National Neonatal Audit Programme (NNAP) 2024 data: Extended analysis report

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Contents

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Further details of the NNAP governance structure are available at: www.rcpch.ac.uk/work-we-do/quality-improvement-patient-safety/national-neonatal-audit-programme/governance-delivery

1. Introduction

This document is a supplementary extended analysis report to accompany the National Neonatal Audit Programme (NNAP) Summary report on 2024 data, available at: www.rcpch.ac.uk/NNAP-report-2024-data. It provides results by NNAP measure at unit level (Special Care Unit (SCU), Local Neonatal Unit (LNU), Neonatal Intensive Care Unit (NICU)), by neonatal network, and for England, Scotland, Wales and the Isle of Man combined, grouped by theme, with a summary of key findings and suggestions for next steps for services seeking to make improvements and links to further resources and case studies.

Full annual results at unit and network level, interactive reporting tools and unit posters are available on NNAP Online at: https://www.rcpch.ac.uk/resources/nnap-online-report-data

The NNAP Public Access Dashboard (PAD) presents timely access to results for each of the 10 NNAP performance metrics as annual rolling averages. This facilitates earlier identification of areas for improvement and data to support improvement work. The dashboard can be found here: https://www.rcpch.ac.uk/resources/nnap-data-dashboard

Those actively engaged in delivering neonatal care can review components of the NNAP metrics, and more detailed information about performance on a close to real time basis by ensuring they are able to review the NNAP Restricted Access Dashboard. Contact the NNAP team (nnap@rcpch.ac.uk) to arrange access.

Methodology and statistical analysis plan

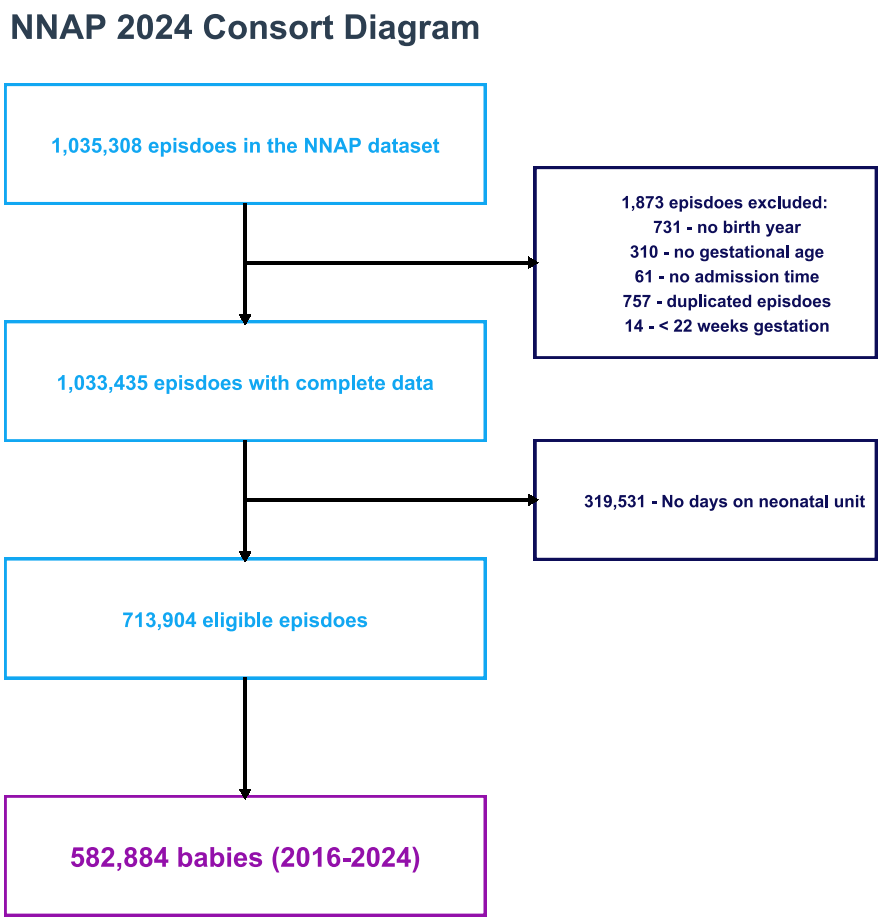
A number of changes have been applied to the data flow and data cleaning processes for NNAP 2024 data, as well as to the derivation of the NNAP measures. The changes are as follows:

- Whilst the case mix adjustment methodology remains broadly the same, two adjustments have been made this year:
    - Weighting is now determined using logistic regression; previously a bespoke estimation was derived.
    - Estimation of uncertainty is now calculated using bootstrapping; previously standard error was used. Outliers are now identified based on the proportion of bootstrap replication results above or below a treatment effect of 0% (national mean).
- All time-series charts use the latest metric definitions, methodology and data as of March 2025 to ensure that figures are comparable between years. For this reason, results from previous years will not always match previously published NNAP annual results. Notes for interpretation are included with the charts and results for individual measures where relevant.
- The clinical outcomes composite was updated to include the PHVD measure in the calculation of the composite result.
- Demographic analysis has been added to the audit, primarily focusing on audit results by ethnicity.
- The temperature measure was updated to include babies admitted up to 12 after birth, previously this was limited to 1 hour after birth.

For a full description of the NNAP methodology and statistical analysis plan, see: www.rcpch.ac.uk/nnap-data-flow-methodology

Figure 1 describes the exclusions and episodes eligible for inclusion in analysis.

Figure 1: Consort diagram, episodes eligible for the NNAP, 2024 data year.



NNAP measures and standards

The NNAP Methodology and Dataset Group and Project Board conduct a regular review of the NNAP dataset and audit measures in close consultation with the wider neonatal community, taking note of the publication or amendment of any relevant professional guidance and/or standards.

Developmental standards are described for most measures of care processes. The concept of 'developmental standard' is derived from the screening literature. The underlying aim is that a standard is set with a view to later revision, on a pathway towards eventual universal delivery of the specified care process item. The developmental standards are described in the NNAP measures guide, and may derive from consensus rather than externally developed standards.

Full details of each measure can be found in the NNAP 2024 audit measures guide: www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/measures.

Frequent reporting of NNAP results

The NNAP public access dashboard (PAD) dashboard provides results for each of the 10 NNAP performance metrics, as annual rolling averages. Data is refreshed monthly. Results can be displayed for neonatal units, Integrated Care Systems, Health Boards (Wales and Scotland), and by neonatal network. The dashboard provides more timely access to the latest available results, facilitating earlier identification of the need for improvement and data to support improvement work.

The NNAP restricted access dashboard (RAD) provides the underlying data for the NNAP performance measures to participants, visible only to neonatal units and networks. The data is refreshed monthly and presented in time series charts, tabular data, and an interactive patient list. The RAD is intended to be used by participating neonatal units and networks for quality improvement purposes, and allows units to drill down further into the component measures of the composite metrics.

Data included in both dashboards are considered provisional and are subject to change.

Data for assurance and data for improvement

It is important to distinguish between the data referred to in this report and that seen within the dashboards referenced above. The data published here has been subject to an NNAP data assurance window, and as such is published using data abstracted on the 2nd of April 2024. As part of the data assurance process, units were asked to review their data and specifically to offer assurance relating to necrotising enterocolitis, bloodstream infection and preterm brain injury. The results of this NNAP data assurance survey are represented in the specific sections of what follows and inform the graphical presentation of data as well as that shown online.

Annual results for 2024 and previous years continue to be available on NNAP Online.

Data completeness and case ascertainment

All eligible neonatal units in England, Wales, Scotland and the Isle of Man participate in the NNAP. It is expected that case ascertainment is 100%; however, the NNAP is aware that issues relating to interfacing of electronic patient record and care summary systems affect the quality of data and case ascertainment for a small number of participating units.

In some past NNAP reports, certain measures have not been reported for units experiencing challenges with data completeness. No units are now excluded from NNAP reporting. Rather it is recognised that some units will have high levels of missing data for certain measures or incomplete case ascertainment. This decision was taken to facilitate maximum participation in the NNAP, identify challenges with participation, and to encourage improvements in the quality of the data flow. The Neonatal Critical Care Service Specification states that all

neonatal unit must submit data to the NNAP for all measures.[1] Neonatal units with known data completeness issues are noted in section 13 - Unit participation.

The NNAP encourages early and frequent engagement with its dashboards so that any issues can be identified and investigated. The audit is actively engaging with affected services and networks, and with the audit commissioners and clinical system providers to consider future mitigations to these data flow issues.

Additional maternity and neonatal data sources

Further data about maternity and perinatal services is available from the National Maternity & Perinatal Audit (NMPA) and Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK (MBRRACE-UK). The NMPA measures various aspects of maternity and neonatal care provided by NHS maternity services in England, Scotland and Wales. MBRRACE-UK conducts robust national surveillance and investigates the deaths of women and babies who die during pregnancy or shortly after pregnancy in the UK.

[1] NHS England. Service specification 240301: Neonatal Critical Care. Available at: https://www.england.nhs.uk/wp-content/uploads/2015/01/Neonatal-critical-care-service-specification-March-2024.pdf

2. Mortality

Audit measure question: What proportion of very preterm babies die before discharge home, or 44 weeks post-menstrual age (whichever occurs sooner)?

The NNAP reports mortality until discharge, or 44 weeks post-menstrual age (whichever occurs sooner), for a one-year cohort of babies born at 24 to 31 weeks gestational age inclusive who turned, or would have turned, 44 weeks post-menstrual age between 1st of January 2024 and the 31st of December 2024. Results are reported by neonatal network, with babies attributed to the unit of birth. When the place of birth is listed as home or transit, babies will be attributed to the network containing the unit of first admission.

Mortality is an area of focus in the NNAP Quality Improvement Strategy. For details of the improvement goal relating to mortality, and the wider rationale for its inclusion and supporting objectives, access the Strategy at: https://www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/healthcare-improvement-strategy

This measure of mortality supplements other measures of mortality, such as that reported by Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries in the UK (MBRRACE-UK). The NNAP measure only includes very preterm babies because they experience higher mortality and is limited to babies born alive and admitted to neonatal units, describing mortality up to the point of hospital discharge. MBRRACE-UK report neonatal mortality, defined as that occurring before 28 days of age, by centre, for all gestational ages. There is evidence that notable numbers of babies die after 28 days.[2] MBRRACE-UK have published data showing national rates of infant mortality (death before a year of age for babies born before 27 weeks gestational age).[3]

The comparative mortality reporting in this report excludes admissions of babies born at 22 and 23 weeks gestation, consistent with previous years. This exclusion was agreed with partners based on evidence that rates of admission for attempted curative intensive care vary between neonatal services. Given high rates of mortality at the lowest gestations, the potential impact on mortality reporting is significant, although this decision will be kept under review. However, in addition to comparative mortality reporting of babies born at 24 to 31 gestational age, we report separately, the proportion of admitted babies born at 22 and 23 weeks gestational age who do not survive to 44 weeks PMA or discharge home.

A case mix adjustment process is used to obtain a mortality treatment effect for each unit and network. This treatment effect helps to identify if differences in mortality between networks might be attributable to the care given in networks.

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[2] Berrington J.B., *et al.* Deaths in Preterm Infants: Changing Pathology Over 2 Decades. *J Peds*;160(1):49-53. Available at: https://www.ncbi.nlm.nih.gov/pubmed/21868028.

[3] Smith, L., *et al.* on behalf of the MBRRACE-UK collaboration. *MBRRACE-UK Supplementary report on survival up to one year of age for babies born before 27 weeks gestational age*. 2019. Available at: https://www.npeu.ox.ac.uk/assets/downloads/mbrrace-uk/reports/MBRRACE-UK%20supplementary%20tables%20on%20births%20before%2027%20weeks%20gestation%202016.pdf

The treatment effect refers to the percentage difference between the observed proportion of babies who died in a network, and the proportion of babies expected to have died in the same network, based on the characteristics of the network's babies.

To estimate the expected proportions, a logistic regression is fitted on the national dataset and, using this model, each baby is assigned an expected outcome between 0 and 1. These are summed for each network, then divided by the number of patients to obtain the expected proportion of outcomes.

The baseline characteristics used in the adjustment are baby ethnicity, mother's smoking status, mother's age, number of previous pregnancies, multiplicity, problems in pregnancy, sex, birthweight, gestational age, and deprivation quintile.

A negative treatment effect suggests that the babies fared better in the unit/network than they would have done elsewhere in the country, and a positive treatment effect suggests that the babies would have fared better had they been treated elsewhere.

Results

Full results are available on NNAP Online and more recent, unassured, data can be viewed in the NNAP Data Dashboard.

Figure 2: Mortality until discharge (or 44 weeks PMA) in babies born at less than 32 weeks gestational age, by year.

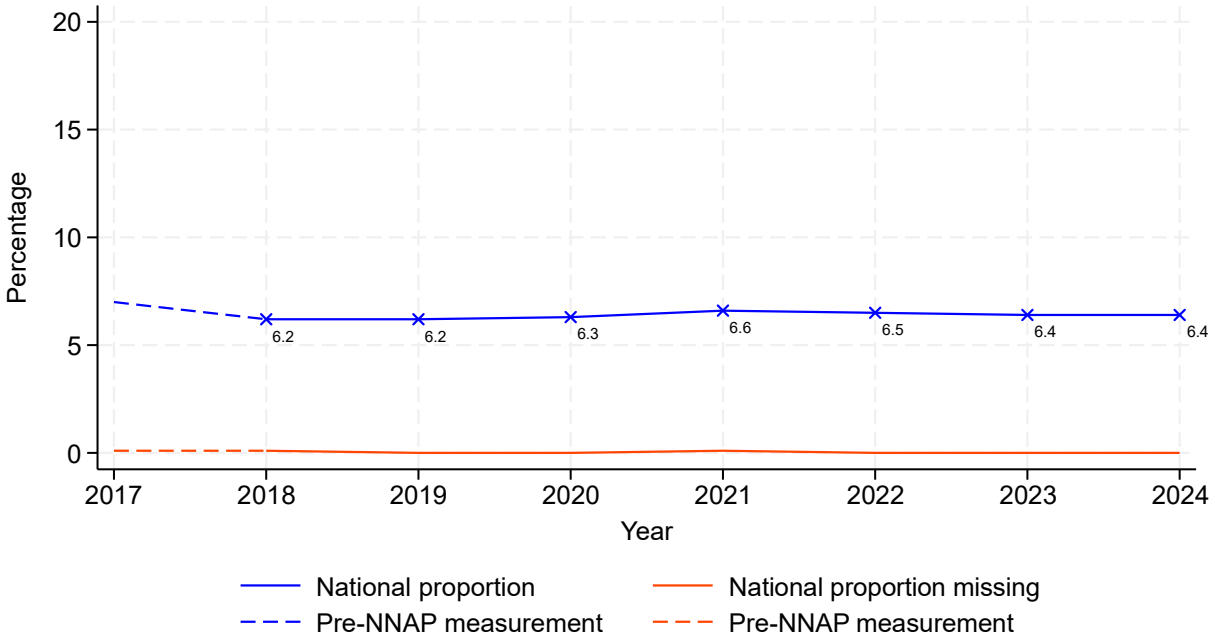


Figure 3: Mortality until discharge (or 44 weeks PMA) in babies born at 28-31 weeks gestational age, by year.

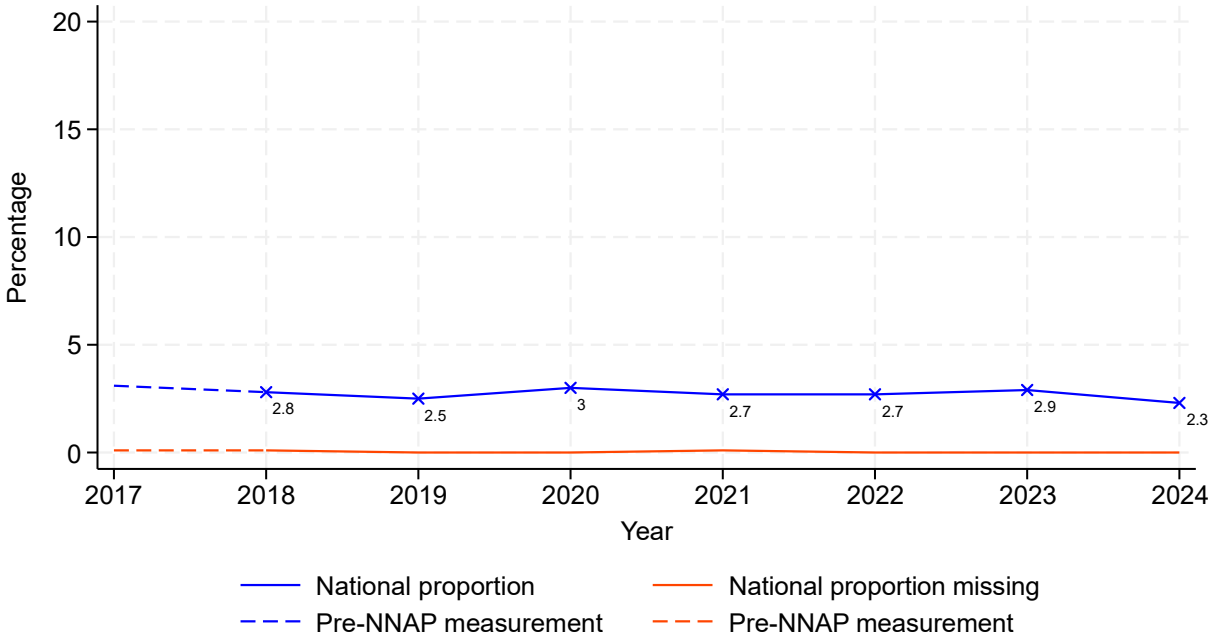


Figure 4: Mortality until discharge (or 44 weeks PMA) in babies born at 24-27 weeks gestational age, by year.

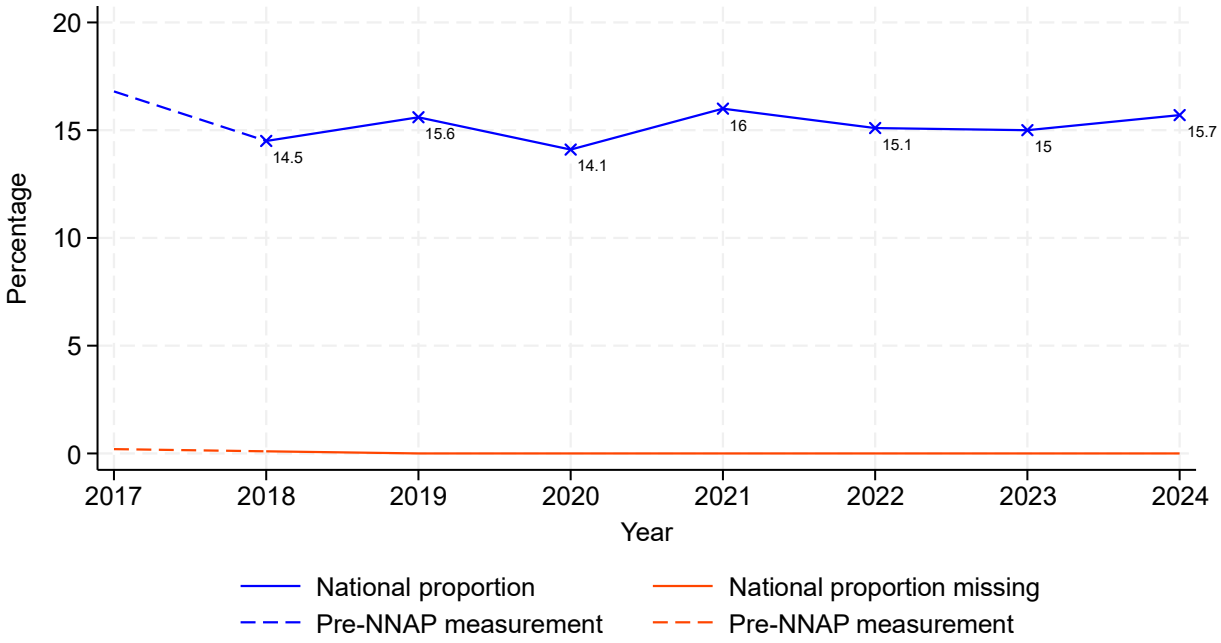


Figure 5: Observed proportion (TOP) and treatment effect (BOTTOM) of mortality until discharge (or 44 weeks PMA) in babies born at less than 32 weeks, by neonatal network.

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

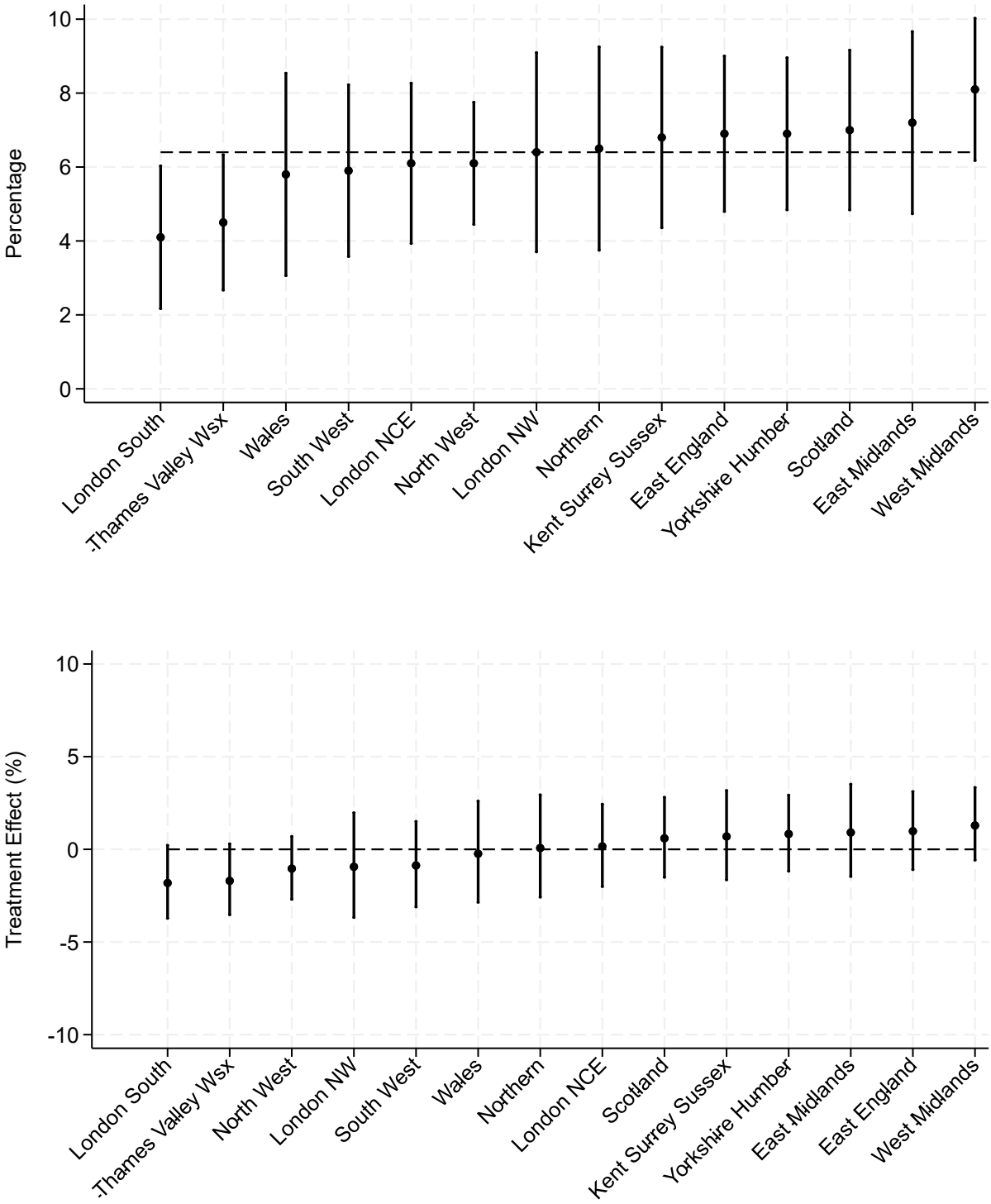


Figure 6: Front and back plot of mortality until discharge home (or 44 weeks PMA) in babies born at less than 32 weeks, by neonatal network.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.

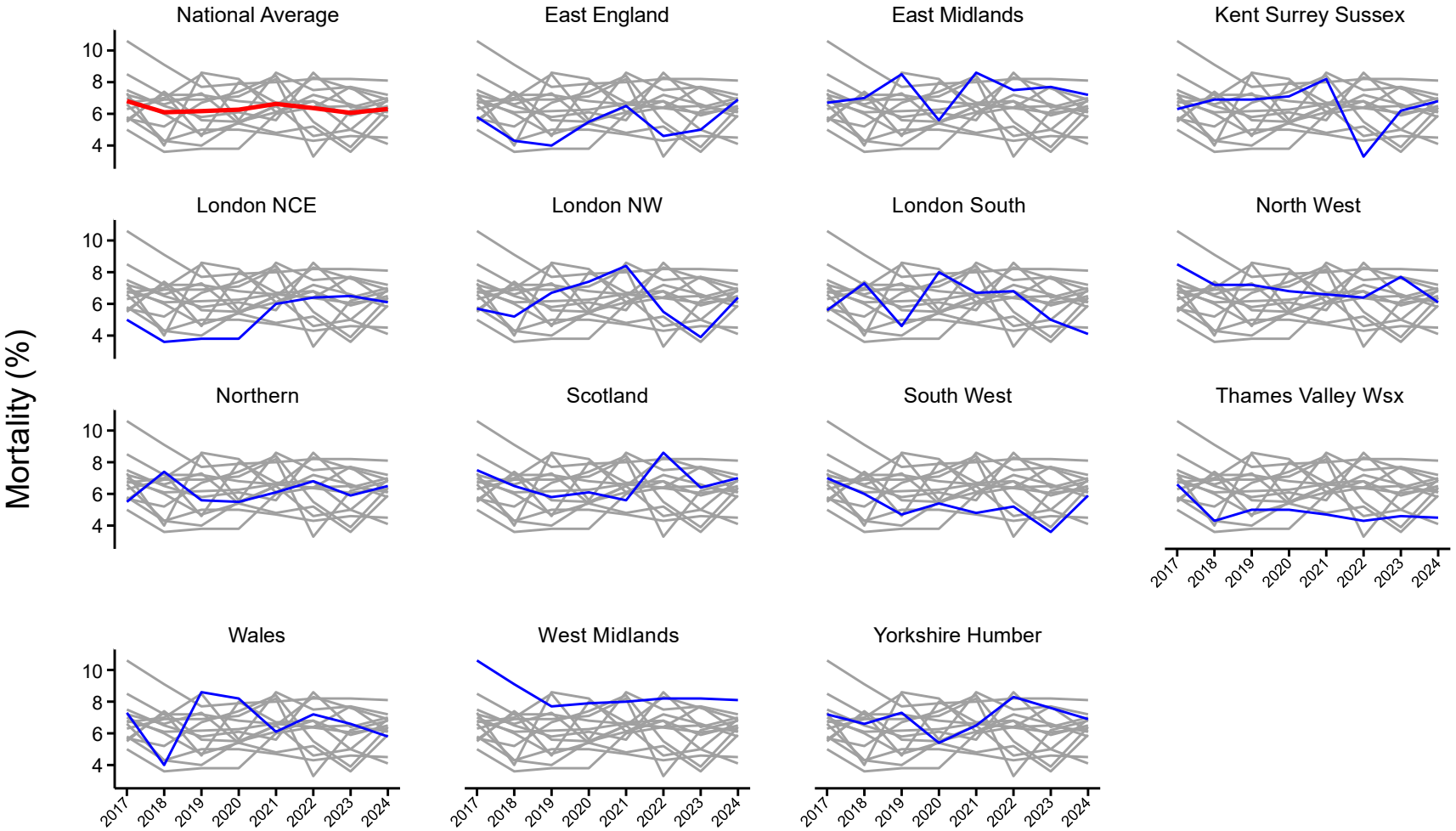


Table 1: Mortality until discharge (or 44 weeks PMA) in babies born at less than 32 weeks gestational age, by year.

