no symptoms it is possible that wider environment contamination occurred.
- Social interactions between high risk groups outside the hospital environment during lockdown periods may have contributed to the transmission of COVID-19 infection.
- The Hospital Estate – difficulty accommodating isolation requirements, lack of space on wards and side rooms, paucity of toilet/bathroom facilities and adequate ventilation.

Infection Prevention and Control (IPC) actions taken to mitigate risks related to COVID-19 transmission:

During the Covid pandemic, the Trust has developed a continual learning environment and improvement programme based on lessons learnt from outbreaks, individual post infection reviews (PIR), regional and national evidence and changing supportive guidance. This has been reviewed and implemented through multidisciplinary clinical reference groups (CRG) to ensure collective understanding and standardised practices. Standard operating procedures have been developed to support all decision making with Trust-wide dissemination and a single point of information on the Trust intranet.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Examples of the improvement programme are:

- Launching a system of alerts within the electronic patient record to remind staff when patients are due their next COVID-19 screening swab.
- Risk assessments associated with PPE adherence.
- PPE hub established to assist the appropriate use of PPE.
- 'Donning' and 'doffing' training delivered to frontline staff groups.
- Posters specific to clinical areas fixed to entrance doors displaying appropriate PPE.
- Implementation of a local PPE audit tool.
- Face fit testing clinics implemented.
- Videos developed to aid training in PPE, social distancing and COVID-19 secure workspaces
- Speciality specific social distancing risk assessments were undertaken e.g. social distancing of patients whilst receiving renal dialysis due to spatial constraints of the unit.
- COVID secure workplace risk assessments were undertaken and further accommodation identified where possible to enable social distancing.
- Protocols for cleaning and disinfection of wards and departments implemented to ensure any areas changing status from "red" (COVID) to "green" (non-COVID) received high level decontamination.
- Risk assessment for ward bed spacing and removal of some beds to improve patient social distancing.
- Improvement to ventilation in areas undertaking aerosol generating procedures.
- Separate pathway in AED to ensure segregation and cohorting of individuals attending with Covid symptoms.
- Separate admission pathways and cohorting procedures for Covid (Red) admissions and non-Covid (green).
- Full clean and disinfection using hydrogen peroxide vapour (HPV) of any wards where outbreaks have been identified.
- Clear signage on ward entrances for red and green pathways with PPE information posters so all staff and visitors are aware as they enter a ward area.
- Utilising wards 31 and 29 as the main Covid cohort wards to support staff and patient safety and wellbeing due to their wide corridors, compartmentation with doors, bed spacing, ensuite facilities and cooling ventilation.
- PPE guardians to support staff with donning and doffing PPE on the Covid wards.
- Additional cleaning of high usage areas such as public toilets and 3 hourly cleaning of high touchpoint surfaces

Recommendation

This report has summarised the organisational learning with regard to hospital onset COVID-19 infections. The serious incident investigations detail specific recommendations and actions to be taken (See Appendices 3 and 4).

It is noted that there may further benefit to ensure reciprocal learning and any related improvement work is shared between our partner organisations and relevant stakeholder groups.

Actions will continue to be reported monthly via the Infection Prevention and Control (IPC) Board

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Assurance Framework. This is an iterative process and reflects the organisations commitment to continual learning and improvement.

Based upon national guidance there is a robust process in place to review all probable and definite hospital onset COVID-19 infection deaths in care. This is monitored and managed by the Learning from Deaths team (within the Quality Team) and in liaison with the IPC team.

Risk assessment						
Strategic Objective	Appetite (G)					
	Avoid	Minimal	Cautious	Open	Seek	Mature
To provide outstanding care for patients			g			
To deliver our financial plan and key performance targets			g			
To be in the top 20% of NHS employers					g	
To be a continually learning organisation				g		
To collaborate effectively with local and regional partners					g	
The level of risk against each objective should be indicated. Where more than one option is available the level of risk of each option against each element should be indicated by numbering each option and showing numbers in the boxes.	Low		Moderate	High	Significant	
	Risk (*)					
Explanation of variance from Board of Directors Agreed General risk appetite (G)						

Benchmarking implications (see section 4 for details)	Yes	No	N/A
Is there Model Hospital data relevant to the content of this paper?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there any other national benchmarking data relevant to the content of this paper?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the Trust an outlier (positive or negative) for any benchmarking data relevant to the content of this paper?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Risk Implications (see section 5 for details)	Yes	No
Corporate Risk register and/or Board Assurance Framework Amendments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Quality implications	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Resource implications	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Legal/regulatory implications	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Diversity and Inclusion implications	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Performance Implications	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Regulation, Legislation and Compliance relevance
NHS Improvement: (please tick those that are relevant) <input checked="" type="checkbox"/> Risk Assessment Framework <input checked="" type="checkbox"/> Quality Governance Framework <input type="checkbox"/> Code of Governance <input type="checkbox"/> Annual Reporting Manual
Care Quality Commission Domain: Safe
Care Quality Commission Fundamental Standard: Safety
NHS Improvement Effective Use of Resources: Clinical Support Services
Other (please state):

Relevance to other Board of Director's academies: (please select all that apply)			
People	Quality	Finance & Performance	Other (please state)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

1	PURPOSE/ AIM
----------	---------------------

The purpose of this paper is to inform the Board about organisational learning and improvement work that has been undertaken in relation to nosocomial (hospital acquired) COVID-19 infections of patients whilst under our care.

Hospital onset COVID-19 infections (HOCIs) have been categorised by NHS England a⁶:

- Probable hospital onset COVID-19 infections – First positive swab 8-14 days after admission.
- Definite hospital onset COVID-19 infections – First positive swab 15 days or more after admission.

2	BACKGROUND/CONTEXT
----------	---------------------------

The COVID-19 pandemic has been described as an ‘unprecedented challenge to health and care services, bringing intense pressure and radical change to systems, organisations and to all of us as individuals’¹. There has been much work to understand how and why this novel disease spreads in order to prevent transmission². However, during the early phases of the COVID-19 pandemic there was a growing concern about hospital onset COVID-19 infections in NHS hospitals². In May 2020, the COVID-19 Clinical Information Network estimated that 20% of patients were reporting symptoms of COVID-19 seven days following admission. Further research suggested nosocomial infections occurring 14 days post admission were at 12.5%². A recently published study for the Getting It Right First Time Programme found that 26.6% of patients with a confirmed diagnosis of COVID-19 died in hospital with COVID-19 as the primary cause of death³. It should also be noted that nationally it has been difficult to determine nosocomial infection rates for COVID-19 as the criteria has changed over time². It is recognised that when considering mortality data related to COVID-19, that every number represents a life lost, as well as, families and friends and NHS staff experiencing the consequences of their death.

At BTHFT from August 2020 to August 2021, there have been a total of 3269 patients admitted with or diagnosed with COVID-19. The total number of in-patients diagnosed with COVID-19 is 1159 of which 222 were diagnosed at 8 to 15 days after admission.

When examining all deaths related to COVID-19 (n=743) across the Trust 7.25% (n=54) were owing to nosocomial infection. In regard to definite hospital onset COVID-19 infections when compared to all COVID-19 related deaths the percentage was 2.8% (n=21) and for probable nosocomial infections was 4.4% (n= 33). A recent survey undertaken by the Health Service Journal⁴ looked at cases from 32 NHS Trusts where patients had died of hospital onset COVID-19 infections. It was reported that more than 20% of COVID-19 deaths at some trusts were likely to be nosocomial.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

The first patient with a definite hospital onset COVID-19 infection that died in our care was in September 2020 and there was cluster of deaths from November 2020 to January 2021 (See Appendix 2). The number of patients that were identified as probable hospital onset COVID-19 infections (n= 116) that died was 33 (28%). The number of patients identified as definite hospital onset COVID-19 infections (n= 106) that died was 21 (19.8%)^{1*}.

Understanding how and why this disease spreads has been a foremost consideration at BTHFT in order to respond to and contain the coronavirus. Throughout the pandemic the Trust has used national and local data in order to rapidly share learning to support clinical practice and to ensure operational decisions are based on best available evidence. However, despite measures to prevent transmission of COVID-19 the Trusts has seen a number of outbreaks (20 cases from June 2020 to May 2021) and patients have died with hospital onset COVID-19 infections.

Therefore, in line with current NHS England guidance⁵ two serious incident investigations have been undertaken to explore themes related to COVID-19 outbreaks and to examine the quality of care (See Appendix 4 and 5 for more details). A thematic analysis approach was used to identify learning and inform quality improvement work. This new approach is in line with the forthcoming Patient Safety Incident Response Framework⁷ which emphasises a proactive approach to learning from patient safety incidents and thus requires alternative methods of investigation.

