Witness Name: Prof Simon Ball
Statement No.: 1
Exhibits: 18
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UK Covid-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR SIMON BALL

I, Professor Simon Ball, will say as follows: -

1. I make this statement in response to a request under Rule 9 of the Inquiry Rules 2006 received from the UK Covid-19 Public Inquiry ("**the Inquiry**"), asking for information from University Hospital Birmingham's (**UHB**) Chief Medical Officer about events at the Queen Elizabeth Hospital Birmingham (**QEHB**) between 1 March 2020 and 28 June 2022, and about the impact of the Covid-19 pandemic on the way that QEHB functioned during the relevant period.

2. I have structured this statement by reference to the questions set out in the request received from the Inquiry. Where I consider that it will assist the Inquiry in reading this statement, I have arranged this statement by reference to groups of questions. These are summarised under the Table in Annex C.

3. I have not been asked to provide a corporate statement on behalf of UHB. However, where matters have been raised in the Inquiry's request which are outside of my personal knowledge, I have consulted with colleagues, and the Inquiry has indicated that it is appropriate for me to do so. This statement reflects my own experience of managing UHB's response to the Covid-19 but has been contributed to by many professionals across UHB, including multi-professional clinical staff, and colleagues with expertise in human resources, informatics,

communications, and operations. I am grateful to these individuals who are identified in **[SB/01INQ000437431]** The Chief Executive Officer (**CEO**) for the Trust between September 2018 and December 2022 (Professor David Rosser) has now left UHB. It has been approved by the current CEO, Mr Jonathan Brotherton.

My role at UHB

4. I held the position of Chief Medical Officer (**CMO**) for University Hospitals Birmingham NHS Foundation Trust (**UHB**) from January 2019 until January 2024.

5. In accordance with the expectations of this role, I was a member of the Board of Directors, sharing responsibility and accountability for all aspects of performance, including meeting the Terms of Authorisation as an NHS Trust, and operating in accordance with the compliance regime established by the Care Quality Commission. I advised the Board on professional medical matters, working with the Chair, the Chief Executive and the other Directors. I also provided medical leadership for clinical governance, clinical risk management and the quality of clinical services provided for patients.

6. During Covid-19, as part of the Board, I oversaw responses to the many challenges caused by Covid-19 for UHB, implementing necessary changes to care processes in accordance with rapidly evolving national guidance. I was supported in this by many people within UHB.

Overview of the Queen Elizabeth Hospital Birmingham and the population it serves

7. The Queen Elizabeth Hospital Birmingham (**QEHB**) is part of UHB. It is one of four hospitals in this group, the others being Birmingham Heartlands Hospital, Good Hope Hospital and Solihull Hospital. QEHB is an acute hospital providing a full range of adult secondary and tertiary services, other than for maternity and gynaecology which are provided across UHB's other hospitals.

8. QEHB provides secondary care to the people of Birmingham and Solihull. The population of Birmingham and Solihull was 1.36 million in the 2021 Census, with a 46% global majority population and a median age of 34 years in Birmingham and 43 years in Solihull. The 2022/23 population served by Birmingham and Solihull Integrated Care Board **(ICB)** is estimated to be 1.58 million by NHS England (NHSE).

9. The Health Foundation, an independent charity, has identified the Birmingham and Solihull population to be the most deprived Integrated Care System (**ICS**) in England with almost 50% of the population falling in the lowest Index of Multiple Deprivation (**IMD**) quintile. The local population faces significant health challenges and poor health outcomes. In 2019 Birmingham City Council published the Birmingham Health Profile, highlighting that overall life expectancy in Birmingham is lower than the national average by approximately two years for both men and women, but with significant variation across the city. The local population faces a high burden of chronic, non-communicable diseases including coronary artery disease, chronic respiratory diseases, diabetes mellitus and higher-than-average prevalence of obesity. These conditions have relevance for patients with Covid-19, as they are associated with poor health outcomes.

10. In Birmingham, the 2011 and 2021 censuses identified that 9.4% of households were overcrowded. These households have at least one bedroom too few for the number of people living in the household and intergenerational living is common. The 2021 Census also describes that a significant proportion of our local population do not have English as a first language (15.3%), with the commonly spoken languages including Urdu (2.9%), Punjabi (2.1%), Bengali (1.4%), Pakistani Pahari (1.1%), Polish (0.9%), Somali (0.8%), Arabic (0.7%), Pashto (0.6%) and Chinese languages (0.6%).

11. In addition to secondary care for the people of South and Central Birmingham, QEHB provides tertiary services across a wide range of sub-regional to supra-regional specialities and is a busy major trauma centre. Approximately 130 beds are typically occupied by patients who are emergency transfers from other centres, in addition to those admitted directly to tertiary services.

12. QEHB includes 7472 staff members, 30% of nearly 25,000 across the UHB hospitals group.

13. In 2019 the mean number of general and acute beds occupied at QEHB was 1053 (representing 99% bed occupancy). The majority of in-patient wards within QEHB are located in the main hospital building, newly built and opened in 2011, providing a modern infrastructure. 26 in-patient wards are located in this main building. Each ward comprises 36 beds of which 45% are single rooms with a separate bathroom; the remaining beds are in a series of four-bedded bays with a shared bathroom facility. QEHB also has an ambulatory care unit (24 beds) and day-case unit (56 beds) plus three acute medical unit wards (71 beds). These have a more open structure. An additional 170 beds were located in the original estate (the Heritage Building) on the QEHB site in 2019, connected to the main building by a corridor. QEHB has a dedicated burns unit, a cardiac care unit (CCU) and a large intensive care unit (ICU) with a total maximum funded capacity of 67 level 3 (complex patient) beds. The ICU has capacity for up to 100 bed spaces on a single floor organised into 4 wards.

14. QEHB is located next to and is closely associated with the University of Birmingham (**UoB**). UoB has a medical school within its College of Medical and Dental Sciences which employs 1,000 substantive academic staff. It teaches 2,000 medical students across a five-year MBChB programme. QEHB acts a central site for medical student education, as well as providing placements for student nurses from Birmingham City University. UHB provides honorary contracts for >100 clinical academic staff (clinical lecturer and consultant grade) who deliver clinical services at QEHB but are substantively employed by UoB. Clinical academic staff and medical students made significant contributions to the delivery of care during the pandemic. Non-clinical researchers at the Medical School also reviewed the emerging Covid-19 academic literature and, with UHB clinical staff, distilled these into clear infographics to ensure the care provided at QEHB reflected the most up-to-date evidence **[SB/02 INQ000437441].**

15. This description of the wider QEHB estate is relevant to my response. During the pandemic there was significant redistribution of activity away from UHB's other hospitals to QEHB, particularly for ICU care. For example, Birmingham Heartlands Hospital is centred in a population from which the rate of admission for Covid-19 during the reporting period was extremely high, but the hospital infrastructure is older, and baseline ICU capacity <10 beds. Despite an expansion of this capacity to a peak of 30 beds, local demand far outstripped supply despite remarkable efforts in this hospital.

16. Over the period March 2020 to Mar 2022 QEHB was responsible for 42% of UHB attendances, including 334,000 Accident and Emergency Department (**ED**) presentations, and 36% of hospital admissions (103,000) to the whole hospital group.

17. As UHB operates as a single organisation, much of the data held for this period is for UHB and not QEHB. I have tried to focus my responses to the QEHB site and provide data for QEHB where it is available. Where data is only available for the wider Trust (UHB), I have identified this to be the case.

Staffing capacity

CQC inspections

18. During the reporting period (1 March 2020 to 28 June 2022), QEHB was inspected by the Care Quality Commission (**CQC**) on two occasions (2 December 2020 and 14, 15, 24, 25 June 2021). The most relevant to the enquiry was the unannounced inspection which took place on 2 December 2020. The CQC inspectors visited seven wards including the acute medical unit, general medical wards, haematology wards, the cardiology ward and a care of the older persons ward. Following the inspection, the CQC acknowledged that at the time of the visit, the QEHB was 10 months into the pandemic response and that several changes to wards and specialties had taken place in response to the emergency, in order to ensure our staff were able to provide care and treatment to the persistently high number of Covid-19 patients. That said, they identified the following areas for improvement:

- The provider must ensure that VTE (Venous thromboembolism) initial risk assessments and VTE review assessments are consistently completed for all patients and that these are clearly documented.

- The provider should consider taking a more consistent approach to sharing of governance information.

- The provider should review their risk registers to ensure that all risks identified are still open risks and dates for routine review of risks on the register should be identified.

- The provider should continue to review nurse staffing levels so that there are adequate numbers and skill mix of staff on each shift to keep patients safe and meet patient care needs.

- The provider should consistently complete 'all about me' documents in full for all patients with additional support needs such as a learning disability

19. At the time, it was acknowledged that we were aware of these issues prior to the inspection and recognised that they required ongoing work. The inspection's findings were reflective of the impact of the pandemic on Birmingham and QEHB. By 2 December 2020, QEHB had admitted 2149 patients with Covid-19, was running an extended ICU footprint including 41 patients with Covid-19 whilst there were 123 in-patients with Covid-19 at midnight on the day of the inspection, when there remained significant staff absence due to a combination of short and long-term ill-health (having peaked at a 23% absence rate amongst substantive staff in April 2020).

Effects of pandemic on staffing levels

20. From the onset of the pandemic, staff from different clinical areas were deployed to areas of high activity (the Emergency Department, the Acute Medical Unit, ICU, respiratory wards) as well as to wards with a high number of Covid-19 positive

patients or/and areas with low staffing levels. The workforce had to continually flex to try to provide adequate staff numbers to maintain patient safety. This was a challenging and changeable care environment in terms of workforce availability and skill mix.

21. In this context of a workforce compromised by levels of sickness and high number of acutely sick patients with Covid-19, there were times when the usual skills and seniority mix of staff could not be met in a clinical area with the established workforce. In this case staff were asked to volunteer to move away from areas with reduced clinical demand, such as the Outpatient Department (OPD), to work in areas where staffing levels were low. Despite the training, clinical materials and support offered to staff working in new areas, unfamiliarity with new clinical areas was associated with delays and sometimes deficiencies in care, such as timely transfer of patients from wards. The aim was always to reduce the impact of this by providing senior oversight through peripatetic teams of nurses and medical staff (individuals not committed to a specific ward and therefore available to support ward-based teams as necessary) and through initiatives to improve staff training and well-being (see also 'The impact on staff wellbeing and morale' at paragraphs 218-233).

22. However, we recognise that this was a deeply unsettling time for some staff members and the patients under our care.

Managing staffing groups within QEHB as the pandemic and responses to it developed locally and nationally.

23. Prior to the pandemic, there were areas of staffing shortfall including for healthcare professionals working in the Emergency Department (**ED**), the Acute Medical Unit and on medical wards. In December 2019, there were 325 vacant medical and nursing posts at QEHB (representing 13% of this workforce in the hospital). It is noteworthy that QEHB has relatively high levels of staffing in non-ward-based nursing roles such as research nurses and specialist out-patient and in-patient management. This is relevant to the capacity available for redeployment in QEHB.

24. The reasons for this level of vacancy reflects national challenges with NHS staff recruitment and retention. The shortage of nursing and medical staff in certain clinical areas, including emergency medicine, acute internal medicine and health care of the older adult is well documented (for example, in the UK Parliament Workforce: recruitment, training and retention in health and social care report 2022).

25. Before the pandemic (Dec 2019), QEHB also had staff on short and long-term sick leave, with the breakdown across staffing groups as follows:

- 0.48% Medical and Dental
- 5.22% Nursing and Midwifery
- 6.54% Additional Professional Scientific and Technical
- 9.10% Additional Clinical Services
- 4.06% Admin and Clerical
- 3.39% Allied Health Professionals
- 6.04% Estates Ancillary
- 3.96% Healthcare Scientists

This provides important context for data from the reporting period.

26. Birmingham faced three main waves of Covid-19, each associated with high numbers of patients seeking hospital care and or requiring hospital admission. This is similar to the national picture, albeit that in Birmingham there was an early rise in Autumn 2020, such that during September 2020 UHB accounted for ~ 8% of England's Covid-19 admissions.

27. At the peaks of the pandemic, it was challenging to ensure that clinical areas caring for high numbers of people with Covid-19 were staffed to levels that would be expected in normal circumstances given the high levels of acuity, particularly in those areas which were expanded due to unprecedented clinical need, such as ICU. Clinical activity was not equally distributed across the hospital so that some areas of clinical care were under immense pressure due to acute Covid-19

admissions and other areas of the hospital (such as outpatient care and elective care) had staff capacity.

28. Outside of peaks of the pandemic, care delivery was complicated by the additional need to deliver different pathways for large numbers of people both with and without Covid-19 (so called "hot" and "cold" care pathways). This was necessary to provide safe patient care through the hospital, to avoid hospital-transmission of Covid-19 to those without Covid-19, whilst expanding much needed elective care services and pathways. The consequences were wide-ranging including with respect to staffing requirements out with peaks of the pandemic.

29. Across the time-frame, care was provided in the context of higher levels of sick leave caused by infection or presumed infection with Covid-19. At the height of the first peak in April 2020, UHB had 2622 staff absent due to Covid-19 and a further 720 unavailable staff who were shielding due to age, pregnancy or being clinically vulnerable. In the second and third waves, staff absence did not reach the same levels, peaking at 1,068 Covid-19 related absences for UHB in January 2021, with a further 141 unavailable shielding staff.

30. At the peak of the first wave of the pandemic the average time lost to Covid-19 by staff group was:

- 24% Medical and Dental
- 24% Nursing and Midwifery
- 24% Additional Professional Scientific and Technical
- 26% Additional Clinical Services
- 20% Admin and Clerical
- 19% Allied Health Professionals
- 27% Estates Ancillary
- 20% Healthcare Scientists

31. In line with national guidance, the reasons people were absent included symptoms compatible with Covid-19, having a symptomatic household member or because

they were shielding, due to health conditions, pregnancy or being aged over 70 years.

32. At different times the Government issued advice to Clinically Extremely Vulnerable (**CEV**) staff to shield from social contact. Prior to the period of shielding, staff were supported in completing a personal risk assessment for Covid-19, co-ordinated by Occupational Health (**OH**) services which work across UHB. This service was used to develop an individualised risk reduction plan (section 'QEHB's approach to staff risk assessments prior to the national guidance being available').

33. Vulnerable staff worked from home where possible, either in their own role or providing support to other work areas remotely. This was understandably a difficult time for all our staff. Many were extremely anxious about their health and that of their family. Staff who were not CEV but had underlying health conditions and wanted specific guidance on their own underlying health conditions, were able to seek advice from Occupational Health on the workplace risks of exposure. There were approximately 5000 Covid-19 related contacts with Occupational Health in 2020 and 2021 across UHB, with questions or to gain support.

34. The Government paused shielding on 1 April 2021. At this time, we recognised that returning to work after shielding was likely to affect staff in different ways. Therefore, as soon as possible, line managers contacted shielding staff to discuss transitioning back into the workplace. Where possible and where able to work from home, staff were encouraged to continue working from home. However, if staff could not work from home due to the nature of their role, managers would discuss and agree a gradual and flexible return to work in a supportive way.

Staff testing

35. Initially, pathogen and antibody testing of staff was only undertaken in the context of a clinical study (where 1,818 QEHB staff were serially tested for Covid-19 and antibody levels) and therefore was not relevant to day-to-day decision making. The preliminary findings of this research were relatively reassuring in terms of the likelihood of hospital versus community transmission **[SB/03 INQ000437442]**. Our staff are drawn from our local population and this research identified that

development of antibodies to the virus (SARs-Cov-2) corresponded with community peaks of Covid-19, and not peaks in Covid-19 hospital admissions, which lagged behind cases by approximately two to three weeks. This suggested staff were developing Covid-19 due to community exposure rather than hospital transmission. Also, there was no excess of Covid-19 antibody detection in ICU staff, suggesting that PPE was effectively mitigating the risk associated with exposure to aerosolised virus.