Year	Eligible babies	With outcome	Survived to 44 weeks PMA or discharge home	Died before 44 weeks PMA (%)
2018	7,827	7,821	7,333	488 (6.2%)
2019	7,674	7,673	7,194	479 (6.2%)
2020	7,280	7,278	6,823	455 (6.3%)
2021	6,993	6,989	6,525	464 (6.6%)
2022	7,212	7,210	6,744	466 (6.5%)
2023	7,009	7,008	6,562	446 (6.4%)
2024	7,038	7,038	6,587	451 (6.4%)

Table 2: Number and proportion of babies born at 22 and 23 weeks GA and admitted to neonatal care, and surviving to 44 weeks PMA, by year.

Reporting period (turned 44 weeks PMA)	Number of babies admitted born at 22 weeks GA*	Survived to 44 weeks PMA (%)	Number of babies admitted born at 23 weeks GA*	Survived to 44 weeks PMA (%)
2018	15	5 (33.3%)	253	114 (45.1%)
2019	14	3 (21.4%)	259	124 (47.9%)
2020	52	15 (28.8%)	271	129 (47.6%)
2021	81	22 (27.2%)	228	108 (47.4%)
2022	104	23 (22.1%)	293	143 (48.8%)
2023	112	31 (27.7%)	245	113 (46.1%)
2024	108	33 (30.6%)	264	131 (49.6%)
National†	486	132 (27.2%)	1813	862(47.5%)

**6 babies with missing outcomes excluded from analysis.*
†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Summary of findings

- Overall, the proportion of very preterm babies, born between 24 and 32 weeks gestational age, who die before discharge home from the neonatal unit is unchanged from 2023 at 6.4% (451 of 7,038) and has not improved over recent years (*Figure 2*). Unacceptable geographical variation persists between neonatal networks – from 4.1 to 8.1%, which is not explained by the clinical or demographic background characteristics of babies cared for in the neonatal network (*Figure 5*).
- Although the NNAP reports only deaths occurring after admission to a neonatal unit, not including stillbirths and delivery room deaths, it's clear that the national ambition in England to halve the number of stillbirths and neonatal deaths by 2025[4] is unlikely to be achieved, and additional approaches to reducing mortality are needed.

[4] Dept. of Health and Social Care. 2015. New ambition to halve the rate of stillbirths and neonatal deaths. Available at: https://www.gov.uk/government/news/new-ambition-to-halve-rate-of-stillbirths-and-infant-deaths

- The number of babies born at 22 weeks gestational age and admitted to neonatal care appears to have plateaued (108 in 2024), having increased approximately seven-fold between 2018 (15) and 2023 (112). The number of babies born at this gestational age and surviving to discharge has increased from 5 in 2018 to 33 in 2024. The proportion of admitted babies born at 22 weeks and surviving to 44 weeks or discharge is largely unchanged (*Table 2*).

National recommendation:

1. Neonatal networks should:

    a. Review their mortality data and, where rates are higher than expected, develop locally prioritised improvement plans. Quality improvement activity should focus on best practices identified from Neonatal Networks exhibiting low mortality, with particular attention given to differences in network structure, staffing, clinical governance, and clinical practices. *(Recommendation repeated from the 2023 data report).*

    b. With their constituent units, undertake reviews of deaths in accordance with the BAPM Framework for Practice: Neonatal Mortality Governance (expected to be published in the second part of 2025) and engage with other statutory death review processes. Shared learning from these reviews should inform network governance and unit level clinical practice.

3. Outcomes of neonatal care

What proportion of babies born between 24 and 31 weeks gestation inclusive did not have a reported serious complication of prematurity?*

**Late onset infection, NEC, BPD, serious preterm brain injury or mortality.*

This composite metric looking at serious complications of prematurity is an area of focus in the NNAP Quality Improvement Strategy. For details of the related improvement goal, and the wider rationale for its inclusion and supporting objectives, access the Strategy at: www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/healthcare-improvement-strategy

Results

Figure 7: Proportion of babies born between 24 and 31 weeks GA with no reported serious complication of prematurity, 2017-2024, using 2024 data, definitions and methodology.

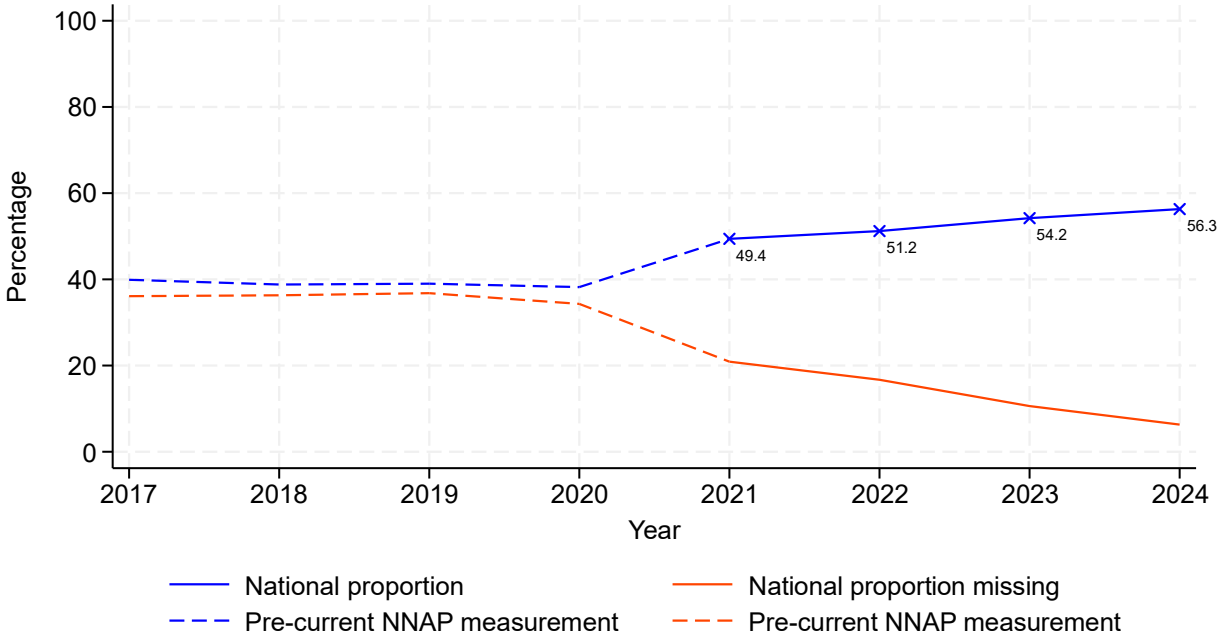


Figure 8: Proportion of babies born between 24 and 31 weeks GA with no reported serious complication of prematurity, by neonatal network, 2024.

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

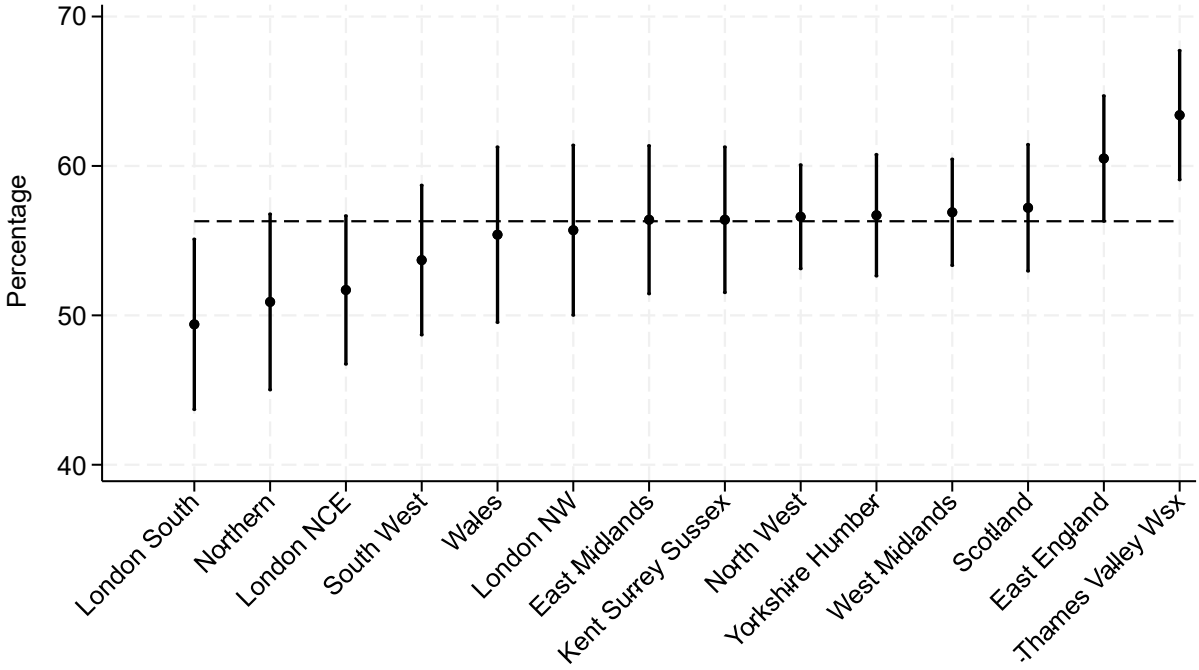
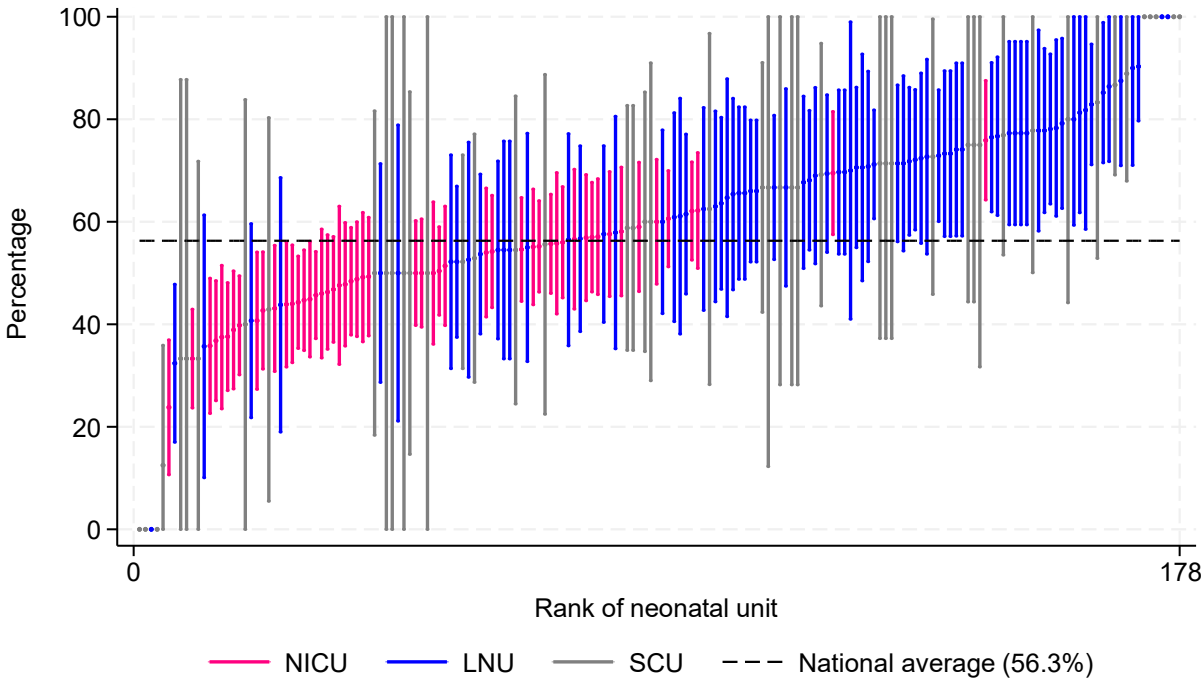


Figure 9: Proportion of babies born between 24 and 31 weeks GA with no reported serious complication of prematurity, by neonatal unit, 2024.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.



Summary of findings

- There has been an apparent increase in the proportion of babies born between 24 and 31 weeks gestational age with no reported serious complications of prematurity (2021 – 49.4%, 2024 – 56.3%), meeting the NNAP improvement goal (Figure 7). However, this trend may well be a result of improving data quality rather than change in underlying rates of complications; there has been no clear reduction in incidence of the outcomes included in this measure.

3.1. Bronchopulmonary dysplasia

Does an admitted baby born at less than 32 weeks' gestational age develop bronchopulmonary dysplasia (BPD) or die?

Babies born very preterm typically have incompletely developed lungs and usually need support with their breathing. Simply being born early can cause some ongoing breathing difficulty. Being on a ventilator can cause damage to the lungs, exacerbate breathing problems later in life and put babies at risk of chest infections. This condition is known as bronchopulmonary dysplasia (BPD) and is sometimes called chronic lung disease.

The NNAP reports on the proportion of babies born very preterm who are receiving help with their breathing or extra oxygen four weeks before their term due date. Only babies who survive their early course can develop BPD, and therefore it is important that we consider rates of BPD alongside rates of death before 36 weeks postmenstrual age. For this reason, we report the combined outcome of 'BPD or death'.

Differing proportions of BPD or death between units and networks could be the result of differing treatment or might partially result from differences in the readiness of clinicians to administer oxygen to very preterm infants, although a recent paper shows no evidence of such a phenomenon[5].

A case mix adjustment process is used to obtain a BPD treatment effect for each unit and network. This treatment effect helps to identify if differences in outcomes between units/networks are due to unit-specific care, or baby characteristics.

The treatment effect refers to the percentage difference between the observed proportion of babies with BPD in a unit/network, and the proportion of babies expected to have BPD in the same unit/network, based on the characteristics of the unit/network's babies.

To estimate the expected proportions, a logistic regression is fitted on the national dataset and, using this model, each baby is assigned an expected outcome between 0 and 1. These are summed for each unit/network, then divided by the number of patients to obtain the expected proportion of outcomes.

The baseline characteristics used in the adjustment are baby ethnicity, mother's smoking status, mother's age, number of previous pregnancies, multiplicity, problems in pregnancy, sex, birthweight, gestational age, and deprivation quintile.

A negative treatment effect suggests that the babies fared better in the unit/network than they would have done elsewhere in the country, and a positive treatment effect suggests that the babies would have fared better had they been treated elsewhere.

[5] Burgess-Shannon J, Briggs S, Oddie S, Mactier H. Variation in use of extended pulse oximetry testing to guide decisions around home oxygen provision for ex-preterm infants; A nationwide survey of UK neonatal units. Respir Med Res. 2023 Apr 7;83:101005. doi: 10.1016/j.resmer.2023.101005. Epub ahead of print. PMID: 37031570.

Results

Full results are available on NNAP Online and more recent, unassured, data can be viewed in the NNAP Data Dashboard.

Figure 10: Proportion of babies born at less than 32 weeks GA who developed BPD or died (TOP) and BPD only (BOTTOM), 2017-2024, using 2024 data, definitions and methodology.

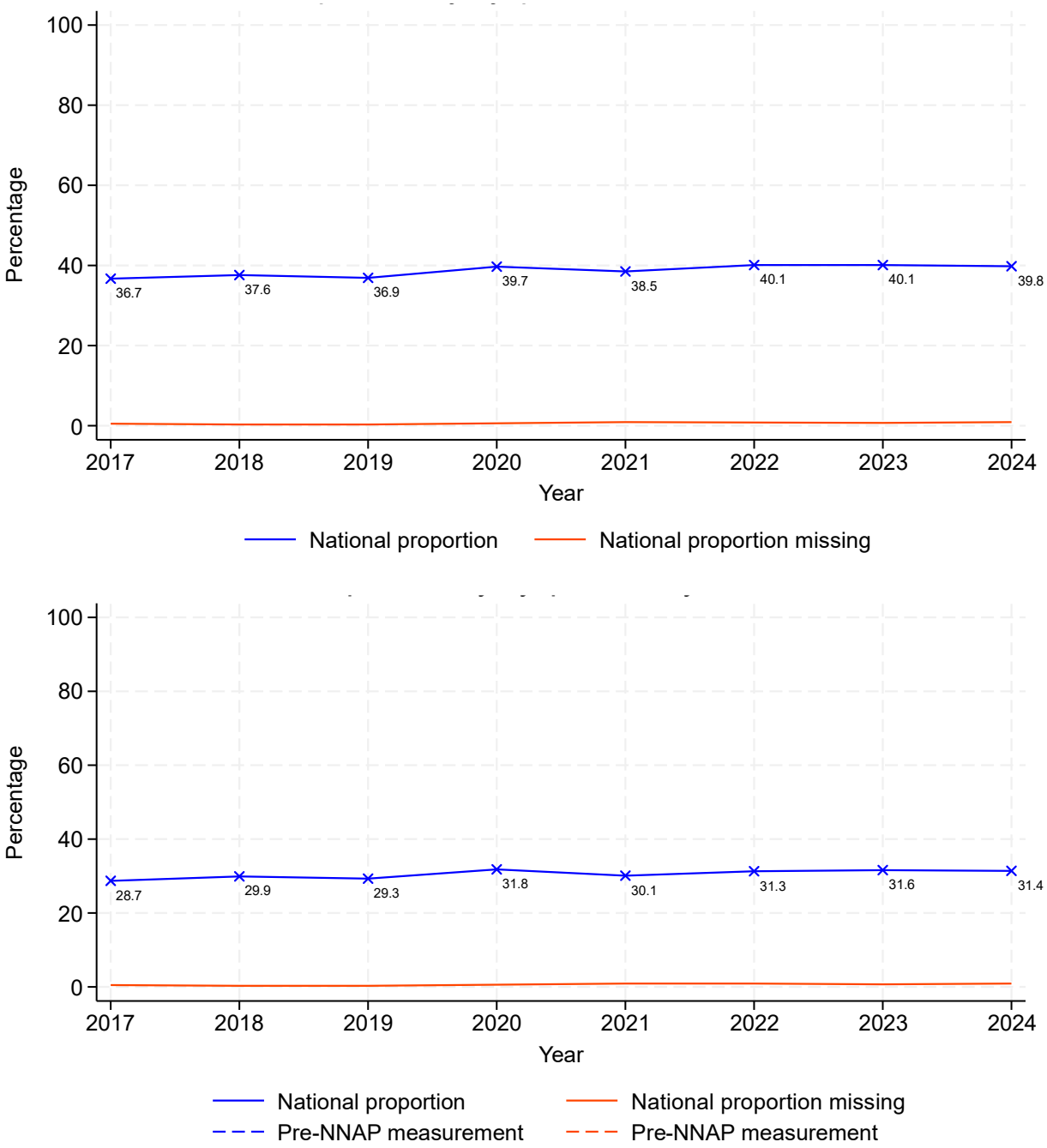


Figure 11: Observed proportions of BPD or death (top) and treatment effect (bottom), by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

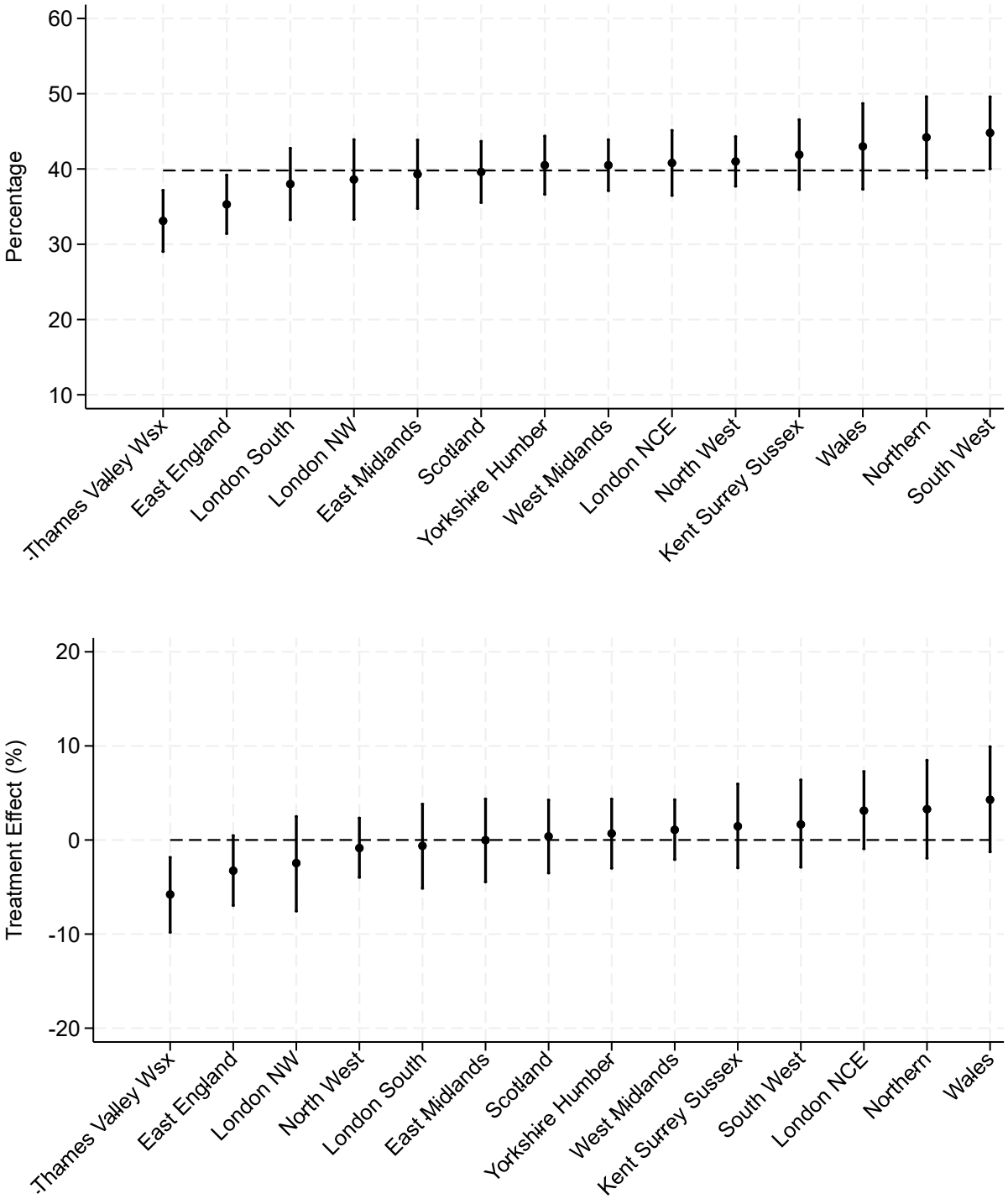
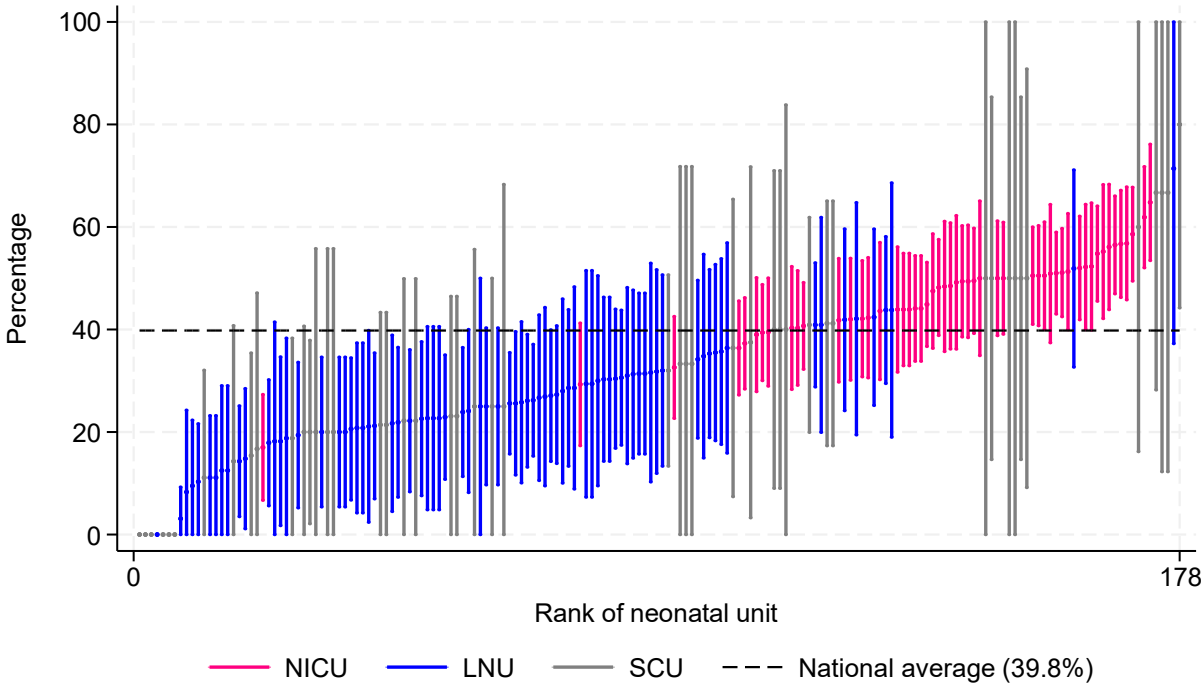


Figure 12: Observed proportions of BPD or death (top), and treatment effect (bottom), by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology



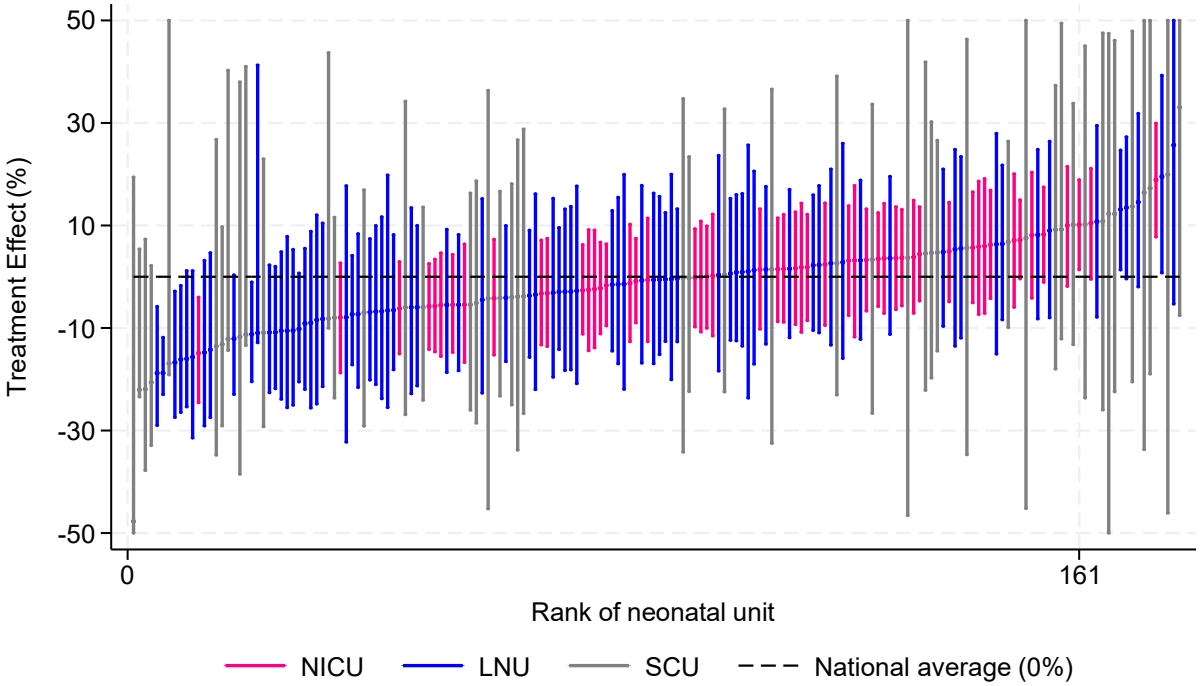


Table 3: BPD and death, by level of neonatal unit.