The learning identified from the serious incident investigations are detailed below:

Key learning points investigating quality of care for patients that died with a definite hospital onset COVID-19 infection

- There were 16 patients included within the serious incident investigation.
- A high standard of care was delivered throughout the patient's journey despite unprecedented challenges to healthcare delivery.
- Many of the patients that contracted a definite hospital onset COVID-19 infection had one or more co-morbidities and were often frail and very unwell on admission with noted recent decline in health by family and carers.
- Areas for improvement include, reviewing GP discharge summaries and understanding delays to medicine prescribing.
- Using Structured Judgement Reviews to inform learning and improvement has been a useful way to review the quality of care for a cohort of patients over time.

^{1*} The figures related to deaths and hospital onset COVID-19 infections should be viewed with some caution. The raw figures regarding patient deaths are not adjusted for differences in terms of expected mortality rates. This means that factors such as, pre-existing co-morbidities, ethnic origin, gender, age etc. would affect patient outcomes (See Appendix 4 for demographic data for patients included within the serious investigation to examine quality of care for patients with a definite or probable HOCl).

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Key learning from investigating COVID-19 outbreaks:

- There have been 20 cases from June 2020 to May 2021
- The atypical presentation of COVID-19 in hospitalised older adults provided a risk of transmission within a hospital environment e.g. asymptomatic patients, late presentation of symptoms.
- Social interactions between high risk groups outside the hospital environment during lockdown periods may have contributed to the transmission of COVID-19 infection.

Infection Prevention and Control (IPC) actions taken to mitigate risks:

- Launching a system of alerts within the electronic patient record to remind staff when patients are due their next COVID screening swab.
- Risk assessments associated with PPE adherence.
- PPE hub established to assist the appropriate use of PPE.
- 'Donning' and 'doffing' training delivered to frontline staff groups.
- Posters specific to clinical areas fixed to entrance doors displaying appropriate PPE.
- Implementation of a local PPE audit tool.
- Face fit testing clinics implemented.
- Videos developed to aid training in PPE, social distancing and COVID-19 secure workspaces.
- Speciality specific social distancing risk assessments were undertaken e.g. social distancing of patients whilst receiving renal dialysis due to spatial constraints of the unit.
- COVID secure workplace risk assessments were undertaken and further accommodation identified where possible to enable social distancing.
- Protocols for cleaning and disinfection of wards and departments implemented to ensure any areas changing status from "red" (COVID) to "green" (non-COVID) received high level decontamination.

3	PROPOSAL
----------	-----------------

The next steps are to ensure key recommendations are acted upon in a timely manner:

- To acknowledge exceptional quality of care delivered by individuals and by teams - This action has been completed.
- To share learning with the organisation, our stakeholders and partner organisations - This will be thorough usual communication channels i.e. Quality Academy, Patient Safety Group, Clinical Business Units Quality and Safety meetings by November 2021.
- To triangulate learning from this SI with other intelligence and data e.g. heat map data, SI report investigating COVID-19 outbreaks to provide a richer understanding how the

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Trust has successfully responded to COVID-19. This is ongoing work within the organisation, as we develop and re-design our learning system.

- To review the management of patient movement across the organisation to prevent the transmission of disease – This is monitored and managed by the IPC team. There are regular IPC meetings to discuss Covid-19 infections.
- To review/audit delays to medication prescribing in order to inform any improvement work – This work will be led by the Medical Safety Officer within Pharmacy.
- To review the practice for discharge summaries for GPs in order to inform any improvement work – This work will be supported by Quality Improvement team working with key CBUs by December 2021.
- To continue to monitor any patient deaths with a definite HOCl's to ensure learning continues to be identified and shared – Following Learning from Deaths process in order to continue any new learning from definite and probable HOCl deaths.

4 BENCHMARKING IMPLICATIONS

Understanding the rate of HOCl infections for other organisations regionally and nationally would help indicate the impact our IPC measures have had to prevent and control the transmission of the disease within the organisation. However, as discussed above, owing to changes over time how COVID-19 related nosocomial infections have been defined this has proved challenging.

Information about differential mortality for patients with hospital onset COVID-19 infections is not currently available nationally.

5 RISK ASSESSMENT

The risk assessment indicates implications for the following areas; Quality, Resource, Legal/regulatory, Diversity and Inclusion and Performance.

The current policy and processes to monitor and manage the learning from deaths will ensure we continue to learn and make improvements as required from any deaths related to hospital onset COVID-19 infections.

The current IPC policies, standard operating procedures in place will ensure the monitoring and management of any further outbreaks.

It is also anticipated that as the Quality Team develops key process and mechanisms to ensure data and intelligence is triangulated across the organisation in order to support learning and improvement activities, this will mitigate risks for key areas identified.

Progress will be monitored through the Quality Academy.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

6 RECOMMENDATIONS

This report has summarised the organisational learning with regard to hospital onset COVID-19 infections. The serious incident investigations detail specific recommendations and actions to be taken (See Appendices 3 and 4).

It is noted that there may further benefit to ensure reciprocal learning and any related improvement work is shared between our partner organisations and relevant stakeholder groups.

Actions will continue to be reported monthly via the Infection Prevention and Control (IPC) Board Assurance Framework. This is an iterative process and reflects the organisations commitment to continual learning and improvement.

Based upon national guidance there is a robust process in place to review all probable and definite hospital onset COVID-19 infection deaths in care. This monitored and managed by the Learning from Deaths team (within the Quality Team) and IPC team.

7 Appendices

- **Appendix 1** - References.
- **Appendix 2** - Number of patients with HOCl's that have died whilst in care at BTHFT from August 2020 to August 2021.
- **Appendix 3** - Concise Investigation Report 2021/8095.
- **Appendix 4** - Concise Investigation Report 2021/8107.

Appendix 1 References

1 The Health Foundation (2021). Available online from <https://www.health.org.uk/what-we-do/responding-to-covid-19>

2 Healthcare Safety Investigation Branch (HSIB) (October 2020). 2020/018 COVID-19 transmission in hospitals: management of the risk – a prospective safety investigation <https://hsib-kqcco125-media.s3.amazonaws.com/assets/documents/hsib-report-covid-19-transmission-hospitals.pdf>

3 Gray, W. K., Navaratnam, A. V., Day, J., Babu, P., Mackinnon, S., Adelaja, I., ... & Briggs, T. W. (2021). Variability in COVID-19 in-hospital mortality rates between National Health Service trusts and regions in England: A national observational study for the Getting It Right First Time Programme. *EClinicalMedicine*, 35, 100859.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

4 Health Service Journal (HSJ) (6 September 2021). Hospital-acquired infection caused one-in-five Covid deaths at several trusts. Available online. <https://www.hsj.co.uk/patient-safety/hospital-acquired-infection-caused-one-in-five-covid-deaths-at-several-trusts/7030819.article?adredir=1>

5 NHS England and NHS Improvement (24 June 2020). Available online from: <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/06/Healthcare-associated-COVID-19-infections--further-action-24-June-2020.pdf>

6 Definitions are set out in the NHS Hospital Onset Covid Infection Sitrep Dataset (Not publically available). See also <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/06/Healthcare-associated-COVID-19-infections--further-action-24-June-2020.pdf>

7 NHS England and NHS Improvement (March 2020) Patient Safety Incident Response Framework Available on line from: https://www.england.nhs.uk/wp-content/uploads/2020/08/200312_Introductory_version_of_Patient_Safety_Incident_Response_Framework_FINAL.pdf