36. As staff testing for infection became available then it became easier to manage workforce availability as there were fewer absences necessitated by self-isolation. This is reflected in significantly lower levels of absence during the January 2021 peak of admissions.

37. Testing became more readily available with the development of the network of laboratories dedicated to Covid-19 testing named 'lighthouse laboratories'. This capacity included the Birmingham Turnkey facility, a medium-throughput Covid-19 testing facility that operated within the UK's national Pillar 2 testing infrastructure, developed with University of Birmingham (**UoB**) and the Department of Health and Social Care (**DHSC**). This could process 3,800 tests in 12 hours and was used to test symptomatic NHS (including QEHB) staff in September 2020. This was soon followed by availability of point-of-care testing for patients and staff, which allowed near real-time management of the workforce and patient flows, enhancing safety. (**section below 'Building testing capacity to protect staff and patients'**).

38. In conjunction with the availability of Covid-19 testing, QEHB developed a standard operating procedure for the testing of staff to support their retention in frontline care (first version approved April 2020). This was associated with a series of infographics outlining how and when to self-test for Covid-19. This infographic (alongside a suite of tools co-developed with UoB) were made available to hospitals nationally and internationally. Testing of symptomatic QEHB staff for Covid-19 commenced in April 2020 in limited numbers. Laboratory turnaround times were initially slow (5-7 days), but these improved over the course of 2020, reaching a 24-hour turnaround time in late 2020. Lateral flow tests were distributed to staff from December 2020. Symptomatic household members were also tested

to identify if staff would need to continue isolating. This enabled staff to return to work sooner if they tested negative. All Government guidance was followed for isolation of infected staff and their household.

39. In addition to these developments in laboratory testing of staff, there were significant logistic responses including development of a system for one-day turnaround that involved the Facilities Department delivering swabs through its Transport Service from April 2020. This involved a driver waiting and collecting the completed test for same day return to the Laboratory. Using this same methodology, UHB worked with healthcare organisations across Birmingham and Solihull, providing a home swab service to their staff, and subsequently to use their drive-through facilities.

40. Between April 2020 and April 2021, a total of 9,276 tests were carried out for UHB staff, with 74% reporting a negative result, enabling 5,252 staff to return to work sooner. 29% of all tests undertaken had been of household members. Everyone tested was contacted by an Occupational Health (**OH**) nurse with their result, for a health check and advice. However, capacity meant that there could be delays in people being contacted, sometimes causing delays in their return to work and access the support they needed. Although rarely more than a day, these could be a source of frustration. These conversations could be extremely demanding, particularly when there had been a death in the family, or a family member was critically unwell due to Covid-19. In these situations, counselling was offered to staff, albeit within the limited resource available to support this across the entire workforce.

41. Staff members fitness to work was assessed as compassionately as possible, while promoting a return to work when within guidance. Where staff undertook lateral flow tests, they were asked to log positive results as per usual absence reporting and a member of Human Resources (**HR**) would also contact these staff individually. UHB is fortunate to have an in-house OH service (not externally sourced) and therefore was able to flexibly adapt the practices of the department to take on this different way of working. However, inevitably the demand for OH

services far outstripped the resources available to deliver the level of support that was needed across the workforce.

Managing workforce and redeployment

42. One of the challenges in managing workforce availability against patient need was the limitation in HR systems to capture and map staffing capacity daily. To overcome this, manual data collection of staffing levels was undertaken at the start of each shift across the workforce, in every clinical area. Later a semi-automated process for near-real time staffing levels was instigated, following development of a web-based application for local data entry.

43. Staffing shortfalls were approached in various ways including the following:

- Development of streamlined employment standard operating procedures to enable a faster recruitment process.

- The retirement procedure was amended to enable people to retire and return more quickly (to enable staff to retire and return with a minimum break of 24 hours rather than the previous 14-day requirement);

- Job evaluation requests were prioritised to ensure that the most urgent roles could be recruited to more quickly.

- A key worker letter was provided to staff to enable their children to be exempt from closure of schools which enabled staff to be at work.

- The limit on the number of days staff could carry annual leave over from one leave year to another was removed when annual leave was constrained by operational pressures.

- All staff had an option to sell up to a week of annual leave.

- Occupational Health continuously updated the 'Guidance on health conditions and remaining at work during the Covid-19 pandemic' (disseminated to staff via email updates and content on our microsite) as evidence improved on how the virus affected individuals.

- An internal deployment unit was set up through each wave of the pandemic and a coordination centre was set up in January 2021 to redeploy clinical staff into ICU and backfill vacancies created by frontline redeployments. Suitable staff were identified through an internal reservist register, where staff with reduced activity in their usual work could be identified and redeployed to an area of greater need.

- Mutual aid from other providers in the ICB and a memorandum of understanding was set up to support this in December 2020. At peak, a total of 1,488 clinical staff were deployed across UHB, including support from across the Birmingham and Solihull ICB network.

- A significant number of senior nurses, particularly on ICU, chose to delay planned retirement. This was highly beneficial during the pandemic response, however, towards the end of the period under review, when it was understood that the immediate crisis had been addressed, these individuals and others then chose to revert to their plans. This then contributed to a relative staffing shortage that led to a greater challenge in supporting the period of recovery.

- Clinical academic staff (substantiative employees of UoB) who usually contribute 0.3-0.5 Full Time Equivalent (**FTE**) time to clinical work were deployed at 1.0 FTE.

- Approximately 800 medical students (those in clinical years 3-5 of the MBChB programme) took on a number of support roles in QEHB (see 'Development of the ICU Family Liaison team during the pandemic', paragraph 148-157), carefully supported by senior managers and clinical staff. These included working as family liaison officers at QEHB, updating family members daily of the condition of their relative, releasing qualified staff to care for patients,

working as volunteer or paid healthcare assistants, liaising with staff and arranged shopping, childcare and other support services to enable staff to work on the frontline and when vaccines became available many students worked in QEHB vaccine clinics as vaccinators and administrators.

44. The response to peaks of the pandemic at QEHB was marked by the need to significantly redeploy staff across the multi-professional teams, to provide care on acute medical wards and ICU, whilst elective activity was reduced or stopped.

45. A detailed example of the significant redeployment, reorganisation, training, and support required has been published for ICU at QEHB in the first peak of the pandemic. This describes that in April 2020 the peak number of patients cared on ICU was 126 (mean daily occupancy = 113). This required deploying an additional 205 doctors, 168 nurses who had previously worked in ICU and 261 nurses deployed from other parts of the hospital. The approach involved creating clearly defined teams that supported individual care delivery and training, alongside other teams that were devoted to a single task for multiple patients, such as proning (turning a patient so that they lie face down for a period of time), renal replacement therapy or tracheostomy formation (creating a breathing tube in the neck). A detailed description has been published **[SB/04 INQ000437443].** This general response eventually became described as a 'reservist' workforce of staff that were known to be trained and were willing to return and support ICU.

46. At QEHB, the creation of temporary registers for doctors, nurses, midwives, and pharmacists to enable trainees and retired staff to work in these roles had relatively little impact upon deployment into the hospital.

47. One of the largest pieces of estates work undertaken in 2020 was the creation of the Nightingale Hospital in the National Exhibition Centre on the outskirts of Birmingham which UHB and, in particular, QEHB staff led on. As concerns grew that Covid-19 would overwhelm the NHS's critical care capacity, emergency Nightingale hospitals were commissioned with the aim of supporting the NHS to cope with surging numbers of patients. The seven Nightingales had different use cases associated with them. The Birmingham Nightingale, was developed to have

an eventual capacity of 4,000, was designed to treat patients who would require less intensive treatment. QEHB deployed a relatively small number of senior members of staff to the Nightingale Hospital development, a major undertaking by this group. These individuals were recalled when it became clear that this facility would not be needed. If the Nightingale Hospital had been used for patient care, it is likely that temporary registers would have come to the fore. The Birmingham facility was closed permanently in April 2021.

48. Apart from these temporary deployments to the Nightingale Hospital, QEHB did not send staff to other hospitals. When the vaccination programme was rolled out across the region, a high number of QEHB NHS staff worked in vaccination clinics as agency or "bank" staff. This was needed to facilitate vaccine delivery and was viewed very positively by staff taking part in the vaccination programme. However, staff working additional shifts in the vaccination programme were then unavailable for clinical shifts in the hospital, effectively reducing staff numbers who were available to work on the wards.

Supporting staff directly affected by Covid-19

49. During the reporting period, there were 36 QEHB staff members with long-Covid who required support from Occupational Health and Human Resources. In the context of the size of the workforce, this had only a minimal impact on staffing capacity overall. However, we recognise the importance of Covid-19 related ill-health on these staff members, their families and their local QEHB teams, and wish to do all we can to support these individuals and others who felt they had been affected by Covid-19 related illness.

50. QEHB runs a staff health clinic, where staff can self-refer for a health check and discuss any health-related concerns. This runs separately to, but with input as necessary from Occupational Health. Although this was paused during the peaks of the pandemic, it was reopened as soon as staff became available. From late 2020, people who were concerned about the impact of Covid-19 on their own health were able to access this, to be reviewed by a medical consultant and to be referred onwards for investigations and treatments, as considered necessary.

However, access to this service was limited and there were delays in people being seen due to the availability of appointments. For those who had been hospitalised with Covid-19, recognising the need to better understand long Covid, QEHB took part in a national programme of post-Covid research clinics (PHosp-Covid). This was also open to staff.

51. In conjunction with OH, QEHB's inclusion team supported the introduction of a long Covid-19staff network; enabling a forum for staff to share their experiences.

52. Briefing sessions with managers were also undertaken to support the management of long-term absence due to long Covid and developed long Covid and disability leave guidelines, aligned to national policy.

53. During the reporting period, QEHB extended its Sick Pay Panel. This met monthly to consider cases where individuals were adversely affected by long-Covid-19 related illness, including decisions around extensions to being on full or half pay during periods of sick leave. During the reporting period, a total of 21 applications were received to this panel, seeking an extension of sick pay. Almost 50% of applicants were granted an extension of their full sick pay entitlements for a minimum of three months. The remainder were either already in receipt of half pay or were moved to paid leave using special leave measures. The extension to Sick Pay Panel remains in place today.

54. In total, one member of QEHB staff died from confirmed Covid-19 while a second unconfirmed Covid-19 death occurred after the deceased had tested positive. One was a Bank Nurse who had retired and returned to work during the pandemic to support her colleagues and the second was a Charge Nurse.

55. The impact of both deaths was extremely hard on those valued staff members' immediate colleagues. Loss of a staff member, whether at the QEHB or at our other hospital sites, was supported locally under the leadership of the relevant executive, with tailored responses and actions dependent on what the staff members felt was needed and appropriate to their situation. For some this was a memorial, for others Chaplaincy and Bereavement support, while more permanent

tributes included tree planting and memory walls. There was a Trust memorial service dedicated to colleagues who died of Covid-19 and blossom trees were planted in the summer 2021 on each of the 4 hospital sites in remembrance.

56. As QEHB forms part of a close-knit clinical community across its own Trust and other Birmingham healthcare partners, we were cognisant that any member of staff was likely impacted by news of an NHS worker's death due to Covid-19.

57. From the outset of the pandemic, staff were signposted to mental wellbeing support through our regular communications which were sent via email to all staff and disseminated by managers and via our dedicated Covid-19 Staff Guidance section on the intranet, which could also be accessed from non-UHB servers 24/7 so that this was available when outside the hospital. A fuller account of the mental health and wellbeing support that was available is outlined below (section 'The impact on staff wellbeing and morale'). However, it is important to reflect that these support services were limited, due to capacity, and undoubtedly were insufficient to meet the needs of all staff, despite our best intentions.

Staff vaccination and VCOD

58. The Covid-19 vaccination programme for NHS staff was a critical turning point during the pandemic, enabling us to protect our workforce whilst supporting them to care for our patients. QEHB staff took part in early clinical trials of the vaccine and there was a high uptake of the vaccine across the reporting period. Eligible staff could receive vaccinations in regional hubs, in QEHB "walk-in" vaccination clinics, which served both staff and members of the public, and later in roving "pop-up" clinics in specific clinical areas.

59. In order to comply with Covid-19 vaccination as a condition of deployment (**VCOD**) regulations, published on 10 November 2021, staff who were in scope of the mandate needed to have had their first dose by no later than 3 February 2022 in order to then receive their second dose by no later than 31 March 2022, to be able to be deployed from 1 April 2022.

60. On 3 February 2022, 84% of staff at QEHB in patient facing roles were fully vaccinated, 8% had one dose and 8% were either unvaccinated or had not declared their vaccination status.

61. Across UHB (including QEHB) the national guidance was applied. This included an interpretation that individuals 'in scope' of the mandate were those who, during their role, enter any open/live clinical areas as part of the patient pathway (for example, ward areas, theatres, outpatient departments, etc.).

62. Those 'in scope' staff who were unvaccinated would not be able to continue in their current role. There were some staff who may have been eligible for medical exemption or temporary medical exemption, but the circumstances in which that was applied were extremely limited. We explored options around redeployment or reconfiguration of roles for those at risk of dismissal who remained unvaccinated without exemption.

63. A multi-professional steering group was established in November 2021, overseen by the Chief People Officer, to manage both the vaccine roll-out and the VCOD programme. Actions were taken forward in relation to data validation, staff engagement campaigns, vaccination champions, support for managers, development of policies, procedures, equality impact assessments and assessing the risk to services.

64. The processes supporting VCOD were extensive and time consuming. Confirming vaccination status was not straightforward as the quality and availability of nationally held information was variable. What was reported as 'unvaccinated,' QEHB decided to call 'unknown vaccination status' as it became clear that significant numbers of vaccinated staff were not captured in the data made available. The description of this group as "unvaccinated" without checking had the potential to cause significant impact for these individuals, on staff morale and therefore on the services they delivered. Access to accurate information was central to making this policy workable.

65. Our priority was to encourage staff to get vaccinated and to give them easily accessible and credible information to help address concerns they may have had leading to vaccine hesitancy. Activities included myth-busting emails and information sheets, and discussion groups, focused on specific staffing groups. We were clear and transparent on the potential consequences on their employment and career if they remained unvaccinated, at the same time being sensitive to the concerns and convictions of individuals. One-to-one conversations took place with all staff for whom we did not have a vaccination status. Line managers were supported in how to have these conversations and how to direct staff with anxieties regarding vaccination to alternative but credible sources of information. Where non-vaccination status was confirmed, a range of approaches were used, including the opportunity for conversations with clinical experts. Psychological support could also be accessed through Occupational Health and the Staff Health Clinic running at QEHB. Easy access to vaccination was also facilitated by on-site hubs and a roving vaccination service, prioritising particularly low uptake areas.

66. The mandate, which came at the time of the third wave, had a significant impact on all staff. As well as unvaccinated staff experiencing anxiety and concerns about their roles, there was a consequential impact on vaccinated staff; they were both concerned for their unvaccinated colleagues as well as fearful about the extra pressures this could put on them to deliver their services. We tried to ensure that all-staff briefings in the hospital addressed concerns from all perspectives, including those with vaccine hesitancy.

67. As more data became available on vaccine uptake, we were able to identify service "hotspots"; those with a greater proportion of non-vaccinated staff. Vaccination teams worked with those areas to encourage vaccination uptake and develop contingency plans for service continuity. There was also extensive effort to gain assurance from staff groups not in our direct employment – including trainees and contractors.

68. For job applicants and new starters, information relating to mandatory vaccinations was made a clear requirement at application and was part of the pre-employment checks. We did not see any impact of this on numbers of applicants or withdrawal

of applications. This requirement was withdrawn when the Government withdrew mandatory vaccination requirements with effect from 15 March 2022.