Unit level	Eligible babies	With outcome	BPD	Died	BPD or death (%)	Missing
Other*	103	102	35	18	53 (52%)	1 (1%)
SCU	418	417	89	36	125 (30%)	1 (.2%)
LNU	2,350	2,326	494	128	622 (26.7%)	24 (1%)
NICU	4,536	4,496	1,684	441	2,125 (47.3%)	40 (.9%)
National†	7,407	7,341	2,302	623	2,925 (39.8%)	66 (.9%)

**'Other' units are those that are hospital or healthcare locations not associated with an NNAP neonatal unit, NNAP units that have closed before the start of this audit year, or location records that are unknown.*
†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Summary of findings

- Over the last three years, the overall proportion of babies born at less than 32 weeks who developed bronchopulmonary dysplasia (BPD) or died has remained stable (2024 – 39.8%, 2,925 of 7,341; 2023 – 40.1%, 2022 – 40.1%) *(Figure 10)*. Prior to 2022, there was evidence of an increase over time[6].
- Among networks, the observed proportion of babies with a combined outcome of BPD or death ranges from 33.1% (Thames Valley and Wessex) to 44.8% (South West ODN). Treatment effect (the difference between observed proportion and balanced proportion) ranges from –5.8% (Thames Valley and Wessex) to 4.3% (Wales) *(Figure 11)*.
- Across neonatal units (SCUs, LNUs and NICUs), observed proportions of BPD or death range from 0% to 71.4% for units with at least 10 eligible babies. Treatment effect ranges from -47.7% to 33.1% *(Figure 12)*. This suggests that variation in rates of BPD is probably not fully explained by differences in case mix and therefore unit level opportunities likely exist to reduce the overall incidence of BPD.
- Proportions of BPD (or death) differ with unit level designation; SCU – 30% (125 of 417), LNU – 26.7% (622 of 2,326), NICU – 47.3% (2,125 of 4,496). It is expected that NICUs would experience higher rates of BPD or death due to the lower gestational age and increased clinical complexity of the babies they treat. It is possible that the higher rates of BPD in babies born in units with an onsite SCU than an onsite LNU are explained by differing case characteristics of the babies. This is because such deliveries at a unit with an onsite SCU are typically unplanned.

[6] Kwok, T. C. et al. 2025. Changes in respiratory support received in very preterm infants between 36 and 40 weeks postmenstrual age - a national observational study in England and Wales. [Article submitted for publication]

Actions for local quality improvement

- Neonatal units with higher rates of bronchopulmonary dysplasia (BPD) and a positive treatment effect, should review the NICE guideline and use the BAPM QI Toolkit to carry out a gap analysis and implement quality improvement programmes.

3.2. Late onset bloodstream infection

Does an admitted baby born at less than 32 weeks have one or more episodes of bloodstream infection, characterised by one or more positive blood cultures taken with a clearly pathogenic organism, after 72 hours of age?

Sick and premature babies are prone to infection by a variety of germs, including some that are normally harmless to healthy people. Infections increase the risk of death, can lengthen the stay in the neonatal unit and may worsen the long-term developmental outlook for babies[7]. Neonatal unit staff and parents can reduce the risk of infection by following good infection prevention and control practice.

To look for infection in babies, neonatal staff usually take blood cultures to check whether bacteria or other organisms are present in their blood. Units are encouraged to report all positive blood cultures: that negative blood cultures are underreported is accepted as likely, or even inevitable. The NNAP reports the proportion of babies with one or more blood cultures positive for a pure growth of bacteria, fungi or yeasts.

In this report, we focus only on very preterm infants (those born at less than 32 weeks gestation) because these are the babies at highest risk of infection and because bloodstream infections in more mature babies may occur more in some units than others depending on the case mix of babies cared for.

A case mix adjustment process is used to obtain a bloodstream infection treatment effect for each unit and network. This treatment effect helps to identify if differences in outcomes between units/networks are due to unit-specific care, or baby characteristics.

This analysis has been conducted at neonatal network level which includes all units, regardless of whether they validated their data. For details of the variables included in the analysis, see the NNAP methodology and statistical analysis plan: https://www.rcpch.ac.uk/nnap-data-flow-methodology.

As with BPD, the treatment effect refers to the percentage difference between the observed proportion of babies with bloodstream infection in a unit/network, and the proportion of babies expected to have infection in the same unit/network, based on the characteristics of the unit/network's babies.

To estimate the expected proportions, a logistic regression is fitted on the national dataset and, using this model, each baby is assigned an expected outcome between 0 and 1. These are summed for each unit/network, then divided by the number of patients to obtain the expected proportion of outcomes.

The baseline characteristics used in the adjustment for bloodstream infection are fewer than for BPD, including only gestational age, and unit type. This is because bloodstream infection

[7] Stoll B.J., *et al.* Neurodevelopmental and Growth Impairment Among Extremely Low-Birth-Weight Infants With Neonatal Infection. *JAMA* 2004; 292(19): 2357–2365. doi:10.1001/jama.292.19.2357. Available at: https://www.ncbi.nlm.nih.gov/pubmed/15547163

is a rare occurrence and therefore requires fewer adjustment variables to maintain a reliable ratio of events to adjustment variables.

A negative treatment effect indicates that the babies fared better in the unit/network than they would have done elsewhere in the country. A positive treatment effect indicates that the babies would have fared better had they been treated elsewhere.

Results

Some organisms grown may either represent true bloodstream infection or contamination of the blood culture sample with skin organisms. For this reason, results for bloodstream infection are presented in two columns. One column presents the number of babies for whom any culture grew any organism. The other column presents the number of babies for whom one or more culture grew an organism of clear pathogenicity. Clearly pathogenic organisms were those of which a pure growth indicates a significant infection with or without the presence of clinical confirmation (a true infection). A list of such organisms is provided in the NNAP 2024 Audit Measures Guide, available at: https://www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/measures.

362 very preterm babies (less than 32 weeks gestation) had a pure growth of a clearly pathogenic organism. Babies contribute to the denominator for this measure for all units to which they were admitted, therefore babies can be counted twice in the analysis conducted for units and networks (if cared for in more than one unit or network). At an overall audit level, babies are only counted once.

NNAP clinical leads were asked to provide assurance that all their positive blood cultures had been entered. 90% (161/179) provided this validation of their infection data (85% in 2023). An indication of whether a unit provided assurance is given alongside unit level bloodstream infection results on NNAP Online. Full results are available on NNAP Online and more recent, unassured, data can be viewed in the NNAP Data Dashboard.

Figure 13: Proportion of babies born at less than 32 weeks with a late onset bloodstream infection, 2017-2024, using 2024 data, definitions and methodology.

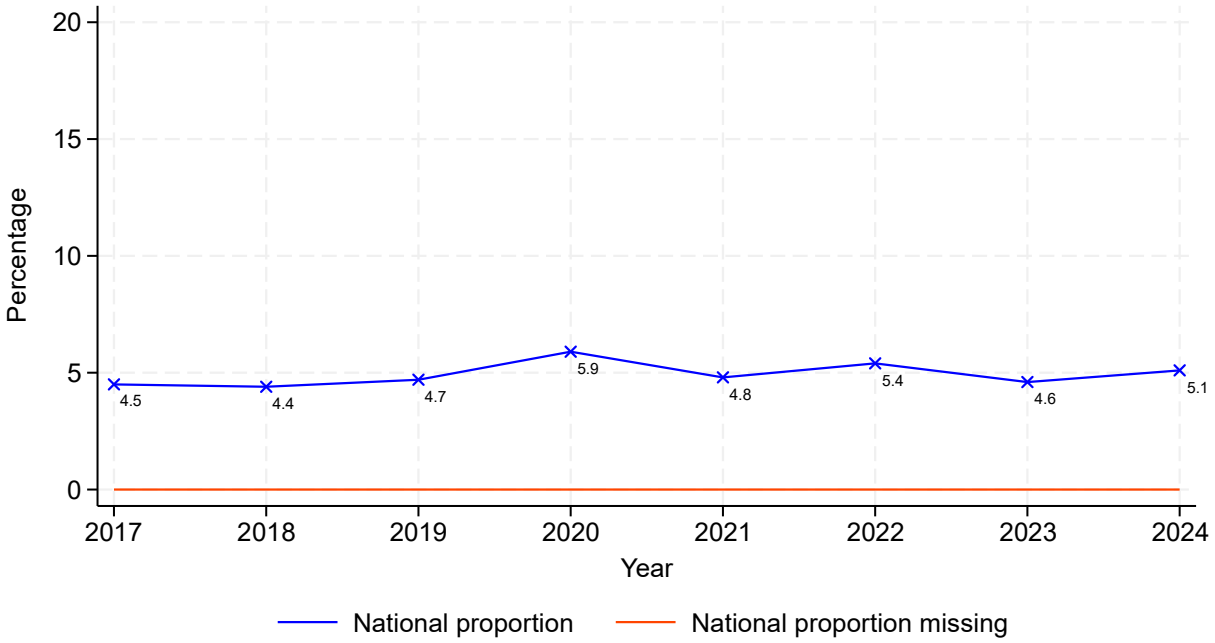


Table 4: Positive blood cultures in babies born at less than 32 weeks, by assurance status.

Assurance status	No. units	Eligible babies	Number of babies with any positive blood culture	Number (%) of babies with growth of any clearly pathogenic organism*
All units	179	7,036	1,095	362 (5.1%)
Units confirming all positive blood cultures entered	161	6,354	1,018	325 (5.1%)

**Pure growth of organisms only.*

Figure 14: Observed proportion (TOP) and treatment effect (BOTTOM) of admitted babies (born at less than 32 weeks gestational age) who experienced one or more positive blood cultures with a clearly pathogenic organism, by neonatal network (all units - 2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

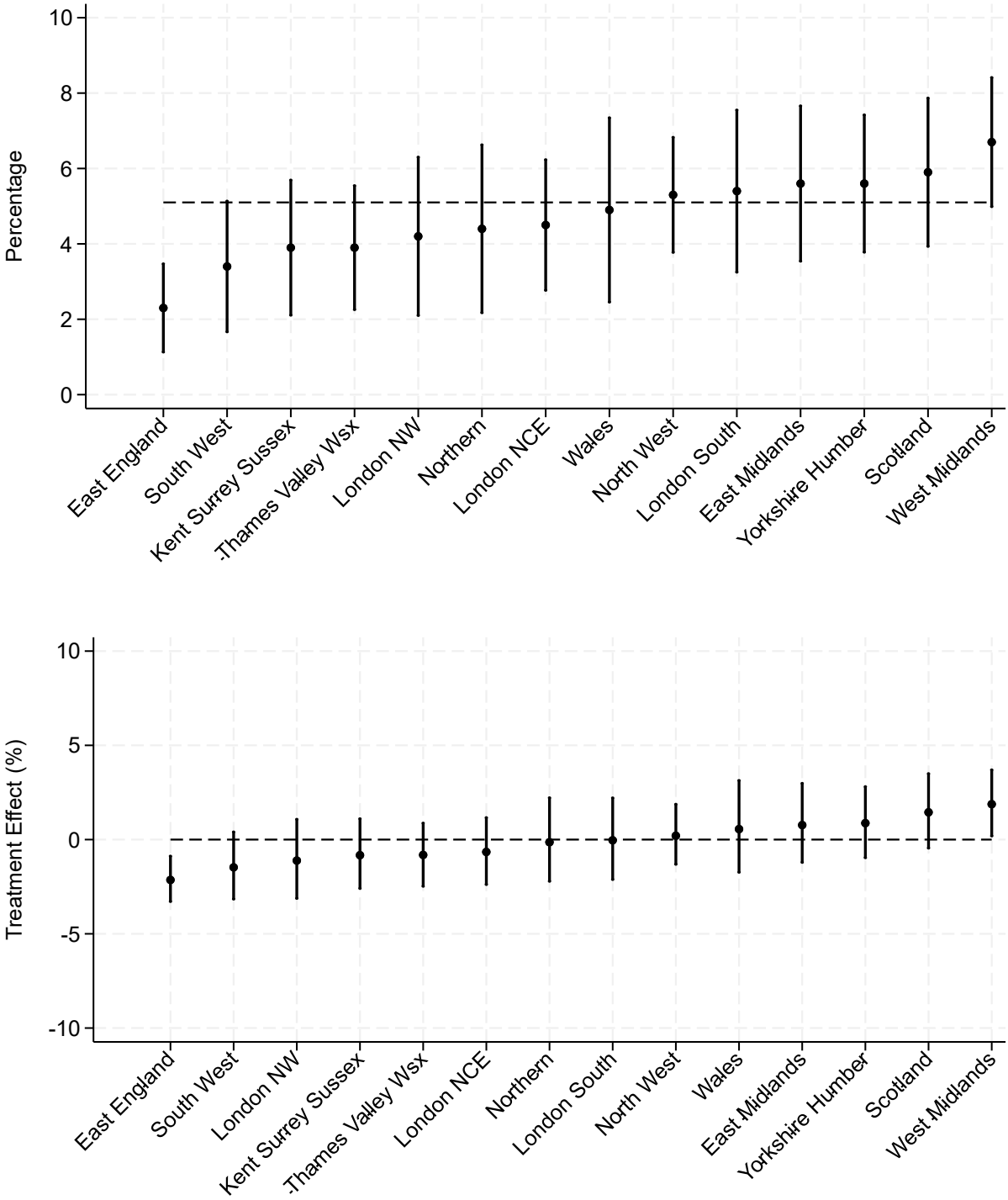
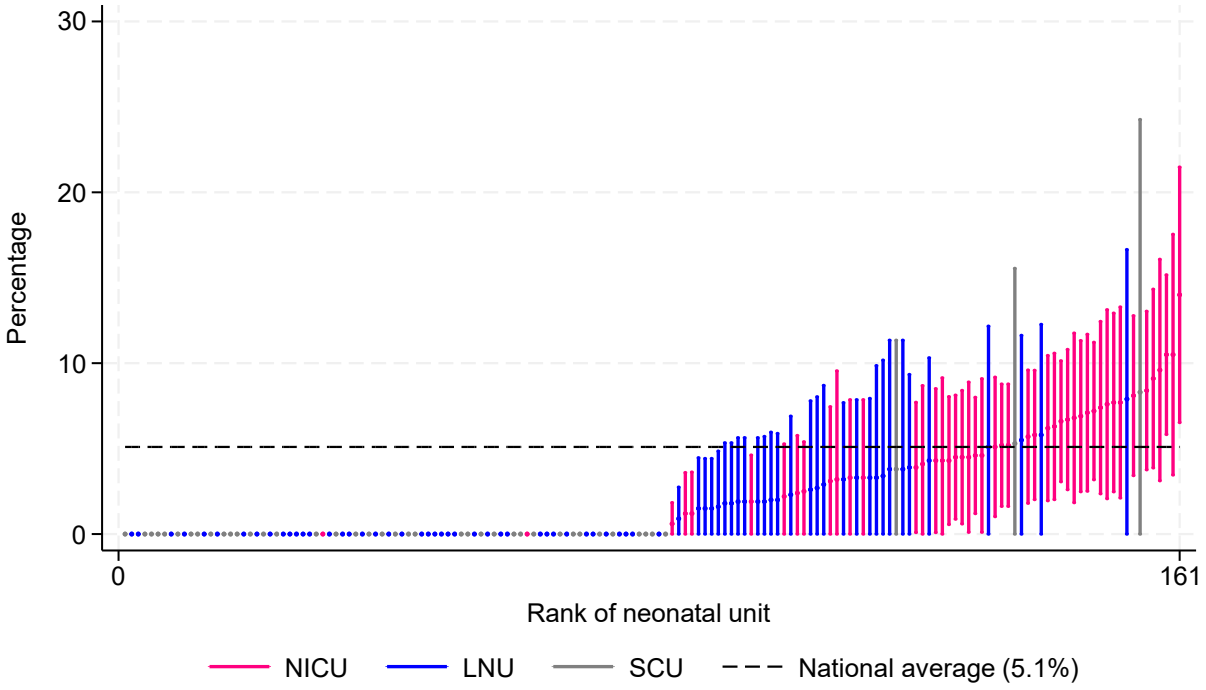
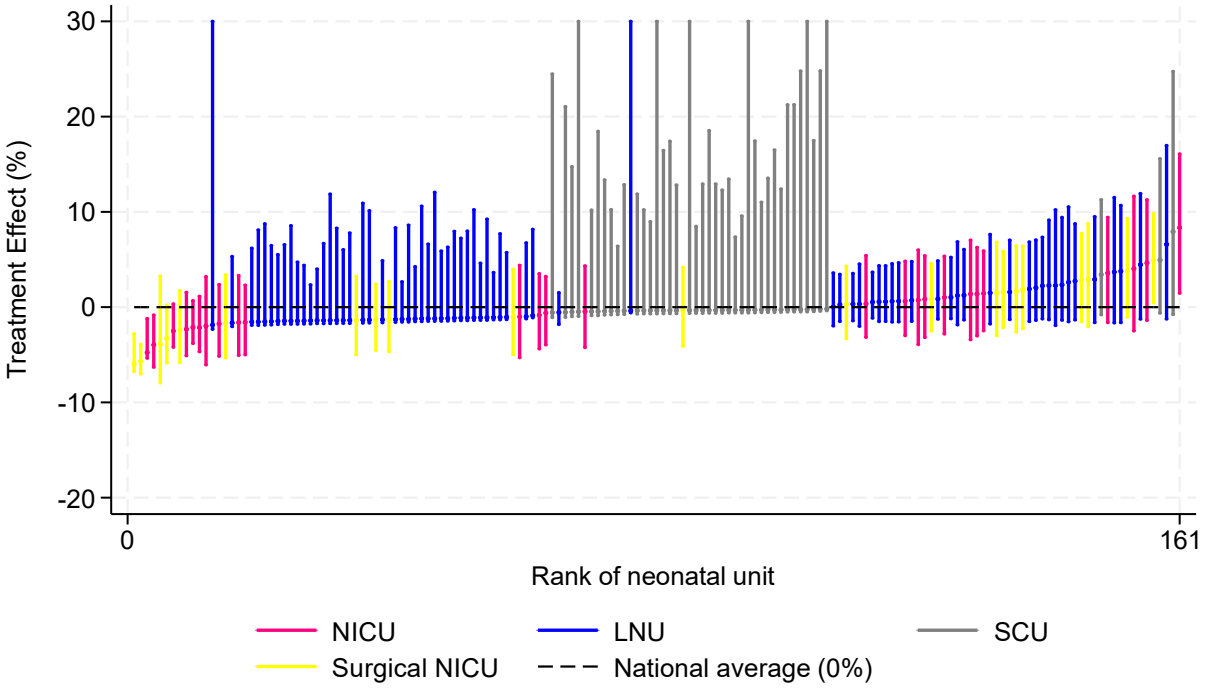


Figure 15: Observed proportion (top), and treatment effect (bottom), of admitted babies who experienced one or more positive blood cultures with a clearly pathogenic organism (born at <32 weeks gestational age), by SCU, LNU, and NICU - units who provided assurance that all positive blood cultures were entered (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology. For units with no bloodstream infection cases, we apply a beta-binomial adjustment during the bootstrapping process to estimate the infection proportion. This adjustment accounts for small sample sizes and sets the lower bound at 0%, causing point estimates to appear at the bottom of the confidence intervals, resulting in asymmetry.





Summary of findings

- Rates of late onset bloodstream infection have remained static since 2019 with no evidence of improvement over time nationally; ranging between 4.7% and 5.9% *(Figure 13).*
- Observed network proportions range between 2.3% (East of England) and 6.7% (West Midlands). Treatment effect (the difference between observed proportion and balanced proportion) ranges from –2.1% (East of England Perinatal ODN) to 1.9% (West Midlands) *(*Figure 14*).*
- Among the 90% of neonatal units who were able to assure their data, observed proportions range between 0% and 14%. Treatment effect ranges from -6% to 8.3% *(*

- *Figure 15)*. Differences in treatment effect, particularly among NICUs, suggest that there may be opportunities to reduce proportions of infection through changes in practice.

Actions for local quality improvement

- Neonatal units without assured data entry for outcomes such as NEC, bloodstream infection and preterm brain injury should develop and implement plans to deliver enhanced completeness and quality of data, using the NNAP Dashboard to support frequent review and to address quality issues in a timely manner.

3.3. Necrotising enterocolitis

Does an admitted baby born at less than 32 weeks gestational age meet the NNAP surveillance definition for necrotising enterocolitis (NEC) on one or more occasion?

Necrotising enterocolitis (NEC) is a serious condition which can follow preterm birth. Bowel inflammation prevents milk feeding and surgery may be needed. Babies who develop NEC tend to stay in hospital for a long time. Rates of mortality in babies with NEC are high, at over 20%[8]. Babies who survive NEC can have developmental as well as long-term feeding and bowel problems. Reporting of NEC is based on a surveillance definition, and cases are attributed to the unit at which the baby is nursed at 48 hours.

A case mix adjustment process is used to obtain a NEC treatment effect for each unit and network. This treatment effect helps to identify if differences in outcomes between units/networks are due to unit-specific care, or baby characteristics.

This analysis has been conducted at neonatal network level which includes all units, regardless of whether they validated their data. For details of the variables included in the analysis, see the NNAP methodology and statistical analysis plan: https://www.rcpch.ac.uk/nnap-data-flow-methodology.

As with BPD and bloodstream infection, the treatment effect refers to the percentage difference between the observed proportion of babies with NEC in a unit/network, and the proportion of babies expected to develop NEC in the same unit/network, based on the characteristics of the unit/network's babies.

To estimate the expected proportions, a logistic regression is fitted on the national dataset and, using this model, each baby is assigned an expected outcome between 0 and 1, these are summed for each unit/network, then divided by the number of patients to obtain the expected proportion of outcomes.

The baseline characteristics used in the adjustment for NEC are fewer than for BPD, including only gestational age. This is because NEC is a rare occurrence and therefore requires fewer adjustment variables to maintain a reliable ratio of events to adjustment variables.

A negative treatment effect indicates that the babies fared better in the unit/network than they would have done elsewhere in the country. A positive treatment effect indicates that the babies would have fared better had they been treated elsewhere.

[8] Jones IH, Hall NJ. Contemporary Outcomes for Infants with Necrotizing Enterocolitis-A Systematic Review. J Pediatr. 2020 May;220:86-92.e3. doi: 10.1016/j.jpeds.2019.11.011. Epub 2020 Jan 22. PMID: 31982088. Available at: https://pubmed.ncbi.nlm.nih.gov/31982088/

Results

NNAP clinical leads are asked to provide assurance of the accuracy of their NEC data. 92% (164/179) of units gave assurance (in 2023 the proportion was 87.6%). NEC results are presented below based on all units' data and on data from those providing assurance. An indication of whether a unit provided assurance is given alongside unit level NEC results on NNAP Online. Units which did not assure their data are omitted from the treatment effect analysis.

Figure 16: Proportion of babies born at less than 32 weeks with NEC, 2017-2024, using 2024 data, definitions and methodology.

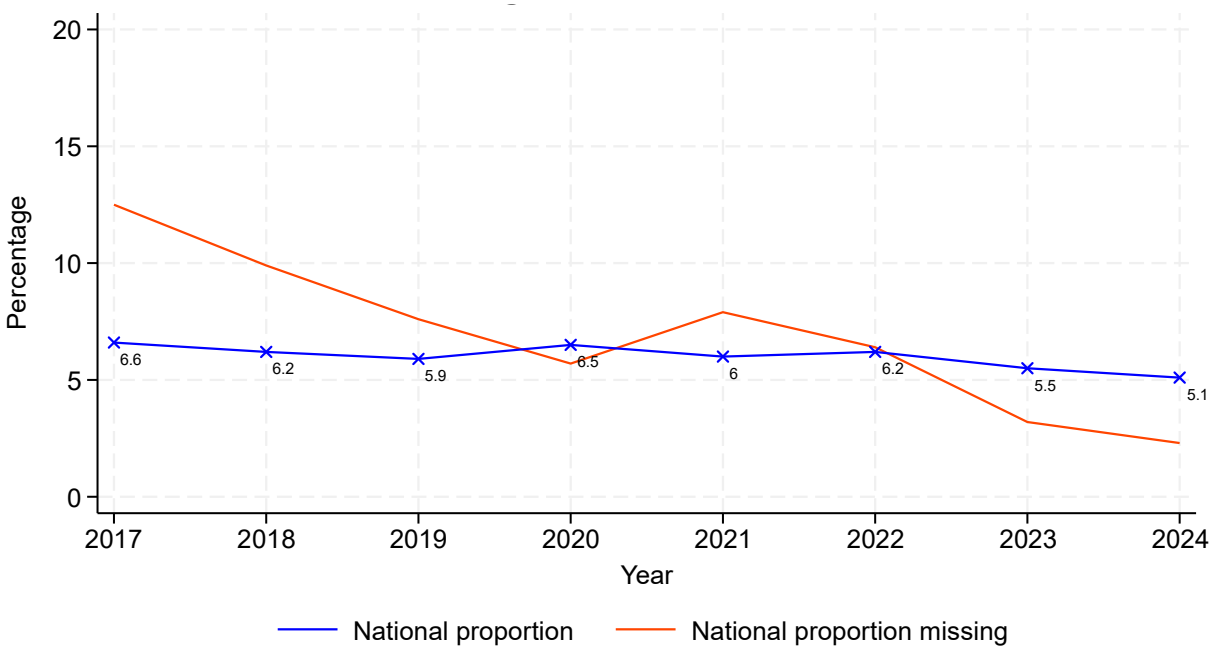


Table 5: Proportions of NEC by neonatal unit level - all units.

Unit level	Eligible babies	With outcome	NEC (%)	Missing (%)
SCU	113	113	2 (1.8%)	0 (0%)
LNU	2029	2002	36 (1.8%)	27 (1.3%)
NICU	4930	4794	313 (6.5%)	136 (2.8%)
National†	7072	6909	351 (5.1%)	163 (2.3%)

†National figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Table 6: Proportions of NEC by neonatal unit level - units who have assured their NEC data only.

