1. Introduction to ICNARC

1.1 The Intensive Care National Audit & Research Centre (ICNARC) is an independent, scientific, not-for-profit organisation (registered charity number: 1039417). We work to ensure the best possible critical care by facilitating improvements in the structure, process, outcomes and experiences of care – for patients and for those who care for them. We achieve this by developing and sharing information about the quality of critical care with those who finance, commission, manage, deliver and experience critical care (both within and outside the NHS) through our national clinical audit and through our national and international research.

1.2 I am the founder and Director of ICNARC. In addition to myself, ICNARC's current Senior Management Team comprises: Peter Hyde (Chief Operating Officer, since November 2022); Professor David Harrison (Head Statistician); and Paul Mouncey (Head of Research). As a registered charity, ICNARC's activities are overseen by a Board of Management made up of the eleven Trustees of the charity, comprising a mix of clinical, scientific, business and lay members. The Chair of the Board is Sue James.

2. Introduction to the Case Mix Programme

2.1 Launched in 1994, the Case Mix Programme is the national clinical audit for patient outcomes from adult critical care units (intensive care and high dependency units) in England, Wales and Northern Ireland. All NHS adult general critical care units providing Level 3 (intensive) care participate in the Case Mix Programme. Other specialist units, including neurosciences and cardiothoracic critical care units, and standalone Level 2 (high dependency) units also participate. The Case Mix Programme does not include critical care units in Scotland, which coordinates its own national audit.

2.2 Critical care units participating in the Case Mix Programme capture/collect data, according to the ICNARC Case Mix Programme Dataset Specification, using local software on all admissions (including readmitted patients) to their unit. Securely, they submit these data to ICNARC, usually either monthly or quarterly, and a series of over 600 data validation checks are run, identifying errors and any missing information. Dedicated, trained (by ICNARC) staff at units then have a chance to correct and complete the data prior to analysis.

2.3 At the end of each quarter, critical care units receive a report which indicates how the unit compares both with other units identified as having a similar profile of admissions and with all units participating in the Case Mix Programme. The report focuses on a defined set of key potential quality indicators, and identify trends in these over time,

helping the unit to understand more about the care they deliver and outcomes they achieve. The aim is to assist the unit in decision-making and resource allocation around service delivery and organisation and to promote and prompt local quality improvement.

3. Preparation for the pandemic

3.1 On 22 January 2020, in response to the WHO 'Novel Coronavirus (2019-nCoV) Situation Report - 1', ICNARC convened an internal working group to prepare for the arrival/likely arrival of SARS-CoV-2 in the UK and to be ready to monitor the impact on adult critical care. The working group began to review the available information on SARS-CoV-2, emerging from China, and to develop a case report form for patients with COVID-19 admitted to critical care, building on the work ICNARC had done during the H1N1 pandemic in 2009 and interpandemic work ICNARC had contributed to as a member of the International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC).

3.2 On 11 February 2020, Professor Keith Willett, the Strategic Incident Director at NHS England and NHS Improvement, contacted me by email asking for a teleconference, as soon as possible. The teleconference was arranged for Sunday 16 February 2020, including myself, Keith Willett, David Harrison, Paul Mouncey and NR (a clinical associate of ICNARC). We discussed the potential contributions that ICNARC could make to informing NHS capacity for delivery of critical care for critically ill patients with COVID-19 and identified a number of reports to be produced using existing data from the Case Mix Programme.

3.3 On 18 February 2020, I sent the first of these reports, 'Patient characteristics, outcomes and activity for admissions with pneumonia' [KR/1 – INQ000099520], to Keith Willett. This report detailed the case mix, outcome (critical care and acute hospital mortality) and activity (organ support and length of stay) for over 75,000 patients admitted to critical care units participating in the Case Mix Programme between 2015 and 2019, with pneumonia, including a comparison of those with viral pneumonia, bacterial pneumonia and no organism isolated.

3.4 On 21 February 2020, I was contacted by Dr Meelad Sayma, a clinical fellow seconded to Keith Willett's team, who requested further breakdowns on the information provided previously for patients with viral pneumonia. On 22 February 2020, I provided Dr Sayma and Keith Willett with the report 'Past medical history, dependency and age distribution for admissions with viral pneumonia' [KR/2 – INQ000099518], which provided the following information for patients admitted to critical care units participating in the Case Mix Programme between 2015 and 2019

with viral pneumonia: the distribution of dependency prior to admission to acute hospital for patients with one or more severe conditions in the past medical history; a breakdown of severe conditions in the past medical history for patients whose dependency was reported as 'able to live without assistance in daily activities'; and a detailed breakdown of the age distribution in five-year bands. On 25 February 2020, I provided a follow-up report, 'Comorbidities for admissions with pneumonia' [KR/3 – INQ000099521], providing a breakdown of less severe comorbidities, assessed using the Charlson comorbidity index, for patients admitted to critical care units in England participating in the Case Mix Programme between 1 April 2013 and 31 March 2016 with pneumonia, utilising a pseudonymised dataset from a research study linked to Hospital Episode Statistics (HES).