69. UHB did not introduce an organisational VCOD policy following the Government withdrawal of its mandated position; instead, we worked with staff to help them make informed choices and addressed their concerns about the vaccine where possible. At the end of the reporting period, vaccination uptake remained at approximately 86% across all patient-facing staff in QEHB (substantive and active bank only workforce).

Other staffing capacity issues

70. UHB was the lead employer for the system Covid-19 Vaccination Programme for Birmingham and Solihull. 6,390 clinical and non-clinical staff were trained and inducted to support the vaccine roll-out. The temporary workforce delivering vaccination to our wider population included substantive staff delivering the vaccine through additional shifts. This worked well in some respects because these staff felt that delivery of vaccines was a positive activity in the context of delivering extremely difficult in-patient care. However, as stated earlier, this resulted in these staff being less available to support other health care activities including frontline care work, reducing the availability of our workforce.

In-patient capacity

Action to free up hospital beds at the onset of the pandemic

71. As the impending scale of the impact of the pandemic on hospital beds became clear, QEHB's operational teams were involved in planning reduced elective activity from late February 2020.

72. On 17 March 2020, NHS England/Improvement's discharge policy was implemented. This had two main components; first to free up the maximum possible inpatient and critical care capacity through the postponement of all non-urgent elective procedures and discharging all patients considered medically fit to leave hospital; second, to prepare for and respond to large numbers of inpatients requiring respiratory support. QEHB had already initiated. In the week before 17

March 2020, Senior Responsible Clinicians for each hospital in the group, including QEHB, were appointed. They took a lead on the organisation and delivery of inpatient medical care outside of the ICU, organisation of seven-day a week consultant led reviews, early discharge, optimisation of care pathways (including clear communication and documentation of any ceilings of invasive treatments), as well as liaison with ICU colleagues for escalation of treatment. They also worked closely with ICU leads in developing optimised pathways for referral (section 'Building capacity in QEHB's ICU').

73. In the 12 months prior to the pandemic the mean number of beds occupied at QEHB was 1053 General and Acute beds (99%) and 66 ICU (97%) beds. By 17 March 2020 when NHS England/Improvement's discharge policy was implemented there were 960 General and Acute beds occupied and 40 ICU beds occupied. The total number of ICU beds available was increased progressively from 67 to 142 (January 2021) in order to deliver the increased need for ventilation in patients with Covid-19, creating average an extra 75 beds at the peaks of the pandemic **[SB/05 INQ000437444]**.

74. All decisions to increase ICU beds were made at a Trust Board level, supported by regional and national decisions that facilitated this marked expansion in capacity, including the eventual provision of suitable ventilators and consumables and the ability to increase the substantive and "reservist" workforce to provide adequate staffing. As described above, increasing ICU bed capacity from 67 (March 2020) to 126 (by April 2020) required the deployment of an additional 205 doctors and 429 nurses to staff those extra 59 level-3 ICU beds at a time when on average 25% of the workforce were unavailable due to ill-health, self-isolation or shielding.

75. The challenge the hospital faced was not the total bed occupancy but the high numbers of patients with Covid-19 **[SB/06 INQ000437445]** combined with the high level of acuity across all those admitted with Covid-19 (Level 1a, 2 and 3). These would conventionally require higher staffing levels.

76. Deployed members of staff had to be moved from other clinical areas to support the expanded ICU footprint and decisions made about which clinical areas could be kept open safely and which needed to close. Reducing overall bed occupancy, where possible, formed a vital part of this decision-making process, due to the workforce capacity it unlocked. The letter from NHSE on 17 March 2020 provided clear direction as to our approach to this difficult situation and enabled joined-up conversations across the Integrated Care System (**ICS**) as to how we would maintain the NHS's ability to care for the most acutely unwell.

77. To prepare for the predicted influx of patients requiring hospital care, QEHB also formed a collaborative working group with clinical academic staff to help shape a pipeline of automated data collection using QEHB's self-designed and managed comprehensive electronic health record.

78. An electronic clerking sheet was designed and built, enabling the capture of structured information about the demographics, presenting symptoms, severity status, test results, and outcomes of patients **[SB/07 INQ000437446]**. Later, this also included "blood bundles" to support standardised approaches to laboratory testing. In time, this was supplemented with links to treatment guidelines as these became available. This resource not only supported staff in new clinical areas but was also used as a planning and research tool to better understand the inflammatory nature and clinical presentations of Covid-19 and to identify patients at greatest risk of decline.

79. For our staff, the information was displayed in a 'dashboard' graphic circulated each day, to help predict and plan likely admissions, and to support discussions about workforce and bed space capacity locally and regionally across our ICB. The first version of the dashboard was available on 6 March 2020, with a daily update generated thereafter.

80. It is important to identify that the initial phase of the pandemic in March and April 2020, was a time of great uncertainty regarding the clinical features of Covid-19, including its presentation and transmission. Although reports of asymptomatic

Covid-19 were emerging in the literature, these were rare and not well described. Furthermore, there was no community testing and in-hospital result reporting was slow with a laboratory turnaround time of 5 - 7 days. It is probable that people with Covid-19 but with mild, atypical presentations were discharged without Covid-19 being suspected. It is also the case that people who were mildly symptomatic and did not require hospital care, were sent home with suspected Covid-19. Once Covid-19 test results were known, the Infection Prevention and Control (**IPC**) team at QEHB undertook patient contact tracing, including of patients discharged in the community.

Building capacity in QEHB's ICU

81. It was apparent in reports from colleagues in Italy, and in the modelling from Ferguson and colleagues released on 16 March 2020, that there was every likelihood of very high levels of demand for ventilation. The infrastructure at QEHB (see 'Overview of the Queen Elizabeth Hospital Birmingham', paras 7-17) meant that the hospital was better placed than many to respond to that demand, dependent upon support and mobilisation of the clinical workforce. As the first wave progressed, data from the electronic healthcare record were used to rapidly adapt our approach and predict demand for ICU, in our population.

82. The practical hurdles of increasing ICU capacity included maintaining a relatively concentrated footprint so that access to support was optimised. The design of the ICU at QEHB was particularly suited to this approach with 4 interconnected wards and provision for up to 100 beds. On de-escalation, wards could be sealed by closing the doors and rerouting staff/patient entry and exit pathways, as each ICU ward has its own entrance. This enabled separation of Covid-19and non-Covid-19pathways. It was therefore not necessary to undertake significant modification of the ICU. A 'mothballed' ICU in the Heritage / Wellcome Building was re-opened to provide a 31-bedded open plan ICU for non-Covid-19pathways (emergency and tertiary cases).

83. While the physical environment of the QEHB leant itself to increasing capacity, this surge in patient numbers and the level of care they needed had a major impact on frontline staff. There were concerns expressed about operating the ICU at 206%

capacity but there was also widespread recognition by healthcare professionals across UHB, that this response would deliver the best possible outcome for the population of Birmingham and Solihull.

84. The clinical leadership actively planned to maximise the capacity to support patients on ICU. There was a clear understanding that any response would reflect best endeavours. Communications from the Chief Medical Officer, the Chief Nursing Officer, from NHSE/S/W and from professional and regulatory bodies played an important role in supporting the workforce providing care out with their normal scope of practice and in unprecedented circumstances. The understanding that these efforts would be appreciated and the challenges of individual decision-making in such circumstances would be understood and considered fairly by the Trust, professional bodies and regulators, was an important message for those delivering care. This was understood and led by senior healthcare professionals within the ICU.

85. This position was further supported by the regular provision of data on outcomes to ensure that outcomes were in line with expectations. Once national coding standards became available, standardised mortality ratios were calculated for Covid-19. This was consistently around 0.85 which is low [**SB/8 INQ000437447**]. Feedback suggested this information sharing was helpful.

86. In order to support the extended workforce, a suite of 'quick look' reference and guidance documents were rapidly produced by the medical and nursing educational leads: these were kept in every bedspace either electronically on the Computer on Wheels or as laminated copies in folders. The staff were guided to use these as a reference to support their work given that ICU trained staff were overseeing care of a number of patients as part of a team, typically caring for groups of 4 patients. Clinical Educators also worked on a rota 24/7 to cover the ITUs and would float across the ICU wards, supporting and guiding the staff whilst also looking for signs of staff in distress or panic.

87. In order to support staff emotionally, senior medical and nursing colleagues delivered Covid-19 briefings daily with their teams and undertook 'post-wave

debriefs'. Bereavement colleagues, chaplains, psychological first aiders and senior staff would maintain a presence at the donning and doffing stations as staff would be regularly leaving the units in distress and require support, in which case it was possible to release them for rest and recuperation. Staff shifts could be changed at short notice when necessary to accommodate those who were struggling and needed time away from work. Individual shift patterns were also monitored as some staff were in 'fight' mode; not getting enough time away from work or not taking their annual leave to try and support colleagues and patients. Staff often declined time off work, many feeding back that they suffered guilt if taking days off in the face of such pressures.

88. We did not anticipate the moral injury to staff who were forced to isolate and therefore could not work on the frontline, leaving them to feel they had let down their colleagues. In truth, we simply did not have sufficient resource to contact and check in on them all; some report feeling forgotten.

89. There were challenges in caring for staff deployed to ICU from other areas of the hospital. Some were well looked after by their line managers, who would contact them regularly and visit them to ensure they knew that they were not alone and were being thought of. However, we know others felt less well supported once they were deployed. This is an area of future learning for the Trust and system.

90. Trust-employed psychologists saw staff members in the greatest distress. This resource would have benefited many more staff, however limited capacity and difficulties of working in the pandemic meant that demand would undoubtedly have outstripped supply. More widely, clinical psychologists who were not working clinically, worked with the wellbeing team to commission provide and roll out Psychological First Aid (PFA) training across UHB. This ensured that there were local PFA in departments to help provided peer to peer support in a timely manner.

91. For context, increasing burn-out and stress requiring dedicated pastoral support was identified within QEHB's critical care nursing staff before the pandemic. In response to this, ICU had adopted strategies to try to support their staff differently and therefore had some foundations to build upon when the pandemic came. Such

support services included restorative practices in Critical Care. Restorative practice is a term used to describe behaviours, interactions and approaches which help to build and maintain positive, healthy relationships, resolve difficulties and repair harm where there has been conflict. QEHB employed a Band 7 full-time Professional Nurse Advocate to run group workshops and build materials to help resolve conflict or distress in ICU. These proved to be extremely helpful during the pandemic. The role was expanded to a team during the pandemic to offer the additional psychological welfare to our most distressed nurses.

92. It is important to reflect that while ICU was a critical area for the Covid-19 response, the majority of patients who died in hospital from Covid-19 were cared for in the Emergency Department, Acute Medical Unit and other medical wards across the hospital. Staff in these areas with high exposure to patients suffering from Covid-19, and particularly the high levels of morbidity and mortality observed in the first wave, can at times feel under-appreciated, given an apparent focus on ICU capacity. This was addressed as much as possible in staff-wide communications, ensuring that all staff groups were thanked and appreciated. The role of ancillary staff that were responsible for supporting the hospital's function should similarly not be under-estimated.

Critical care network

93. QEHB was part of a Critical Care network across the West Midlands. QEHB made use of inter-hospital transfers as much as possible, however as a very large ICU with significant capacity. It generally received patients from other hospitals in the region.

94. Between late March 2020 and June 2022, QEHB accepted a total of 363 transfers in and made 160 transfers out. 216 of the transfers in were for repatriation or clinical indications and 51 of the transfers out were for repatriation or for clinical indications. With specific reference to capacity transfers during this period, QEHB received 147 transfers, 138 were from within UHB, a further 6 from within network and 3 were from outside our network; QEHB transferred out 109 patients, of which

53 were within UHB, a further 7 were within our network, and 49 were outside of the network. Of these transfers out of QEHB 43 occurred in a 28-day period from the 22 January 2021.

Managing supplies and equipment to ensure safe patient care

95. In the first phase of the pandemic, the availability of suitable ventilators to manage patients with Covid-19 was a particular concern and, initially, a number of unsuitable machines were delivered from central procurement. These were portable/mobile ventilators, normally used for temporary patient transfers and not suitable for long-term patient use. However, the efforts of national procurement to respond to this issue were appreciated and going into the January 2021 peak, there was a reasonable reserve of usable ventilators.

96. As already outlined, QEHB is a largely modern hospital and the oxygen supply is therefore well specified to most parts of the new building. As the pandemic grew and capacity was managed, there was careful monitoring of supplies in the Heritage Building (legacy estate), which required upgrades to flow monitoring.

97. The capacity of the QEHB's vacuum insulated evaporator (**VIE**) storage for oxygen (a form of pressure vessel that allows the bulk storage of cryogenic liquids including oxygen) was significant and well monitored with the BOC (medical gas supplier) system in place, which included central alarm systems and dashboards displaying information on liquid level and tank pressure.

98. The primary concern with respect to oxygen supplies lay in UHB's other hospitals, where the estate is significantly older and where hospitals had lower oxygen carrying capacity. This resulted in careful planning of where patients would be cared for, using QEHB to mitigate the risk at times of peak demand.

99. The use of High Flow Nasal Oxygen (**HFNO**): an oxygen supply system capable of delivering up to 100% humidified and heated oxygen at a flow rate of up to 60 litres per minute) had been reported in case studies but not tested widely. The use

of HFNO had been reported to be associated with other hospitals' concerns about oxygen supplies. There was also no existing evidence that HFNO benefited outcome in this setting, therefore patients at QEHB received HFNO primarily in the setting of a national randomised controlled studies testing the efficacy of this treatment (the RECOVERY-RS study). In total, UHB enrolled 480 patients into this trial, which was reported in January 2022. There was indeed no benefit from HFNO compared to usual oxygen therapy (Oxygen Therapy: JAMA.2022;327(6): 546-558).

100. The QEHB ICU uses an online system for the provision of ultrapure water and online manufacture of diafiltration fluid, similar to a dialysis unit. This protected it from shortages in the supply of haemofiltration consumables that impacted other centres including those in the Trust.

101. The supply of medication used in ICU such as propofol and atracurium, was problematic. This was managed by standardised daily monitoring, integration with regional procurement, load balancing across hospitals in the group and mutual aid between hospital trusts. Alternative medications were used such as pancuronium, whilst the Pharmacy Aseptic Unit batch produced morphine/midazolam syringes and noradrenaline bags to reduce nursing time making these up on the ICU, freeing up time for patient care. Again, the EHR was used to signpost healthcare professionals to structured prescribing for the use of both standard and alternative medicines and formulations, to try to ensure that any shortages did not impact on patient care or safety.

102. Later in the pandemic, medication for treating Covid-19, including remdesivir, tocilizumab, sotrovimab were sometimes in short supply. The DHSC issued Central Medicines Supply Notifications (MSN's) with recommendations which were followed scrupulously. (MSN's issued for remdesivir on 13/04/2022, 27/07/2022, 09/12/2022, issued 08/03/2023, tocilizumab on 03/08/2021, 03/12/2021; sotrovimab was always on allocation). These provided advice on the specific indications for treatment and alternative options. Pharmacy supported these processes through liaison with the NHS regional pharmacy

procurement leads who were managing stock allocation across the country, along with mutual aid between trusts. In addition, pharmacy ensured that usage of medication was strictly aligned with the commissioned criteria as defined in the Blueteq approval forms, lead on the completion of the Blueteq form on behalf of medical teams, checking stock to ensure there was enough to complete the course when prescribed, supported Trust communications and liaised with the Infectious Diseases team and Medicines Management Advisory Group, as new advice around treatment options were released. The wider Pharmacy response has been described in detail [**SB/09 INQ000437448]**

103. Where possible, and before these therapies were included in clinical guidelines, UHB hospitals, took part in a large number of clinical trials of emerging therapies. This was felt to be important, enabling patients to benefit from new therapies while adding to our understanding of the disease. QEHB recruited 807 patients into such intervention studies over the reporting period. (Our patients also contributed to many national observational studies, to better understand Covid-19 in general and in specific patient groups. In total, in the reporting period, QEHB recruited 13,091 patients into observational studies of Covid-19, contributing significantly to our knowledge of this new disease).