Unit level	Eligible babies	With outcome	NEC (%)	Missing (%)
SCU	99	99	2 (2%)	0 (0%)
LNU	1923	1896	33 (1.7%)	27 (1.4%)
NICU	4588	4519	282 (6.2%)	69 (1.5%)
National†	6610	6514	317 (4.9%)	96 (1.5%)

†National figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Figure 17: Observed proportions of NEC (top) and treatment effect (bottom), by neonatal network – all units (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

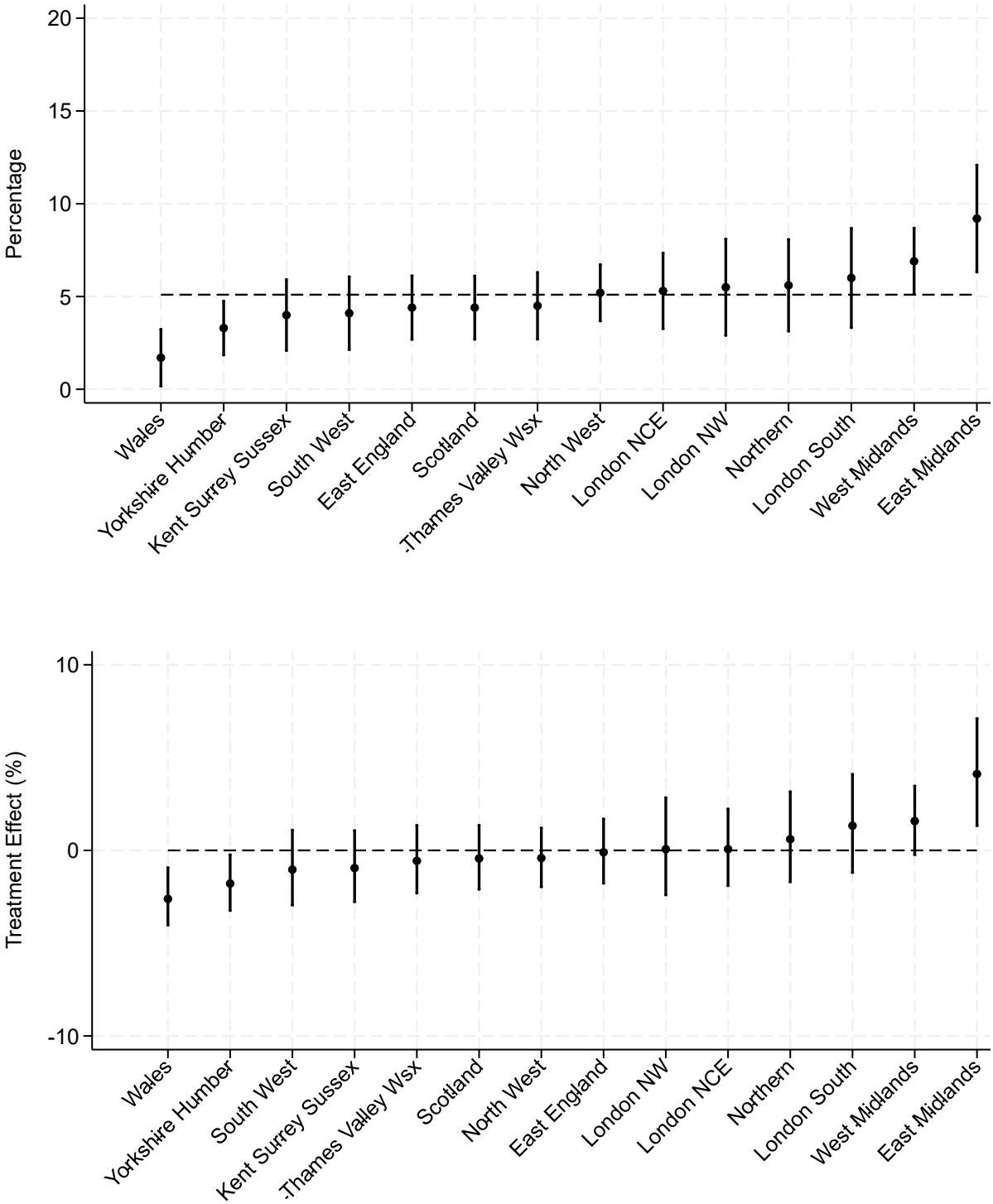
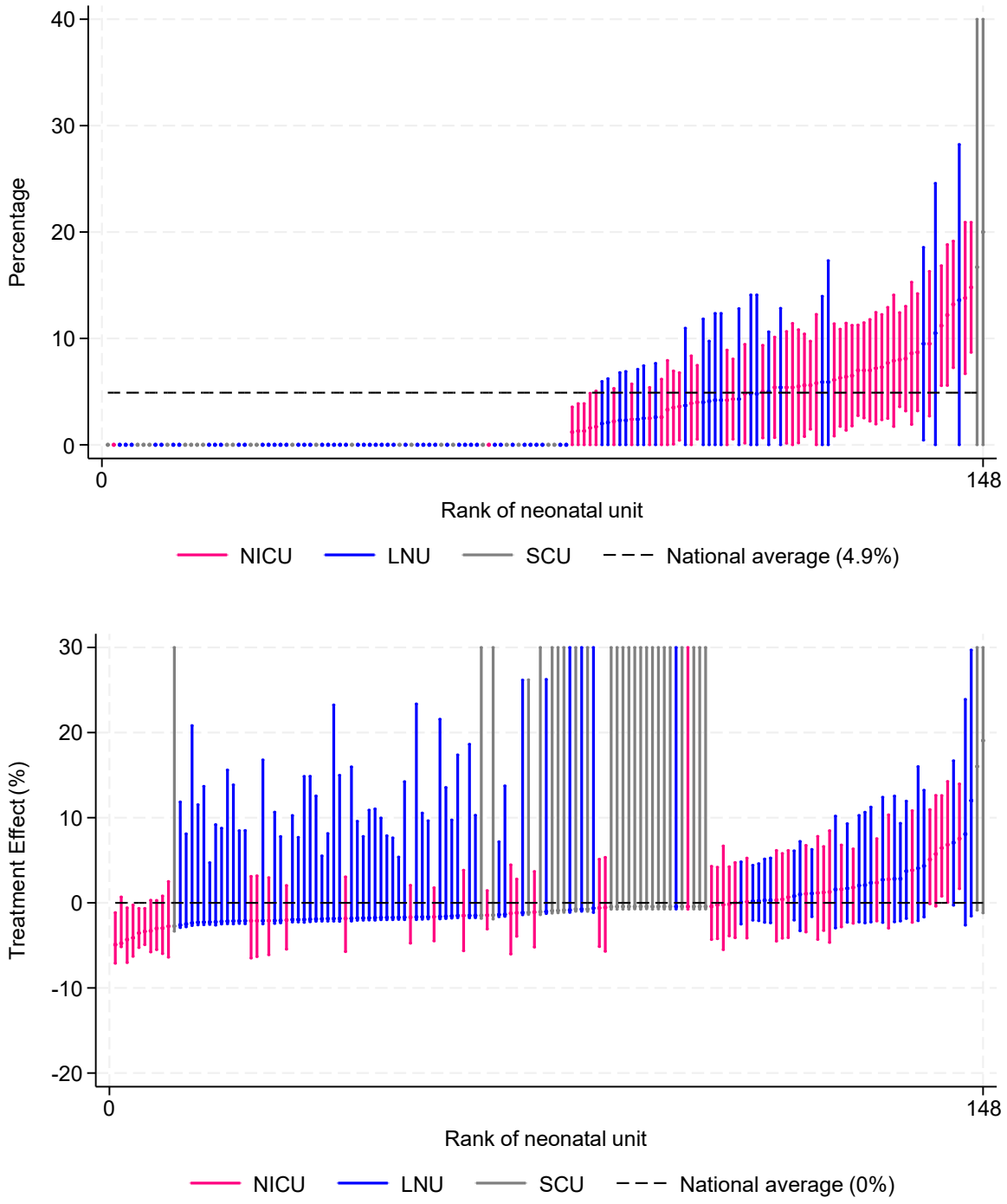


Figure 18: Observed proportions of NEC (top) and treatment effect (bottom), by LNU, surgical NICU and non-surgical NICU - units who provided assurance that their NEC diagnosis data was complete only (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

For units with no bloodstream infection cases, we apply a beta-binomial adjustment during the bootstrapping process to estimate the infection proportion. This adjustment accounts for small sample sizes and sets the lower bound at 0%, causing point estimates to appear at the bottom of the confidence intervals, resulting in asymmetry.



Summary of findings

- There is some evidence of a small overall reduction in the incidence of necrotising enterocolitis (NEC) in babies born at less than 32 weeks gestational age over time, from 6.6% in 2017, to 5.1% (351 of 6,909) in 2024 *(Figure 16)*. However, figures describing the proportion of babies affected by NEC should be interpreted with some caution.
- Among neonatal networks, reported proportions of babies with NEC ranges from 1.7% (Wales) to 9.2% (East Midlands), and treatment effect ranges from -2.6% (Wales) to 4% (East Midlands); indicating that regional variation is not explained by differences in the gestational age of the babies being cared for *(Figure 17 and NNAP Online)*.
- Among the 92% of units who provided assurance of the accuracy of their NEC data, the proportion of babies with NEC ranges from 0% to 8.7%. Treatment effect ranges from -4.9% to 18.1%; suggesting that variation between units is not explained by differences in gestational age of the babies being cared for *(Figure 18 and NNAP Online)*.
- However, caution should continue to be exercised over these results due to the levels of missing data and quality assurance, while data completeness - and ultimately hopefully data quality - continue to improve. Unit and network level variation in rates should result in scrutiny as to data accuracy even when outcomes have been described for all babies in a unit or network.

Actions for local quality improvement

- Neonatal units without assured data entry for outcomes such as NEC, bloodstream infection and preterm brain injury should develop and implement plans to deliver enhanced completeness and quality of data, using the NNAP Dashboard to support frequent review and to address quality issues in a timely manner.
- Neonatal units and networks with higher rates of necrotising enterocolitis (NEC) and a positive treatment effect should seek to learn from units with validated low rates of NEC, and consider introducing a single cross-network probiotic and feeding guideline.

3.4. Preterm brain injury

- *Does a baby born at less than 32 weeks gestational age experience germinal matrix/ intraventricular haemorrhage (IVH).*
- *Does a baby born at less than 32 weeks gestational age experience cystic periventricular leukomalacia (cPVL).*
- *Does a baby born at less than 32 weeks gestational age experience post haemorrhagic ventricular dilatation (PVHD).*

The NNAP reports proportions of the more serious grades of intraventricular/ periventricular brain injury, proportions of cystic periventricular leukomalacia (cPVL) and the proportions of experience post haemorrhagic ventricular dilatation (PVHD).

Very preterm infants may experience brain injury, either from bleeding or consequent to cyctic periventricular leukomalacia. The consequences of such injury vary, in part depending on the severity of the injury. In the NNAP, we assess the proportion of babies in whom these types of brain injury occur. For intraventricular haemorrhage (IVH), we concentrate only on the more severe grades of injury. We appreciate that within these grade 3 and 4 haemorrhages the clinical sequalae may vary sigificantly depending on the laterality and size of injury. However, where the surveillance case definition, as set out in the NNAP measures guide, is consistently applied by neonatal units, we believe it will form the basis for appropriate comparisons of rates of adverse outcome between neonatal services.

The NNAP is also reporting proportions of cystic periventricular leukomalaicia (cPVL) based on the published surveillance case definition. Similarly to IVH, cases identified with cPVL will experience heterogenous outcome, but one that on average is much more likely to be characterised by disability than in babies without cPVL. It is not the case that all IVH or cPVL outcomes are known to be, or likely to be, preventable. However, these forms of brain injury are reasonably common and regarded as clinically important, with increased risk of adverse neurodevelopmental outcomes[9]. Care bundles targetting reduction in their incidence are described, which may be of interest to units experiencing high rates of preterm brain injury[10],[11].

Results

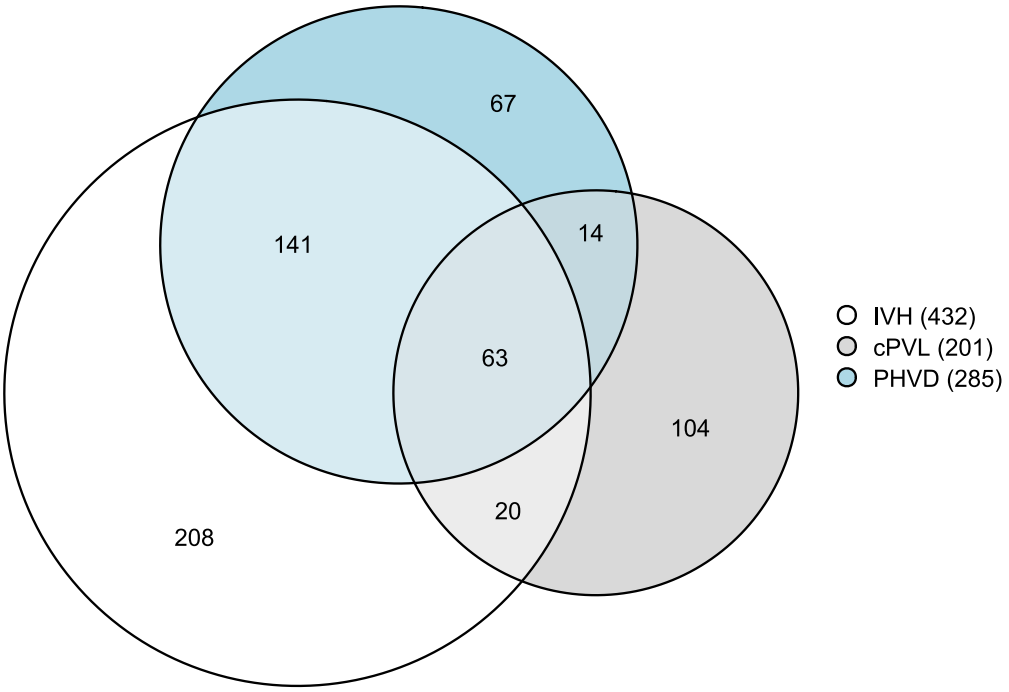
NNAP clinical leads were asked to provide assurance that all their scan data had been entered. 89.4% (160/179) of units provided this validation of their preterm brain injury data; in

[9] Rees et. Al., Preterm Brain Injury and Neurodevelopmental Outcomes: A Meta-analysis. *Pediatrics* December 2022; 150 (6): e2022057442. 10.1542/peds.2022-057442. Available at: https://doi.org/10.1542/peds.2022-057442.
[10] Murthy et. Al., Neuroprotection Care Bundle Implementation to Decrease Acute Brain Injury in Preterm Infants. Pediatr Neurol. 2020 Sep;110:42-48. Available at: https://pubmed.ncbi.nlm.nih.gov/32473764/
[11] Gross et. Al., Evaluating the Effect of a Neonatal Care Bundle for the Prevention of Intraventricular Hemorrhage in Preterm Infants. Children (Basel). 2021 Mar 25;8(4):257. Available at: https://pubmed.ncbi.nlm.nih.gov/33806111/

2023, 84.5% of units were able to do so. An indication of whether a unit provided assurance is given alongside unit level brain injury results on NNAP Online.

Figure 19 describes the number of babies with each type of brain injury as reported in NNAP data for 2024. Post haemorrhagic ventricular dilatation (PVHD) is a complication of IVH, and therefore it would be expected that most babies with a diagnosis of PHVD would also have a diagnosis of IVH 3 or 4. However, 81 of 285 babies reported to have PHVD were reported not to have IVH 3 or 4, which may indicate that there are data accuracy issues.

Figure 19: Venn chart illustrating the relationship between the NNAP brain injury measures (2024).



1. Intraventricular haemorrhage (IVH 3 and 4)

Figure 20: Proportion of IVH 3 or 4 (TOP), and IVH 3 or 4 or death (BOTTOM), by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

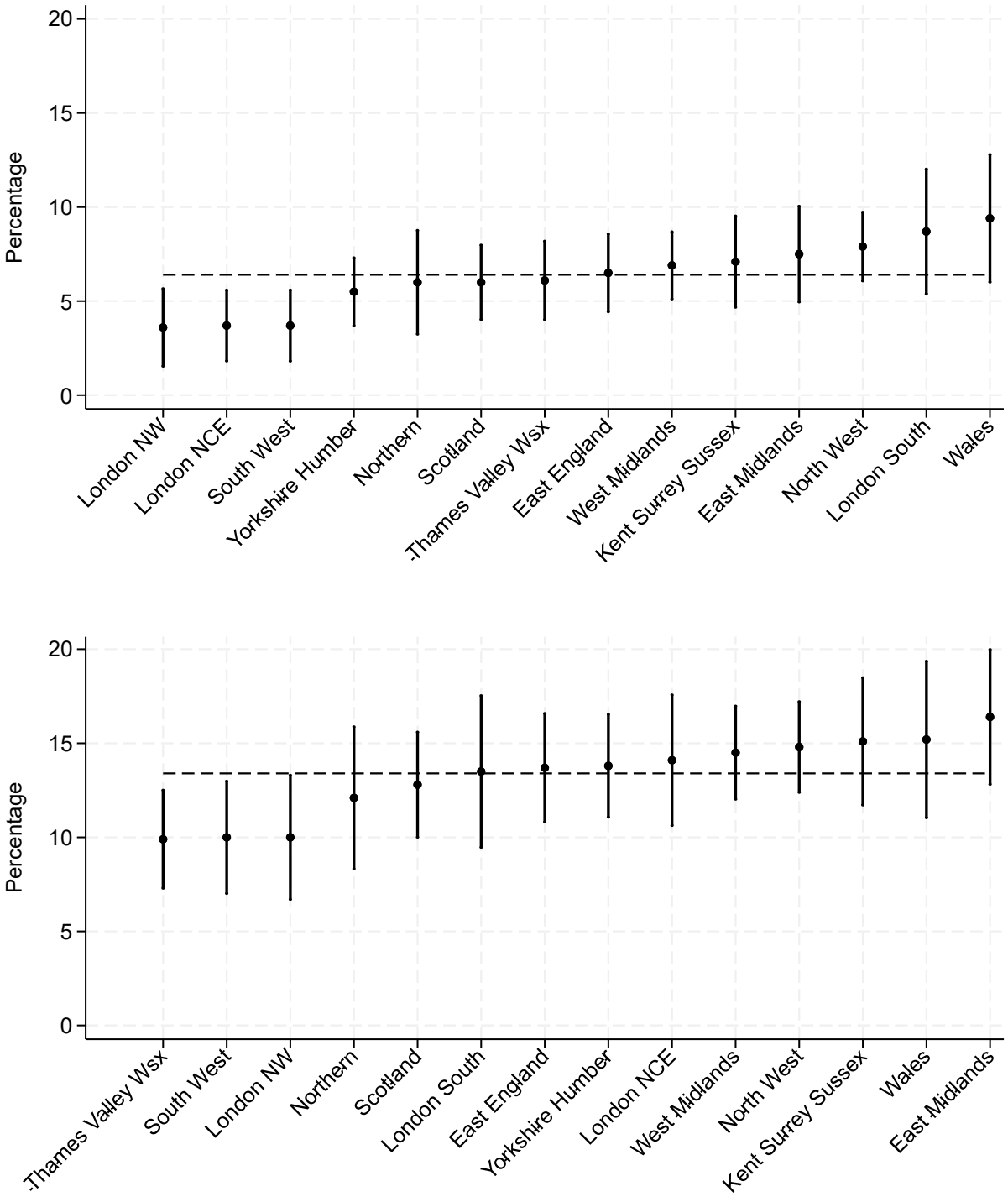


Figure 21: Change in the proportion of missing data for IVH grades 3 or 4, by neonatal network (2023-2024).

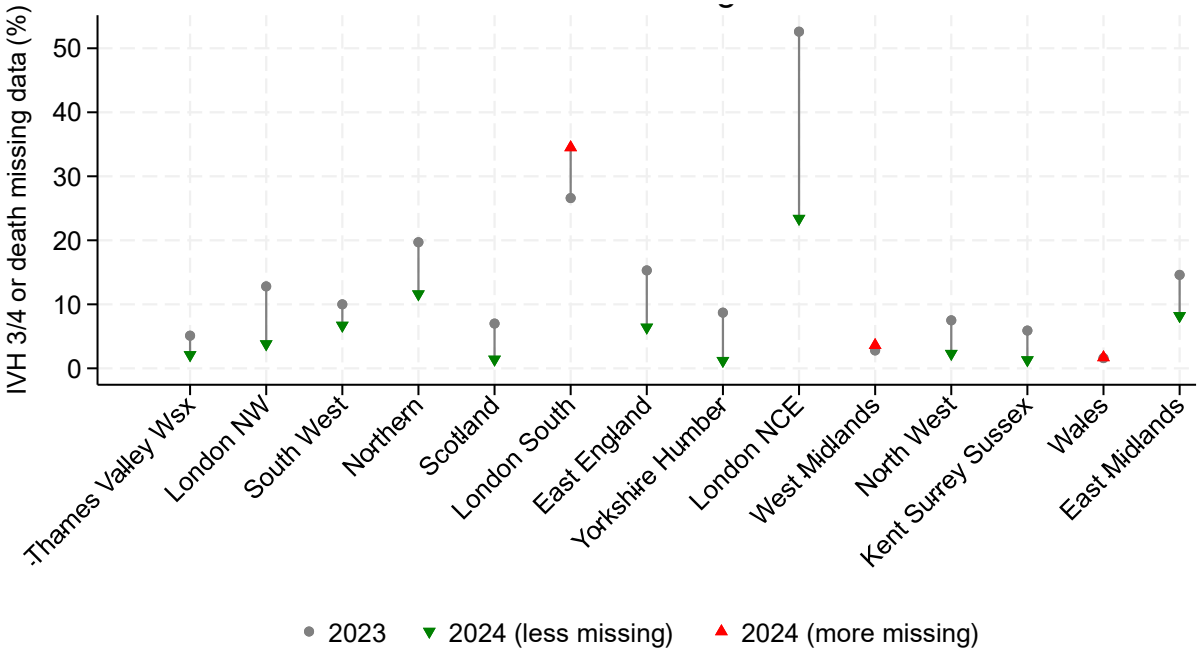


Figure 22: Proportion of intraventricular haemorrhage (IVH) 3 or 4 (TOP), and IVH 3 or 4 or death (BOTTOM), by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

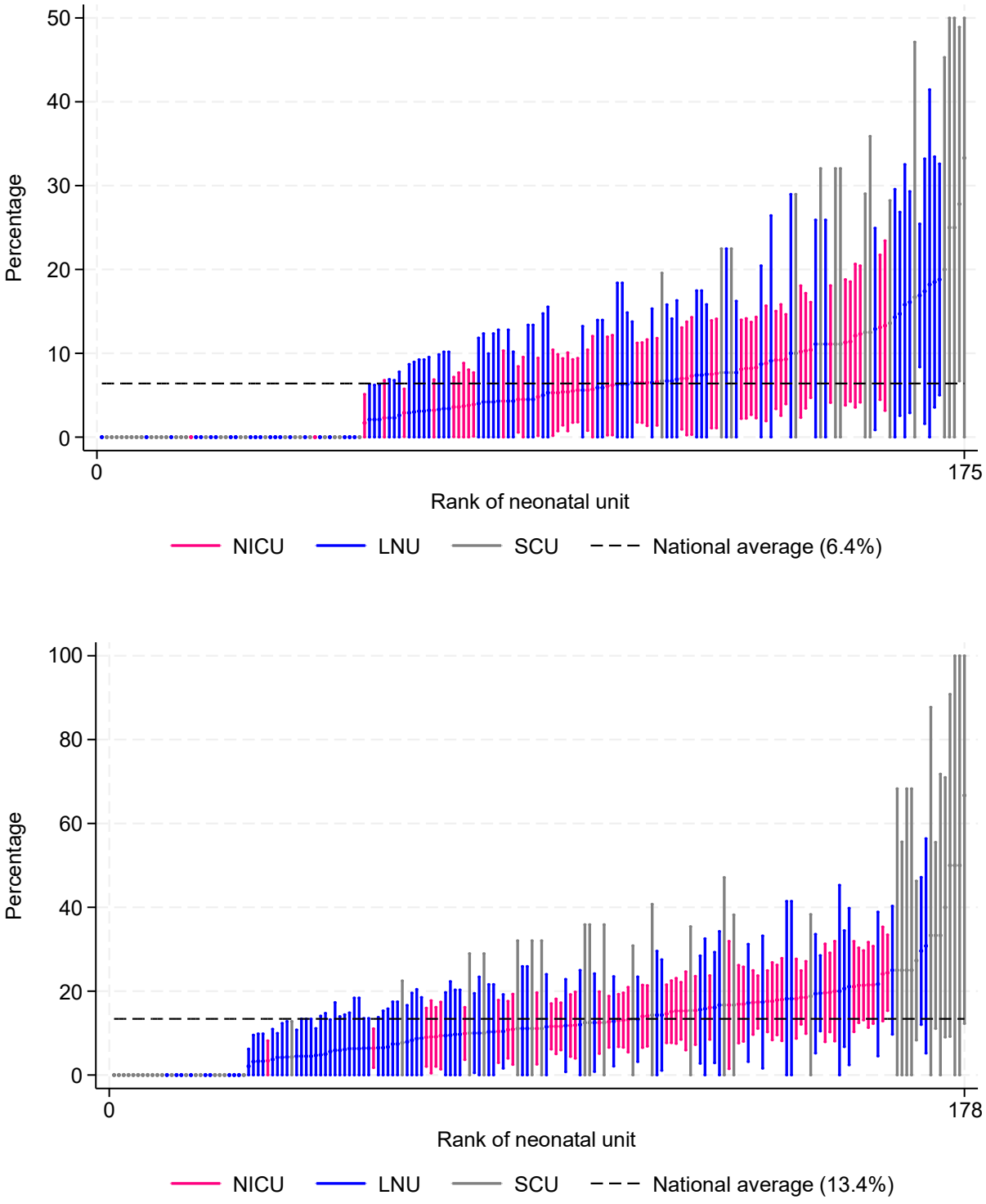
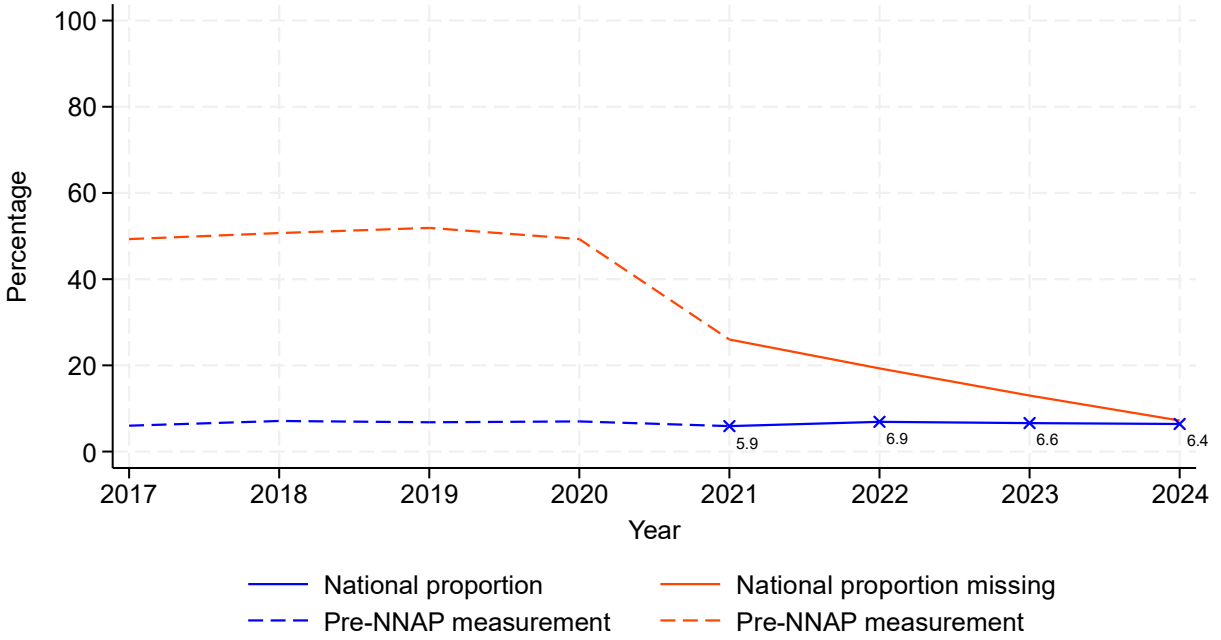
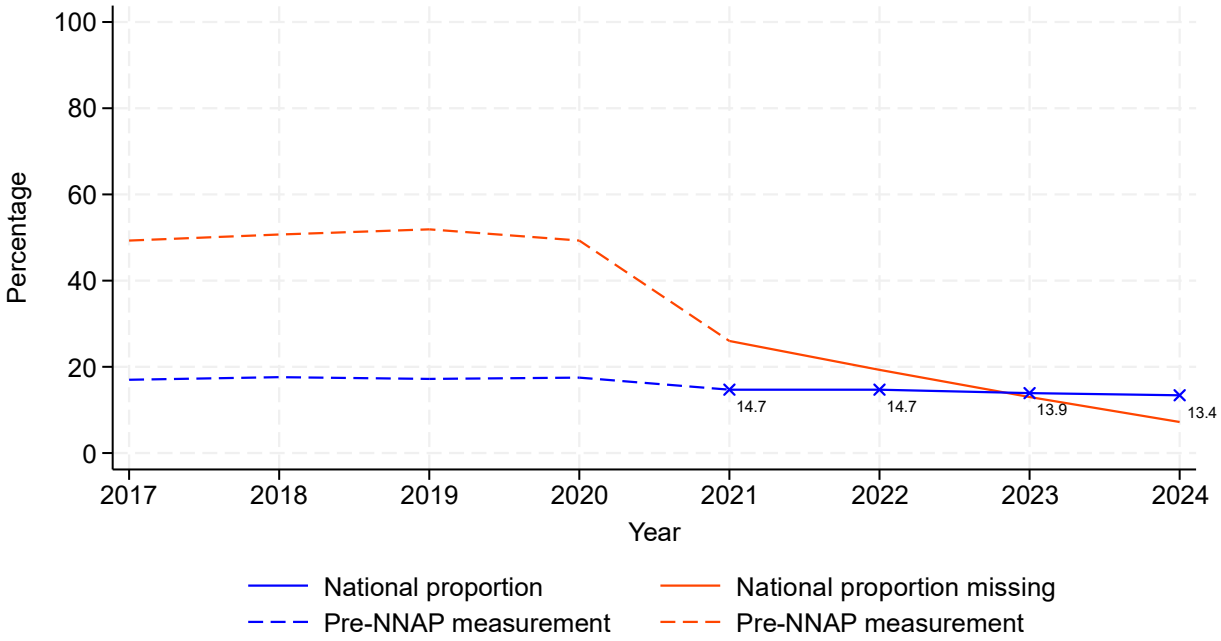


Figure 23: Proportion of babies born at less than 32 weeks gestational age who experience IVH 3 or 4 (top), and IVH 3 or 4 or death (bottom), 2017-2024, using 2024 data, definitions and methodology.