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Appendix 2

Table 1: Number of patients diagnosed with COVID-19

Month	Total COVID Admissions (Admitted with and inpatients diagnosed)	Total Inpatients Diagnosed	8-14 Days			15+ Days		
			Total Diagnosed above 8-14 days	8-14 days Compared to total admissions	8-14 days Compared to total Inpatients Diagnosed	Total Diagnosed above 15+ days	%15+ days Compared to total admissions	% 15+ days Compared to total Inpatients Diagnosed
Jul-20	50	36	0	0.0%	0.0%	0	0.0%	0.0%
Aug-20	50	36	1	2.0%	2.8%	0	0.0%	0.0%
Sep-20	133	93	2	1.5%	2.2%	0	0.0%	0.0%
Oct-20	395	257	5	1.3%	1.9%	15	3.8%	5.8%
Nov-20	536	299	23	4.3%	7.7%	23	4.3%	7.7%
Dec-20	360	239	32	8.9%	13.4%	32	8.9%	13.4%
Jan-21	490	281	27	5.5%	9.6%	16	3.3%	5.7%
Feb-21	304	149	7	2.3%	4.7%	5	1.6%	3.4%
Mar-21	192	121	0	0.0%	0.0%	0	0.0%	0.0%
Apr-21	138	100	13	9.4%	13.0%	10	7.2%	10.0%
May-21	58	32	0	0.0%	0.0%	1	1.7%	3.1%
Jun-21	112	64	0	0.0%	0.0%	0	0.0%	0.0%
Jul-21	217	121	6	2.8%	5.0%	0	0.0%	0.0%
Aug-21	284	167	0	0.0%	0.0%	4	1.4%	2.4%
Grand Total	3319	1995	116	3.5%	5.8%	106	3.2%	5.3%

Table 2: Number of patients deaths with hospital onset COVID-19 infections (definite and probable)

Deaths of Inpatients diagnosed with COVID-19 after 8 days of admission			
Month	8-14 Days	15+ days	Total
Aug-20	1	0	1
Sep-20	0	1	1
Oct-20	0	0	0
Nov-20	5	3	8
Dec-20	5	10	15
Jan-21	12	3	15
Feb-21	4	0	4
Mar-21	0	0	0
Apr-21	4	2	6
May-21	1	2	3
Jun-21	0	0	0
Jul-21	0	0	0
Aug-21	1	0	1
Grand Total	33	21	54

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Appendix 3 Concise Investigation Report 2021/8095

Incident Investigation Title:	Thematic analysis of patients meeting the NHS England/Improvement definition of Definite Hospital Onset COVID Infection.		
Incident Date:	March 2020 –January 2021		
Incident Number:	2021/8095		
Author(s) and Job Titles	Liz Tomlin Improvement and Clinical Outcomes Lead		
Investigation Report Date:	4 August 2021		
Report Approved	Ray Smith Chief Medical Officer Date: 4 August 2021		

Background incident description and consequences

Background:

The COVID-19 pandemic has been described as an ‘unprecedented challenge to health and care services, bringing intense pressure and radical change to systems, organisations and to all of us as individuals’¹. A key characteristic of COVID-19 is that it is a highly transmittable viral infection and has contributed towards a rapid global pandemic^{2,3}.

Understanding how and why this disease spreads has been a foremost consideration at Bradford Teaching Hospitals NHS Foundation Trust (BTHFT/the Trust) in order to respond to and contain the coronavirus. Throughout the pandemic the Trust has used national and local data in order to rapidly share learning to support clinical practice and to ensure operational decisions are based on best available evidence.

However, despite measures to prevent transmission whilst in hospital, a small number of patients have contracted COVID-19 whilst under our care and have subsequently died. These patients have been identified as having a definite hospital onset COVID-19 infection (HOCI). As this met the criteria of a patient safety incident, a formal ‘cluster’ serious incident investigation was undertaken.

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

The aim of this investigation is to review the quality of care delivered in order to identify learning and inform improvement work. A thematic analysis approach⁴ was used to identify learning using themes derived from a qualitative data set. This approach is in line with the forthcoming Patient Safety Incident Response Framework⁵ which emphasises a proactive approach to learning from patient safety incidents and thus requires alternative methods of investigation.

Incident description:

From March 2020 to January 2021, 16 patients died whilst under our care following a definite HOCl diagnosis. A definite HOCl is defined as a first COVID positive swab 15 days or more after admission to hospital⁶. These infections were discovered either as a result of the Trust's routine inpatient COVID-19 swabbing process, or patients developing clinical symptoms of COVID-19 infection. The first definite HOCl case was identified in November 2020.

In line with the Trust's Incident Reporting and Investigation Policy (2017), an investigation was undertaken to assess the quality of care and identify any additional learning about the control and prevention of HOCl transmissions.

Incident date: March 2020 to January 2021

Incident type: Cluster incident

Specialty: Multiple

Potential impact:

Patients - Patients contracted COVID-19 whilst in hospital and subsequently died in our care.

Organisational – Potential reputational impact

Actual severity of the incidents: The impact of the Hospital onset Covid-19 Infection is difficult to assess in these cases and the causal links were not solely attributable to Covid-19.

Level of investigation

Level 1 – Concise investigation

Involvement and support of patient and relatives

Bereaved families and carers were informed and supported by the clinical teams in line with 'Being Open' principles and the Trust's Duty of Candour policy.

Methodology

In order to understand the quality of care delivered to the patients identified in the SI investigation a thematic analysis methodology⁴ was adopted. It was anticipated that this would provide a richer picture of care delivered for all the identified cases and help to inform wider learning for the organisation about COVID-19.

Data Source:

Structured judgement reviews (SJR's) were used to examine the quality of care in line with national guidance⁷ and the BTHFT Learning From Deaths policy. SJRs are a narrative account

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

of care delivered. The process requires reviewers to make explicit written comments about the quality and safety of care and provide an overall care score (1=very poor care, 2=poor care, 3=adequate care, 4=good care and 5=excellent care).

Post Infection Reviews (PIR's) are based on a Root Cause Analysis (RCA) approach. They are undertaken in order to identify possible factors that have contributed to a HOCl and to reduce the risks of occurrence. NHSEI requested all organisations to undertake a root cause analyses (RCAs) for every probable healthcare associated COVID-19 inpatient infection.

Data Analysis:

An inductive thematic analysis approach was used to make sense of the data. The approach to analysis involved reading and familiarisation with each SJR in order to identify codes, patterns and themes across the data set. The final themes represent the learning derived from the reviews in relation to the quality of care.

Findings

There were 16 SJRs and matched PIRs included in the investigation. The key patient characteristics are detailed in Appendix 1. The age range was from 58 to 92 years old and included nine female patients and seven male patients. The majority of patients identified as being White British (13/16), and 11/16 were documented as having one or more co-morbidities on admission. The average care score from the SJRs was 4 (i.e. the patient received good care).

The analysis explored the quality of care delivered to patients who contracted a definite HOCl whilst under our care. The three main themes derived from the data were; clinical effectiveness of care, impact of COVID-19 and patient factors. The following section presents a discursive narrative of the reviews with anonymised extracts from SJRs to support the findings.

Theme 1 – Clinical Effectiveness of Care

Clinical effectiveness is a broad term used to describe a range of processes and activities that support best practice. All our policies, procedures and individual care pathways are designed to ensure the Trust meets nationally agreed standards of treatment and care. These are monitored for example through local clinical audits and key clinical performance indicators.

A consistent feature across the SJR's was the explicit judgement about good to excellent care in relation to expected best practice. This was seen across all phases of care delivery from admission, to care during procedures, to End of Life decision making and the involvement of families and carers.

There was clear documented evidence that appropriate care pathways were started in a timely manner and associated assessments were conducted within the first 24 hours of care. The

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

following extracts illustrate examples of key elements in a patient's initial period of care that are considered to be good practice. The first refers to the management of a diabetic patient (SJR 1), the second refers to the management of a patient re-admitted with a recent history of falls and increasing confusion (SJR 9):

'Admitted via A&E, unresponsive, Blood glucose 35, chest pain, cough, vomiting... DKA [diabetic ketoacidosis] pathway [started]. Poor skin condition and Datix completed- good practice. Referral to Tissue Viability Team - good practice. Consultant review within 24 hours – good practice. Conversation with Next of Kin re CPR – good practice' (SJR 1)

'Multiple seizures on ward, daughter updated. Unable to take oral medication – immediate request to review Parkinson's medication-good practice. Mishap with communication and Parkinsons medication cancelled – noted by nurse within 3 hours-chased urgent pharmacy support – good practice.' (SJR 9).

On-going care and treatment also demonstrated similar examples with evidence to suggest multidisciplinary approach to care delivery and good communication with families and carers:

Throughout this admission the care and management of this patient was timely and appropriate. There were frequent discussions with family and she was discussed with the Thoracics Team in Leeds at the correct juncture. (SJR 8)

On the discovery that patients had contracted a definite HOCI, families and carers were informed as soon as possible in an open, honest and transparent manner. This is in keeping with the main principles of 'Being Open' set out in the Trust's Duty of Candour policy.