104. In addition, there was significant liaison through the regional and national command structures, regarding requirements for ventilators, the risks associated with oxygen supply, and renal replacement therapy. The relative shortage of ventilators was a national problem, although perhaps particularly acute given the demand evident at QEHB and more widely across Birmingham and Solihull. Arguably the greatest concerns of all staff within QEHB related to supply of adequate PPE of all types and capacity for FIT testing. This exacerbated uncertainty and anxiety already being experienced by staff delivering frontline care.

Managing Infection Prevention and Control within the QEHB

105. Throughout the pandemic, UHB followed national Infection Prevention and Control (**IPC**) guidance, developing a "policy tracker" living document, recognising

that central policy and PHE (now UKHSA) advice would and did evolve rapidly **[SB/10 INQ000437432].** Each time new IPC or PPE guidelines were published for NHS teams by UKHSA, UHB updated its IPC standard operating procedures and controlled documents to ensure these were aligned. This role was overseen by the IPC team within UHB. This team provided seven-day working cover throughout pandemic peaks.

106. UHB took a multi-faceted approach to the dissemination of IPC guidance and Covid-19 guidance in general, including email, regular staff briefings using Teams, cascaded communications through clinical leadership teams and ward champions, posters and social media campaigns. However, the most effective/popular was a dedicated microsite in which local and national guidance was made available alongside summary information in the form of infographics developed by members of the UoB academic teams and informaticians within UHB.

107. The Covid-19 microsite included an easily accessible and searchable gateway to 166 controlled documents. There were more than 4 million unique page views between March 2020 and June 2022 with a maximum number of visits in a day of 23,000 (with the majority of activity taking place during the peaks of the pandemic). This was both within and outside UHB. The associated infographics for IPC, mask wearing, and self-testing were reported widely and disseminated locally, nationally and internationally. They included links to the full controlled document which itself included links to underlying national policy.

108. UHB undertook multiple pieces of communication during the pandemic that touched on IPC, from weekly Chief Executive bulletins to daily and weekly communications provided during the pandemic to staff and patients. The dedicated Covid-19 intranet pages were regularly updated with new information and guidance for all staff. The Covid-19 dashboard **[SB/11 INQ000437433]** and daily situation report **[SB/12 INQ000437434]** were also available for staff. A daily report was presented at strategic and tactical meetings where all information was reviewed and utilised to guide the on-going pandemic response.

109. In monitoring instances of staff infection, it was determined that a contributory factor in outbreaks included staff practice e.g., PPE usage or failure to comply with social distancing in confined office spaces. An example of this might be a staff member wearing a mask over the mouth but not the nose in non-clinical areas. In response to this, Covid-19marshals were placed across the hospital, tasked with sharing best PPE practice. The marshals would help staff with the correct use of PPE and improved social distancing compliance in the hospital. The Trust provided continual education around PPE, which involved working with the Communications Department and UoB teams to develop and update educational infographics and staff updates via email, plus face-to-face education in clinical areas. Wards and departments were requested to conduct monthly Covid-19 compliance audits and submit to the IPC team for assurance. There were also posters and floor stickers to help with social distancing, as well as the development of one-way systems and limited lift occupancy.

110. One of the challenges during the Covid-19 pandemic was ensuring hospital processes were aligned to the rapidly evolving national IPC guidance (which was dependent on both emerging knowledge of Covid-19 and the changing national picture of infections and hospitalisations) at a time of considerable strain on healthcare provision. In order to address this fast-changing environment the Trust had regular strategic and operational Covid-19 meetings in 2020/21, continued in 2021/22; held on a daily basis during peak periods and three times a week outside these times. The strategic group was chaired by the Chief Executive and members of the group included the Chair of the Trust, all the executives (Chief Medical Officer, Chief Nurse, and Chief Operating Officer), Deputy Director IPC and Lead Infection Control Doctor. Here, rapid decisions were made in response to the pandemic. As mentioned previously, the Trust had appointed Senior Responsible Officers (Medical SROs; Deputy Associate Directors of Nursing) who supported Covid-19 outbreak management in conjunction with IPC leads. The primary role of the SRO was to provide clinical leadership, allocating resource and supporting staff.

111. Daily operational outbreak meetings with wards at QEHB were chaired by the Deputy Director IPC or Lead IPC Doctor. These meetings included external

regulatory partners such as the ICB/CCG, UKHSA and NHSE. There was regular attendance from the ICB/CCG and UKHSA at these meetings. During the heights of the pandemic, daily strategic incident management team meetings were held and chaired by the Director of IPC (Chief Nurse) or Deputy (Consultant Clinical Scientist) with SROs, Lead IPC Nurses, Lead IPC Doctor and local partners including PHE, NHSE/I and the Clinical Commissioning Group (**CCG**). IPC provision and compliance formed a running agenda item.

112. During 2020-21, multiple healthcare policies were published by the UK Government and healthcare regulatory bodies (e.g. UKHSA, NHSE/I, MHRA, NHS, CQC, NICE etc.) detailing how healthcare institutions should manage Covid-19. UHB reviewed the multiple policy changes and advice published by these regulatory bodies, implementing that which was salient, ensuring both our staff and patients were as safe as possible from acquiring Covid-19. To ensure operating procedures were aligned to national guidance, as stated above, a living "policy tracker" document was developed, which captured changes to guidance/policy and UHB's response. National guidance was mapped to operating procedures in a series of version-controlled Covid-19 documents. These were discussed at weekly Medical Scientific Advisory Group meetings, to check for consistency and clarity.

113. Despite the measures outlined to disseminate new and evolving IPC guidelines, there were some difficulties when implementing IPC guidance. Some of this related to the supply of equipment, so the Trust implemented a strategic PPE group to manage all PPE issues. A novel fit testing team was created, involving trained healthcare assistants within Infection Prevention and Control to deliver fit testing to our staff. The expansion of fit testing is documented from 3rd February 2020. Despite this new team being in place, lack of availability of a consistent supply of FFP3 masks and fit testing solutions meant that fit testing could not be delivered at the ideal pace and scale.

114. The FFP3 Masks supplied to the Trust were often poorly constructed with visible faults. It was unclear what checking mechanisms were in place centrally to ensure the quality of equipment during procurement. If similar experience was replicated across all centres, there is a strong argument that better central quality

control would have been more efficient and safer. Those in stores described their frustration at being unable to provide necessary equipment to protect clinical staff and patients. In order to overcome the continued supply issues, the Trust sourced more than 1000 hoods to ensure safe, fit-for-purpose protective equipment was always available to staff.

The UHB estate

115. In contrast to other parts of the UHB estate, the majority of the QEHB provided a modern infrastructure which positively facilitated IPC procedures. The main QEHB building is made up of 44% single, ensuite rooms, with good ventilation. There are 12 lifts serving seven floors, each able to hold a hospital bed and associated staff. There are corridors which run in parallel down the length of the building which facilitated "hot" and "cold" patient flows. Corridors were also wide enough to enable directed staff flow (staying in lanes) with stickers placed to highlight this and to demarcate appropriate social distancing. Despite this, significant estate works were needed to respond to the pandemic and these were delivered across the reporting period.

116. Covid-19 can be acquired by exposure to surfaces, objects, etc (fomites) and the surrounding environment. In an outbreak there is contamination of a patient's surrounding environment with Covid-19 and this could be found for up to five days. Cleaning therefore played a major role in reducing transmission of Covid-19 to patients and staff. QEHB invested in new technologies to help reduce the risks of spread of infection.

- UV air scrubbers were used to optimise ventilation in certain key areas, such as endoscopy and on the respiratory support units. They were also used in waiting areas of ED's, in an attempt to further reduce transmission. (QEHB had previous experience of their use in terminal room cleaning).
- 'Redi-rooms' (pop-up side rooms) were purchased for use in areas such as Haematology and in certain admissions areas e.g. the Surgical Assessment Unit.

- Doors were added to all bays and rooms within the Emergency Department. This created side rooms for all patients being admitted into the hospital and thus reduced transmission in the admitting areas.

117. A ward was repurposed as a respiratory support unit for patients with Covid-19 that allowed use of CPAP and HFNO as part of the RECOVERY – RS study and subsequently. This included space for staff to put on FFP3 PPE equipment (clean dress room) and a separate area to safely remove and destroy worn PPE (dirty room). It also enabled us to concentrate the deployment of staff with particular expertise in non-invasive ventilation (or who had undertaken needed training). An ICU in the Heritage estate that was re-opened was modified to extend capacity and improve IPC, including the creation of areas for donning and doffing PPE.

118. During the pandemic, multiple wards were repurposed to house patients with known or presumed Covid-19. As stated earlier, initially there was little known about asymptomatic carriage or atypical presentations of Covid-19. Early results indicated that mixed 'hot' and 'cold' wards resulted in increased transmission, and so these were rapidly barred. Different flows for infected and non-infected patients were possible with a high degree of fidelity once point-of-care rapid testing was available for all staff and patients.

119. These differential patient flows required matched operational and staffing models, which was a challenge, particularly given the high levels of acuity of patients admitted with Covid-19.

120. The Facilities and Estates team worked hard to support the workforce and patients in adhering to IPC guidance on multiple levels, such as:

- Introduction of touchpoint cleaning in multiple clinical areas that involved cleaners providing extra cleaning and attention to door handles, switches, buzzers, etc to reduce contamination risk.

- A complementary meal service to ICU staff with hot and cold food, drinks provided on a trolley directly to ICU, so staff did not need to come out of their PPE.

- Introduction of clear one-way systems to help people maintain social distancing on site.

- Introduction of gel stations at all main entrances with co-located PPE stands.

- Placement of Perspex screens at main reception desks to help reduce transmission.

Building testing capacity to protect staff and patients

121. It was recognised that testing symptomatic patients and screening asymptomatic staff and patients (or those with atypical symptoms) was the most important means of protecting people from nosocomial spread of infection.

122. Central to this was the early identification of patients with Covid-19 through timely screening. At the start of the pandemic only symptomatic patients were tested on arrival to QEHB and laboratory turnaround time was initially slow (5-7 days). Patients were triaged and cared for, based on an assumed diagnosis until the results of tests were reported. In 2020/21, the most frequently identified root cause for the outbreaks was transmission from asymptomatic patients placed within a bay who subsequently tested positive on their routine admission screening.

123. The most significant intervention to reduce nosocomial cases of Covid-19 in 2020/21 was therefore implementation of Point of Care Testing (**POCT**) laboratories in Accident and Emergency. Laboratory-based PCR turnaround times had ranged from 24-72 hours. Covid-19 POCTs implemented from autumn 2020 eventually allowed results to become available within an hour. This led to patient allocation and bed utilisation within the hospital to reduce the risk of nosocomial transmission.

124. In 2021/22, testing capacity was increased further which allowed increased screening of asymptomatic patients not only on admission, but at day three, day five, day seven and every three days thereafter, further reducing the risks of undetected infection.

125. As staff testing became available it was initially focused on frontline clinical areas. However, as more was learned of asymptomatic carriage, and as staff outbreaks were an apparent source of transmission, increased staff screening capacity was implemented hospital-wide, irrespective of role. High-risk speciality staff were screened weekly by PCR. All staff were required to undertake lateral flow tests at least twice weekly. During outbreaks, staff were screened weekly via PCR and daily via lateral flow tests. The rapidly evolving national guidelines pertaining to staff and patient screening were continually reviewed and implemented as relevant for each patient and staff group. The frequency of this screening regime was determined by a combination of test availability and national guidance.

126. QEHB did not experience shortages of centrally managed reagents but did depend on their 'just-in-time deliveries'. With the support of central teams, we were able to increase testing capacity and create point-of-care solutions within the Accident and Emergency Department to introduce more testing opportunities, to optimise patient flows.

Transmission of Covid-19 within QEHB

127. The hospital experienced nosocomial outbreaks of Covid-19. These were tracked and investigated by the IPC team with resulting changes to processes, as described below. The national definitions of Covid-19 case attribution include community onset, indeterminate hospital onset, probable hospital onset and definite hospital onset, as follows:

- 0-2 days: community onset
- 3-7 days: hospital onset indeterminate healthcare associated
- 8-14 days: hospital onset probable healthcare associated
- 15 or more days: hospital onset definite healthcare associated

128. There are several caveats and limitations in the data collection and analysis of hospital onset cases during this pandemic period. These include the fact that definitions of nosocomial infection did not exist prior to summer 2020 and the data collection period from March 2020 to June 2022 includes the phase before creation of national testing capability and policy, when regular inpatient testing of asymptomatic patients was not undertaken.

129. Between, 1 March 2020 and 16 June 2022, UHB had 1,339 definite hospital onset cases, 1,413 probable hospital onset cases and 1,949 indeterminate hospital onset cases. This equates to 9.3% of UHB's cases being attributed to a healthcare associated origin. This is likely to be an overestimate due to the initial absence of asymptomatic screening described, with high community prevalence meaning many patients admitted without typical features of Covid-19 were not tested at the point of admission but were subsequently found to be positive as new symptoms emerged during the admission, necessitating testing.

130. In total, QEHB had 73 Covid-19 outbreaks during the pandemic from 1 September 2020 until the end of the reporting period. Outbreak recording began in the summer of 2020 once routine testing, nosocomial definitions and processes had been established nationally. All Covid-19 outbreaks (defined as two or more cases linked in place and time) during the pandemic were reviewed daily (Monday-Friday) in an operational outbreak meeting chaired by the Deputy DIPC or Lead Infection Control Doctor with the relevant specialities (nursing, medical, allied health professionals, occupational health, facilities, health and safety etc) and external partners (UKHSA and ICB/CCG). Out-of-hours input was provided by the relevant on-call infection specialists in conjunction with members of the IPC team.

Outbreaks were reviewed on daily operational outbreak calls to ascertain sources and implement relevant preventive and control measures. Via these outbreak meetings, interventions were identified that could be applied to prevent similar transmission events occurring and this learning was fed into our Trust-wide interventions and disseminated both regionally and nationally.

131. It became apparent that a contributory factor to outbreaks was asymptomatic staff infection. This emphasised the importance of staff screening as it became available as well as of good IPC practice to reduce transmission. Other outbreak sources and contributory factors were observed, including those related to visiting and meeting visitors in hospital grounds. Interventions to minimise the risk of healthcare acquired Covid-19 infections include bur were not restricted to:

- Closure of bays when positive Covid-19 cases were identified within bays. If multiple bays were involved or multiple hospital cases were identified, the operational outbreak meeting would decide if the ward needed closing.
- All contact patients were isolated where possible or remained together for a period of time defined by the UKHSA guidelines at the time (this has ranged from five days (providing two negative lateral flow results on consecutive days) up to 14 days; sometimes for greater periods in immunocompromised patients guided by repeat PCR results) until the incubation period had elapsed.
- Until there was capacity to screen asymptomatic patients every three days (before the UKHSA/NHSE guidelines required us to do so); during outbreaks enhanced screening of patients was undertaken.
- Enhanced staff testing was undertaken during outbreak periods (daily). This varied across the pandemic dependent on the testing platforms available and the UKHSA/NHSE guidelines at the time. Testing ranged from regular PCR testing to daily lateral flow tests. Outbreak data at UHB showed daily staff lateral flow testing on arrival for shift was one of the best measures to control outbreaks and preventing further spread. This eventually formed part of the 'Midlands NHSE principles' guidance for managing Covid-19.