2. Cystic periventricular leukomalacia (cPVL)

Figure 24: Proportion of cPVL (TOP), and cPVL or death (BOTTOM), by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology

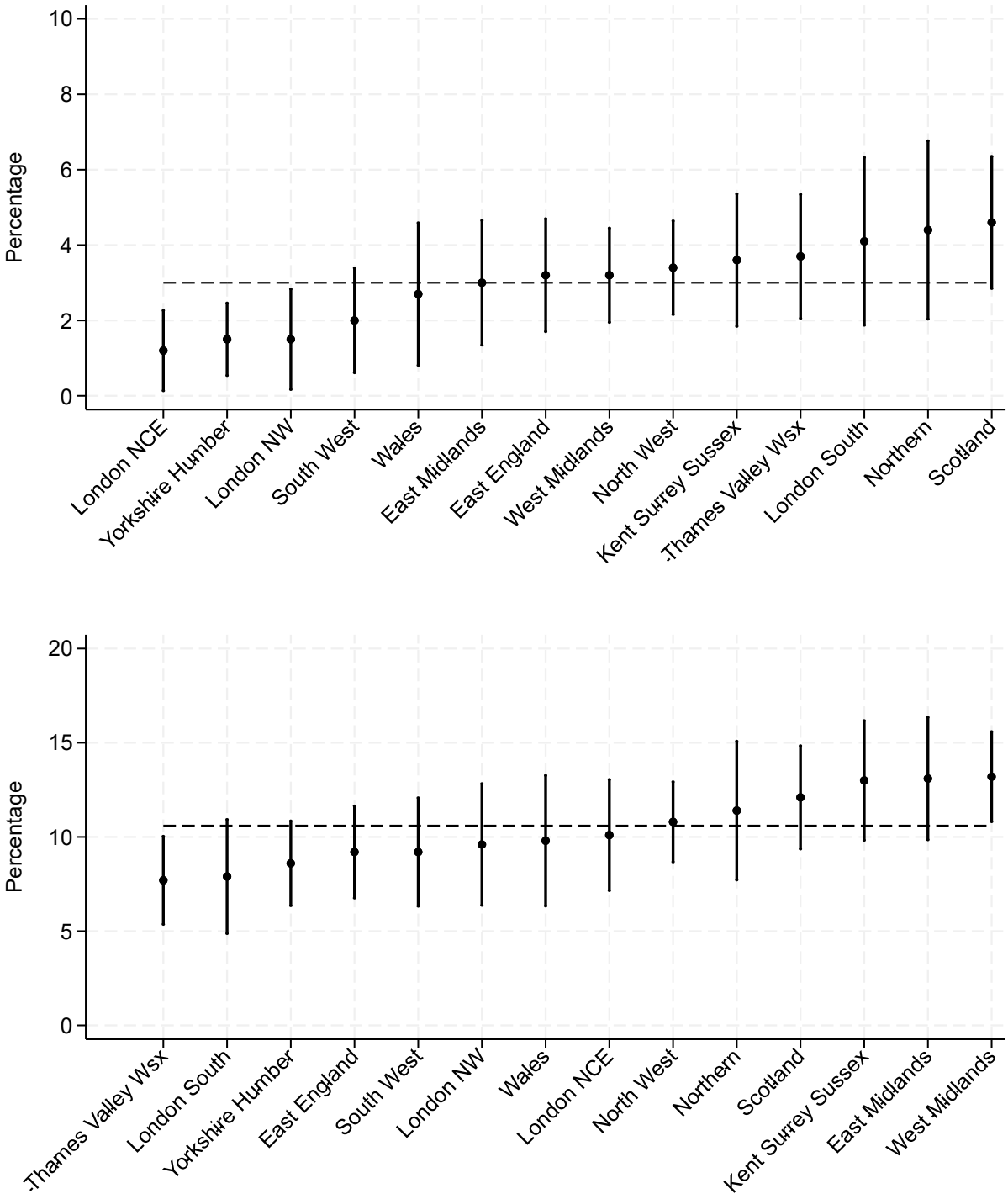
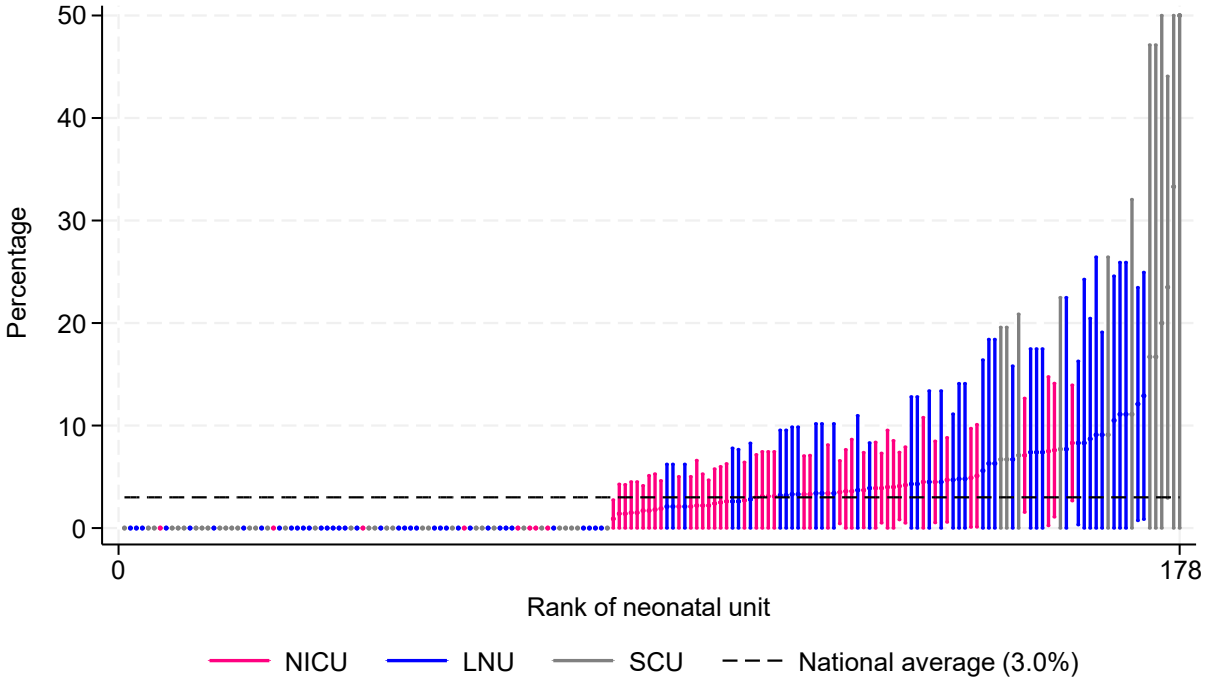


Figure 25: Proportion of cystic periventricular leukomalacia (cPVL) (TOP) and cPVL or death (BOTTOM), by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.



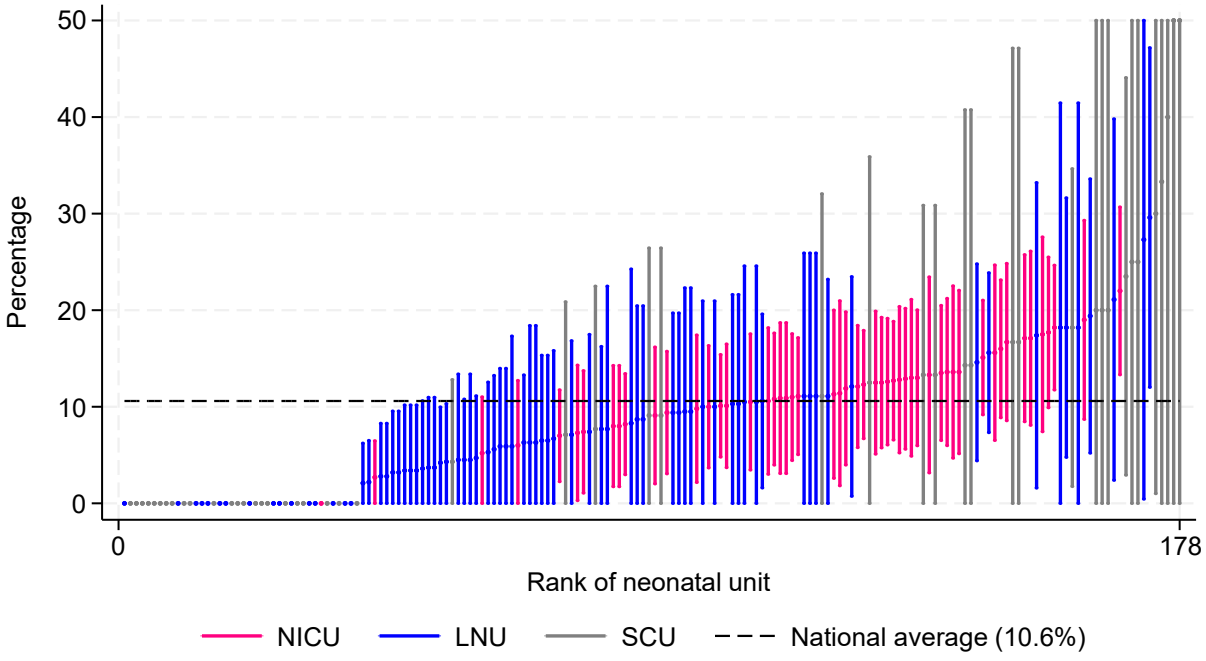
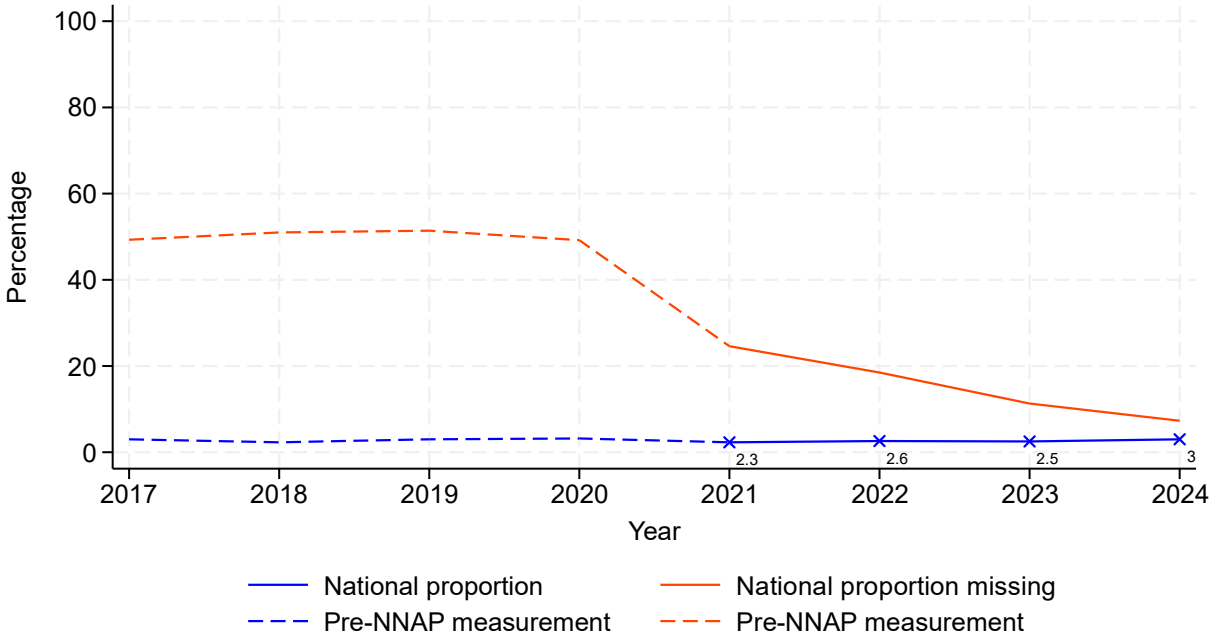
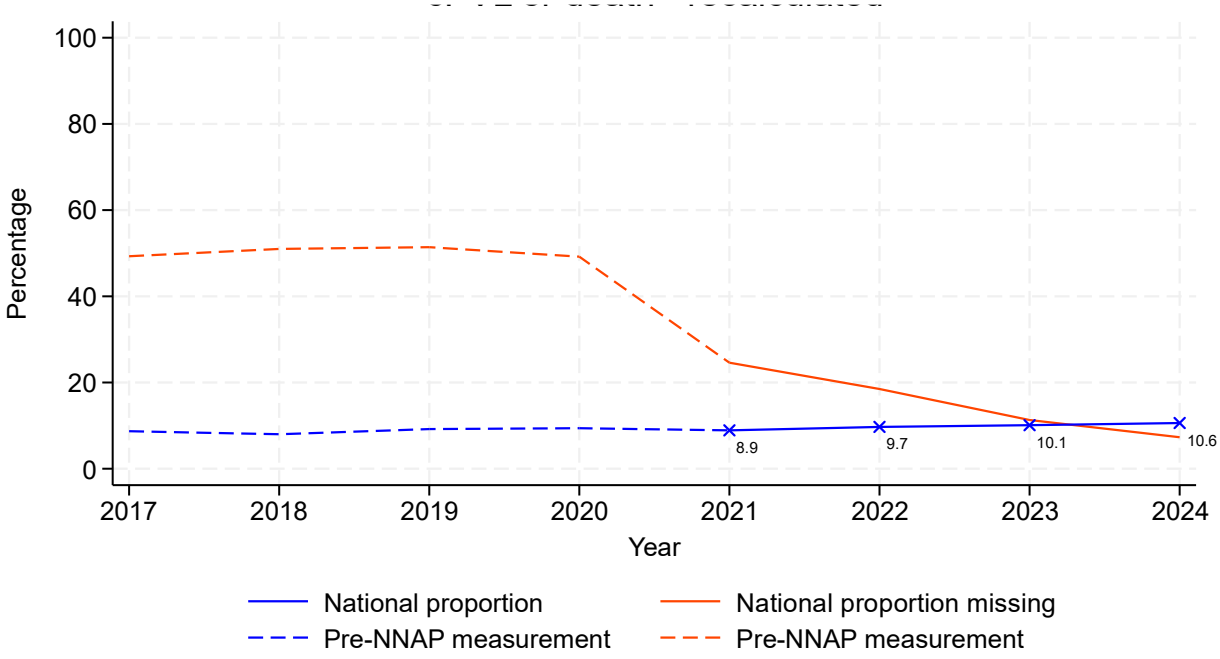


Figure 26: Proportion of babies born at less than 32 weeks gestational age who experience cPVL only (top), and cPVL or death (bottom), 2017-2024, using 2024 data, definitions and methodology.





3. Post haemorrhagic ventricular dilatation (PHVD)

Figure 27: Proportion of PHVD (TOP), and PHVD or death (BOTTOM), by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

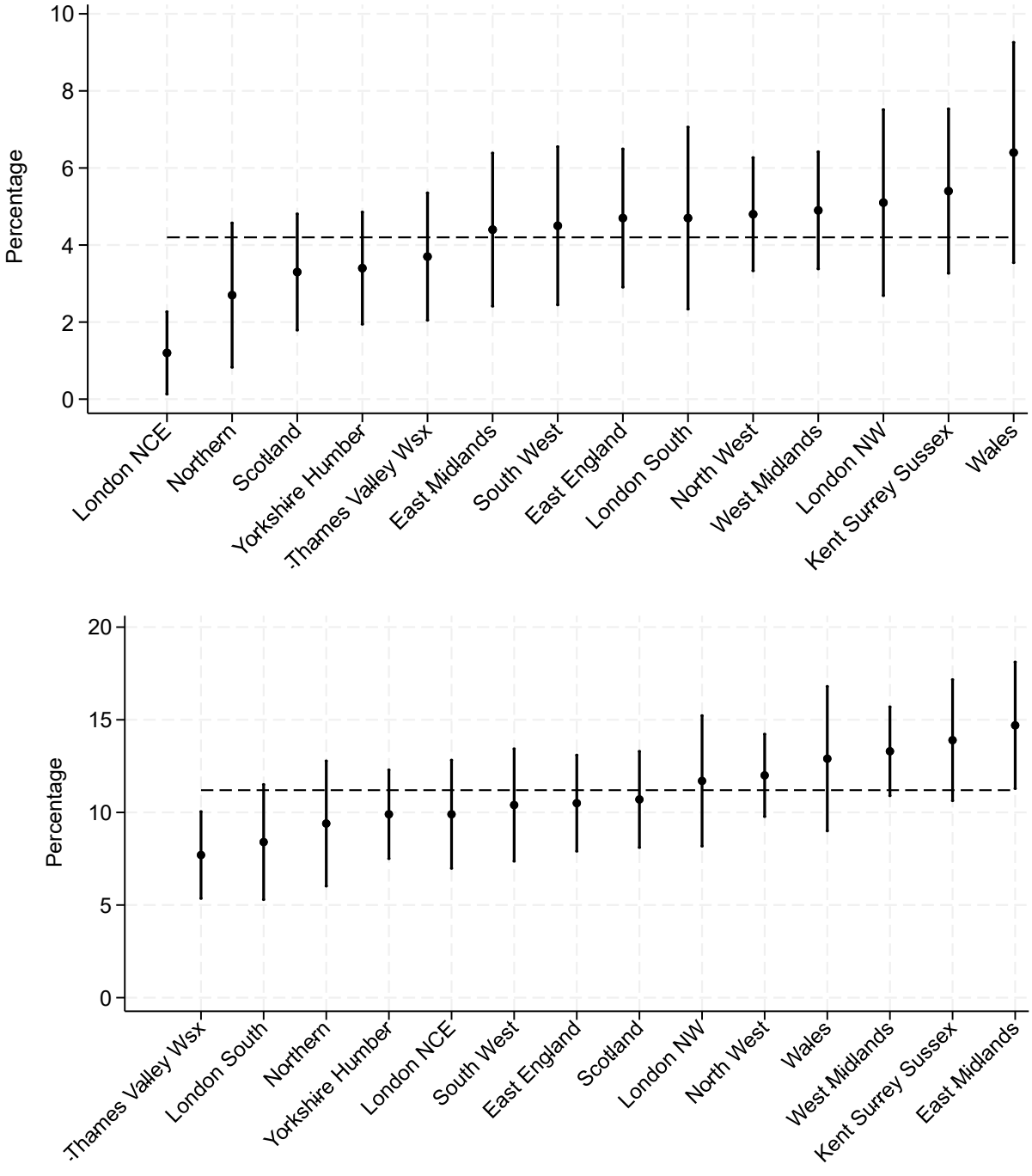
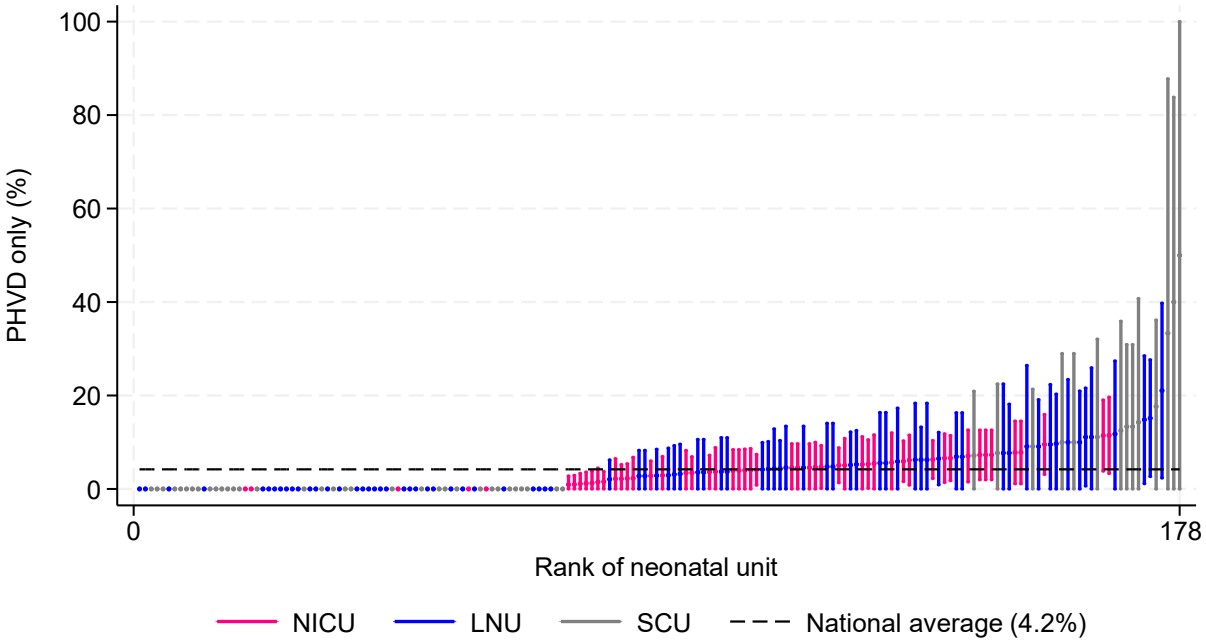


Figure 28: Proportion of PHVD (TOP) and PHVD or death (BOTTOM), by neonatal unit.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.



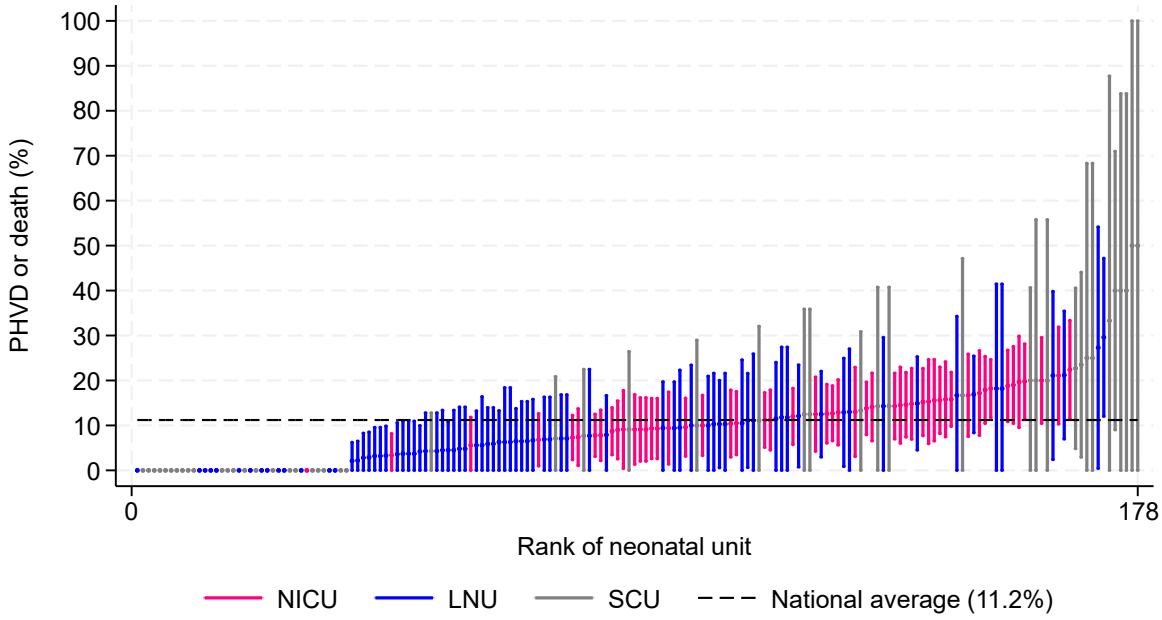
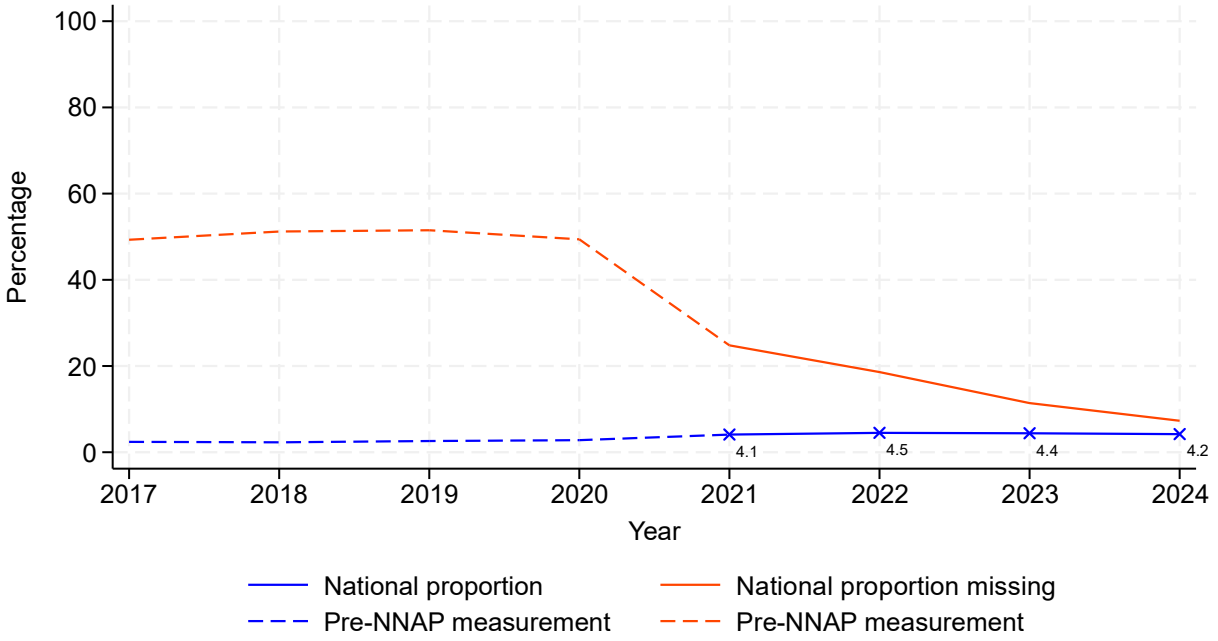
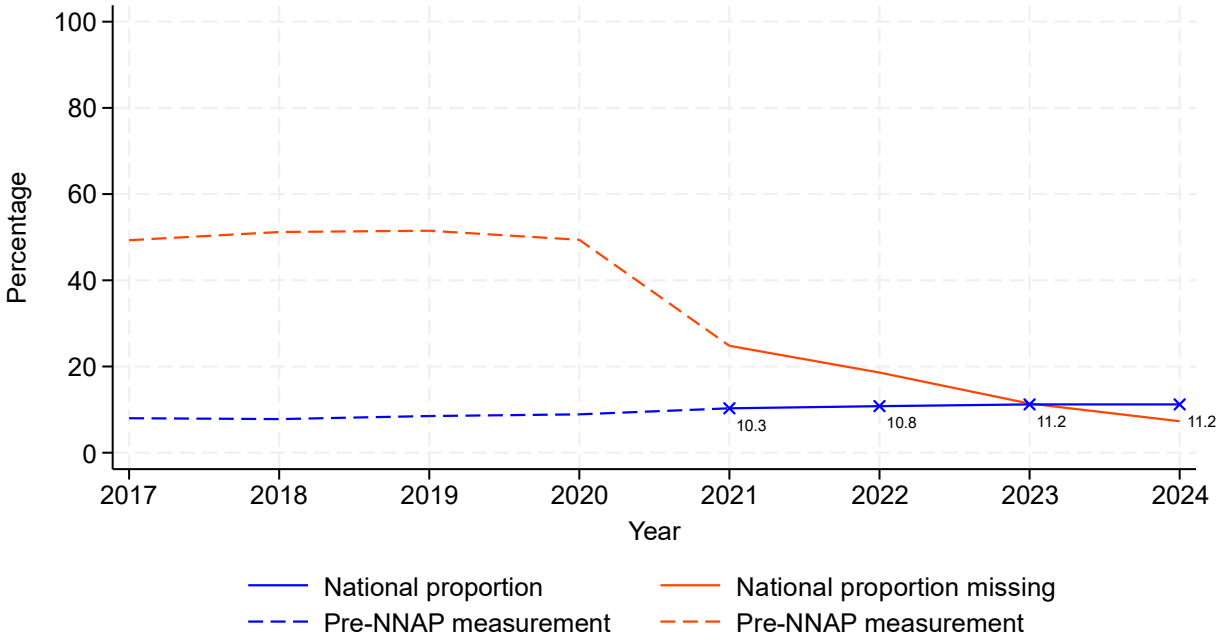


Figure 29: Proportion of babies born at less than 32 weeks gestational age who experience PHVD only (top), and PHVD or death (bottom), 2017-2024, using 2024 data, definitions and methodology.