'Covid contact identified – appropriate initiation of isolation and explanation offered to Next of Kin' (SJR 4)

'Documented Covid contact ...documented discussion with apology to Next of Kin –meets expected standard' (SJR 6)

The communication with families and carers and the level of detail documented ranged from good to excellent practice. It was noted that five members of staff had demonstrated exceptional levels of care and communication skills to support families and carer's at difficult and highly sensitive moments in the patient's journey.

End of Life care also demonstrated that the quality of care met best practice, with multiple examples of documented discussions about the care and management of patients requiring palliative care. Decisions were made with family involvement and visiting was encouraged where possible.

'Good comprehensive discussion with both patient and next of Kin about CPR status and ceiling of care.' (SJR 7)

'Dr X – honest and compassionate discussions with family at End of Life.' (SJR 10)

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

'Completion of the ReSPECT document prior to transfer to the Community Hospital stating patient's wishes regarding future care as per Trust procedure.' (SJR 15)

There were very few incidences of care falling below expected standard. These were seen as delays in care related to medication prescribing and delays to assessment and admission from the emergency department. In addition, it was noted that the quality of discharge summary sent to the GP was below expected standards:

'A very poor discharge summary was sent' (SJR 10)

The PIRs revealed that there were few concerns with regard hand hygiene and use of appropriate personal protective equipment as per Public Health England guidance. There were few reported concerns with the standards of environmental and equipment cleaning that may have contributed to the infection. The PIRs identified that patients that had contracted a definite HOCI had come into contact with a patient that often had an asymptomatic presentation.

On very few occasions the routine swabs were missed either on admission or during on-going phases of care. For example:

'Admission swab missed' (PIR 5).

'No admission swab noted, 1st swab 3 days post admission' (PIR 16)

Some learning was identified on the PIRs. This related to preventing HOCIs when cohorting multiple patients with COVID-19 infections

'Do not put multiple COVID contacts in a ward, mixing up COVID 14 day contact times and increasingly the likelihood of patient acquisition of infection' (PIR 6).

Theme 2 – Impact of COVID-19

Controlling the transmission of COVID-19 has had a direct impact on the operational management for the organisation to ensure the right patient is being cared for in the right place. The Trust has a robust screening policy for in-patients that is monitored and led by the IPC team.

However, owing to the fact that COVID-19 is a new disease, understanding the signs and symptoms has been an iterative process for the whole of the NHS. This has meant that patients have presented with atypical symptoms which have been hard to detect. Despite negative tests for COVID-19 on admission, and subsequent tests as per IPC procedures, it was noted that low level respiratory symptoms could have been due to community acquired COVID-19. Stringent procedures are in place to monitor and control any transmissions and it is nearly impossible to mitigate all circumstances.

A patient within this cluster of cases was appropriately transferred to another hospital within the Trust, having followed all procedures to ensure safe movement. However, this patient was later

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

found to be a contact for a patient who was identified as COVID-19 positive on the previous ward. Immediate action was taken as soon as the patient was identified as a contact.

'...[the patient] was placed in a bay with a patient who was initially asymptomatic and/or had a negative test on admission to hospital in which it would be difficult to mitigate risk. (SJR 4)

Visiting was a key aspect of patient's care that was directly impacted by COVID-19. To control and prevent the spread of the disease amongst patients and staff the visiting policy was changed. This made it difficult for families and carers to spend time with loved ones at the end of life. However, the reviewers noted the use of available methods that were developed over the height of the pandemic. This included the use of the patient telephone line, video consultation and facilitated face-to-face visits.

'Facilitation of video conferencing with Next of Kin in lieu of visiting – good care' (SJR 6)

'Regular Next of Kin updates via ward and patient line' (SJR 5)

For one relative the impact of COVID-19 was more personal. The risk of possibly contracting the disease meant they were unable to visit their spouse at their end of life.

Theme 3 – Patient factors

Patients that attended the hospital for emergency care were often very frail, had one or more co-morbidity and families remarked on rapid decline of health prior to admission. For example:

'Patient presented to ED with a diabetic foot infection (SJR 3)

'Associated urosepsis and deteriorating renal function' (SJR 2)

'Admitted with delirium and fall of unknown cause so cannot rule out he was incubating infection' (PIR 10).

It was noted on several occasions that despite a COVID-19 infection diagnosis this would probably not have affected the final outcome, as highlighted by the following extracts:

'Good care throughout this prolonged admission with MDT involvement. Predictable decline throughout admission despite frequent Physiotherapy input' (SJR 2)

'Overall this [patient] received good to excellent care. This [patient] was already in her last days of her life when she contracted COVID and the infection is unlikely to have had any clinical impact' (SJR 8)

'Good standard of care with input from Allied healthcare professionals and specialties in a complex illness during a pandemic. Family involved with decisions and kept informed' (SJR 3)

The majority of the patients (10/18) that have been identified in this cluster of incidents were related to a significant hospital or community outbreak that occurred in December 2021. (Please see separate SI report for the identified learning) This was during the apex of the last significant wave of COVID-19 infections across the country.

CONCLUSION:

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Investigating the quality of care for patients with definite Hospital Onset COVID-19 infections who subsequently died has revealed that care has been delivered to a high standard. This includes the different phases of care during an episode of care from admission to End-of-Life. There were very few exceptions where any phase of care fell below the expected standards.

The symptomology of COVID-19 is still emerging. The sensitivity and specificity of COVID-19 tests has meant that the monitoring of transmission is not always accurate. However, these challenges are being faced by all acute health and social care providers across the NHS. Understanding the rate of HOCI infections for other organisations regionally and nationally would help indicate the impact our IPC measures have had to prevent and control the transmission of the disease within the organisation.

Many of the patients that contracted a definite HOCI had one or more co-morbidities and were often frail and very unwell on admission with noted recent decline in health by family and carers. In summary, the key points to share across the organisation, our stakeholders and partner organisations are:

- A high standard of care was delivered throughout the patient's journey despite unprecedented challenges to healthcare delivery.
- Good communication with family and carers – Being open and involvement in decision making.
- Using SJR's to inform learning and improvement has been a useful way to review the quality of care for a cohort of patients over time.

Recommendations

- To acknowledge exceptional quality of care delivered by individuals and by teams
- To share learning with the organisation, our stakeholders and partner organisations
- To triangulate learning from this SI with other intelligence and data e.g. heat map data, SI report investigating COVID_19 outbreaks to provide a richer understanding how the Trust has successfully responded to COVID-19
- To review the management of patient movement across the organisation to prevent the transmission of disease
- To review/audit delays to medication prescribing in order to inform any improvement work
- To review the practice for discharge summaries for GPs in order to inform any improvement work
- To continue to monitor any patient deaths with a definite HOCI's to ensure learning continues to be identified and shared.

Arrangements for Shared Learning

Clinical Business Unit Quality and Safety meetings
Quality Academy

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Clinical Outcomes Committee Director of Operations, Operations Medical Director and the Associate Directors of Nursing West Yorkshire Association of Acute Trusts	
Author and Job Title	
Ms Liz Tomlin PhD RN (Head of Quality Improvement and Clinical Outcomes) Mrs Judith Connor (Associate Director of Quality) Mrs Claire Chadwick (Director of Infection Prevention and Control)	
Report date	
05/08/2021	

References

- 1 The Health Foundation (2021). Available online from <https://www.health.org.uk/what-we-do/responding-to-covid-19>
- 2 Khan, M., Adil, S. F., Alkhatlan, H. Z., Tahir, M. N., Saif, S., Khan, M., & Khan, S. T. (2021). COVID-19: a global challenge with old history, epidemiology and progress so far. *Molecules*, 26(1), 39.
- 3 Coronavirus disease 2019 (COVID-19) BMJ Best Practice. Available online from: <https://bestpractice.bmj.com/topics/en-gb/3000201>
- 4 Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>. Accessed 19 July 2021
- 5 NHS England and NHS Improvement (March 2020) Patient Safety Incident Response Framework Available on line from https://www.england.nhs.uk/wp-content/uploads/2020/08/200312_Introductory_version_of_Patient_Safety_Incident_Response_Framework_FINAL.pdf
- 6 Definitions set out in the NHS Hospital Onset Covid Infection Sitrep Dataset (not publicly available). See also Healthcare-associated-COVID-19-infections--further-action-24-June-2020. pdf (england.nhs.uk)
- 7 National Quality Board (2017) National Guidance on Learning from Deaths. Available online from: <https://www.england.nhs.uk/wp-content/uploads/2017/03/nqb-national-guidance-learning-from-deaths.pdf>