- The single most important intervention was the aforementioned rapid, point-of-care testing by hot labs within the ED. Within these hot labs, there was access to rapid Covid-19 PCR testing, which significantly reduced the turnaround time for results. Rapid point-of-care testing enabled the identification of patients infected with Covid-19 on presentation and enabled appropriate triage into designated hot and cold areas. This prevented transmission from asymptomatic Covid-19 carriers. Without this intervention the number of outbreaks and hospital onset cases would have been substantially greater.
- During the peak periods of the pandemic, the site was locked down to reduce footfall i.e., restriction of visitors, enhanced security on the front doors, etc. National lockdown and social distancing similarly benefited the hospital setting.
- During peaks of the pandemic, catering was moved to take away services to prevent social mixing of both staff and patients. The removal of this ability for staff to come together to eat and decompress mid-shift was felt greatly by staff members.
- During late 2020, national guidelines required staff to wear masks throughout the hospital and when coming to work. Surgical masks were and are still available for all at every entry point of the hospitals and within clinical areas.
- As the pandemic progressed, patients were also asked to wear surgical masks where they could tolerate them. An algorithm for staff was created to document within the clinical noting where patients could not tolerate wearing a mask. Although staff strongly encouraged patients to wear masks on the wards, this was extremely difficult to enforce, and compliance was often poor.
- As the pandemic progressed, the Health and Safety team became more prominent in the management of outbreaks. They often attended the operational outbreak meeting and were integral to this meeting in the peak periods of the pandemic. Where outbreaks/clusters of cases amongst staff and/or patients were identified, the Health and Safety team undertook a review. Reviews included use of PPE by staff, social distancing of both staff/patients, cleanliness of areas etc.
- Wards and departments were requested to conduct monthly Covid-19 compliance audits and submit to the IPC team for assurance.

- At the strategic and operational meetings, any Covid-19 incidents identified as serious or raised on Datix (NHS incident reporting system) were reviewed. The incidents were reviewed weekly so there was executive oversight, swift resolution of any issues and timely implementation of learning. This ensured a quick response to these incidents to protect our patients and staff by minimising transmission.

Personal protective equipment (PPE) and respiratory protective equipment (RPE)

Concerns about supply

132. The availability of Personal Protective Equipment, ventilators and CPAP equipment was a concern throughout the pandemic.

133. At the beginning of the pandemic, the central (NHSE/DHSC) emergency routes were used to support overall supply, however there was rarely sufficient quantity and sometimes quality of supply. This was exacerbated by uncertain and delayed delivery resulting in the hospital needing a 24/7 workforce to receive supplies which often arrived without notification. It has been commented that supply and demand management seemed to be uncoordinated with little reflection of the level of demand. Given the level of demand at QEHB it was likely that our organisation was particularly sensitive to shortcomings in coordination of supply.

134. When building the Nightingale Hospital in Birmingham, the Trust was assured of a commitment to centrally supply equipment and consumables. During the development of the site however, this was not the case, which caused additional concerns to those involved in procurement.

135. Other concerns identified included:

- FFP3 masks were out of date with sticker(s) over original dates to notionally extend the life of the equipment.

- Type IIR masks that deteriorated on wearing causing respiratory issues with the dust released from the mask.
- Surgical facemasks were occasionally sent through which were not type IIR, but type II. These could not be used in a clinical environment.
- The visors provided arrived in two pieces that were difficult to assemble.
- The foam on visors rapidly deteriorated, impacting on the durability of their use.
- There was difficulty procuring visors that were latex free.
- Masks often arrived without ties to secure them around the face.
- Staff with turbans and hearing aids had great difficulty using looped masks and yet tie masks were not provided.
- Aprons were often of poor quality with some aprons arriving without ties to secure around the waist or even a hole for the head.
- Examination gloves were sent with incorrect or absent paperwork.
- Powered respiratory hoods were difficult to purchase.
- There were frequent equipment/product recalls for delivered items, for example gowns that were so flimsy that they did not protect staff.
- Stock arrived at times in an unfit state, with pallets loaded too high, unsafe and at risk of falling. Bottom boxes were crushed and occasionally wet through.

136. At the end of the pandemic, the Trust was required to destroy 275 pallets of PPE items that were not fit for purpose; 48 of these pallets were face shields which NHSE/DHSC recalled hours after delivering them to Trusts across the country. This supports the concerns regarding central management of quality of products supplied.

137. These recalls also impacted upon the confidence of the users. Staff were worried about their own safety and knowing there were concerns regarding the quality and quantity of equipment impacted on staff morale. This is likely to have impacted upon rates of sickness; staff thought that they could be putting themselves and their families at additional risk. Recalls also distracted from operational planning as there was concern about meeting IPC guidelines.

138. In order to address these concerns, the Trust took more direct control of the procurement of some key items such as type IIR masks, FFP3 masks, visors

and gowns, working with local and national suppliers and in co-ordinating donations. It then played a role in providing aid to the wider ICS including other trusts, primary care, care homes, hospices, schools and homeless shelters.

Fit testing of PPE

139. As described earlier, the Trust implemented a strategic PPE group to manage all PPE issues and created a fit testing team, incorporating healthcare assistant roles within Infection Prevention and Control to deliver fit testing to our staff. This rapidly assembled team was trained in fit testing, and then expanded to try to meet demand, as IPC guidance changed.

140. Initially, fit testing was slow and prioritised to staff and clinical areas in which immediate demand was high.

141. QEHB employs a diverse workforce, and so the fit testing operating processes accounted for the wearing of turbans, hijabs and facial hair, with hoods being available from the onset of the pandemic. Hoods were in short supply, however, and not easily available from central procurement services. In response to this, UHB sourced and purchased supplies of hoods, as described earlier.

142. The wearing of FFP3 masks was a new experience for most staff, and there were concerns about wearing these incorrectly. At times limited availability of consumables to support ongoing fit testing as PPE supplies varied, contributed to staff anxiety.

Visiting and family liaison

How QEHB managed visiting guidance as the pandemic emerged and progressed

143. Inpatient visiting was managed during the pandemic through a series of standard operating procedures, controlled documents, which were updated in line with NHSE guidance. A final iteration of this guidance was approved for use in November 2022 [**SB/13 INQ000437435**], reflecting the progressively applied

learning from the waves of the pandemic and our understanding of changing profiles of risk as the pandemic evolved. (This was version 9. Previous versions: v1 Jun 20, v2 Jul 20, v3, Sep 20, v4 Dec 20, v5 not published, v6 Jul 21, v7 May 22, v8 Jul 22). It should be noted that the QEHB does not provide paediatric or maternity services at the site.

144. During the first wave of the pandemic, NHS visiting guidance was followed, with visiting enabled in specific circumstances, for example, when a patient was at the end of life or undergoing a high-risk intervention such as intubation. The guidance also enabled visiting in other circumstances in which adult visiting was appropriate, including for patients with dementia, learning disability, autism, communication difficulties or in whom the patient's mental health was deteriorating whilst an inpatient. Visiting was generally restricted to one person except in the case of someone approaching the end of life when this was up to four visitors. The decision to allow additional visitors was made by senior clinical staff and the reasons for allowing this were recorded in the medical notes.

145. There were challenges in safely supporting visitors, especially in areas deemed high risk (such as those where FFP3 masks would be needed) especially during the peaks of the pandemic, where access to PPE was limited. These challenges included a lack of equipment for visitors, the inability to fit test visitors and often poor compliance with PPE wearing, with some difficult conversations between staff trying to support PPE wearing and visitors and patients who were often distressed.

146. There were important reasons to limit visiting at times during the pandemic. The hospital experienced nosocomial outbreaks of Covid-19 which affected both patients and staff members, at a time of significant strain on clinical equipment and facilities and workforce availability. Root cause analysis of these outbreaks identified visitors to the Trust who were unaware of/did not disclose Covid-19 status as one of several contributory factors. The only means to access the hospital was through the main entrance or entrances in the Emergency Department or Acute Medical Unit. Accessing wards is mainly via lifts. Large numbers of visitors would have meaningfully impacted upon maintenance of social

distancing and hampered the ability to maintain hot and cold routes though the hospital, to protect patients admitted without Covid-19.

147. When visiting was suspended (with exemptions as described in NHSE guidance) several initiatives were introduced to support communication between patients and their relatives. These included 'virtual visiting' by phone or video calling on hospital provided tablets, 'letters for loved ones' and 'knitted hearts' in which emails, letters, photos etc could be delivered through a central service. Central arrangements were also made for the delivery of parcels (Parcels for Patients) including delivery of personal (cold) food. There was also an ICU family liaison team initiative, described in detail below.

Development of the ICU Family Liaison team during the pandemic

148. During the initial planning stages of the Covid-19 pandemic, the ICU team recognised that communication with relatives in the ICU setting would be severely compromised by the visiting restrictions and the use of PPE, which not only prevented face-to-face communication between nurses and doctors and families, but also inhibited telephone communication between medical staff and families. We therefore set up a team to deal with this problem, which became known as the Family Liaison Team, to facilitate improved communication with the families of our ICU patients.

149. The team was set up by one ICU Consultant at the start of the pandemic and consisted of a group of eight retired Consultant staff, from several specialist areas, who volunteered their services, and who all had established communication and clinical skills. They provided the day-to-day leadership for the team. As well as these senior staff, there was a group of volunteers, who were mainly medical students, but also staff members who needed to shield from the frontline Covid-19 duties for clinical reasons (pregnancy, pre-existing illness, etc), as well as some GPs who volunteered to join the initiative in their spare time, later in the pandemic. Usually there were about 30 people per day involved in the team.

150. Teaching for the telephone operators was provided by a senior ICU Consultant and then supported by the Consultants who were present every day. The Consultants provided stability for the group, as one of them was always present, as well as providing pastoral care to the staff who worked making the family calls. They were able to supervise difficult conversations, taking over these calls where necessary. Some conversations were with families who were understandably angry or upset. The presence of senior support was therefore essential.

151. The practical needs of the group included setting up space for the team to work, ensuring they had space to socially distance from each other, setting up computer terminals and dedicated telephone lines.

152. The group was able to work effectively by using the UHB Electronic Health Record (**EHR**). This meant that ICU nurses could update the noting about the days' events, which could be read by the Family Liaison Team in a remote location. They could then ring the family, answer their questions and give updates about what was happening. Questions could be directed to the ICU team electronically and answered in a timely fashion.

153. The advantage of having this team was that during every day of the pandemic, every family had the opportunity to receive a phone call from the hospital, with an update about the ICU patients' condition, and the chance to have questions answered and explanations provided. This offered support to families at a critical time. The second advantage of this is that it allowed nursing and medical staff on the ICU, to concentrate on clinical care, safe in the knowledge that the usual communication with families was being delivered. Many nurses were appreciative of the fact that this part of ICU care, which is so important, was being done and it helped them deal with guilt in being unable to complete holistic care implicit in good family communication. The retired staff who led the daily team also felt involved and valued and able to contribute their considerable skills to the pandemic effort.

154. Some medical students were able to produce patient diaries, which documented the patient's stay in ICU, which were offered to the patient and the family after their ICU stay. This helped them to make sense of the timeline of what had happened, as they had not been able to visit during their hospital stay. Medical students report feeling well supported, learned about ICU management and developed their communication skills. The overall feedback from the students and the retired staff was that they felt appreciated and pleased to have been able to undertake such an important role in patient care.

155. Complex conversations, such as end-of-life conversations, were always delivered by the ICU Consultants by phone.

156. One senior nursing colleague has described how her ICU team benefited from the support. She wrote:

> *"Words cannot express the impact the Family Liaison team had on families and the workforce. This was true psychological safety at its finest. Staff could get through the gruelling shifts with the knowledge that the Family Liaison team were in contact with families and providing an alternative lifeline for our patients and staff. You can't imagine the distress the staff would feel and report back to us about being unable to get to the telephones when they rang out constantly on the units day and night. We had to prioritise internal calls as operationally we needed to ensure the Laboratory, Pharmacy, Imaging, Equipment, and Medical teams could get through to us timely with updates."*

She added:

> *"Magnificent people and I can't imagine how challenging some of the calls must have been for the teams. We had some fantastic feedback from families via the Critical Care outreach follow-up service who would meet with patients and families once patients progressed onto wards and home. The Family Liaison team were spoken of positively as they provided the time to listen and talk to our distressed families when we couldn't"*

157. It is a credit to the whole team that they were awarded the Care and Compassion Award in the NHS Parliamentary Awards in 2021. One point of regret, however, was that although this service covered patients in ICU, it did not cover patients with Covid-19 in other wards to the same degree. Managing over 150 calls a day was a significant undertaking for patients in ICU. Providing this for the many hundreds of patients admitted with Covid-19 across QEHB (and thousands across UHB) would have required human resources that were not available in any other way.

Responding to NHSE guidance

158. In general, NHSE guidance was followed to reduce visitor restrictions at the time of their publication, (pending amendment of operating procedures and a practical assessment of how to embed new guidance into the hospital). However, the decision of when to implement new guidance was always considered with reference to the current impact of Covid-19 on QEHB at that time and the background population levels of infection. The exact timings of waves of Covid-19 differed across the UK; community vaccination uptake across Birmingham was variable (very low in some wards), and workforce availability was often a concern. In some instances, decisions to reduce visitor restrictions were delayed until there was confidence in the capacity of staff and facilities to deliver safe care. These decisions were made at the daily strategic meetings, chaired by the Chief Executive and including all the executives), advised by senior clinical teams including the IPC team.

159. In April 2022 QEHB (and the Trust's three other hospitals) were the focus of a media report which questioned the decision to suspend visiting at the hospitals and compared our visiting policy negatively with that of other trusts.

160. At that time the Directors of Infection Prevention and Control (DIPCs) (the Chief Nursing Officer) and the Deputy DIPC (Clinical Lead for IPC) met every three days to discuss the approach to IPC including relaxing visiting rules. These were then reviewed weekly in a meeting of the Executive team, given a high level of

awareness of the benefits of visiting inpatients, even given the existing provisions described above.

161. The decision was not taken lightly but was based on real concerns about an increase in Covid-19 admissions and cases across our local population. At the time this article was published in April 2022 there were 144 patients with Covid-19 in the hospital with four in ICU and approximately 12 patients per day being admitted with Covid-19, which had increased progressively over the course of April. Vaccination uptake in some Birmingham wards was amongst the lowest in the UK, with several wards reporting < 60% of eligible adults having had their first dose of the Covid-19 vaccine, and < 60% of eligible adults having their second dose. This ongoing significant rate of admission and inpatient stay, coupled with a high percentage of the local population remaining vulnerable to Covid-19, influenced the adoption of a precautionary approach so that the decision to lift restrictions was somewhat later than many.

162. The visiting guidelines were maintained until the publication of further guidance five weeks later, on 1 June 2022, when they were reconciled with national guidance.

Consequences of strict visiting restrictions during the pandemic

163. It is acknowledged and inevitable that restricting visitors had a negative impact on patient experience and the experiences of family members and loved ones. The lack of visitors also impacted negatively on healthcare staff who often had to discuss difficult clinical information about deteriorating patients with distressed family members who were not present. The impact of visitor restrictions was felt even more acutely in the lockdowns, where families had often not seen each other for a prolonged period. Examples of some of the negative impacts of limiting visitors are given below:

- For people with larger families, visiting restrictions during end-of-life care placed a heavy burden on both those who were able to be there, and those who could not be there.

- Patients admitted to ICU often had prolonged admissions of several weeks and months, and underwent a considerable physical transformation during this time, including the loss of muscle mass and functional capabilities. Patients described the shock of their family members when seeing them so changed on discharge, after only virtual contact during the admission.

- Often, during protracted hospital stays, it is the family members who encourage the patient to engage with much needed rehabilitation, and their input and support was missed.

- Visitors often had to make difficult decisions about isolating away from more vulnerable members of their own families who were still living the community, to prevent infecting them with Covid-19 after a period of exposure while sitting with in-patients.

164. The initiatives the hospital put in place to connect patients and their loved ones (described above), and the exemptions applied for patients with specific needs or during end-of-life care, could not take the place of direct and free contact between families.