Summary of findings

- The completeness of preterm brain injury data reported in the NNAP continues to improve year on year, with only two networks with missing data over 20% in 2024 for each of the reported brain injury types (IVH grades 3 or 4, cPVL and PHVD) *(Figure 23, Figure 26, Figure 29,* NNAP Online*)*. At trust level, certain trusts have very high proportions of preterm babies with undescribed preterm brain outcomes. However, data quality issues and accurate reporting of PHVD measurement mean that NNAP cannot yet confidently describe rates of brain injury and trends over time.
- Rates of missing data have reduced since 2023; with continued year on year improvement across all three types of brain injury. However, marked regional variation remains in the completeness of these data (ranging from 1.2% to 34.5% between networks for IVH) (*Figure 21*).
- In 2024, the overall rate of IVH is 6.4% (IVH 3/4 or death - 13.4%). There apparent fall over time in the rate of IVH ¾ should not confidently be interpreted as a real decrease given the high rates of missing data *(Figure 23)*.
- The overall rate of cPVL is 3% (cPVL or death - 10.6%). There is an apparent increase in cPVL or death rate over time (from 8.9% in 2021), however the historically high rates of missing data means that it is difficult to interpret this change with confidence *(Figure 26)*.
- The overall rate of PHVD is 4.2% (PHVD or death - 11.2%). The apparent rise over time in PHVD rate should not be over-interpreted given the historically high rates of missing data *(Figure 29)*. Improvements to BadgerNet requiring a diagnosis to be supported by measurements should drive improvements to the description of PHVD rates, pending action on the national recommendation below.

National recommendation:

2. NHS England[12] and health departments in Devolved Governments should:

    a. issue clear guidance to neonatal services around the correct reporting of preterm brain injury including PHVD, so that robust data collection can support the achievement of the national ambition for neonatal brain injury.

    b. develop a mandatory NHS neonatal information standard to ensure that clinical reporting systems are interoperable, ensuring robust data collection to support effective measurement and reporting of all neonatal processes and outcomes.

Actions for local quality improvement

- Neonatal units without assured data entry for outcomes such as NEC, bloodstream infection and preterm brain injury should develop and implement plans to deliver enhanced completeness and quality of data, using the NNAP Dashboard to support frequent review and to address quality issues in a timely manner.
- Neonatal networks with high levels of incomplete preterm brain injury data should take urgent action in the short term to address this to ensure that local and regional and national rates of preterm brain injury can be confidently described.

[12] NHS England or succeeding responsible organisation in England.

4. Optimal perinatal care

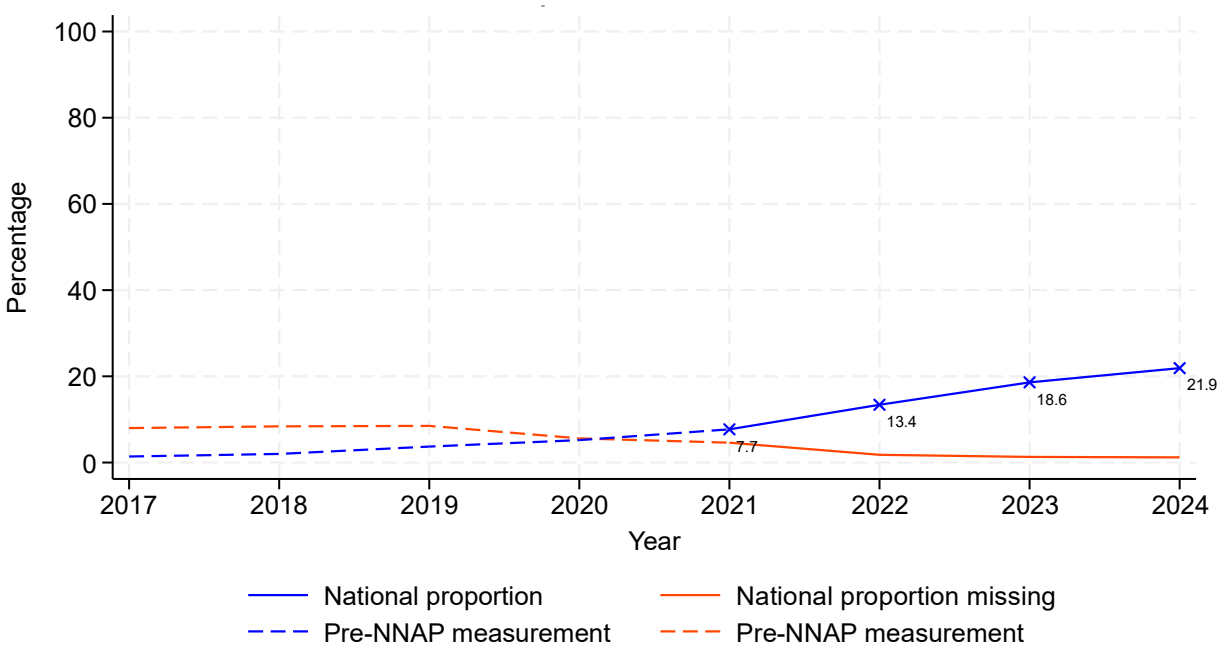
Does a baby born at less than 34 weeks gestational age receive all reported perinatal optimisation measures (appropriate to their gestational age at birth)?*

**Antenatal steroids, antenatal magnesium sulphate, birth in a centre with a NICU, deferred cord clamping, normal temp. on admission, breastmilk in first 2 days.*

Optimal perinatal care is an area of focus in the NNAP Quality Improvement Strategy. For details of the improvement goal relating to optimal perinatal care, and the wider rationale for its inclusion and supporting objectives, access the Strategy at: https://www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/healthcare-improvement-strategy

Results

Figure 30: Proportion of babies born at less than 34 weeks GA who received all reported perinatal optimisation measures, 2017-2024, using 2024 data, definitions and methodology.



Summary of findings

- Despite rapid improvement in the proportion of babies receiving all reported perinatal optimisation measures[13], only 1 in 5 babies (21.9%, 2,849 of 13,023) currently receives a complete optimal perinatal care journey, increased from 7.7% in 2021 (*Figure 30)*.
- There is evidence that optimal perinatal interventions are linked to key outcomes such as mortality and brain injury.[14, 15, 16] Therefore, there is an important opportunity to address more rapid improvement in perinatal optimisation nationally, to increase the proportion of babies receiving an optimal perinatal care journey and reduce regional variation in mortality and brain injury.

National recommendation:

As recommended in the NNAP Summary Report on 2023 Data:

3. Neonatal Networks should ensure that their constituent units are using the NNAP restricted access dashboard to regularly review their rates of optimal perinatal care delivery, identifying instances of non-adherence, and implementing quality improvement activities in response to them.

Actions for local quality improvement

- Every neonatal unit should ensure multi-disciplinary leadership for optimal perinatal care to ensure strong and consistent messaging. Perinatal teams can use NNAP frequent reporting tools and quality improvement methodology to understand the proportion of babies receiving perinatal care interventions in their service and network, to identify opportunities for improvement to maximise quality of care, and the delivery of interventions identified by national improvement initiatives.
- Perinatal teams should work on building their perinatal culture, to develop a fully collaborative multi-disciplinary approach, with high quality communication habits, joint

[13] Antenatal steroids, antenatal magnesium sulphate, birth in a centre with a NICU, deferred cord clamping, normal temperature on admission, breastmilk feeding in the first 2 days of life.

[14] Fogarty, M. et al. Delayed vs early umbilical cord clamping for preterm infants: a systematic review and meta-analysis. *Am J Obstet Gynecol.* 2018 Jan;218(1):1-18. doi: 10.1016/j.ajog.2017.10.231. Available at: https://pubmed.ncbi.nlm.nih.gov/29097178/

[15] Oddie S., Tuffnell D. J., McGuire W. Antenatal magnesium sulfate: Neuro-protection for preterm infants. *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2015; 100: F553-F557. Available at: https://fn.bmj.com/content/100/6/F553

[16] McCall EM, Alderdice F, Vohara S, et al. Interventions to prevent hypothermia at birth in preterm and/or low birthweight infants. Cochrane Database of Systematic Reviews 2018, Issue 2. Available at: www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004210.pub5/full

decision making and agreement of shared goals to improve outcomes for preterm babies and their families. The following resources can be used to support these efforts:

- BAPM toolkits and resources:
  - Building Successful Perinatal Optimisation Teams Toolkit
  - Antenatal Optimisation for Preterm Infants less than 34 weeks: A QI Toolkit
  - Maternal Breastmilk Toolkit
  - Normothermia Toolkit
  - Optimal Cord Management Toolkit
  - Perinatal Optimisation Pathway Resources (BAPM and BICS)
- The Scottish Perinatal Programme and Preterm Wellbeing Package
- West of England Academic Health Sciences Network, PERIPrem
- PERIPrem Cymru
- The QUiPP App Toolkit
- The Maternity Transformation Programme, NHS England

4.1. Antenatal steroids

Does a mother who delivers a baby between 22 and 33 weeks' gestational age receive a full course of antenatal corticosteroids within 1 week prior to delivery?

Babies born at less than 34 weeks' gestational age sometimes have breathing difficulties in the first few days after they are born. Antenatal steroids are a powerful health intervention, given to mothers by obstetricians and midwives before delivery of a preterm baby. Antenatal steroids help reduce mortality and make other serious complications, such as bleeding into the brain, less likely. The NICE guideline *Preterm Labour and Birth*[17] details recommendations on the use of antenatal corticosteroids prior to suspected preterm birth.

The NNAP reports the proportion of eligible mothers who received a full course of antenatal corticosteroids within one week of delivery. Prior to 2022, the NNAP reported the proportion receiving at least one dose before delivery. On time delivery of a full course of antenatal corticosteroids, with 24 hours between doses, is challenging to achieve, due to the complexities of accurately predicting preterm birth. This intervention is likely to be more achievable in some groups of mothers and babies, such as planned deliveries due to preeclampsia, compared to others such as clinical emergencies such as delivery for placental abruption.

[17] NICE guideline [NG25]. Preterm labour and birth. Last updated: 10 June 2022. Available at: https://www.nice.org.uk/guidance/ng25

Results

Figure 31: Proportion of eligible mothers receiving a full course of antenatal steroids, 2017-2024, using 2024 data, definitions and methodology.

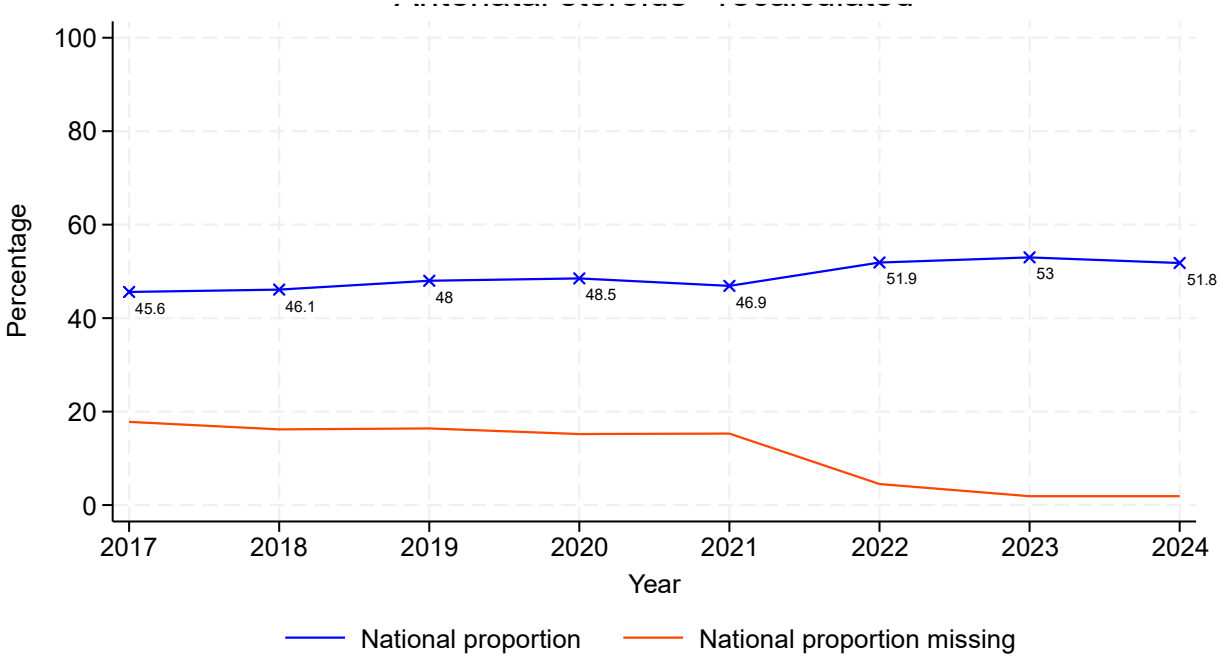


Figure 32: Proportions of administration of antenatal steroids, by neonatal network, 2024.

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

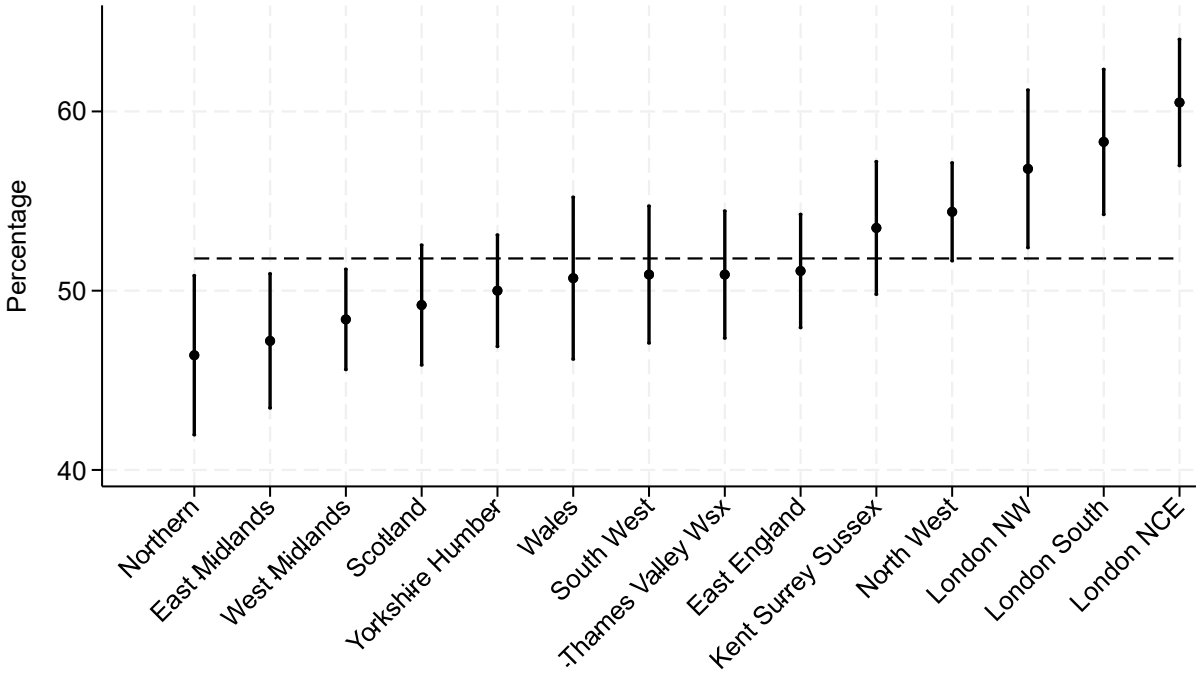


Figure 33: Proportions of administration of antenatal steroids, by neonatal unit, 2024.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.

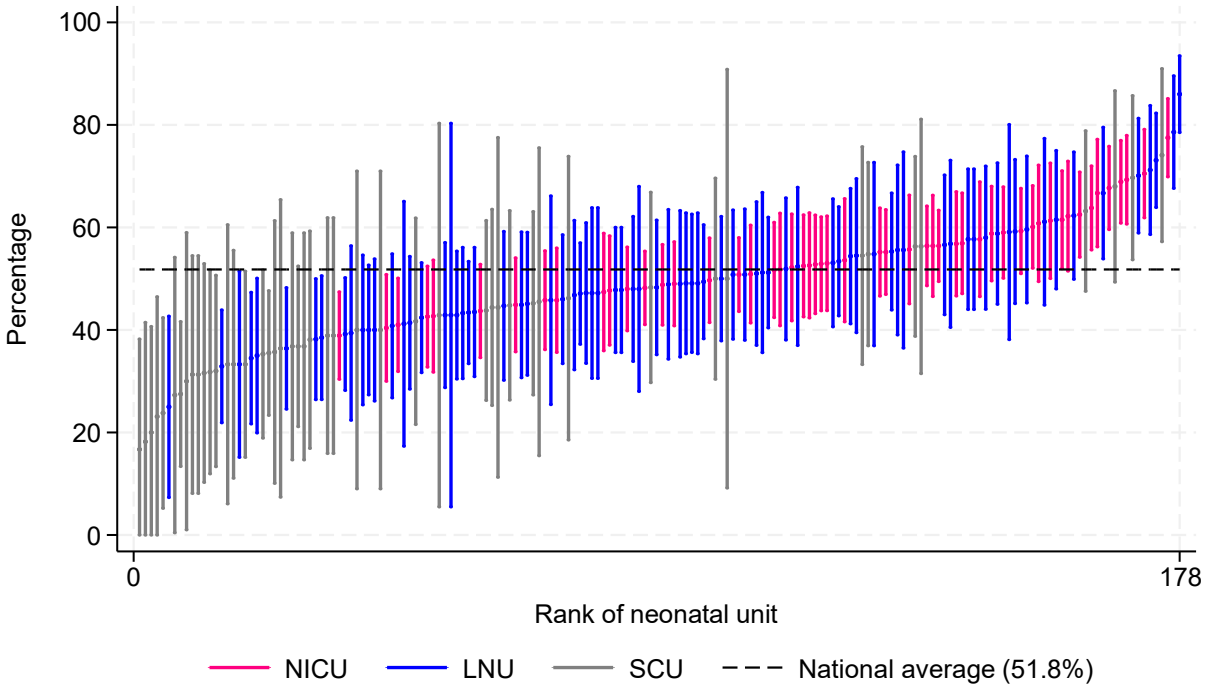


Table 7: Administration of a full course of antenatal steroids, by unit level.

Unit level	Eligible mothers	With outcome	Antenatal steroids given (%)	Missing
Other*	29	22	5 (22.7%)	7 (24.1%)
SCU	1,068	1,030	434 (42.1%)	38 (3.6%)
LNU	4,297	4,204	2,121 (50.5%)	93 (2.2%)
NICU	6,144	6,065	3,307 (54.5%)	79 (1.3%)
National†	11,538	11,321	5,867 (51.8%)	217 (1.9%)

**'Other' units are those that are hospital or healthcare locations not associated with an NNAP neonatal unit, NNAP units that have closed before the start of this audit year, or location records that are unknown.*

†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Summary of findings

- There has been a small reduction in the overall proportion of eligible mothers receiving a full course of antenatal steroids within one week prior to delivery (2024 – 51.8%, 5,867 of 11,321; 2023 - 53%) *(Figure 31)*.
- However, there is evidence that shortened courses (less than 24 hours) are common.[18] Antenatal steroid courses with a short duration do not have additional benefit over standard length courses and may cause harm.[19] It is important to ensure that NNAP measurement of antenatal steroid usage does not inadvertently encourage sub-optimal delivery of this treatment.
- Variation exists in the delivery of this intervention between networks *(Figure 32)*; however, caution must be exercised as it is not possible to establish whether improvement in measure adherence currently reflects real improvement in care.
- Changes have been made to the BadgerNet clinical system and NNAP data dictionary to allow the dosing interval to be calculated, and to establish the timing of the full course (in the target 7-day period, or earlier).
- Measurement of antenatal steroid administration by NNAP has not to date described the proportion of cases where adherence to the NNAP standard has been achieved through the use of shortened courses. However, data entry amendments that have been introduced in March 2024 mean that this could form part of forthcoming NNAP reporting for the 2025 year and beyond.

[18] Pettinger, K. et al, (2025) Hitting the target and missing the point with shortened courses of antenatal steroids: An observational study. Neonatal Society Summer Meeting. 19 June 2025; London. Available at: https://www.neonatalsociety.ac.uk/wp-content/uploads/2025/06/Summer-Meeting-2025-Abstract-book.pdf

[19] Pettinger KJ, Spencer R, Oddie SJ. Perinatal medicine's best treatment: how should we be using antenatal steroids? *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2025;110:245-246. Available at: https://fn.bmj.com/content/110/3/245.info

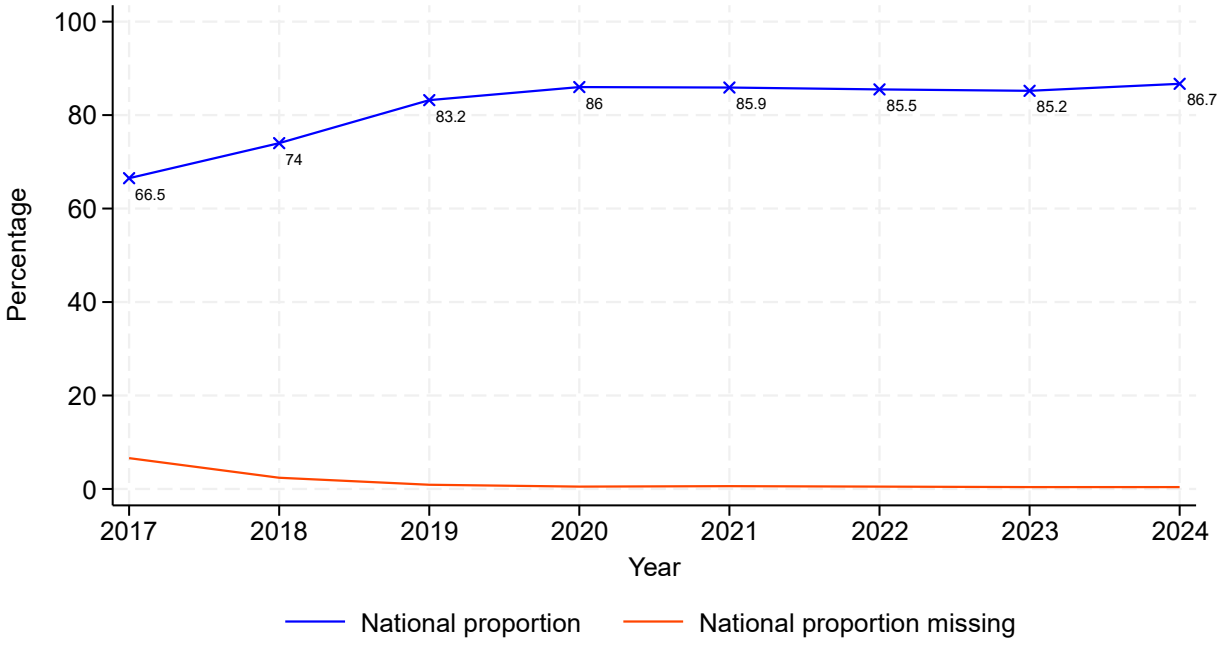
4.2. Antenatal magnesium sulphate

Is a mother who delivers a baby below 30 weeks gestational age given magnesium sulphate in the 24 hours prior to delivery?

Giving magnesium sulphate to women who are at risk of delivering a preterm baby reduces the chance that their baby will develop cerebral palsy by 32%.[20] The NICE quality standard *Preterm Labour and Birth* recommends that all women who may deliver their baby at less than 30 weeks gestational age are offered magnesium sulphate where possible.[21] The NNAP developmental standard is that ninety percent (90%) of eligible mothers should receive antenatal magnesium sulphate.

Results

Figure 34: Proportion of eligible mothers receiving antenatal magnesium sulphate, 2017-2024, using 2024 data, definitions and methodology.



[20] Oddie S., Tuffnell D. J., McGuire W. Antenatal magnesium sulfate: Neuro-protection for preterm infants. *Archives of Disease in Childhood - Fetal and Neonatal Edition* 2015; 100: F553-F557. Available at: https://fn.bmj.com/content/100/6/F553

[21] National Institute for Health and Care Excellence. *Preterm labour and birth. NICE guideline (NG25)* 2015. Available from: https://www.nice.org.uk/guidance/NG25

Figure 35: Proportion of eligible mothers receiving antenatal magnesium sulphate, by neonatal network.