3.5 On 28 February 2020, I sent a subsequent report, based on the original discussion on 16 February 2020, 'Available and potential critical care capacity' [KR/4 – INQ000099519]. This report detailed the available critical care beds in adult general critical care units in England, Wales and Northern Ireland and the percentage of bed days occupied by patients admitted following elective or scheduled surgery and those with a lower requirement for organ support.

4. Early response to the pandemic and initiation of regular reporting

4.1 On 4 March 2020, I emailed all critical care units participating in the Case Mix Programme to request that they:

- notify ICNARC immediately of any patient with confirmed or clinically suspected COVID-19 admitted to their unit;
- export all available data on these patients after the first 24 hours; and
- re-export data on these patients immediately after critical care discharge.

4.2 To facilitate this request, we "unlocked for use" codes that had been introduced into the ICNARC Case Mix Programme Dataset Specification, following the H1N1 pandemic, for 'Pandemic influenza, suspected' and 'Pandemic influenza, confirmed', repurposing these to record suspected and confirmed COVID-19.

4.3 ICNARC received the first notifications from participating critical care units in response to this request the same day (4 March 2020). Subsequent data submissions indicated that the first critical care admission with confirmed COVID-19 occurred on 5 February 2020.

4.4 On 10 March 2020, Keith Willett contacted me again to ask for help in confirming that all critical care units were instigating PCR testing for all patients admitted with an acute community acquired respiratory infection. We emailed all critical care units in the Case

Mix Programme asking for rapid confirmation that this policy had been implemented and fed the responses back to Keith Willett. We also provided Keith Willett with telephone contact numbers for all critical care units in the Case Mix Programme.

4.5 Also, on 10 March 2020, we produced our first report on patients with confirmed COVID-19 admitted to critical care units in the UK, 'ICNARC weekly report on COVID-19: 10 March 2020' [KR/5 – INQ000099531]. This was based on data we had received for 13 patients with confirmed COVID-19, out of 20 patients that had been notified to us by that date. I emailed this report to Keith Willett. Due to the small number of patients included, we did not make this report available publicly. We subsequently updated the report on 17 March 2020 (sent to Keith Willett on 18 March 2020), including data for 83 patients.

4.6 On 20 March 2020, we produced a more detailed report including data on 196 patients, 'ICNARC report on COVID-19 in critical care: 20 March 2020' [KR/7 – INQ000099532]. This report was circulated to all critical care units participating in the Case Mix Programme, to Keith Willett, and to representatives of the Intensive Care Society, the Faculty of Intensive Care Medicine and the Adult Critical Care Clinical Reference Group of NHS England. The report received attention from the national media, and we decided to make the report, and all our subsequent similar reports, available to all via our ICNARC website.

4.7 On 23 March 2020, I forwarded the report to Stephen Powis (National Medical Director, NHS England) and Simon Stevens (Chief Executive, NHS England). I included in the email, the daily and cumulative numbers of new cases of which we had been notified. I, or one of my senior colleagues, continued to send daily updates on the numbers of new cases to Stephen Powis and to Simon Stevens (then Alison Pritchard) throughout the pandemic.

4.8 We continued to produce reports weekly throughout the waves/peaks of the pandemic, reducing frequency to monthly when critical care admissions were lower and subsequently to quarterly in 2022. These reports were circulated to senior NHS and Department of Health and Social Care (DHSC) colleagues (including Keith Willett, Stephen Powis, Simon Stevens (then Alison Pritchard), Jonathan Van Tam, Jane Eddleston, Ramani Moonesinghe, Richard Arnold, Chris Moran, Celia Ingham Clark and Adam Roberts) before being posted on our website with a link circulated to participating critical care units and to the media. Jonathan Van Tam indicated that he routinely forwarded our reports on to the UK Chief Medical Officer's Senior Clinicians Group. Copies of all 91 public reports produced have been shared with the inquiry as a general disclosure.