165. Decisions about restricting visitors were extremely difficult to make, with significant harms associated with both restricting and enabling visitors. Allowing free visitation would have had serious and significant consequences for the ability to safely care for patients during the pandemic. Root cause analyses identified visitors as one important source of hospital infection outbreaks even given the restrictions in place. Reducing footfall through clinical spaces, supporting social distancing and (later in the pandemic) frequent lateral flow testing was a vital part of maintaining patient safety and workforce capacity. Restricting visitors was considered to be an important part of the effort to minimise transmission within the hospital. This was a difficult balance. On reflection, the hospital teams felt the necessary steps were taken based on best but imperfect knowledge available at the time decisions were made. However, the negative consequences of these decisions on families and patients must be acknowledged and are not underestimated. The impact on patient and family experience at the time was

significant, as has been the longer-term effects on patients and families, particularly the bereaved.

Utilising the private sector to maintain some non-Covid-19care for our patients

166. The pandemic, and especially the initial waves of Covid-19, had a profound effect on UHB's ability to provide non-Covid-19related elective care. ICU beds were at a premium throughout the period.

167. From late March 2020, all elective and non-urgent services were suspended to facilitate the readiness of the organisation for the impact of the pandemic. This was a Trust decision made in line with regional and national guidance. The national decision to stand down all elective services took effect from mid-April. However, by 17 April 2020 UHB had already admitted 2,217 with a proven diagnosis of Covid-19 illustrating the need for early decision-making in our local area.

168. This was an extremely difficult decision and was not taken lightly. We knew that affected patients would be distressed and upset with this decision, and for this we could only apologise at the time. It also affected medical and nursing teams who often knew the individuals affected having cared for them over a period. They wanted to do the best for their patients but were not always able to do so in the circumstances. It was necessary to ensure that all those needing urgent care were able to access treatment safely. Cancer treatment and life-saving care remained our priority. All patients affected by the announcement to suspend elective procedures were contacted individually to rearrange their postponed surgery.

169. Re-opening of elective services took place according to available resource in the NHS and Independent Service Providers (ISPs) across the Birmingham and Solihull ICS and was done in a stepwise fashion, with access prioritised according to clinical priority. Across UHB hospitals admissions with Covid-19 had already begun to rise again from early September 2020, such that on the day the second

national lockdown on 5 November 2020, UHB hospitals admitted 52 patients. This further impacted upon the potential recovery of elective cases in Autumn 2020.

170. The total number of elective cases for UHB from April 2020 to March 2021 fell to 124,863 compared to a predicted number of 232,871. The ongoing demands on ICU beds throughout the Autumn had a particular impact upon on complex elective cases, and other activity requiring level 3 care, which is an important function of QEHB.

171. The independent sector providers (**ISP**) formed an important part of the regional Covid-19 response including our recovery plan. The Trust made early and extensive use of the agreement with the ISP to provide services and share equipment. This was coordinated by a small operational group chaired by a Medical Director for Operations who was the Senior Responsible Officer for elective care. ICB support was provided by a senior Commissioning Manager. All ISP organisations were represented from Birmingham and Solihull, including Hospital Directors for Spire Little Aston, Parkway, BMI Priory and Edgbaston, Ramsey Westbourne and West Midlands Hospitals and Burcot Hall Hospital. A weekly meeting was scheduled to coordinate the high-level agreement and actions were cascaded down to individual hospital (ISP) sites in liaison with divisional teams in UHB and neighbouring trusts.

172. There was an early decision to avoid enlisting "reservist staff" from ISP sites in an attempt to preserve as much elective activity as possible through ISPs. However, UHB's experience of high levels of staff absence (due to Covid-19 symptoms, self-isolation or shielding) was mirrored across the sector. ISPs provided medical equipment, with anaesthetic machines being loaned to UHB from 2 ISP sites.

173. Phlebotomy services were established at BMI Edgbaston hospital to allow access to all Birmingham and Solihull patients in a site that was providing non-acute "cold" (non-Covid-19) services. Endoscopy diagnostics and cross-sectional imaging were made available in all ISP sites, albeit not in sufficient numbers to

make up for the loss of elective services at QEHB and these services were not available from the beginning of the pandemic.

174. Elective surgery services were transferred to ISP providers, with priority being given to cancer and specialist tertiary services. This allowed maintenance of breast cancer surgical care, liver and cardiac care, thoracic surgery, general surgery, urology, ENT and gynaecology services, although not the level required to provide the usual number of patient reviews and procedures delivered by QEHB pre-pandemic.

175. Pathways of care were changed as part of the response. Most changes were geographical, with equivalent care being delivered in an alternative NHS site or in the ISP. Some care pathways were altered to achieve safe cancer care whilst reducing inpatient stay and dependency on ICU. For example, in the early days of the pandemic some head and neck cancer patients were planned and delivered as resection only cases, rather than free tissue transfer reconstructions. In the management of breast cancer, simultaneous resection and reconstruction was suspended. These changes have inevitably impacted upon the wellbeing of those who did not receive a single definitive treatment, knowing that they would require a further procedure, solely as a consequence of falling ill during the pandemic.

176. Some tertiary services were maintained at QEHB as the regional centre: liver transplantation, urgent cardiac surgical care, neurosurgery, head and neck cancer care. Access to resources to support this care was allocated according to clinical need and priority in a daily multi-disciplinary meeting, led by the Medical Director for Operations.

177. During the course of the pandemic, as resources became available (particularly ICU beds), these were opened in a coordinated way, with daily meetings to allocate access. Theatre plans for increased estate were developed on a weekly basis initially, then monthly, then quarterly as resource was made available. In the later stages of the pandemic, the use of ISP capacity reduced as internal capacity for elective care became more established. Nevertheless, for

reasons described elsewhere access to ICU remained relatively constrained in the aftermath of the peaks of Covid-19 based demand. This in part reflected increased rates of retirement and resignation, following the immediate crisis of the pandemic.

178. Birmingham and Solihull developed and adopted a clinical prioritisation schedule across all providers and all categories of elective surgical care, which was based on the Surgical Royal Colleges / FSSA guidelines for prioritisation.

179. After the first wave of the pandemic as part of the recovery of services, a decision was made to dedicate the Solihull Hospital site as a green elective site (it is important to note that there were no hospital onset cases throughout its period of use as a Covid-19 protected hospital). This resulted in eight operating theatres, endoscopy suite and outpatient areas becoming available for the dedicated management of elective surgical care. This was in line with national guidance on so called "green" sites, and ahead of the designation of elective hubs. Part of this response included the commissioning of two additional Vanguard theatres.

180. As part of the wider Trust planning for recovery, green pathways were introduced in all sites, with a tertiary elective surgical area being established on the seventh floor of QEHB for multispecialty surgical care. These pathways were established in Jun 2020, coincident with investment in the Trust's Solihull Hospital expand its capacity for green elective activity. Above normal activity was delivered across the 7th floor until Oct 2020, and below normal activity occurred in Jan 21-Mar 21, before recovering to at, or above baseline elective activity at QEHB from Jun 21 onwards. A clean ICU and clean Theatre areas were also implemented, along with a separate elective care green entrance and pathway. This allowed the return of more significant volumes of complex elective surgical care to the QEHB site.

181. Cross system working was maintained throughout the pandemic and has become the norm since. In the early stages of the pandemic this resulted in the establishment of elective orthopaedic (hip replacement) surgery at the Royal Orthopaedic Hospital (**ROH**) with UHB patients and surgeons transferring to the

ROH site. Operating theatre capacity across the system was planned in a coordinated way, using NHS and ISP capacity.

182. In other specialty areas (paediatrics, ENT, oral and maxillofacial surgery, gynaecology) joint working with Birmingham Women's and Children's Hospital and Birmingham Dental Hospital to transfer care was also implemented to assist recovery.

183. Also, in part of the recovery of elective services, UHB and Birmingham and Solihull ICS have developed excellent working relationships with primary care providers and ISP providers in the community to deliver a large volume of outpatient care through alternative pathways. At the time of writing over 70,000 patients have been treated through this new pathway.

184. For patients with urgent or emergency care needs for conditions other than Covid-19, emergency service provision was maintained throughout the pandemic. Within QEHB this was achieved by segregation of patient pathways and designation non-Covid-19 areas in ED, theatres, patient lifts, certain corridors, ICU and wards. This was challenging to deliver, especially prior to the advent of rapid point-of-car testing. Initially, delays in Covid-19 testing and a lack of knowledge of asymptomatic carriage and atypical presentations created uncertainty as to which pathway a patient should be directed. During the peaks of the pandemic there was a significant reduction in non-Covid-19 emergency presentations to QEHB, which was mirrored in acute and emergency care data nationally. This was beneficial in the short term although not in the long term with respect to the health of our population. Locally, the proportion of young adults, non-cardiac chest pain, musculoskeletal conditions and self-discharges from the ED reduced. The proportion of admissions due to alcohol misuse, psychiatric conditions, overdoses and falls increased, as described in a publication from QEHB and UoB at that time **(SB/14 INQ000437436]**, potentially consequent upon social isolation.

How lockdowns and their impact on the ambulance service led to the QEHB's front door

185. During the lockdown periods, in both April to August 2020 and from January to April 2021, ambulance handover delays (of over 30 minutes) were at their lowest (10-15%). The reasons for this were threefold; a reduction in overall ED attendances during these periods, especially for non-Covid-19 related health concerns; improved patient flow from the ED to other areas of the hospital due to a focused effort to discharge people when they no longer needed hospital care; and the availability of QEHB ED staff to rapidly triage patients in ambulances and receive them into the unit.

186. However, the same patterns were not seen out of lockdowns. Between the first and second lockdown, delays in ambulance handover of over 30 minutes occurred in up to 25% of attendances. After lockdown two and until the end of the reporting period, the percentage of patients experiencing delays of over 30 minutes in ambulance handover peaked at 40% and then plateaued at this level.

187. The increase in patients experiencing delays in ambulance handover coincided with a return to normal or supra-normal attendance at the ED. This trend was replicated nationally. The return to high ED attendances most likely reflected a combination of the unmet demand for health care which built up during periods of lockdown and the perceived ability of our population to access face-to-face care more readily through EDs compared to other available routes, which often remained virtual consultations.

188. The ED teams not only faced an increased number of attendances, but also an increase in both the complexity and acuity of patients arriving at the ED. Furthermore, care delivery was configured to manage patients with and without Covid-19, effectively delivering two pathways of care, including the use of different triage and ward areas, lifts and corridors. The need to ensure effective infection prevention and control (IPC) contributed to extended waiting times.

189. To try to decrease the impact on ambulance handovers, the Trust undertook the following activities:

- The IPC requirements were partly mitigated by estate modification such as the replacement of curtains with screens and doors in ED and through demarcated "hot" and "cold" pathways, to protect patients and staff. However, this change in process significantly impacted upon efficient work patterns and workforce availability (as running two separate pathways was much less efficient than the usual combined service).

- The implementation of a rapid turnaround Covid-19 testing laboratory within ED aided not only early diagnosis but more efficient streaming of patient flows.

- The hospital worked with the West Midlands Ambulance Service to ensure patients were routed to hospitals within the group in which there was greatest capacity in order to minimise delays in access to assessment and treatment.

- Developed risk management protocols to ensure review of patients whilst they were on ambulances.

- Soon after the reporting period, ambulance decision areas were created to allow ambulance offload and cohorting of patients adjacent to ED, managed by paramedics but with patients' details, observations etc recorded within the EHR, and therefore subject to clinical decision support and alerting.

Care decision-making

Difficult decisions: how staff were supported in the best interest of the patient

190. At the start of the pandemic, there was wide debate amongst hospital clinicians, regarding the potential need for a national clinical decision-making tool regarding care escalation. The more extreme boundaries of the modelling published by Ferguson and colleagues on 16 March 2020, included the potential for demand for hospital care to overwhelm capacity. If this were the case, then it was likely that some form of decision-making tool would be required to support healthcare professionals if care was to be rationed. This extreme case was mitigated by national lockdown. It was equally recognised that there were risks in premature deployment of a decision-making tool and that this would in any case

be optimally managed at a national level. Further to the real concern about the impact on patients, there was also concern about moral injury to staff if a tool was implemented and resulted in decisions different from the conclusions of the multi-professional team delivering care.

191. The criteria for admission to ICU at QEHB were therefore based upon standard individualised clinical decision making, based upon the best interests of patients as individuals, consistent with usual practice. Good decision making in the face of such high activity, depended upon high levels of senior involvement at all stages of care, including senior ICU clinicians who played an important role in supporting ED and ward-based decision making. This all depended upon a remarkable expansion of ICU bed capacity to a maximum of 142 patients. Arguably, this demand came close to but did not cross the limits at which it would have been necessary to review adherence to conventional criteria for ICU support. The provision of this capacity had significant consequences on the well-being of staff, including reservist staff, working in this area. Patients were extremely unwell, there was a high mortality rate, the ventilatory period for each patient tended to be longer than seen in many other conditions, and there was the added distress of family members, who were frightened and had limited contact with their loved ones. Beds were as close as allowable for IPC purposes, meaning the ICU space was more cramped than usual. Staff were working in full PPE for entire shifts. In short, maintaining the basis for admission to ICU, benefitting the patient population and not altering the basis for admission in the face of the pandemic, nevertheless came at significant, often personal, cost.

192. As discussed above, there were no limits on oxygen therapy at QEHB, although at times there was a need to support another hospital in the group in which there was briefly concern with respect to oxygen carrying capacity. Initially, most patients with critical illness associated with Covid-19 requiring ventilatory support underwent invasive ventilation. This was often protracted and required the placement of a tracheostomy to safely manage their airway.

193. Given a lack of evidence for benefit, there was an early decision to use HFNO only as a bridge to ventilation in ICU or as part of the RECOVERY-RS

randomised trial of continuous positive airway pressure (CPAP) and HFNO (section 'Managing supplies and equipment to ensure safe patient care'). UHB was the highest recruiter to the trial accounting for approximately 40% of all recruitment. The trial eventually reported no benefit for HFNO but some benefit from CPAP. As this evidence for CPAP accumulated, facilities to manage CPAP on specialist wards were developed, reducing the requirement for tracheal intubation and opening more capacity for ventilation beyond the intensive care setting. This required estate modification and development of multi-professional teams (nursing, physiotherapy, medical) to deliver CPAP at a scale not seen before in QEHB (section 'Managing Infection Prevention and Control within the QEHB'). This approach to HFNO combined with the high oxygen carrying capacity in QEHB meant that there was no need to limit oxygen therapy.

194. The Covid-19 rapid guideline: critical care in adults, NICE guideline [NG159] published in March 2020, was used as a basis on which to recognise patients in whom a sudden deterioration was likely. Here, escalation discussions and decisions were made as early as possible during the admission. This guideline was used only to support and facilitate joint decision-making from multi-speciality clinicians, patients and their families, defining an escalation plan in the patient's best interest.

195. Given the high numbers of critically unwell and deteriorating patients admitted to the QEHB, there was significant reliance on senior clinical decision-makers to optimise plans for each individual patient. These included high levels of consultant input at a ward level that included at least twice daily ward rounds. There were peripatetic senior clinicians and nurses with ICU experience (individuals not committed to a specific ward and therefore available to support ward-based teams as necessary), supporting decision-making for patients with more complex medical needs such as in the presence of multi-morbidity. Each hospital had a Senior Responsible Clinician and support from a central Clinical Support Group (CSG).

196. Ensuring timely joint decision-making was aided by the CSG. The CSG was established to provide support to senior clinical decision makers caring for

patients with Covid-19, with the aim of ensuring consistent and timely responses across the population of patients cared for by UHB. This acknowledged the potential pressures on individual clinicians resulting from the volume and pace of decision making, particularly in the first phase of the pandemic. The CSG was led by the chair of the Clinical Ethics Group, who demitted from that role for the period. The CSG was itself able to seek the advice and opinion of the Clinical Ethics Group for significant ethical and legal issues. These different groups were constituted by different members of the Trust clinical ethics group, including senior members of the multi-professional team and legal support. In practice most of the support for decision making occurred at a local level. Consultants across a shift involved one another in these decisions, making best use of the widespread expertise that was available on each shift including respiratory and ICU medicine.