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

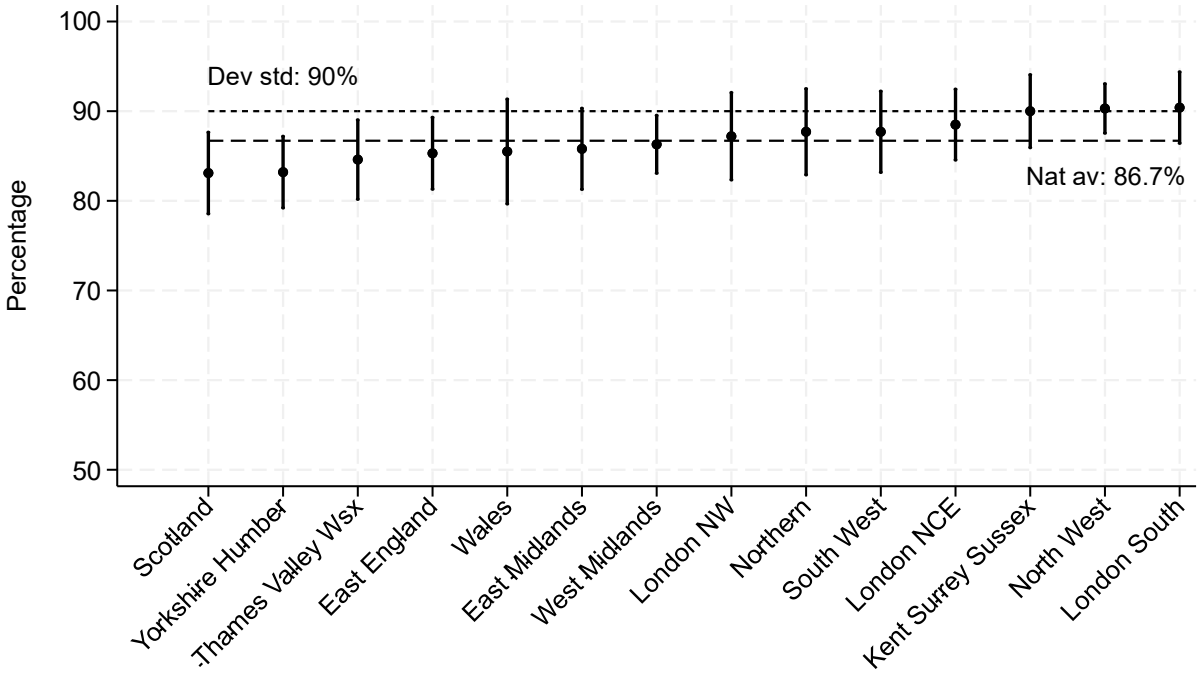


Table 8: Administration of antenatal magnesium sulphate, by unit level.

Unit level	Eligible mothers	With outcome	Antenatal magnesium sulphate given (%)	Missing
Other*	12	8	3 (37.5%)	4 (33.3%)
SCU	163	160	128 (80%)	3 (1.8%)
LNU	1,018	1,016	846 (83.3%)	2 (.2%)
NICU	2,618	2,611	2,314 (88.6%)	7 (.3%)
National†	3,811	3,795	3,291 (86.7%)	16 (.4%)

**'Other' units are those that are hospital or healthcare locations not associated with an NNAP neonatal unit, NNAP units that have closed before the start of this audit year, or location records that are unknown.*

†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Figure 36: Proportion of eligible mothers receiving antenatal magnesium sulphate, by neonatal unit.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.

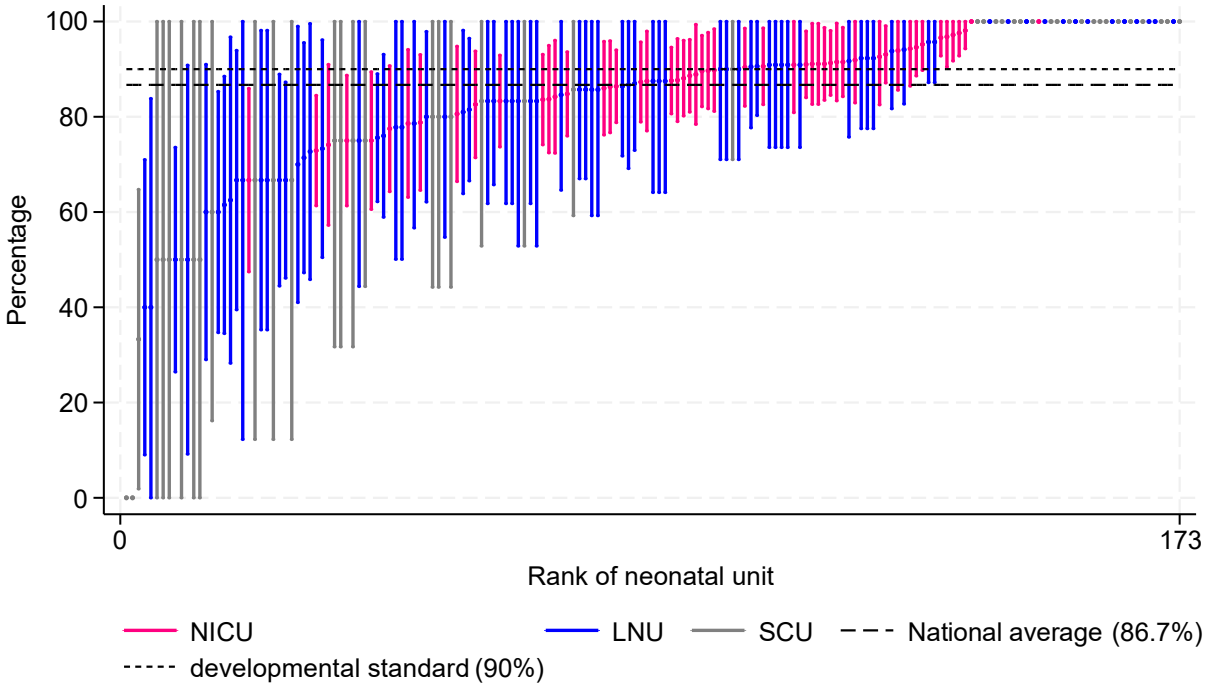
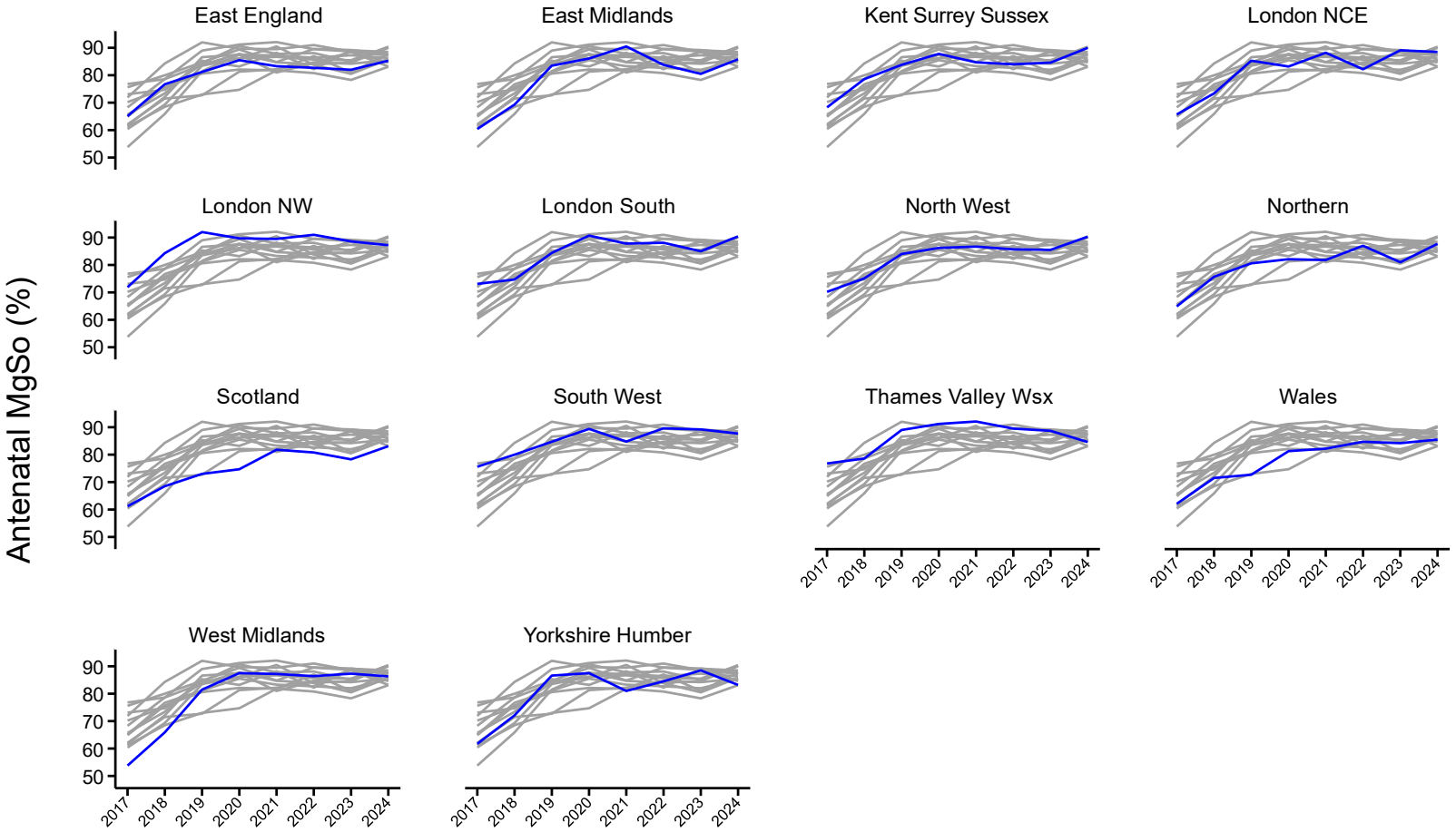


Figure 37: Front and back plot of administration of antenatal magnesium sulphate by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- Broadly, delivery of antenatal magnesium sulphate is relatively unchanged in recent years (2024 – 86.7%, 3,291 of 3,795; 2023 – 85.2%; 2022 – 85.5%) following the introduction in 2018 of the PReCePT programme[22] in England, and in 2020, PERIPrem Cymru[23] in Wales *(Figure 34)*.
- Variation between neonatal networks is low, from 83.1% (Scotland), to 90.4% (London ODN – South), with three neonatal networks achieving the NNAP developmental standard of 90% *(Figure 35)*. The front and back plot shows the improvement trajectory of neonatal networks between 2017 and 2024 *(Figure 37)*. This plot further illustrates the previously described slower uptake of antenatal magnesium sulphate in Scotland and Wales.
- Delivery of antenatal magnesium sulphate is poorer at SCUs (80%, 128 of 160) and LNUs (83.3%, 846 of 1,016) than at NICUs (88.6%, 2,314 of 2,611) *(Table 8)*. This may be due to the unplanned nature of the delivery of extremely preterm babies in SCUs and LNUs. Variation between neonatal units does exist, and there may be opportunities for further improvement at neonatal units with below average delivery of antenatal magnesium sulphate *(Figure 36)*.

[22] NHS England. PReCePT – using magnesium sulphate to reduce cerebral palsy in pre-term babies. 20 June 2023. Available at: https://www.england.nhs.uk/long-read/precept-using-magnesium-sulphate-to-reduce-cerebral-palsy-in-pre-term-babies/

[23] NHS Wales Executive. PERIPrem Cymru for professionals. Available at: https://executive.nhs.wales/functions/networks-and-planning/maternity-and-neonatal-services/information-for-professionals/periprem-cymru-for-professionals/

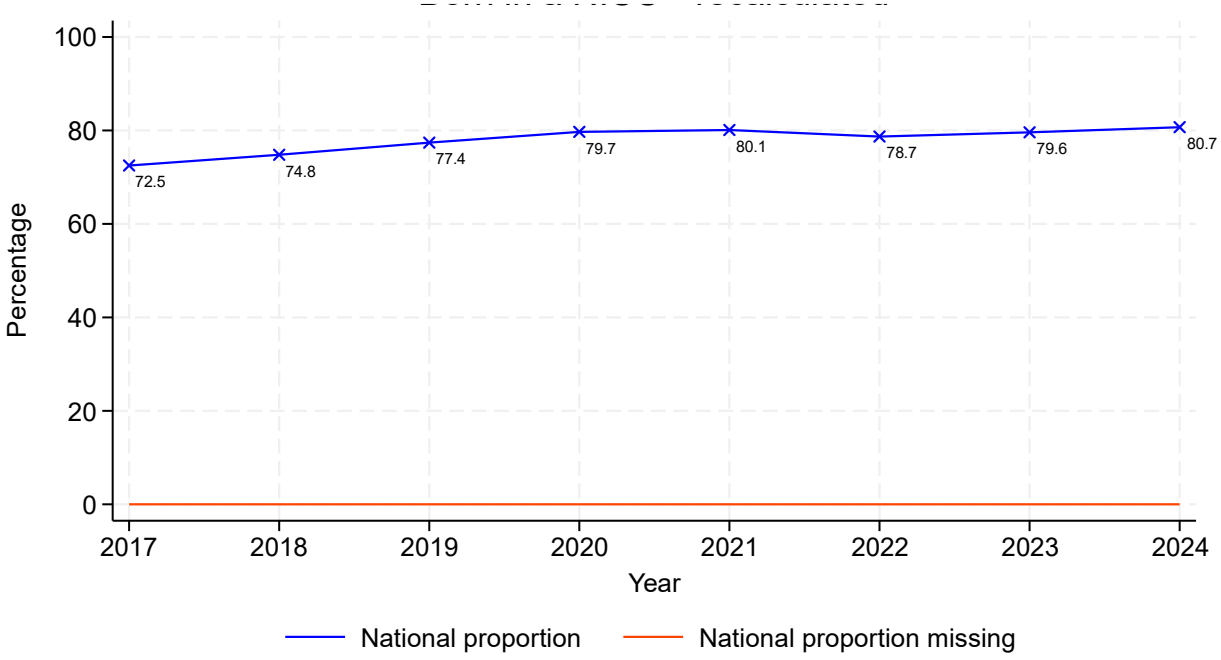
4.3. Birth in a centre with a NICU

Is a baby born at less than 27 weeks gestational age, or less than 800 grams at birth, or born as a multiple at less than 28 weeks gestational age, delivered in a maternity service on the same site as a designated neonatal intensive care unit (NICU)?

Babies who are born at less than 27 weeks gestational age are at high risk of death, serious illness, and brain injury. National recommendations in England[24],[25] state that neonatal networks should aim to configure and deliver services to increase the proportion of babies at this gestational age being delivered in a hospital with a neonatal intensive care unit (NICU) on site. This is because there is evidence that outcomes improve if such premature babies are cared for in a NICU from birth. The NNAP development standard states that at least 85% of eligible babies should be delivered in a maternity service on the same site as a NICU.

Results

Figure 38: Proportion of extremely preterm babies born a centre with a NICU, 2017-2024, using 2024 data, definitions and methodology.



[24] NHS England. *Neonatal Critical Care Service Specification*. 2016. Available from https://www.england.nhs.uk/commissioning/spec-services/npc-crg/group-e/e08/.

[25] NHS England. *Implementing Better Births: Integrating Neonatal Care into Local Maternity System Transformation Plans*. 2017.

Figure 39: Proportion of extremely preterm babies born a centre with a NICU, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

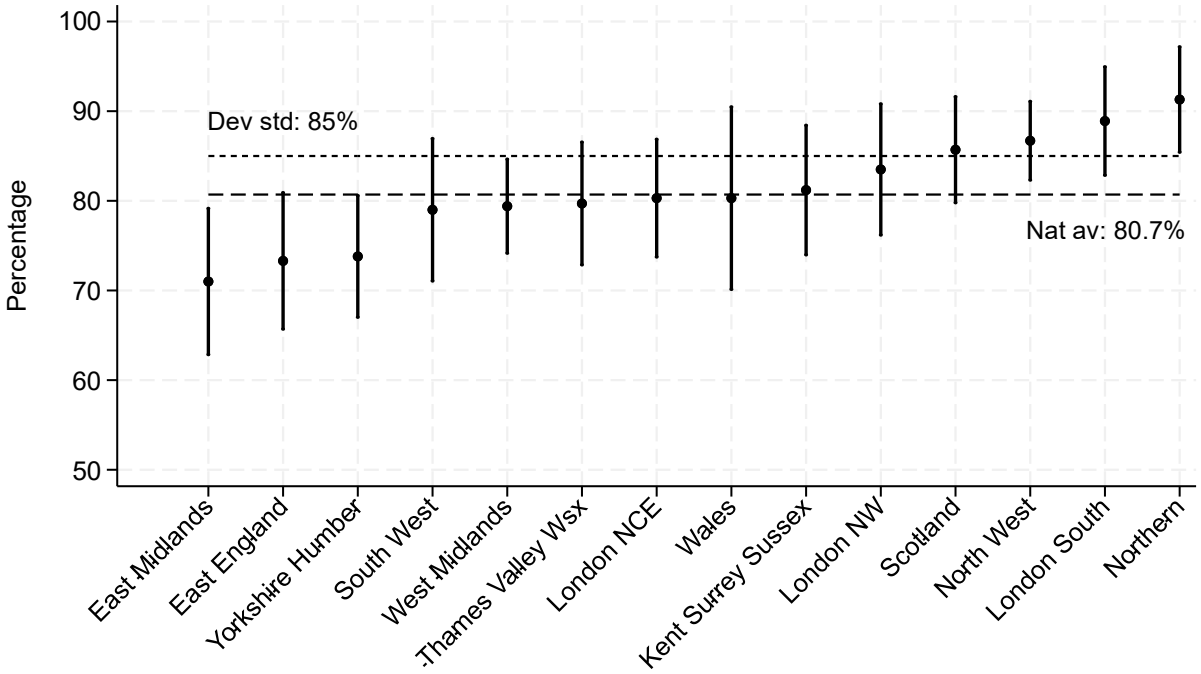
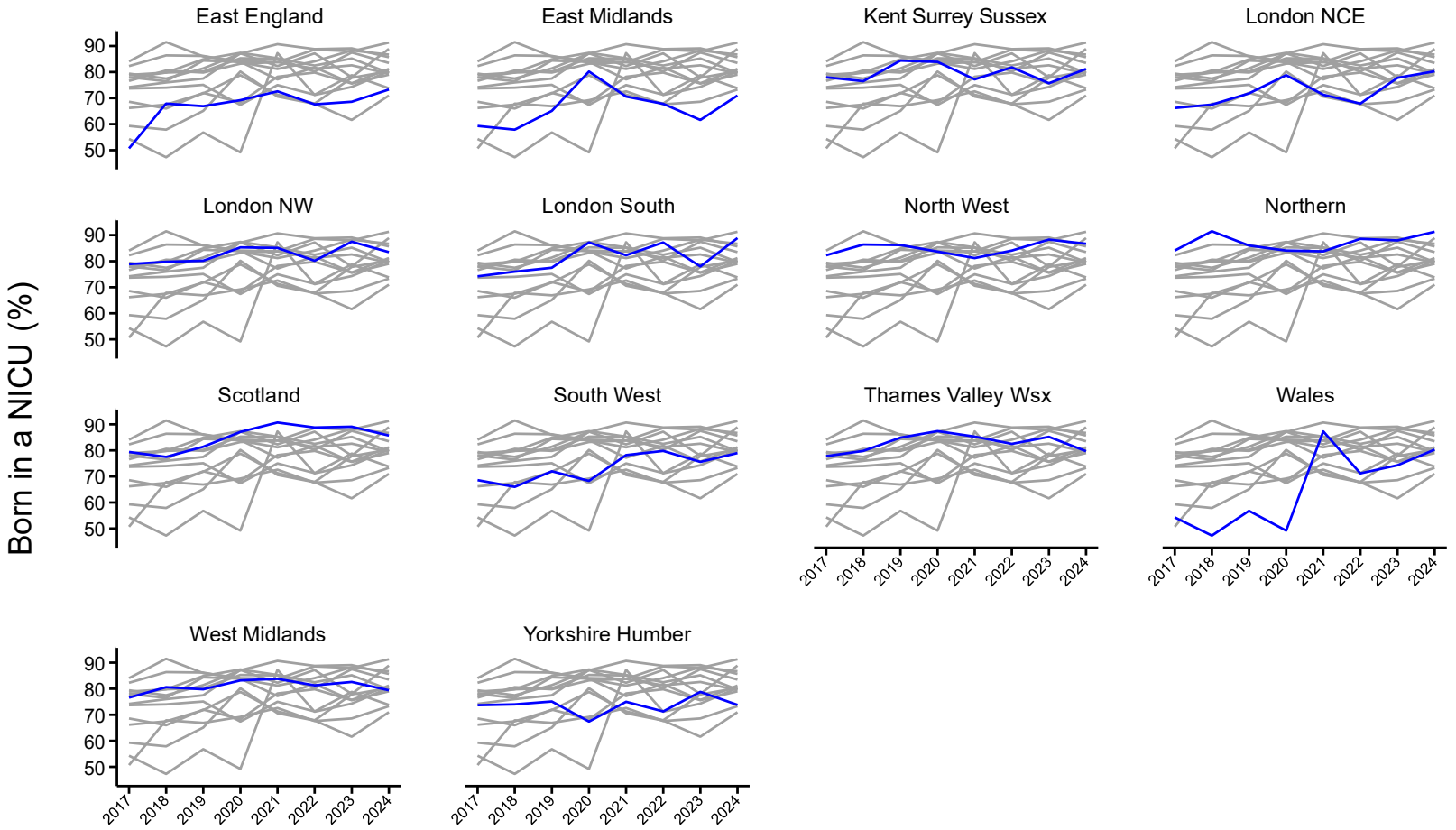


Figure 40: Front and back plot of proportion of extremely preterm babies born a centre with a NICU, by neonatal network.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- Despite a small increase in the overall proportion of extremely preterm babies born in a centre with a NICU this year, performance has remained relatively unchanged since 2020 (2024 – 80.7%, 1,549 of 1,920; 2020 – 79.7%) *(Figure 38).*
- Regional variation does exist, with network rates ranging from 71% (East Midlands ODN) to 91.3% (Northern ODN); only four networks are meeting the NNAP developmental standard of 85% *(Figure 39)*. The front and back chart shows the neonatal network improvement trajectories over time *(Figure 40)*. The network variation observed reflects both population geography, and network management of patient flows. Networks with more dispersed populations evidently face different challenges centralising deliveries of the least mature infants compared to networks with either smaller catchments, more neonatal intensive care units, or both.

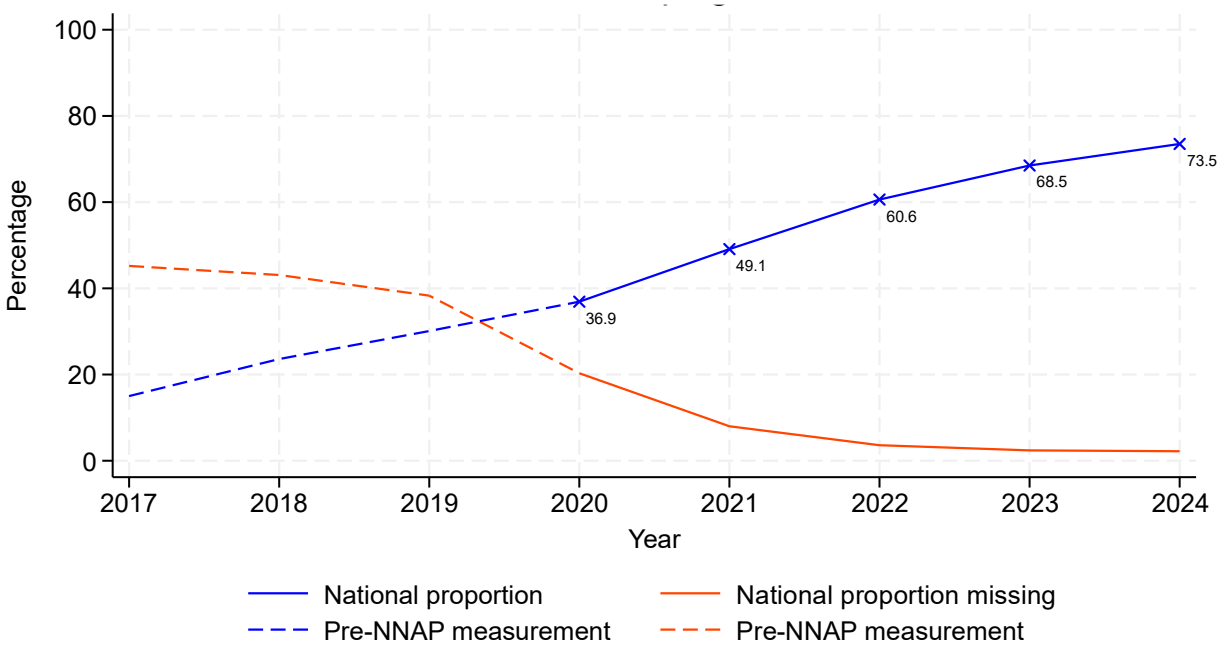
4.4. Deferred cord clamping

Does a baby born at less than 34 weeks gestational age have their cord clamped at or after one minute?

Evidence shows that avoiding immediate cord clamping reduces death in preterm babies by nearly a third.[26] Deferred cord clamping has been shown to be incompletely implemented in the UK and is one of the key perinatal care interventions identified by MatNeoSIP. The NNAP developmental standard is that at least 75% of babies born at less than 34 weeks gestational age should have their cord clamped at or after one minute.

Results

Figure 41: Proportion of babies born at less than 34 weeks GA receiving deferred cord clamping, 2017-2024, using 2024 data, definitions and methodology*.



From 2022, the measure was changed to include babies born at 32 and 33 weeks gestational age, therefore data relating to these babies may not have been completed and quality assured prior to this point.

[26] Fogarty, M. et al. Delayed vs early umbilical cord clamping for preterm infants: a systematic review and meta-analysis. *Am J Obstet Gynecol.* 2018 Jan;218(1):1-18. doi: 10.1016/j.ajog.2017.10.231. Available at: https://pubmed.ncbi.nlm.nih.gov/29097178/

Figure 42: Proportions of deferred cord clamping at less than 34 weeks gestational age; by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

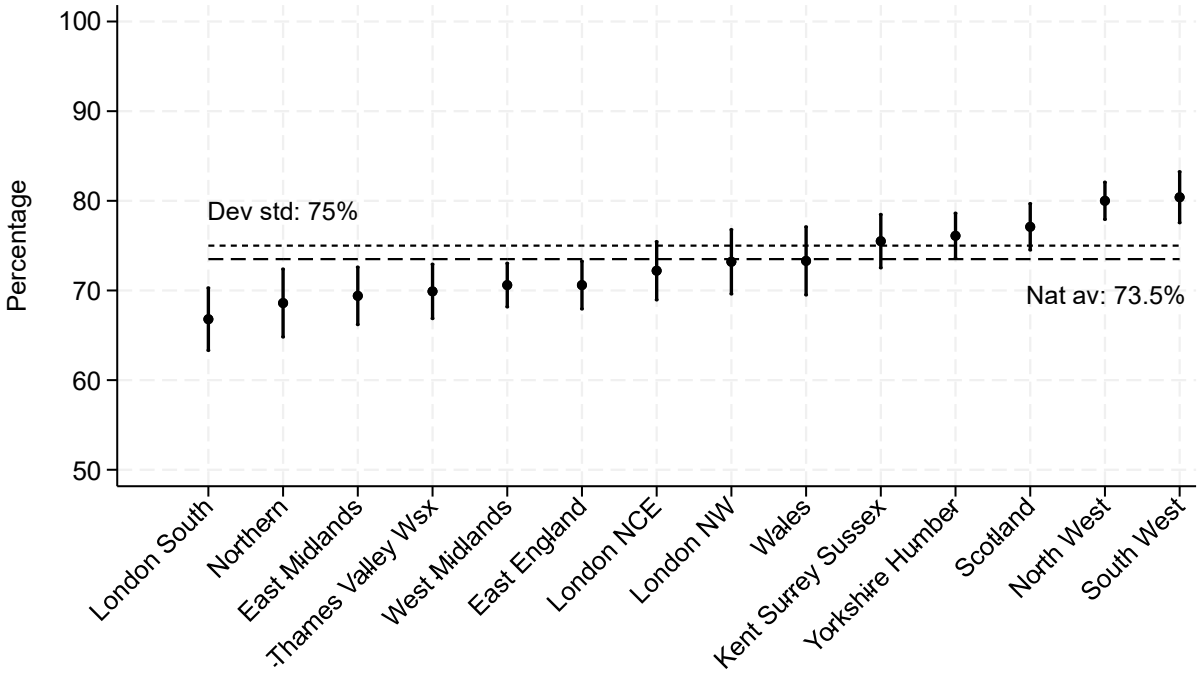


Figure 43: Proportions of deferred cord clamping at less than 34 weeks gestational age; neonatal units (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

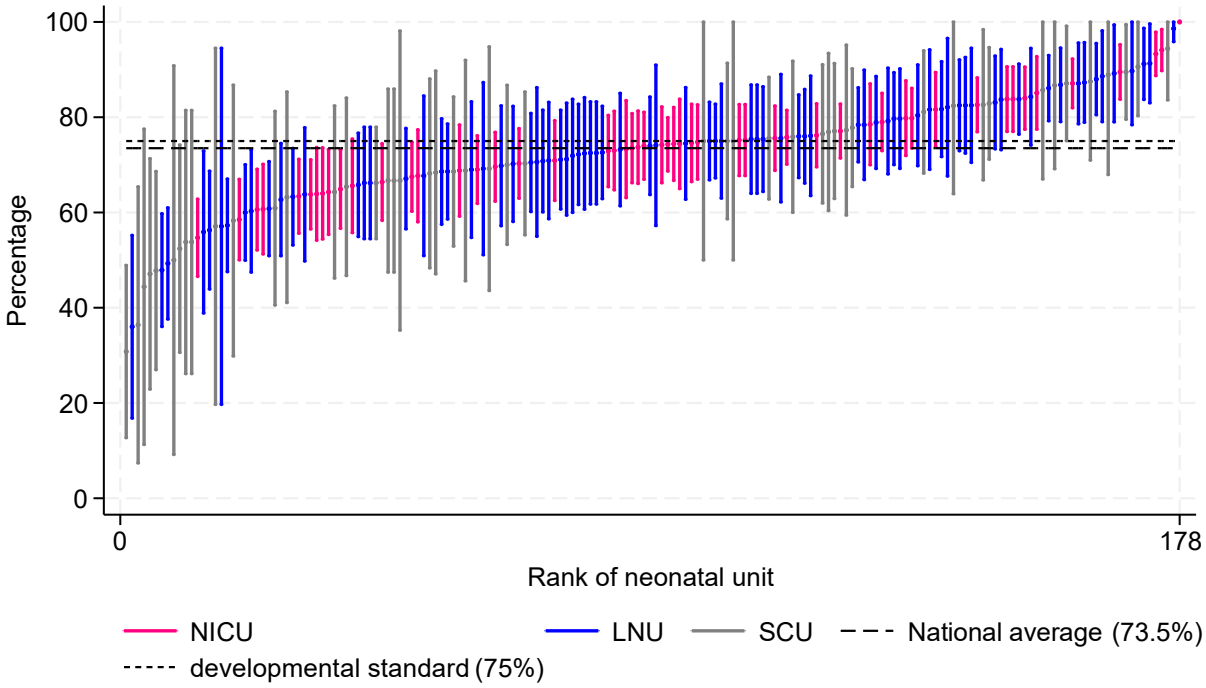


Table 9: Deferred cord clamping, by neonatal unit level.