Meeting Title	Board of Directors		
Date	23.09.21	Agenda item	Bo.9.21.14

Appendix 1 Key Characteristics of patients included within the review

Age	Gender	Ethnicity	Month of death	Learning Disability Yes/No	Co-morbidity 1 or more Yes/No	SJR - Overall score of Care
73	F	Not recorded	Nov	No	Yes	4
87	M	White British	Nov	No	Yes	4-5
85	M	White British	Jan	No	Yes	4
77	F	White British	Dec	No	Yes	4
84	F	White British	Dec	No	Yes	4
91	F	Asian British	Dec	No	No	4
58	M	White British	Dec	No	Yes	3
72	F	White British	Dec	No	No	5
90	M	White British	Nov	No	No	5
88	M	Black British-Caribbean	Dec	No	Yes	4
74	F	White British	Dec	No	No	4
75	F	White British	Dec	No	Yes	4
92	M	White British	Dec	No	Yes	4
87	F	White British	Dec	No	No	4
90	F	White British	Jan	No	Yes	4
87	M	White British	Jan	No	Yes	3

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Appendix 3 Action plan 2021/8095

Action plan			Date initiated	05/08/2021		
			Date of update			
Accountability			Responsibility			
Lead		Oversight /governance structure	Lead		Workstream / Operational group	
Dr Ray Smith		Quality Academy	Dr Ray Smith		Mortality / Learning from Deaths Group	
Dr LeeAnne Elliott		Clinical Outcomes Committee	Dr LeeAnne Elliott			
			Judith Connor			
			Liz Tomlin			
Aim		Objective		Expected outcome	Assurance mechanism	Review date
		Ref				
To triangulate learning from this SI with other intelligence and data e.g. heat map data, SI report investigating COVID_19 outbreaks to provide a richer understanding how the Trust has successfully responded to COVID-19.		1.	To provide Board of Directors assurance in relation to the management and learning from Hospital Onset Covid -19 infections.	The trust identifies learning that adds to current body of knowledge in the prevention and management of patients with highly infectious air borne respiratory diseases,	Quality Academy Clinical Outcomes Committee	October 31 st 2021

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Appendix 4 Thematic Analysis - Cluster of COVID-19 Outbreaks - Concise Investigation Report 2021/8107

Incident Investigation Title:	Thematic Analysis Cluster of COVID-19 Outbreaks
Incident Date:	Incidents between June 2020 –May 2021
Incident Number:	2021/8107
Author(s) and Job Titles	Debbie Sykes Clinical Risk Manager Infection Prevention and Control
Investigation Report Date:	20 July 2021
Report Approved	Karen Dawber Chief Nurse Ray Smith Chief Medical Officer Date: 4 August 2021

Background incident description and consequences

Background:

Since the emergence of COVID-19, determining how it spreads, how it affects people and communities, and how it can be treated has represented a steep learning curve. It has been identified that individuals are generally infectious for up to 48 hours prior to experiencing any symptoms. However, in some cases individuals remain asymptomatic throughout their entire infectious period. This, in conjunction with a negative COVID-19 screening swab on admission, can result in individuals being admitted to an inappropriate care setting. In this scenario the likelihood of others becoming infected, and the subsequent declaration of an outbreak is high.

Nationally and regionally, investigations were commissioned in an attempt to identify what factors may have contributed to the transmission of COVID-19 within acute hospital settings. The following were used to compare and contrast to the findings of this COVID-19 outbreaks thematic analysis:

- Healthcare Safety Investigation Branch (2020) COVID-19 transmission in hospitals: management of the risk – a prospective safety investigation.
- NHS England and NHS Improvement (2020), North East and Yorkshire Lessons Learned from the COVID-19 Pandemic Response (see appendix 1).

The learning points were directly compared to those identified within both of these reports.

It is evident that the Trust has learned lessons derived from both clinical experience and in response to nationally led guidance. This new knowledge and the actions taken may potentially have reduced the risk of COVID -19 transmissions within the Trust.

Incident description:

Between June 2020 and May 2021, a total of twenty COVID-19 outbreaks were declared, four involved staff only, all were reported to NHS England (NHSE). The criterion for declaration to

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

<p>NHSE is when ‘two or more persons have the same disease or similar symptoms and are linked in time, place and/or person association’.</p> <p>Patients were identified as having COVID-19 infection after their admission to the Trust. These infections were discovered either as a result of the Trust’s ongoing inpatient COVID-19 swabbing process, or patients developing clinical symptoms of COVID-19 infection, despite returning negative PCR screens, during their inpatient episode. The late identification of these infections has resulted in localised transmission of COVID-19.</p> <p>In line with NHSE guidance a review of COVID-19 hospital outbreaks reported over 2020/2021 has been undertaken to identify any further learning to aid national understanding and prevention of future nosocomial transmission.</p>			
Incident date: June 2020 to May 2021			
Incident type: Cluster incident			
Specialty: Multiple			
<p>Potential impact:</p> <p>Multiple patients as a result of their inpatient contact with an individual who developed COVID-19 infection after admission:</p> <ul style="list-style-type: none"> • were required to isolate, either just within the hospital setting or in both the hospital and their home setting; • became infected with COVID-19; • may have required a prolonged hospital stay; • in the long term this may have an adverse effect on their health; in some instances this may lead to death. <p>Organisation:</p> <ul style="list-style-type: none"> • reduced service provision due to multiple restrictions affecting established bed numbers; • increase in both the provision and associated cost of environmental cleaning. 			
Actual severity of the incidents: Moderate			
Level of investigation			
Level 1 – Concise investigation /Thematic analysis			
Involvement and support of patient and relatives			
<p>Patients and/or relatives (as appropriate) were informed and supported by the clinical teams. Some of the outbreaks applied only to staff. Duty of candour is/has been undertaken as applicable.</p>			
Methodology			
<p>An inductive thematic analysis methodology (Braun & Clarke, 2006) was used to understand what contributory factors may have facilitated the transmission of COVID-19.</p> <p>An advantage of using inductive methodology is that theme development originates through observation. It considers the recorded experience rather than reviewing the data using preconceived themes (a deductive approach), themes the analyst may expect to find reflected there, based on theory or existing knowledge.</p> <p>Qualitative data sources associated with each of the twenty outbreaks was examined. The</p>			

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

emergent themes were compared and contrasted to the themes identified by:

- Healthcare Safety Investigation Branch (HSIB) independent patient safety investigation
- NHS England and NHS Improvement (NHSEI), North East and Yorkshire's thematic analysis (see appendix 1).

Internal documentation reviewed included:

- outbreak meeting notes;
- outbreak action plans;
- COVID-19 ward checklist (when applicable);
- Trust report summarising the clinical themes extrapolated from the COVID-19 Post Infection Reviews (2020);
- Trust reports Infection Prevention and Control: Progress for Board Assurance Framework for COVID-19.

Any additional learning points were extracted to assist with infection prevention and control (IPC) preparedness for the ongoing management of COVID-19 and any potential future pandemic wave.

Results:

The majority of the outbreak-related themes extracted from the data compared directly with those identified by NHSEI and HSIB. These were addressed within the Trust at the time by local direct action and in addition when appropriate wider organisational action.

Multiple approaches were taken to address any broader actions identified either as a direct finding from an outbreak or in response to an alternative stimulus such as emerging national guidance. Below are outbreak findings cross referenced to the NHSEI themes and additional information to demonstrate wider actions:

- NHSEI theme 1. Personal and Protective Equipment specific to 1.1a Sub-optimal / inappropriate use of PPE, was reflected in:

"The staff from Friday who wasn't wearing the correct PPE" (Outbreak 3; Meeting Notes 12/06/2020).
- NHSEI themes 2: Social Distancing specific to 2.1b Breaks and 5: Estates, facilities & cleaning specific to 5.2b Inadequate staff room facilities to ensure social distancing was reflected in:

"Further designated staff dining area required to allow consistent social distancing" (Outbreak 4; Action plan 05/12/2020).
"Staff rest rooms and offices have been risk assessed for Covid secure areas; many areas have been reviewed several times and assessments revised as lessons are learnt from outbreaks." (IPC: Progress for Board Assurance Framework for Covid 19, April 2021).
- NHSEI theme 3: Screening specific to 3.2a Inconsistent screening protocols was reflected in:

"Patient A: Admitted 13.12.20 swabbed negative on 13.12.2020. No repeat swabs performed on day 3 or day 5. Covid swab performed on day 8 (21.12.20) reported positive"

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

(Outbreak 12; Meeting Notes 30/12/2020).

At the time of this patient's admission NHSE's guidance (June 2020) required COVID screening to be undertaken only on the day of admission and again between days 5 and 7 for acute asymptomatic admissions.