197. Although there was no rule-based decision-making regarding escalation of care, there was significant support for optimal clinical decision-making. This included easy access to well curated guidelines that were reviewed bi-weekly by the Medical and Scientific Advisory Group (MSAG). This joint clinical and academic group was responsible for reviewing all evidence and guidelines, publishing them on a dedicated microsite and reporting relevant metrics both through 'dashboards' and widely shared infographics made by University of Birmingham research teams. Over 160 controlled documents and related infographics were produced. The infographics were shared widely and used in hospitals beyond UHB. Infographics were also available to support patients and carers, including how to wear masks, when to test for Covid-19 and the positive effects of vaccination. These were translated into locally prevalent languages and shared across local, national, and global communities.

198. The infographics included guidance (updated as information changed and disseminated under strict version control) not only on the management of Covid-19 directly, but associated conditions and presentations, including delirium, renal impairment, diabetic emergencies, secondary bacterial infections and venous thrombotic events, to name but some. These also focused on specific patient groups, such as pregnant women. Later, the infographics highlighted which patient characteristics might be relevant to clinical studies which were open. These were

updated to provide the results of the clinical trials as they read out, especially where a medication or approach proposed in the literature was beneficial or potentially ineffective or harmful.

199. The EHR and decision support systems were optimised to support staff working in new areas such as ICU. For example, structured prescribing support (suggesting doses and routes of medications) was available for oxygen prescribing, end of life medications and treatments for Covid-19 as these became available. Prescribing information was supplemented with information from guidelines, including potential treatments based on clinical parameters such as the severity of Covid-19. The same system enabled supported prescribing where usual medicine formulations or routes of administration were limited. For example, it was recognised that syringe drivers (small pumps which deliver a continual dose of medication subcutaneously or intravenously) may become limited. Alternative formulations were built into the structure prescribing systems, to try to ensure patients received the medications they needed.

200. The EHR was rapidly adapted to ensure that all relevant information was collected, that treatment was optimised through passive and active clinical decision support and performance managed through the analysis of patient level data. This experience is published in an appended paper [**SB/15 INQ000437437**]. UoB scientific staff contributed to continuous literature reviews and to reviews of datasets derived from electronic records that contributed to an early understanding of the role of ethnicity in presentation and presentation with more deranged physiology in young men of Asian descent. An example of these insights is published in the appended paper which shows that in the first wave of pandemic, people from Asian communities were more likely to present with severe symptoms, but with no difference in the duration of symptoms and more likely to be admitted to ICU than people from predominantly white ethnic backgrounds. This knowledge changed how we assessed severity in this population, including more close monitoring to identify signs of deterioration and a lower threshold for ICU review (**SB/16 INQ000437438**].

Managing conversations with family members around care escalation decisions

201. Whilst ReSPECT forms were in use in the community and in the Trust's other three hospitals, at QEHB the related Treatment Escalation and Limitation (**TEAL)** form was in use throughout the period. The TEAL form is embedded within the QEHB EHR and when completed, the form is easily accessible and visible to all healthcare professionals involved in that person's care. More recently, this has been further developed to reflect the contents of the ReSPECT form in the electronic environment. The TEAL documents are already able to be reviewed at subsequent hospital visits, although a decision for care escalation is needed at each attendance.

202. Use of ReSPECT forms in the community was limited for most patients who presented acutely unwell with Covid-19. Care escalation decisions were therefore made when that patient was admitted to hospital, albeit with the benefit of access to a summary of the primary care record, secondary care record, the patient and family.

203. All medical staff working at QEHB have specific induction and training in how to utilise the electronic health record to record decisions of care escalation, including who was involved in those decisions. Training in how to make care escalation decisions and discuss them with patients and family members forms part of the GMC training requirements. Staff received training and support in managing conversations with family members around care escalation decisions during visiting restrictions. A patient undergoing a high-risk procedure (such as intubation) or moving towards the end of their life could be identified and visits by loved ones expedited. It is however important to acknowledge that errors did on occasion occur, when managing the detail of documentation and communication with families and advocates. For example, there were 2 complaints received in the reporting period expressing concerns about how the capacity of loved ones was assessed prior to their involvement in care escalation or end of life discussions. This was mitigated as much as possible by a high level of senior input, regular bedside multi-disciplinary meetings and support from the Vulnerabilities Team (section 'Steps undertaken to address potential inequalities in care for any of our patients').

204. An important principle which remained in place during the management of patients with Covid-19 is that other aspects of care delivery are not contingent upon the TEAL decision. For example, the TEAL form enables the clinician to select specifically which interventions may not be suitable but provide situational exemptions when that intervention might be considered. An example might include a person not being considered well enough to survive invasive ventilation (being placed on a ventilator to help with breathing) in most circumstances but who might benefit from limited breathing support after a short procedure which required sedation. This level of complexity in decisions making is described in the section of Trust-wide Covid-19 guidance 'Ceilings of treatment in Covid-19 – to include DNACPR / TEAL and ReSPECT', the latest version of which was published in January 2021 **[SB/17 INQ000437439]**. It is also supported with advice from multi-disciplinary teams which support these discussions, including our critical care outreach team.

205. As discussed previously, the early, joint decision-making involving senior clinicians regarding advanced care planning was integral to the Trust's response to Covid-19. This was supported by consultant delivered ward care involving a minimum of twice daily ward rounds and continuity of care on a day-by-day basis, using a 'four days on / four days off' shift pattern. Further support was available from senior clinical teams from ICU and Respiratory medicine who were available on a peripatetic basis.

206. In the first wave of the pandemic there was a marked increase in the proportion of admissions in which a TEAL form was completed from a baseline of 20% prior to the pandemic to a peak of 60%. However, it is important to stress that this was associated with a higher proportion of patients in this group identified as being for cardiopulmonary resuscitation (24% vs 9%) and for full active treatment (31% vs 26%). This reflects an important principle of clinicians actively identifying the preferences of patients who were at risk of deterioration within an easily accessible TEAL form, as well as within the free text record. Despite the increased utilisation of TEAL, the proportion of discussions involving patients was unchanged at 96%, however, there were fewer that involved discussions with family members

at the time of the decision (51% compared to 75% before the pandemic), mainly due to visitor restrictions. These discussions were raised in family communications, with the patient's consent, as described earlier. It is important to acknowledge how difficult this situation was at the time. Patients were being asked to be involved in very upsetting conversations about their own care, without the support of their families. We also recognise the distress felt when family members were not as involved as usual in care escalation decisions, perhaps feeling guilty and angry that they had not been able to advocate and support their loved one in the same way that they would have been able to do in usual circumstances.

207. There was no suggestion that DNACPR notices were disproportionately high in those with protected characteristics, however, it should be noted that the population admitted with severe Covid-19 were different to the population admitted prior to the pandemic, particularly during the first wave. For example, the population of patients admitted with Covid-19 from white ethnic groups were approximately 15 years older, had more dementia but less diabetes mellitus than Black or South Asian patients. In the first wave of the pandemic South Asian patients at UHB had a greater likelihood of receiving ICU care even after adjustment for age and co-morbidities **[SB/16 INQ000437438]** There was a slight increase in patients in whom a DNACPR was in place on arrival or admission in 2020 and 2021 compared to 2019 however the numbers were still low (for example 8.4% vs 4.8% for white British and 4.2% vs 2.6% for South Asian patients 2021 vs 2019). We are not aware of any concerns that patients arriving at the hospital had DNACPR notices which did not appear to be clinically appropriate.

208. Patients admitted who also had Learning Disability (**LD**) or Autistic Spectrum Disorder (**ASD**) inpatients were reviewed by the Vulnerabilities Team / Community Healthcare Facilitation Team. During the review they checked the DNACPR status of the patient, the basis for that decision and communication with next of kin and carers. This was facilitated by remote access to the electronic healthcare record, particularly during times of peak admission and is described in more detail below (see 'Steps undertaken to address potential inequalities in care for any of our patients', below).

Steps undertaken to address potential inequalities in care for any of our patients

209. As previously stated, it is important to acknowledge the distress caused to patients and their families by visitor restrictions, mask wearing and social distancing. The impact of these measures could only be partly mitigated by the care of healthcare professionals, the use of video calls and careful visiting for those in exceptional circumstances.

210. Patients with vulnerabilities such as a learning disability particularly benefit from advocacy of loved ones or carers, which was made more difficult in the context of limited visiting, albeit that presence of a learning disability led to exemptions from visitor restrictions. During the pandemic the Vulnerabilities Team (**VT**) played an important advocacy role to identify and mitigate any unequal impacts in the hospital's response, by supporting people to express their needs and preferences. It is appreciated that this systematic support for people with learning difficulties could not replace the role of those close to an individual who would have been able to offer bespoke support and reassurance.

211. The Vulnerabilities Team had been developed during 2019 in response to increasing needs for patient advocacy and support. It was therefore early in its development in 2020, consisting of two Learning Disability (**LD**) nurses, one General Nurse with a specialist interest in caring for patients with learning difficulties and a Band 2 activities co-ordinator. (It subsequently expanded and by June 2022 there were five Band 7 nurses (made up of three LD nurses/ one Mental Health nurse and one General Nurse) and six Band 6 nurses (two LD nurses, one Dementia Nurse and three General Nurses). Over this time the team developed increasing knowledge and skills needed to support patients with a Learning disability (LD) and/or Autism (ASD), Mental Health concerns, and Dementia. It is now Trust policy that every patient with known LD, autism, or dementia must be reviewed by the Vulnerabilities Team at least once during their inpatient stay. They ensure care needs are being addressed and support delivery of any necessary adjustments in care processes, such as medication timings or optimal ways to communicate with the patient. The general policy of each patient receiving a review continued throughout the pandemic and included patients with Covid-19.

212. This was supported by the Trust LD/ASD standards which clearly outlined and defined expectations regarding care for patients with a LD/ASD and these were used to support patients and to guide staff. There is also an escalation process to support non-compliance with standards.

213. The Vulnerabilities Team advocated for the patient and joined multi-disciplinary meetings to help guide care escalation discussions, alongside family members and patients. This was vital during visiting restrictions, and on a number of occasions the intervention of the Vulnerabilities Team ensured patients had the opportunity to have a carer or loved one with them as per visiting guidance and agreed exemptions. In total, from April 2020 to June 2022, the Vulnerabilities Team reviewed 1428 LD/ASD patients in the QEHB site.

214. PPE inevitably impacted upon the experience of the deaf and those who in whom non-verbal communication is important. Attempts to mitigate this included access to clear masks. Unfortunately, type IIR clear masks were not available via the NHSE/DHSC supply routes, so that this could not be addressed through a central procurement route. UHB did seek support from Midlands Make who manufactured clear masks within the Midlands for NHS staff, albeit that this has not continued post-pandemic.

215. Good support for remote translation services was maintained throughout the pandemic. Also, the hospital benefited from a workforce that reflects the background diversity of Birmingham, many of whom were multi-lingual and assisted with translation when needed.

216. Overall, there were no trends in serious incidents or increases in complaints which involved vulnerable adults or those with protected characteristics. This may reflect the significant work and expansion of the Vulnerabilities Team.

217. It is important to recognise that we did not always get decisions right. Some staff were redeployed outside of their usual workplace and were less experienced

in recognising a LD or ASD during acute care episodes or making necessary adjustments to care for acutely unwell and vulnerable adults. Many diagnoses of LD, ASD and other health needs such as deafness or issues associated with cognitive impairment are poorly captured in health records, and the usual communications between community and primary care were more limited during Covid-19. The general presentation and level of sickness associated with Covid-19 often was associated with confusion in patients and sometimes decisions about care pathways had to be made quickly. There were occasions when recognition of vulnerabilities were delayed and this may have impacted upon family or other advocates early involvement in care decisions. The development of the Vulnerabilities Team and its expansion during the pandemic helped address some of these issues but not all of them. The expansion of the Vulnerabilities Team came about as a direct result of recognition, at Board level, that we needed to do better for this patient group.

The impact on staff wellbeing and morale

218. The impact of caring for patients with Covid-19 was significant for all NHS staff, whether they were working in clinical or non-clinical areas.

219. The impact on staff working in ICU and acute wards was considerable; staff were under immense strain for a prolonged period of time. This reflected the high numbers of people needing ICU care, the high numbers of patients who died, the difficulties of communicating with the loved ones of the acutely sick, the difficulties of working using PPE, and concerns about disease transmission and individuals' own health and wellbeing. For those involved in clinical care delivery the context can be illustrated by the fact that in the first month of the pandemic, (March 2020 – April 2020) of the 2217 patients admitted to QEHB with proven Covid-19, 611 (almost 28%) died in the same period. Covid-19 admissions for ICU tended to be prolonged, with extended to weaning times from ventilation or at times succumbing to their illness after a period of what seemed like recovery. In addition to the profound impact upon families, these deaths had a major impact on the morale of staff, with personal accounts from the first wave including discussions of distress because 'everyone seemed to be dying', as deterioration was rapid and recovery slow.

220. For staff working in other areas of the hospital caring for patients with Covid-19, the impact was equally significant, but perhaps less well recognised. Early in the pandemic the majority of patients admitted were extremely unwell, ward staff were dealing with relatively high levels of acuity themselves, managing end-of-life care, whilst at the same time having personal fears and concerns. In the first wave this was exacerbated by a perception that treatments were solely supportive, promoting a feeling of helplessness in the face of the initial outcomes. This was in the face of significant personal trepidation with respect to the consequences of infection for themselves or transmission to loved ones. At this difficult time, many chose to stay away from home if they felt that they would expose vulnerable family members to risk.

221. In redeployed staff such challenges were amplified, working in new surroundings and needing to learn new skills without established support from colleagues. Many people (who volunteered to work in these challenging areas) had little exposure to critical illness or the high number of fatalities in their usual working roles prior to the pandemic.

222. When operating defined "hot" and "cold" care pathways, staff working in "cold" areas felt under significant pressure to protect the Covid-19 negative patients under their care. Many such patients were extremely vulnerable, there was an increasing recognition that Covid-19 could be asymptomatic in some people, and staff describe guilt felt if they tested positive when working on these "cold" areas. Fears about letting a stretched clinical team down or infecting a patient were commonly expressed.

223. For those in non-clinical roles, there was often a feeling of helplessness, and in some a feeling of guilt, in being unable to contribute directly to frontline care. Many who were compelled to work from home experienced significant impact on their mental health due to isolation, particularly for those early in their careers, where jobs often form part of people's social life. Over the course of the pandemic, QEHB developed better systems to support shielding and non-clinical staff to contribute to patient care, albeit from a distance. This included participating in

virtual clinics, working as family liaison officer, reviewing results, helping to co-develop newsletters and disseminate information. This return to important and valued work improved morale, but many people describe periods where they felt relatively abandoned from support, whilst clinical teams although working in difficult circumstances were perceived as maintaining a sense of shared purpose. An important learning point for the hospital is to think more creatively about how these staff members can be included in important work.

224. Staff described the fear and subsequent guilt in bringing Covid-19 back to their own homes. Some staff lost loved ones and feel sure their work in the NHS contributed to exposing their loved ones to this illness. Other people avoided loved ones, even outside of lockdowns and social restrictions, as they were so afraid of the consequences of infecting vulnerable members of their families.

225. It was a period of sacrifice by members of staff and sometimes bleak despair. It is a credit to our people that they continued to work and do their best for patients, despite what seemed like overwhelming circumstance. Fear, guilt, low morale and anger were sometimes focused upon concerns about the availability and the effectiveness of PPE, especially if it was felt that equipment was sub-optimal.