4.9 In producing these reports, our aim was to provide accurate and timely data to aid in the planning and delivery of critical care for patients critically ill with confirmed COVID-19. We made an active decision to limit the interpretation of the data analyses presented to providing definitions and highlighting any appropriate caveats. We engaged with those receiving our reports to help explain the content of the reports and in responding to queries but we avoided making any recommendations on consequent actions.

4.10 We received much praise for our timely reporting from our senior NHS and DHSC colleagues. On 18 April 2020, Chris Moran described the report as "invaluable" and Celia Ingham Clark asked to "add my thanks to you and your team and frontline colleagues". On 27 May 2020, Keith Willett wrote "The ICNARC support is critical, has been to date and we will need it going forward." When Jonathan Van Tam left DHSC in March 2022 he offered his thanks for the reporting and said "it has been a pleasure working with you".

5. Initiation of data flows

5.1 On 18 March 2020, I was contacted by Professor Susan Hopkins (at the time, Deputy Director of the National Infection Service at Public Health England) with a request to discuss data flows. I had a brief conversation with her and we sent her a copy of the data collection form detailing the data we were routinely capturing/collecting in the Case Mix Programme. Later the same day, I was emailed by Ming Tang (Director of Data and Analytics, NHS England and NHS Improvement), copied to Susan Hopkins, who indicated that NHS England/Improvement and NHSX had been asked by the Cabinet Office to urgently set up a data store to collate health information to support the planning and operational management across government for the COVID-19 response. David Harrison and I met with Ming Tang and Susan Hopkins on 19 March 2020 to discuss technical and governance aspects of the proposed data transfers.

5.2 Following rapid review and agreement of a dataset specification [KR/8 – INQ000099525], a data sharing agreement for transfers from ICNARC to NHSX of data for patients with confirmed COVID-19 was signed on 24 March 2020 with the first data transfer taking place on 25 March 2020. These data transfers continued daily throughout the pandemic.

6. Age

6.1 On 24 March 2020, I was approached by Professor Calum Semple with a request from Professor Jonathan Van Tam, Deputy Chief Medical Officer, for a breakdown of patients by single and multiple organ failure and age band. The original request had

been sent to Calum Semple as one of the leads of the CO-CIN study, but he indicated that ICNARC were may be better placed to address it. I sent the resulting report, 'Multiorgan dysfunction for critically ill patients with COVID-19 by age' [KR/9 – INQ000099526], to Jonathan Van Tam on 25 March 2020.

6.2 The above report was the only report to make specific reference to age within the request, and there were no meetings between ICNARC and the UK Government, Welsh Government or Northern Ireland Critical Care Network specifically concerning age.

6.3 A summary of the distribution of the age of patients critically ill with confirmed COVID-19 was included in all descriptive reports from the very first report produced on 10 March 2020 onward. From 20 March 2020 onward, the distribution of age was reported separately for males and females. From 16 October 2020 onward, 28-day in-hospital mortality by age group was also included in the reports published on the ICNARC website.

7. Expansion of reporting to devolved nations

7.1 On 30 March 2020, I was approached by Dr Andrew Ferguson, Clinical Lead for the Critical Care Network Northern Ireland, requesting a regional report on COVID-19 in Northern Ireland. The first report for Northern Ireland was produced on 10 April 2020 and sent to Nichola Cullen, Network Manager at the Critical Care Network Northern Ireland for onward dissemination [KR/10 – INQ000099535]. The report included information on patients admitted to critical care units in Northern Ireland only. We continued to produce these reports weekly, alongside our national reports, and posted them on the ICNARC website after sending to the Critical Care Network Northern Ireland. Copies of all 75 reports produced have been provided to the inquiry as a general disclosure. All our interactions regarding reporting for Northern Ireland were with the Critical Care Network and we did not have any direct contact with the Northern Ireland Executive. Although there was discussion with the Critical Care Network Northern Ireland regarding providing a patient level dataset for admissions with COVID-19, a process for this was never pursued by them/agreed.

7.2 On 31 March 2020, I was contacted by Professor Ronan Lyons, Co-Director of the SAIL Databank, the trusted research environment for Wales hosted within the Health Informatics Research Unit at Swansea University. Professor Lyons indicated that he had a new role working to the Chief Medical Officer for Wales and was requesting access to "ICNARC data" for Wales for the purpose of COVID-19 analyses for Welsh Government and NHS Wales. David Harrison, Paul Mouncey and I met with Ronan Lyons by Zoom on 13 April 2020 to discuss what we could provide in terms of both

data and reporting. The first report on patients admitted to critical care units in Wales was sent to Ronan Lyons and other colleagues in SAIL on 4 May 2020 [KR/11 – INQ000099538]. The report included information on patients admitted to critical care units in Wales only. We continued to produce these reports weekly, alongside our national reports, and posted them on the ICNARC website after sending to the SAIL team. Copies of all 71 reports produced have been provided to the inquiry as a general disclosure.