In December 2020 NHSE increased the recommended frequency of swabbing to the day of admission and days 3, 5 and 7. The Trust's standard operating procedure was updated on 11/12/2020 to reflect this increased swabbing frequency.

"Patient A: Admitted 22.12.20 and swabbed negative on 22.12.20, 27.12.20 and 29.12.20 reported Covid positive on 01.01.21" (Outbreak 13; Meeting Notes 12/01/2021).

Subsequent post infection reviews highlighted that day 3 and day 5 COVID-19 swabbing was often being missed.

"Day 3 and day 5 swab missing therefore pt. appears to be hospital onset" (IPC: Progress for Board Assurance Framework for Covid 19, April 2021).

This may have resulted in those patients admitted with covert COVID-19 being incorrectly categorised as hospital onset. This risk has now been mitigated by the launching of a system of alerts within the electronic patient record reminding staff when patients are due their next COVID screening swab.

Examples of wider actions:

- Risk assessment associated with PPE e.g. the use of donated PPE which does not adhere to EU 2016/425 Annex II. Sessional gown wearing was undertaken.
- PPE hub established to assist in preventing the inappropriate use of PPE.
- Donning and doffing training for frontline staff groups.
- Posters displaying appropriate PPE, specific to the clinical area, fixed to entrance doors.
- The introduction of a local PPE audit tool to focus targeted interventions as required.
- Face fit testing clinics commenced to ensure:
 - FFP3 masks were the correct type for staff especially as supplies kept changing requiring staff retesting
 - Staff were trained in fit checking
- Videos developed and produced to aid training in PPE, social distancing and COVID-19 secure workspaces.
- Updated door posters displaying the appropriate way to wear gowns (sleeves rolled up), when applicable to a clinical setting.
- Speciality specific social distancing risk assessments were undertaken e.g. Social distancing of patients whilst receiving renal dialysis due to spatial constraints of the unit.

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

- COVID secure workplace risk assessments were undertaken, and further accommodation identified where possible to enable social distancing.

Additional learning

The outbreak process allowed clinical teams to highlight a number of additional factors that appeared to facilitate the nosocomial spread of COVID-19 infection within Bradford Hospitals. As each factor was highlighted timely actions were taken to, as far as possible, mitigate against each emerging risk:

1. Atypical presentation of COVID-19 in hospitalised older adults

As the Trust entered the second wave of COVID-19 it had been noted that many older patients were not presenting with the symptoms which had been identified on the main COVID-19 symptoms list. There are a small number of studies which have also highlighted this phenomenon. Ming Gan et al. state 'in acute illness states, older adults respond differently to young adults. Although aetiologies may be multifactorial, differences in physiological and immune responses are likely important contributors to varied presentation' (2020).

All Trust patients identified as likely to meet NHSE's definition of hospital onset (probable or definite) healthcare associated COVID-19 infection were the subject of a post infection review. This process corroborated that there was a cohort of older adults presenting with symptoms not identified in the national COVID-19 list of main symptoms. The atypical symptoms which were noted are:

'a fall of unknown cause, delirium/ increased confusion, 'Off their legs' and unable to stand (previously mobile), hypothermic, decreased GCS' (Clinical themes findings from COVID Post Infection Reviews in Bradford Teaching Hospitals NHS Foundation Trust 2020).

This cohort of patients generally exhibit the trait of having a negative COVID-19 swab on admission days 3, 5 and possibly 7 but then subsequently would swab positive.

"Patient A: Admitted 22.12.20 and swabbed negative on 22.12.20, 27.12.20 and 29.12.20 reported Covid positive on 01.01.21" (Outbreak 13; Meeting Notes 12/01/2021).

The post infection review process highlighted that during the medical clinical review process recent primary care interventions are not always being seen as significant, possibly due to the patient's atypical presentation.

"A history of community respiratory symptoms on admission i.e. shortness of breath, GP treatment for chest infection, cough and community acquired pneumonia are sometimes not taken into consideration on the possible COVID symptom review." (Clinical themes findings from COVID Post Infection Reviews in Bradford Teaching Hospitals NHS Foundation Trust 2020).

"Clinical review of hospital onset cases identified possible missed diagnosis of Covid at admission – example; elderly admitted with new onset falls and ?CAP, CXR indeterminate for Covid however swab negative x2. Lymphocytes low on admission." (Outbreak 3; Meeting Notes 07/12/2020).

Actions taken to mitigate these risks include:

- Established Care of the elderly senior reviews process in place.

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

- Patient mask wearing and encouragement to remain in bed until senior care of the elderly review has been undertaken.
- Antibody testing to support clinical decision making

2. Increased risk that unrecognised environmental contamination has occurred

The Trust's immediate priority has been to prevent cross transmission originating from those patients who were laboratory reported or clinically identified as having COVID-19 infection. However due to a significant proportion of patients presenting with no symptoms, it is possible that wider environment contamination occurred.

"Reducing the viral load risk in the environment - has been reduced by using chlorine releasing agents for routine cleaning and increasing the decontamination of high touch-point surfaces". (IPC: Progress for Board Assurance Framework for Covid 19, Jan 2021).

Protocols for cleaning and disinfection of wards and departments had been revised and implemented to ensure any areas changing status from "red" (COVID) to "green" (non-COVID) received high level decontamination including hydrogen peroxide vapour fogging.

"Ward restrictions in place, bays systematically being cleaned and disinfected (HPV)." (Outbreak 12; Meeting Notes 05/01/2021).

To support these initiatives the Trust increased the number of hydrogen peroxide vapour machines available to improve fogging capability. Additional resources were also procured to support the enhanced cleaning of shared toilets and bathrooms as well as the regular cleaning of high touch-point surfaces.

"3 hourly touch point cleaning is done on top of the 2 normal cleans a day." (Outbreak 4; Meeting Notes 23/11/2020).

Due to the additional cleaning and disinfection demand placed on services in response to the pandemic there has not been the capacity to provide a program of regular deep cleaning for all wards, which would be a provision above and beyond the normal cleaning schedules.

However, to facilitate mitigation against the risk that the overall patient environment may have become contaminated a business case has been submitted with the aim of securing the delivery of a regular program of deep cleaning to all areas of the hospital.

3. Socialising outside of Trust premises specific to renal dialysis patients

Patients receiving haemodialysis need to attend the dialysis unit up to three times per week; within this small unit encounters with varied health care staff and other patients is unavoidable. It is not surprising therefore that friendships are forged, perhaps even a sense of kinship, within the extended dialysis family. This possibly contributed to a blurring of the COVID regulations resulting in additional risk taking, such as social gatherings conducted outside of the healthcare setting, facilitating the transmission of COVID-19 infection.

"This is a complex outbreak with a number of distinct clusters with a common theme of renal dialysis, although some cases appear to be related to the renal medical ward. Many of these patients socialise outside of NHS care and this is being investigated as part of the outbreak." (Outbreak 16: Meeting notes 02/02/2021).

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Moreover, this predominantly elderly population has a high burden of comorbidity, including cardiovascular disease and diabetes, making them more susceptible to COVID-19 infection. This combination has made the delivery of dialysis uniquely challenging in the face of the pandemic.

Many of the themes reflected in the renal dialysis and renal medical ward outbreaks were identified in the NHSEI general thematic analysis (appendix 1); multiple interventions were put in place to reduce transmission risk. However, specific to individual behaviour outside of Trust premises a programme of weekly screening was commenced in an attempt to identify asymptomatic individuals earlier.

“The action plan has been reviewed and it has been confirmed that the dialysis patients will be screened weekly for COVID -19.” (Outbreak 16; Meeting minutes 23/2/2021).

Additional root causes

- **Incidence of Asymptomatic Patients and Staff**

The incidence of asymptomatic COVID-19 seen in patients, in particular in the older adult population, and in staff groups provides a risk of transmission within a hospital environment.

- **The Hospital Estate**

There is not enough provision for isolation in relation to bed spacing, isolation room capacity, ventilation and a paucity of toilet/bathroom facilities. This likely contributed to an increased risk of patients with undiagnosed COVID-19 infection being nursed in areas where patient to patient transmission remains possible, despite there being other infection prevention and control measures in place.