226. The robust Organisational Change Procedure that would usually be applied when moving staff to another area could not be applied due to the pace at which the changes needed to happen. To put this into context, in the first wave of the pandemic, there were 15 ward moves affecting QEHB, both across site and within the hospital, affecting approximately 250 staff. For the most part, staff worked flexibly and supported the needed changes in hospital services. Line managers tried to accommodate preferences (site/specialty) as far as possible. However, staff voiced anxiety as the pandemic progressed, as no one knew how long 'temporary' changes would last. Some staff were concerned the pandemic was being used as a tool to circumvent proper procedure when making significant changes. This was exacerbated by hospital line managers being unable to provide any level of certainty in terms of timescales. Some staff chose to leave the NHS, and there were 2259/7472 (30%) staff members who resigned during March 2020

to June 2022 and at a variable rate at different points in the pandemic. To place this in context, there are usually approximately 10% of staff members who resign in one year. This continued to have an impact on care delivery.

227. Given all these concerns a wide range of hospital activities and initiatives were set up focusing on staff morale, wellbeing and burnout. These included:

- financial advice to staff, who due to the pandemic may have become the sole breadwinner in their family.
- development of "pop up" honesty shops stocked with essentials such as dried, canned foods and toiletries for staff to be able to access and pay via an honesty system when many shops were limited in what they had to sell.
- Establishment of a Covid-19action steering group. This met weekly and was chaired by the Chief Nurse. The areas covered in open meetings included:
    - Employer Duty of Care
    - Nutrition and Hydration
    - Physical Comfort
    - Hygiene / IPC
    - Financial / benefit / hardship
    - Psychological Support
    - Mental Health
    - How to sleep and recovery
    - Bereavement Support
    - Managers and Leaders Wellbeing
    - Communicating with colleagues and patients and their families

228. Staff Networks began to provide their meetings virtually providing online support to staff. The BAME Network and the Disability and Long-Term Conditions Network had special sessions that were attended by the Trust CEO, Chief Nurse and Chief People Officer to discuss key points such as vaccinations, PPE and risk assessments.

229. We aimed for all staff who were shielding at home to have a wellbeing check-in call at least once a week. However, this took some time to set up, and some staff were missed initially. These staff have fed back that they felt lost by the NHS, as described above.

230. Wellbeing hubs were developed and set up to provide a safe space for staff to rest relax and rejuvenate while being able to access first line psychological support and, when needed, signposted to other support services.

231. Psychological First Aid training was developed to provide peer to peer support and a supportive resource was published on the intranet, where advice was provided on a range of wellbeing items such as burnout, working from home and shielding.

232. In addition to the measures outlined above:

- Chaplaincy (across all major faiths) increased staff support.

- The NHS 5 steps to wellbeing advice was adopted, displaying pull up banners and posters across the sites.

- There was significant support from external companies. Over 200 cabin crew volunteered to help support the wellbeing hubs as part of the Project Wingman programme and the Wellbeing team organised and distributed donations to help improve staff morale (for example, we were gifted more than 10,000 Easter Eggs which were distributed to staff).

233. There was little information available from the scientific literature to understand the likely long-term impact on staff or most effective ways to support staff wellbeing. Considering, and in addition to the initiatives described above, 1,605 staff members at QEHB consented to take part in research specifically focusing on the short and long-term impact of this pandemic on the emotional and

physical wellbeing of healthcare professionals (including studies such as COPE-HCP and STAT-STRESS Covid-19).

QEHB's approach to staff risk assessments prior to the national guidance being available

234. The national risk assessment tool for staff was released in February 2021. This was preceded by the development of the shielded patient list, which was deployed on a rolling and expanding basis, as more health data was assessed.

235. Trust-wide, from April 2020, a three-tiered approach to staff risk assessments was used in response to Covid-19, with three tiers of increasing risk, depending on demographic, health-related characteristics and household factors. There was a standard operating procedure to guide process (current version 5, deployed June 2022). The risk assessment was implemented from April 2020 and any complex cases were referred to a multi-professional panel, chaired by the Chief People Officer with the Occupational Health Clinical Service Lead, Deputy Medical Director and Operational Nursing Lead. Prior to April 2022, Occupational Health oversaw the assessment and job planning of any staff members known to be (or concerned about) their health during the pandemic.

236. In the absence of a national tool, the UHB risk assessment framework was designed in-house by our Clinical Lead and Occupational Health Consultant, who was also a Respiratory Consultant. The framework was ratified by the Trust's Medical Scientific Advisory Group, based upon the evolving understanding of profiles of risk as more research was reported globally.

237. Risk assessments were undertaken for all staff identified for shielding so that the return to work could be informed as shielding was lifted. This included risk reduction recommendations and redeployment advice.

238. Early in the pandemic an equality impact assessment for the workforce exposure identified that the virus was having a disproportionate impact on certain

demographic groups and/or on people with particular chronic conditions including age and weight profile, with consequential increased severity of disease and mortality. The EIA was undertaken in April 2020, and repeated in October 2020 and June 2022. Those areas identified through EIA as having potential adverse impact were:

- those aged over 70 (which affected some of our staff and volunteers).
- individuals from a Black, Asian and minority ethnicity background;
- those aged over 50 and from a Black, Asian and minority ethnicity background;
- those aged over 60 any ethnicity;
- pregnant workers;
- initial evidence that men were at higher risk of being admitted to hospital;
- some disabilities including learning disability, plus long-term chronic conditions such as diabetes.

239. In recognising that there was no single solution to protect the workforce, a clinically led tiered risk assessment approach was developed which assessed risks in terms of the working environment, underlying risk factors and home circumstances. Where individuals hit a medium to high-risk threshold and were concerned that the protective measures generated by our algorithm may not be sufficient to protect them, escalation to an MDT risk review panel was allowed.

240. The risk assessments also took account of household risks, such as multi-generational living or living with the clinically extremely vulnerable. It considered the risks of mental illness or poor mental wellbeing on the ability to comply with the risk mitigations identified. Staff members' personal concerns were taken into consideration when risk assessing work placement and job activities and where anxiety was a factor, active steps were taken by the manager and address provoking circumstances.

241. Although risk assessments for pregnant workers and those with physical disability existed pre-pandemic, this was the first time that environmental risks were identified which would differentially impact people according to ethnicity, learning disability or mental illness.

242. These processes had an ongoing impact on individuals in terms of an appreciation of their protected status. There were some individuals living with disabilities who had not previously considered themselves vulnerable who have had to come to terms with such an attribution, after receiving advice from Government to shield.

243. Our initial risk assessment was extended to a four-tier risk assessment when the apparent effect of ethnicity on outcome was recognised. In total, there were 4,884 risk assessments requiring further Occupational Health specialist input or assurance, particularly responding to the then emerging evidence of variation in disease susceptibility with ethnicity. Panels were held twice weekly from April to September 2020, and thereafter weekly from September 2020 to September 2022 (being stood down if there were no new cases to assess). The panel also undertook and published generic risk assessments for matters such as Ramadan, pregnancy, menopause and diabetes.

244. In general, most staff agreed with their risk assessment. However, there were delays in performing risk assessments across all staff groups, due to capacity of the assessment panel and the complex nature of some assessments. Those felt to be at highest risk of poor outcomes were therefore prioritised for first review. Prior to the introduction of a further tier which included risks associated with ethnicity, some staff expressed concerns that their risk was not adequately accounted for. Others suggested that there was insufficient account taken for their caring for vulnerable adults at home in the initial assessment, although this was always considered by the panel.

Unequal impacts on staff

245. The QEHB workforce reflects the diverse community it serves. As outlined in the section 'Concern over supply and quality of Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) and how this was managed' (paras 132-138), central procurement did not seem to have sufficiently considered

the needs of such a diverse workforce. It was evident at an early stage that standard PPE distributed did not meet the requirements for some staff groups. Ventilator hoods did not adequately fit staff with braids, fit mask testing often highlighted issues with PPE for people wearing turbans or hijabs, and mask fitting was difficult for people with different nose shapes, including flatter noses. UHB worked with Midlands Make suppliers to develop a range of options that responded to particular requirements. The risks were partly mitigated by a supply of respirator hoods until it was possible to deploy the locally developed options.

246. Locally, there were reports of significant vaccine hesitancy in some communities. To better understand the challenges faced, focus groups were held for staff to discuss and answer questions regarding vaccination and PPE, help to mitigate any concerns and reduce anxieties and misinformation. Further support and focus groups were established to support Asian, Black and Caribbean staff during the planned VCOD implementation, as it was recognised that this might impact staff from these communities most. Importantly these were generally staff led or supported initiatives.

Communication between the QEHB and the wider healthcare system during the pandemic

247. QEHB is a part of UHB, and the Trust operated a central leadership and operational team to coordinate a joined-up response across the Trust while enabling a delegated decision-making model through a hospital-based senior leadership team. Communications were both top down and bottom up. Senior healthcare professional staff, with specific expertise, were used to help create and then update standard operating procedures, guidelines and patient pathways. The Trust leadership tried to be as visible as possible to staff members across all 4 hospitals, performing daily briefs and talking to staff across the site.

248. Feedback suggests that the amendments made to the electronic healthcare record, and training materials and infographics were particularly valued by staff. At times it was difficult to be sure that the right level of communication was being maintained and that messaging helped staff prepare for the pandemic waves without amplifying distress. Our approach in every way (language, channels,

methods, etc) evolved with the pandemic as we learned what was most effective and for which staff groups.

249. Regionally, the response to Covid-19 felt connected and coordinated, with staff from across the ICB and NHSE contributing to a combined effort to enable safe patient care. As QEHB is the largest of hospital in the region, colleagues from other organisations sought assistance to deliver aspects of care and share resource. The expanded ICU capacity would have been difficult to maintain without reservist colleagues from across local organisations. UHB coordinated recruitment to clinical studies, enabling the West Midlands population to benefit from new medications and approaches to managing Covid-19, with >34,000 patients recruited in total. This response was supported by medical and nursing students from UoB and Birmingham City University (section Overview of the Queen Elizabeth Hospital Birmingham), who showed great resilience when working alongside their clinical colleagues. Research staff from UoB also supported the region's Covid-19 response, by ensuring our understanding of Covid-19 literature was up to date. Work with Public Health England in the West Midlands (now UK-HSA) helped identify community outbreaks, and our clinical teams worked with them to help mitigate risk where possible.

250. It is difficult to say how much our experiences of Covid-19 fed into national thinking or policy. We recognise that the pandemic was a time of great uncertainty and change. NHSE was attempting to quickly develop guidelines and policies which aided delivery of clinical care. Some policies were supported for wider roll-out without evidence of efficacy or a clear basis for evaluation. For example, the "Covid-19 virtual ward" includes discharging people with Covid-19 who meet objective criteria based on acuity scores and oxygen saturations, with pulse oximeters and daily phone calls for up to 14 days. Observational studies had reported the safety of this system but without describing its efficacy when compared to usual care. We studied 2300 people admitted with Covid-19 and could find no evidence that those patients that would have been stratified to a virtual ward-based follow-up on discharge had any greater rate of re-presentation, re-admission, ICU escalation or death, than those who did not meet these criteria on discharge **[SB/18 INQ000437440]**.

251. Staff have fed back that the central procurement system appeared poorly organised and unresponsive to need. Equipment arrived which was frequently unusable (section 'Concern over supply and quality of Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) and how this was managed'). There was undoubted waste when low-quality equipment had to be destroyed. Perhaps most important however was the corrosive effect that receipt of poor-quality equipment had on the confidence and well-being of staff members.

Recommendations

252. The experience of QEHB, within Birmingham and Solihull, reflects care for an ethnically 'super-diverse' population with high levels of deprivation. This is associated with high demand for acute hospital care, accentuated by the pandemic.

253. The national model of ICU capacity provision, its regional distribution, and the appropriate level of redundancy to manage national surges in demand should be evaluated. QEHB benefited from its role as a major tertiary centre. It has a single floor ICU with capacity for 100 beds, associated oxygen supply and ultrapure water supply for dialysis, designed between 2000 and 2010. That capacity allowed 142 level 3 patients to be cared for simultaneously at peak demand in January 2021. The scale of response required the development of the specific models of care described, predicated by the built estate. This benefited our population as escalation to ICU, guided by highly experienced consultants, was not restricted by local capacity despite such high demand.

254. Differences in infrastructure between UHB hospitals was evident not only in ICU but extended to differences in the availability of side-rooms, bed spacing, corridor width, ventilation and other factors across older estate which impacted upon Infection Prevention and Control. These are relevant to annual peaks of influenza however the effects of these deficiencies are amplified in a pandemic, even more so if future pathogens are more contagious than Covid-19. Hospital building notes should continue to refine recommendations for new and there is a

need to continue to renew hospital estate, if inequalities in healthcare are not to be amplified in any future pandemic.

255. The scale of response in ICU and acute medical admissions was facilitated by modern infrastructure at QEHB, however it was delivered by people working throughout the hospital. Acknowledgement of the benefits of this scale of response must also recognise the personal consequences for many of those contributing to that response. The effects are manifold however there was evident reduction in staffing for tertiary bed capacity following the pandemic. Understandably, many highly experienced nurses retired, resigned, or limited their uptake of additional shifts. The need for, and means to, mobilise high levels of psychological, occupational health and human resources support for staff should be reviewed. It is likely that greater levels of support during and after the pandemic would have benefited individuals and system recovery by improving retention of staff.

256. The mechanisms of central quality control of PPE should be reviewed. Central Quality control of PPE was generally considered to be sub-optimal. This has been discussed in a submission by the UHB Director of Procurement. It is however worth emphasising that whilst many healthcare workers were willing to place themselves in situations in which they understood that work may expose them to additional risk of infection, that courage and good will is rapidly eroded if they perceive there are systematic barriers to appropriate risk mitigation. Any failure of PPE supply therefore works on multiple levels to degrade our response and will need to be a focus of future preparedness.

257. The ability to adapt electronic healthcare records at pace needs to be considered in commissioning future electronic healthcare records. QEHB benefited from the ability to rapidly adapt its acute secondary healthcare record to provide clinical decision support at the point of care, thereby optimising the healthcare record, the delivery of treatment pathways and quality assurance.

258. Consideration should be given as to how technical and contractual arrangements for the management of newly generated patient level data, such as the immunisation record, can be returned to healthcare providers for patient benefit. The ability to share centrally curated patient level data on immunisation

status was considered to be a missed opportunity with respect to supporting acute and elective admission pathways. This is particularly important in supporting those with low levels of health literacy.

259. The ITU associated family liaison team to manage daily communications with relatives of patients was successful. Although this could only partly mitigate the significant distress caused by visiting restrictions it provided a degree of certainty and order for the families involved. This service did not however extend to all patients and families who were more reliant on remote access to ward-based staff. The family liaison team model should be reviewed across centres who delivered similar solutions, to determine whether and how it may be generalised to a wider in-patient population if similar circumstances were to arise. There is an argument for a common set of recommendations to support organisations planning such a response.

260. Consideration should be given to developing a standard memorandum of understanding that can be used by organisations redeploying individuals into other organisations in emergency situations such as the pandemic. Contributions to care delivery at QEHB included workers from across several organisations across the ICS. At the start of the pandemic there was no model to manage this redeployment which would have been facilitated by this simple measure.

261. Consideration should be given as to how existing resources could be adapted to deliver a rapid means to share education and training material pertinent to a pandemic response. In many instances this was achieved through informal networks or through professional societies, however there is an argument that an easily searchable, light touch curation of material made easily available, would allow the rapid dissemination of best practice. As a large centre with high levels of demand for Covid-19 management, UHB was well placed in developing specific education and training material which was widely shared through the aforementioned networks.

262. It is important to continuously evaluate new models of care delivery in the same way as new treatments or diagnostics. The unintended consequences of

apparently beneficial change are often under-estimated, particularly when implemented beyond the originating centre. We have given one example with respect to an assessment of the utility of Covid-19 virtual wards.

Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed: Personal Data

Dated: 03/05/23