7.3 A data sharing agreement with SAIL was signed on 13 May 2020 and the first file of patient data was sent the same day. The dataset included data for patients with confirmed COVID-19 admitted to critical care units in Wales. Pseudonymised data were securely transferred to SAIL, with patient identifiers transferred to NHS Wales Informatics Service who provide the data linkage service for Wales. Data extracts continued to be transferred weekly throughout the pandemic.

8. Ethnicity

8.1 On 5 April 2020, we introduced reporting of the numbers of patients critically ill with confirmed COVID-19 by ethnic group into our weekly report. The report showed that the proportion of non-White patients admitted to critical care was higher than expected, even after accounting for the geographical distribution of admissions [KR/12 – INQ000099533].

8.2 On 7 April 2020, I was contacted by NR from the Race Disparity Unit in the Cabinet Office requesting a breakdown by more detailed ethnic groups and by location, which we provided the same evening [KR/13 – INQ000099528].

8.3 ICNARC's report appears to have been one of the triggers for a considerable focus on disparities in risks and outcomes of COVID-19, particularly with respect to ethnicity, and was cited in the Public Health England report 'COVID-19: review of disparities in risks and outcomes' (June 2020), which prompted further cross-governmental work in this area led by the Equalities Minister. ICNARC's public reports were cited in the 'Second quarterly report on progress to address COVID-19 health inequalities' (Cabinet Office, February 2021) as evidence that outcomes of COVID-19 had improved for most ethnic minority groups.

8.4 On 20 September 2021, ICNARC was approached by NR from the Race Disparity Unit in the Cabinet Office to request updated comparisons of variation in mortality among ethnic groups between waves. David Harrison sent summary results of the requested analyses on 23 September [KR/14 – INQ000099539], although these were not ultimately included in the 'Final report on progress to address COVID-19

health inequalities' (Cabinet Office, December 2021) as they were not externally published and citable.

9. Use of ECMO

9.1 On 7 May 2020, I was approached by NR the clinical lead for the national ECMO service, to request analyses of patients referred and transferred for ECMO using linked data collected by the national ECMO services and the ECMO centres. On 21 May 2020 and 26 May 2020, we met with NR NR of NHS England to discuss the approach.

9.2 After further internal meetings, we received patient identifiers for patients referred and accepted for ECMO in September 2020 and, on 14 October 2020, we provided NR NR with a report describing the characteristics and outcomes of patients with confirmed COVID-19 transferred for ECMO at each of the ECMO centres [KR/15 – INQ000099524].

9.3 On 26 November 2020, we provided NR with a report on risk-adjusted outcomes for patients with confirmed COVID-19 transferred for ECMO to share with the NHS England Clinical Reference Group for Adult Critical Care [KR/16 – INQ000099534]. Further updated reports were provided on 4 February 2021 and 21 April 2021.

9.4 David Harrison presented of analyses on the characteristics of patients referred and accepted for ECMO to the clinical leads of the ECMO centres on 22 October 2021 [KR/17 – INQ000099523].

10. Comparative outcomes

10.1 To assist critical care units in learning from each other's experiences, and following rapid development and validation of a risk prediction model for COVID-19, in September 2020 we produced a comparative report showing risk-adjusted mortality for patients with confirmed COVID-19 in each critical care units in the form of funnel plots [KR/18 – INQ000099537]. Each critical care unit was given access to the report through our online file sharing system, together with information on the results for their unit. Individual critical care units were not identified in the report. On 17 September 2020, we met with Keith Willett, Mike Prentice, Chris Moran, Ramani Moonesinghe and Adam Roberts to take them through the report.

11. COVID-19 Process Audit

11.1 In December 2020, ICNARC was approached by Ramani Moonesinghe with a suggestion to collect additional data on treatments received by patients critically ill with COVID-19. We worked this suggestion into a proposal for a process audit, to evaluate whether patients were receiving the interventions that had been established to be effective through clinical trials such as RECOVERY and REMAP-CAP and to explore variability in use of other treatments where the evidence base had not yet been established.