Contributory factors

As also highlighted in the NHSEI report the following factors have likely played a role in the transmission of COVID-19 within the Trust:

- The difficulty in maintaining social distancing between patients, particularly in those that are affected by cognitive impairment is a significant challenge. Trust staff are aware of the importance of preventing patients wandering and maintaining social distancing, reasonable care adjustments are made however this remains an ongoing and challenging issue. The Trust has an ageing estate which also increases the complexity of maintaining social distancing between patients due to there not being enough provision for isolation in relation to bed spacing, alignment of access/exit corridors and a paucity of toilet/bathroom facilities.
- Maintaining 2 metre bed spacing is not always feasible. Additional mitigations are being reviewed and tested, including the use of clear plastic curtains to separate beds and provide a protective screen, removal of some bed spaces has been undertaken to allow 2 metre separation.
- In order for the Trust to maintain service provision it is necessary for patients to have some inter-hospital transfers during their admission. To mitigate against transmission risk COVID pathways are in place. Patients are allocated accommodation in either Red, Amber or Ultra

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Green wards dependent upon their initial clinical assessment.

- The majority of the Trust's clinical and non- clinical estate relies on natural ventilation. National guidance places an emphasis on improving ventilation for all clinical areas. Recirculating air-conditioning units (ACUs) have been identified as presenting an increased risk in the transmission of infections. A review of areas undertaking aerosol generating procedures(AGP) has taken place with collaboration from clinical teams, infection prevention and control teams and estates colleagues to improve the standards of ventilation (e.g. radiology, endoscopy, theatres).

Additional lessons learned

It is acknowledged that the lessons learnt as described in Infection Prevention and Control Lessons Learned from the COVID-19 Pandemic Response; Preparation for the future (NHSEI North East and Yorkshire [appendix1]) predominantly reflect our findings. Additionally, the Trust has learned:

- Atypical presentation of COVID-19 in hospitalised older adults provides a risk of transmission within a hospital environment due to:
 - Return of a negative COVID-19 swab on admission but production of a positive result at a later inpatient screening episode.
 - Symptoms that do not conform to the known norm result in missed diagnosis and therefore in an inappropriate initial bed allocation.
 - During the medical clinical review process recent primary care interventions need to be assessed for significance.
- There is likely to be an increased risk that unrecognised environmental contamination has occurred
- The friendships forged and the influence long term group treatment schedules may have on some renal dialysis patients may result in their participation in high transmission risk behaviour whilst not on Trust premises.

CONCLUSION:

This thematic analysis has affirmed that the vast majority of lessons learned throughout the twenty COVID-19 Trust outbreaks closely affiliate with those identified at a national and regional level. There were however three distinct further learning points which were recognised, addressed and/or mitigated against at the time of each outbreak.

Recommendations

- It has been noted that each of the extracted additional learning points have been recognised and either addressed within the associated action plans or mitigated.
- Wider dissemination of the learning points should be achieved.

Arrangements for Shared Learning

The Quality Academy
BTHFT Patient Safety Group
All Care Groups (Director of Operations, Operations Medical Director and the Associate Directors of Nursing)

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Public Health England West Yorkshire Association of Acute Trusts
Author and Job Title
Mrs. Claire Chadwick, Director of Infection Prevention and Control Mrs. Debbie Sykes, Infection Prevention and Control Clinical Risk Manager Ms Liz Tomlin, RN\Improvement and Clinical Outcomes Lead
Appendices
Appendix 1 - Copy of NHSE & NHSI Lessons learned. (Power Point Slide Set) Appendix 2 - Timeline SI 2021/8107 Appendix 3 – Action Plan SI 2021/8107
Report date
05/08/2021
References
Healthcare Safety Investigation Branch (2020) COVID-19 transmission in hospitals: management of the risk – a prospective safety investigation. https://www.hsib.org.uk/documents/257/hsib-report-covid-19-transmission-hospitals.pdf Accessed 19 July 2021
Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa . Accessed 19 July 2021
Ming Gan, J., Kho, J., Akhunbay-Fudge, M., Ming Choo, H., Wright, M., Batt, F., Amit K. J. (2020); Atypical presentation of COVID-19 in hospitalised older adults. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7505490/ . Accessed 19 July 2021

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Appendix 1 - Copy of NHSE & NHSI Lessons learned. (Power Point Slide Set)



North East and Yorkshire Infection Prevention and Control

Lessons Learned from the COVID-19 Pandemic Response

Preparation for the future

NHS England and NHS Improvement



Overview

The regional NHSEI Test, Trace and Outbreak Cell sought to identify lessons learned from the COVID-19 pandemic response, to inform infection prevention and control (IPC) preparedness for the ongoing management of COVID-19 and any potential future pandemic wave.

Learning from previous waves will also inform trust, ICS and regional operational planning for recovery of the elective programme and preparedness for winter.

The NEY region approached this by undertaking a thematic analysis of the responses received from Trusts in answer to a set of specific experiential questions. Responses were received from 20/33 Trusts, from which five key themes, learning and recommendations have been identified. Data was extracted from the responses using a modified version of Braun & Clarke's (2006) Data Analysis Framework. This approach supports a process of identifying, analysing and reporting themes from qualitative data.

The responses were coded under pre-established criteria with specific headings from the questions provided; this organises data into meaningful groups where patterns and themes emerge. The pre-liminary coding identified broad themes which were then regrouped into main themes and sub-themes.

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Theme 1: Personal Protective Equipment (PPE)



1.1 Staff

1.1a Sub-optimal / inappropriate use of PPE, including the correct use of FFP3 masks

1.1b Use of long sleeve gowns in critical areas increased risk of line infections

- Anxiety and confusion with regards to PPE from the outset of the pandemic
- Exacerbated by the frequent changes made to national guidance.
- Despite the guidance and the wearing of PPE in healthcare settings becoming the norm, a significant number of Trusts have reported suboptimal and/or inappropriate use of PPE

"Guidance issued that staff should wear an FFP3 mask when undertaking an AGP regardless of the patients COVID status."

"Staff observed not wearing PPE continually and not changing between patients."

"Staff assumed PPE less important in COVID secure areas."

Trusts have approached the issue of suboptimal and/or inappropriate use of PPE compliance in a variety of ways:

- "PPE monitoring incorporated into regular audits."
- "PPE monitored via IPC during routine visits."
- "PPE Officers... Hands, Face, Space Champions... introduced."

Increases, in critical care settings particularly, in *Klebsiella* spp. and *Pseudomonas aeruginosa* bacteraemia, or outbreaks of other Gram-negative organisms.

"We have seen an increase in *Pseudomonas* cases, as such we have changed our PPE back to single patient use rather than sessional."

"Since reverting back to short sleeve gowns, we have seen a reduction in the incidence of GNBSIs."

1 |

Theme 2: Social Distancing



2.1 Staff

2.1a Car sharing

2.1b Breaks

- Social distancing was identified as a key preventative measure in reducing the risk of transmission from the start of the pandemic. Despite this, it has been one of the most difficult measures to manage in a healthcare setting for both staff and patients.

"Transmission between staff was evident in many outbreaks, mainly due to social distancing."

"Poor compliance with social distancing when not in the clinical setting – particularly for breaks. These have been identified as likely sites for staff to staff transmission."

"Buffets and sharing of food have been an issue with staff transmission."

"COVID secure areas identified for staff breaks."

"Car sharing SOP produced advising where car sharing cannot be avoided."

2.2 Patients

2.2a Beds no always 2m apart

2.2b Difficulties with patients with cognitive impairment understanding social distancing and isolation

- Maintaining social distancing with patients that are cognitively impaired such as in the older person wards and mental health units was identified as a significant theme and remains an ongoing challenge

"Capacity in multi-occupancy bays reduced to 4 beds to facilitate social distancing."

"Beds were removed but we weren't able to sustain this due to bed pressures. This meant the outbreak policy wasn't always followed."

"Managing social distancing in the older person wards is particularly challenging when patients have dementia."

"Patients on leave not always compliant with social distancing at home, this increases the risk of spread when they return."

1 |

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Theme 3: Screening



3.1 Staff

3.1a Staff not consistently undertaking 2/7 LFD testing

- Staff screening initially was PCR testing when symptomatic and testing as part of outbreak management.
- The use of twice weekly LFD testing was introduced much later into the pandemic and has been effective in identifying asymptomatic cases.
- Compliance with twice weekly testing and the recording of results has become inconsistent and therefore challenging to monitor and demonstrate assurance

"Twice weekly lateral flow testing for staff has been rolled out. This has helped identify early infected staff. The challenge has been the ability to ensure compliance with self-testing and monitor results when staff don't log in to the LFT result portal."

"We've introduced widespread twice weekly lateral flow testing. The uptake at first was good but is needing constant reinforcement."

3.2 Patients

3.2a Inconsistent screening protocols

- Patients initially screened if symptomatic, followed by admission screening, then protocols of varied frequency.
- Latest national guidance recommends screening on days 0, 3, 5 -7 and prior to discharge to a care facility.
- Screening beyond day 7 varies across the Region and requires further national guidance to support a consistent approach

"Screening protocol changed to 0, 3, 5, 7, 14 days and then weekly."

"Also screen on day 10, 14 and the weekly."

"Additional screening on day 28 for patients not screened weekly."

"Patient screening frequency increased: Day 0, 3, 5, 7. Every 7 days thereafter"

1 |

Theme 4: Operational / IPC Processes



4.1 Staff Issues

4.1a Inadequate IPC capacity

- Inadequate specialist IPC team capacity - IPC team establishments have rarely met demand.
- Recognition that a thorough review of existing IPC capacity needs to be undertaken; significant investment in terms of numbers, skill mix and development.

"There has been a considerable increase in workload of an already understaffed IPC Team."

"The Trust has started to invest in the IPC Team with a sensible approach to banding, career development and leadership."

4.2 Bed Management

4.2a Frequent ward moves increasing risk of transmission

4.2b COVID pathway & IPC protocols not always followed due to bed pressures & capacity

4.2c Managing contacts not always done effectively & increased risk of transmission

- Expectation that patients will have some inter-hospital transfers during an admission, some Trusts have reported an increase in ward moves during the pandemic.
- Implementing COVID pathways i.e. Red/Amber/ Green or High/Medium/Low, were key to minimising the risk of transmission:
- It is evident that mixing known contacts with patients not previously exposed to COVID significantly increases the risk of transmission. Despite this, operational demand on beds has prevailed resulting in nosocomial cases:

"Patients have undergone a significant number of moves to meet outbreak management protocols and support operational requirements to create bed capacity"

"COVID 19 red and amber pathways were tightened, this had a significant impact on reducing outbreaks on the amber wards."

"Mixing contacts most definitely led to transmission."

1 |

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Theme 5: Estates, facilities & cleaning



5.1 Ventilation

5.1a Ventilation inadequate

- Inadequate ventilation has increasingly been identified as a significant issue in transmission.
- national guidance requires 'wards to be effectively ventilated'.
- Further work required to improve with potential substantive investment.

"The ventilation for general wards is sub-optimal with the air changes being less than the recommended 6. The Trust used mobile air handling units in high risk areas such as red wards and where AGPs were being carried out."

"Deployment of 'air scrubbing units' to critical care / AGP areas. Business case put forward to increase critical care ventilation to 10 acph."

"Extractor fans have been placed in the windows of many ward bays."

5.2 Inadequate Estate

5.2a Inadequate isolation capacity to meet demand /not enough side rooms with en-suite facilities

5.2b Inadequate staff room facilities to ensure social distancing

- Inadequate isolation capacity particularly as demand has never been greater.
- Some trusts able to increase demand by converting existing space into single-room facilities, often without en-suite facilities, only partly mitigating the risk of transmission.
- Inadequate staff room facilities; additional space identified and utilised in some areas but not always practical or sufficient.
- As with the other estate's issues identified, this needs further review and potential investment.

"The historical lack of side rooms made it challenging to manage patients having AGPs. The Trust has converted some wards and office spaces into single rooms to increase capacity for isolation."

"The staff facilities within the older part of the estate are limited and don't allow for social distancing."

"Temporary additional break areas have been set up to facilitate social distancing. A more permanent solution needs to be found."

1 |

Recommendations



PPE

- Clarity on when and where to use FFP3 and FRSM – should the risk assessment change?
- PPE compliance and ongoing assurance – should masks and gloves be worn less, reserved for higher risk or unknown risk patients?
- Due to risks that staff compliance will drop as public health restrictions are lifted, how should trusts reinforce and monitor compliance with staff who are required to wear PPE in health and care settings according to the current guidance and locally defined policy?
- Consider the risks of contamination from wearing long sleeved gowns. While community and hospital prevalence of Covid-19 is low, sessional use of gowns should be discontinued in preference to single episode of care use.

Social distancing

- Should beds in multi-occupancy bays continue to be reduced to maintain a minimum of 2m distance. Should the aim be to achieve current bed spacing guidance? Does the decision depend on patient risk, quality of ventilation, vaccination status (and immunocompetency)?
- Need to develop approaches with patients to increase compliance with social distancing – HCOP and Mental Health areas particularly.

Screening

- Should staff in long stay in-patient areas or departments with immunodeficient patients undertake twice weekly LFD testing? Do other staff need to continue? Does it depend on community rate?
- Should all patients in acute hospital settings for more than seven days be screened weekly? In long stay mental health or learning disability units consider monthly screening as an alternative?
- Some evidence that lots of ward moves increases risk of HOC if patient unknown to be positive prior to move. Is this just a risk with high prevailing community rate? What works best when moving emergency admissions through the estate before negative status confirmed?
- If the community rate is low, should we move from testing all patients, to just those symptomatic? Who decides? How does the trust link with the local authority / PHE team?

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Recommendations cont...



Operational / IPC processes

1. How are contacts best managed? Is it site / estate dependent or are there basic principles?
2. Should trusts / systems review and invest in specialist IPC service provision?
3. Impact of undertaking pathway / service redesign assuming reduced contact and no overcrowding – e.g. wait in car till paged or alerted / virtual clinics / bring the clinician to the patient /
4. Have clinical / cleaning staff refused vaccine? Where are they safest working (for patient safety)?
5. Is vaccine status recorded on patient record – should this affect ward placement?
6. What works best re messaging re social distancing in and out of work frequently reinforced, Comms/Trust bulletins?

Estates

1. Ventilation – do larger number of air changes mitigate for larger number of people in a setting ie OPD, diagnostics? What work is needed to improve ventilation in all clinical settings?
2. Should all bays have doors installed to aid outbreak management?
3. Reduce number of multi-bedded bays
4. Increase the number of single occupancy rooms with en-suite facilities.
5. Do/should higher risk wards (cancer, haematology, renal) have more side rooms? Is this the same for elderly care, medical patients?
6. Benefits on other infections, e.g. noro/flu outbreak prevention
7. If one trust has poor estate how does the ICS provide mutual aid?

1 |

Appendix 2 – Timeline SI 2021/8107

Outbreak code	Speciality	Outbreak date
Outbreak 1	Radiology	12/06/2020
Outbreak 2	Dermatology	09/10/2020
Outbreak 3	Care of the Elderly	12/10/2020
Outbreak 4	Care of the Elderly	09/11/2020
Outbreak 5	Macular	11/11/2020
Outbreak 6	Gastroenterology	13/11/2020
Outbreak 7	Respiratory	12/11/2020
Outbreak 8	Stroke and Neurology	13/11/2020
Outbreak 9	Care of the Elderly	02/12/2020
Outbreak 10	Vascular	23/10/2020
Outbreak 11	Orthopaedics	24/12/2020
Outbreak 12	Surgery	30/12/2020
Outbreak 13	Care of the elderly	12/01/2021
Outbreak 14	Surgery	19/01/2021
Outbreak 15	Vascular surgery	22/01/2021
Outbreak 16	Renal	04/02/2021
Outbreak 17	Care of the elderly	08/02/2021
Outbreak 18	Renal	10/04/2021
Outbreak 19	Care of the elderly	16/04/2021
Outbreak 20	Medicine	21/04/2021

Meeting Title	Executive Team meeting		
Date	13.09.21	Agenda item	E.

Appendix 3 Action plan 2021/8107

Action plan		Date initiated	Multiple
		Date of update	
Accountability		Responsibility	
Lead	Oversight /governance structure	Lead	Workstream/ Operational group
Multiple across care groups	Multiple across care groups		
Judith Connor (JC), Associate Director of Quality, Quality Governance	Quality of Care Group	Debbie Sykes (DS)	Clinical Risk / Infection Prevention and Control

Aim	Objective		Expected outcome	Assurance mechanism	Review date
	Ref				
To prevent the nosocomial transmission of COVID -19.	1 (Complete)	All learning points within the associated action plans will have been addressed	Action plans associated with each outbreak are completed and any mitigation implemented.	Care Group Infection Prevention and Control Review Groups monitor and record progress	Complete
	2 (JC, DS)	Wider dissemination of the learning points.	Report to be shared with: <ul style="list-style-type: none"> West Yorkshire Association of Acute Trusts Public Health England 	Serious Incident record	August 2021