11.2 The COVID-19 Process Audit went live on 3 March 2021, with units requested to enter data retrospectively for patients admitted from 1 January 2021 onwards, where possible. In June 2021, individual critical care units were provided with reports showing their results compared with other units [KR/19 – INQ000099527]. On 13 July 2021, ICNARC hosted a webinar to present the overall summary results across all units. The summary results were subsequently updated and shared with Ramani Moonesinghe in October 2021 and April 2022.

12. Pregnancy

12.1 On 7 January 2021, I was approached by Professor Ramani Moonesinghe, National Clinical Director for Critical and Perioperative Care at NHS England, for information on the characteristics of pregnant women with confirmed COVID-19 admitted to critical care. On 14 January 2021, we sent a report comparing characteristics and outcomes for pregnant women between the waves to Ramani Moonesinghe and to Professor Anthony Kessel, Clinical Director for Specialist Commissioning at NHS England [KR/20 – INQ000099536].

13. Vaccination

13.1 On 26 January 2021, I was approached by Professor Wei Shen Lim, Chair of COVID-19 Immunisation for the Joint Committee on Vaccination and Immunisation (JCVI) requesting analyses to support the JCVI discussions on phase 2 of the vaccine rollout. David Harrison and I met with Professor Lim and other members of the JCVI on 29 January 2021 to discuss what information would be useful to them and we joined the JCVI meeting on 4 February 2021 to present the results of the analyses we had conducted looking at the breakdown of critical care admissions with confirmed COVID-19 according to the JCVI-defined vaccine priority groups and the characteristics of critically ill patients in priority group 10 (those aged 16-49 years and not in an at-risk group) [KR/21 – INQ000099542].

13.2 Following the JCVI meeting on 4 February 2021, the JCVI requested further analyses of priority group 10 to present the numbers of admissions to critical care as an admission rate per million population by age and sex. These additional analyses were sent to JCVI on 8 February 2021 [KR/22 – INQ000099541]. The strong age gradient in critical care admissions, even when restricted only to those aged 16-49 years, was one of the key pieces of evidence used to support a continuation of the rollout of vaccination by age groups. This was demonstrated by one of the slides from our presentation on the numbers of admissions by age group being used in the media briefing on the roll-out by Prof Lim.

14. Reporting to the Cabinet Office

14.1 On 4 June 2021, ICNARC was approached by NR from the Health Analysis team in the Cabinet Office COVID-19 taskforce. He noted that the data in our public reports (which at that time were being produced monthly) were "incredibly rich and a fantastic resource" and he wanted to be able to arrange access to the data as rapidly as possible.

14.2 David Harrison, Paul Mouncey and I met with NR from the Cabinet Office COVID-19 taskforce on 10 June 2021. From that date forward, we included the Cabinet Office in dissemination of the daily updates on numbers of cases that were being sent to NHS England. We also discussed production of a weekly report with a timing that would fit into their regular data briefings for the Prime Minister and Cabinet. A first weekly report was sent to the Cabinet Office on 16 June 2021 [KR/23 – INQ000099543], and was subsequently refined for future reports incorporating feedback from the Cabinet Office team. We continued to send these reports weekly until the summer of 2022.

14.3 On 1 July 2021, NR sent examples of charts produced from the weekly report that were planned to be incorporated into the internal dashboard used to brief the Prime Minister and Cabinet. We provided feedback on these charts, and in particular appropriate caveats around the data, on 7 July 2021.

14.4 On 6 September 2021, David Harrison had a further meeting with NR and NR to discuss whether it would be possible to incorporate information on vaccination status into our reports. David explained that we did not have routine access to vaccination data, but that our data were being linked with vaccination data for a research project funded through Health Data Research UK and we would attempt to provide any early information from that project that we were able to share as soon as it became available.

14.5 Rates of admission to critical care by age group and vaccination status, based on results from this research project, were introduced into our public reports from 19 November 2021.

14.6 On 5 January 2022, David Harrison and I met with Alex Wilson, Deputy Director: Analysis, Data and Dashboard in the Cabinet Office, and others from the Cabinet Office team to discuss the vaccination reporting. Following the meeting, we shared further detailed graphs from the ongoing research project showing information on critical care admission rates by age group and vaccination status over time [KR/24 – INQ000099540]. These graphs were incorporated into the Cabinet Office briefing pack and we were subsequently informed by NR that there was "a lot of interest and praise from the PM and Cabinet on your work around the vaccination status of patients admitted to critical care". Graphs on vaccination status based on information from our public report were subsequently included in the 10 Downing Street press conferences on 19 January 2022 and 21 February 2022.

I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court 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 in its truth.

PD

Date: 30/5/23

Professor Kathy Rowan
Director, ICNARC