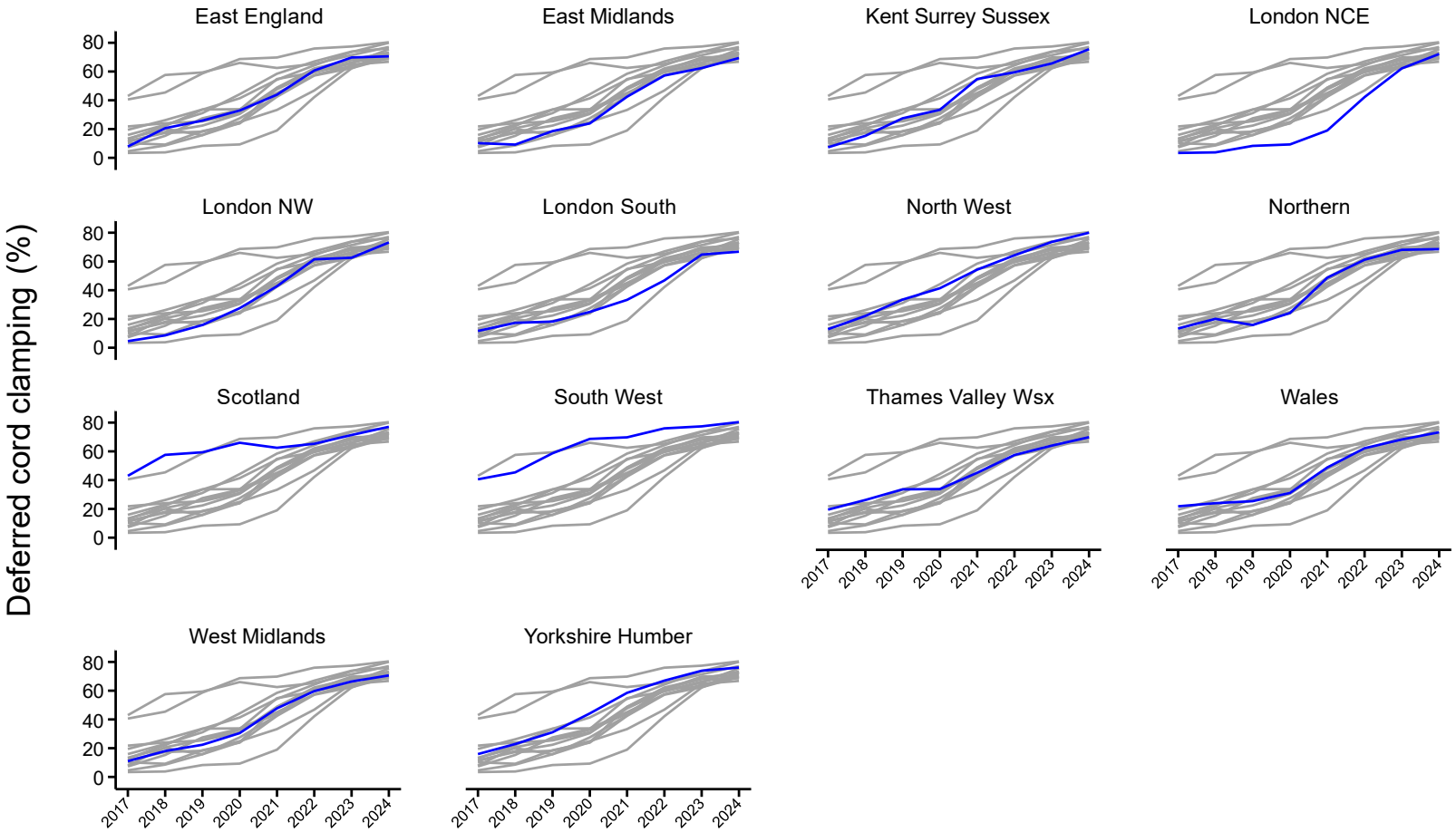
Unit level	Eligible babies	With outcome	Deferred cord clamping (%)	Missing (%)
Other*	32	16	10 (62.5%)	16 (50%)
SCU	1171	1127	806 (71.5%)	44 (3.8%)
LNU	4,914	4,872	3,593 (73.7%)	42 (.9%)
NICU	7,070	6,879	5,070 (73.7%)	191 (2.7%)
National†	13,187	12,894	9,479 (73.5%)	293 (2.2%)

**'Other' units are those that are hospital or healthcare locations not associated with an NNAP neonatal unit, NNAP units that have closed before the start of this audit year, or location records that are unknown.*

†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Figure 44: Front and back chart of deferred cord clamping by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- Since the introduction of deferred cord clamping into NNAP reporting in 2020, there has been rapid uptake of this important intervention by the neonatal community, with significant overall year-on year improvement in data completeness and delivery - from 36.9% in 2020 to 73.5% (9,479 of 12,894) in 2024 (Figure 41).
- Among neonatal networks, proportions vary between 66.8% (London ODN – South), and 80.4% (South West ODN), with five networks achieving the NNAP developmental standard of 75% (Figure 42). The front and back chart shows the neonatal network improvement trajectories over time (Figure 44).
- Delivery is similar across neonatal unit types (Table 9). However, there is still striking unit level variation (from 30.8% to 100%) and therefore opportunities exist for further improvement (Figure 43).

4.5. Normal temperature on admission

Does an admitted baby born at less than 32 weeks gestational age have a first temperature on admission which is both between 36.5–37.5°C and measured within one hour of birth?

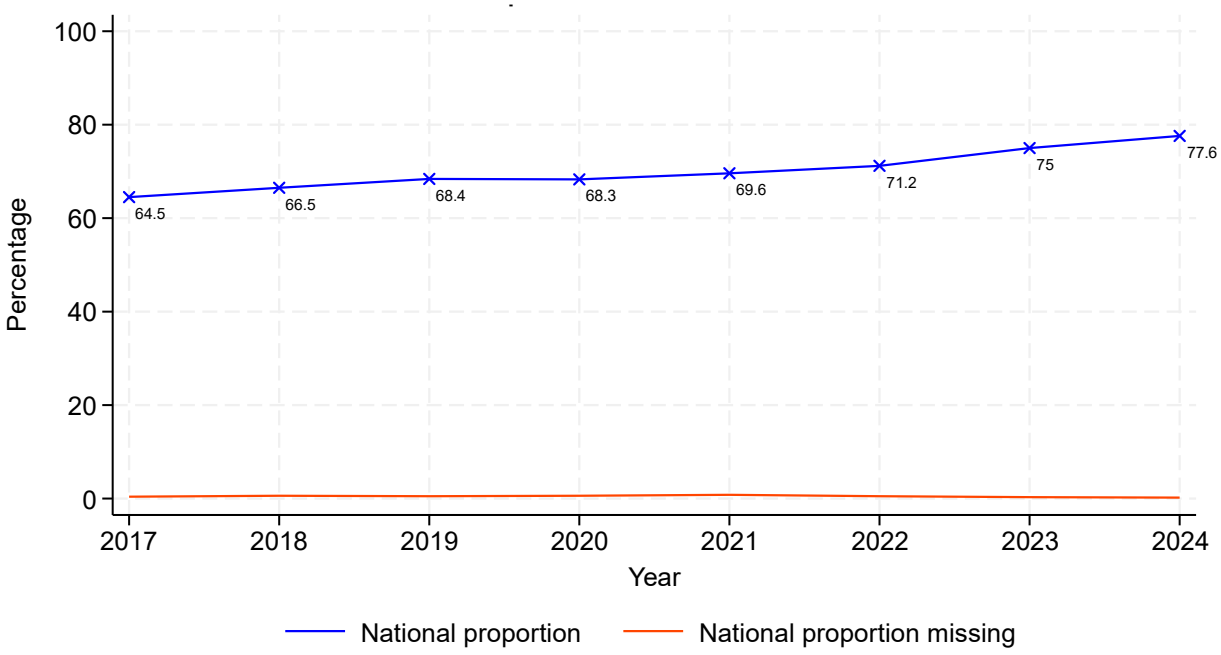
Low admission temperature is associated with an increased risk of illness and death in preterm babies. Low temperature (or hypothermia) is a preventable condition in vulnerable newborn babies.

This NNAP measure looks at how successful neonatal units are at achieving a normal first temperature (between 36.5 and 37.5°C) within an hour of birth in very preterm babies. The NNAP developmental standard is that at least 90% of babies should have an admission temperature taken within an hour of birth and measuring within the normal range. From 2023, the cohort for this measure included babies born at 32 and 33 weeks gestational age, in line with MatNeoSIP measurement. The measurement specifically includes babies whose admission to neonatal units was after an hour of age – though these are small in number. This was at the request of audit users, who noted that exclusion of babies admitted after an hour of age risked providing a perverse incentive to delay the admission of already hypothermic moderately preterm infants. National guidance notes the risk of excessive therapeutic optimism in choosing location of care for preterm infants.[27]

[27] BAPM. Framework: Early Postnatal Care of the Moderate-Late Preterm Infant. 2023. Available at: https://www.bapm.org/resources/framework-early-postnatal-care-of-the-moderate-late-preterm-infant

Results

Figure 45: Proportion of babies born at less than 34 weeks GA with normal temperature on admission, 2017-2024, using 2024 data, definitions and methodology*.



**From 2023, this measure was changed to include babies born at 32 and 33 weeks gestational age, therefore data relating to these babies may not have been completed and quality assured prior to this point.*

Figure 46: Proportions of temperature taken on time and within normal range, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

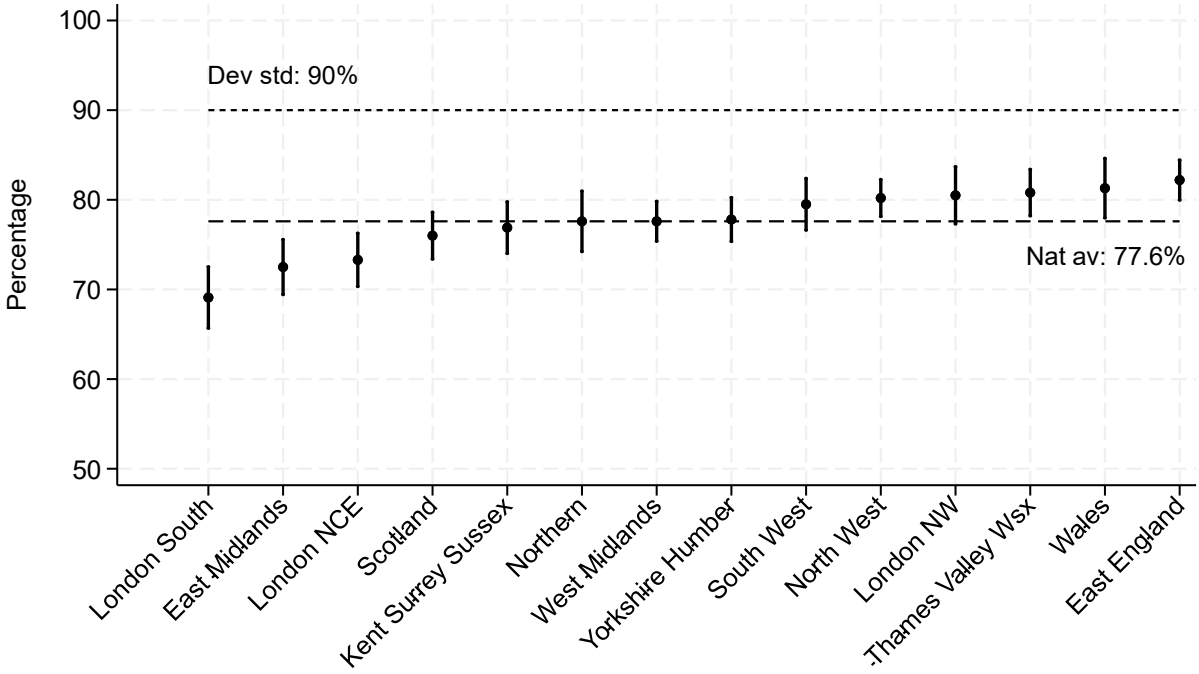


Figure 47: Proportions of temperature taken on time and within normal range: neonatal units (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

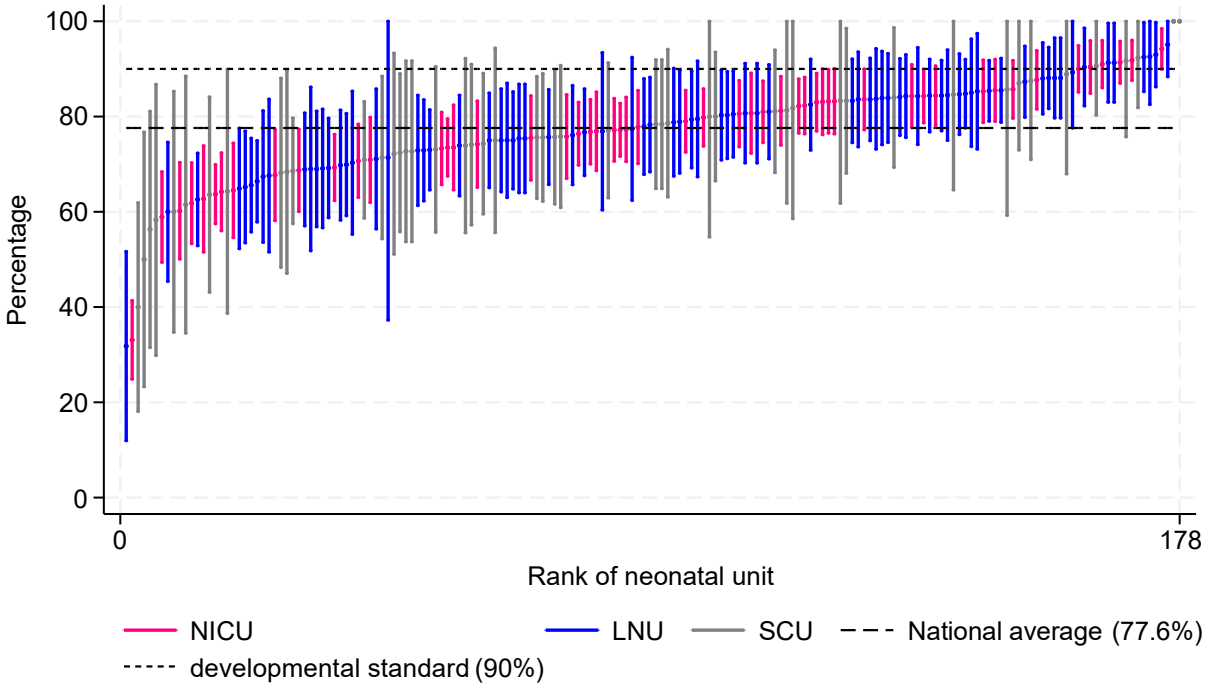


Table 10: Temperature on time and within normal range, by neonatal unit level (2024).

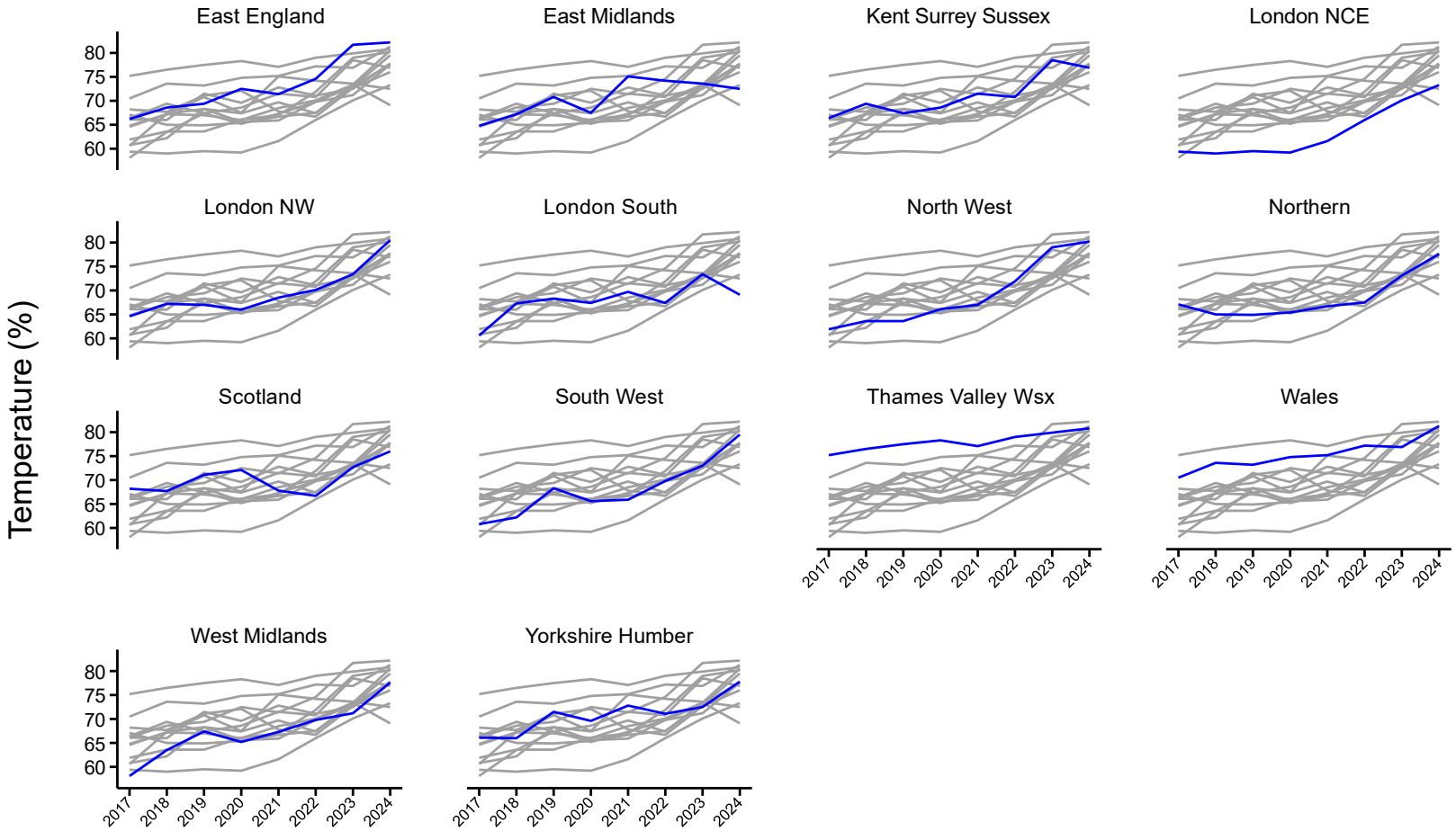
Unit level	Eligible babies	With outcome	< 32°C	32 to 35.9°C	36 to 36.4°C	36.5 to 37.5°C	> 37.5°C	After hour	Not taken	Missing data (%)
Other*	19	18	0 (0%)	0 (0%)	1 (5.6%)	5 (27.8%)	0 (0%)	12	0	1 (5.3%)
SCU	1,166	1,162	0 (0%)	15 (1.3%)	100 (8.6%)	875 (75.3%)	62 (5.3%)	108	2	4 (0.3%)
LNU	4,900	4,886	0 (0%)	36 (0.7%)	333 (6.8%)	3,840 (78.6%)	363 (7.4%)	310	4	14 (0.3%)
NICU	7,023	7,011	1 (0%)	85 (1.2%)	444 (6.3%)	5,429 (77.4%)	532 (7.6%)	511	9	12 (0.2%)
National†	13,108	13,077	1 (0%)	136 (1%)	878 (6.7%)	10,149 (77.6%)	957 (7.3%)	941	15	31 (0.2%)

**'Other' units are those that are hospital or healthcare locations not associated with an NNAP neonatal unit, NNAP units that have closed before the start of this audit year, or location records that are unknown.*

†*'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.*

Figure 48: Front and back plot of temperature taken on time and within normal range by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- Using the latest definition of this measure, there is a clear year-on-year improvement in the proportion of babies with a normal temperature on admission and within an hour of birth, from 64.5% in 2017 to 77.6% (10,149 of 13,077) in 2024 *(Figure 45)*.
- While improvements can clearly still be made, variation between networks is relatively low, ranging from 69.1% (London ODN – South) to 82.2% (East of England ODN), with year-on-year improvement continuing in most networks *(Figure 46, Figure 48)*.
- While 18 neonatal units now meet the NNAP developmental standard of 90%, variation does exist across all neonatal unit levels, representing further opportunities for improvement *(Figure 47)*.

Quality improvement case studies

- Getting it Just Right: A Quality Improvement Initiative in Preterm Thermoregulation. Natasha G et al., Department of Neonatology, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust. Available at: www.rcpch.ac.uk/resources/NNAP-summary-report-2024-data
- POSH- Prevention of Significant Hypothermia, a quality improvement project. Written by Lucy Bradley & Helen Cockcroft, Advanced Neonatal Nurse Practitioners at University Hospitals Coventry and Warwickshire. Available at: www.rcpch.ac.uk/resources/NNAP-summary-report-2024-data

5. Parent partnership in decision making

5.1. Parent consultation within 24 hours

Is there a documented consultation with parents by a senior member of the neonatal team within 24 hours of a baby's admission?* [28,29,30]

**Consultant or middle grade doctor, or a nurse practitioner acting in such a role.*

It is important that neonatal teams explain to parents the care provided to babies admitted to neonatal unit. If families are well informed, they will be more able to be fully involved in decision making for their baby. This first consultation provides an opportunity for the senior staff member to meet the parents, listen to their concerns, explain how their baby is being cared for and respond to any questions. This measure of care looks at whether parents have had a consultation with a senior member of the neonatal team within the first 24 hours of their baby being admitted. It applies for all babies who require care on a neonatal unit. A consultation should take place within 24 hours of admission for every baby, for every admission.

[28] Scottish Government. *Neonatal Care in Scotland: A Quality Framework*. 2013. Available from http://www.gov.scot/Resource/0041/00415230.pdf.

[29] Welsh Health Specialised Services Committee, NHS Wales. *All Wales Neonatal Standards - 2nd Edition*. 2013. Available from http://www.wales.nhs.uk/document/219405.

[30] Department of Health. *Toolkit for high quality neonatal services*. 2009. Available from https://webarchive.nationalarchives.gov.uk/ukgwa/20100604134939/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

Results

Figure 49: Proportion of admissions where a consultation with parents took place within 24 hours, 2017-2024, using 2024 data, definitions and methodology.

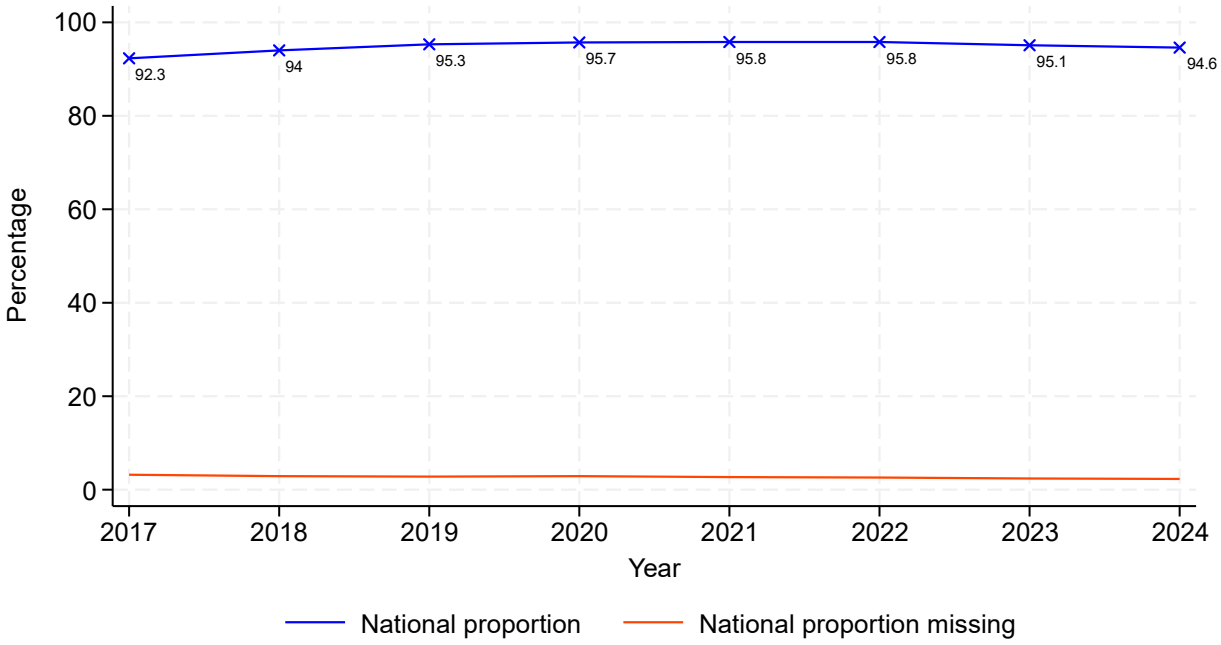


Figure 50: Proportion of admissions where a consultation with parents took place within 24 hours, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

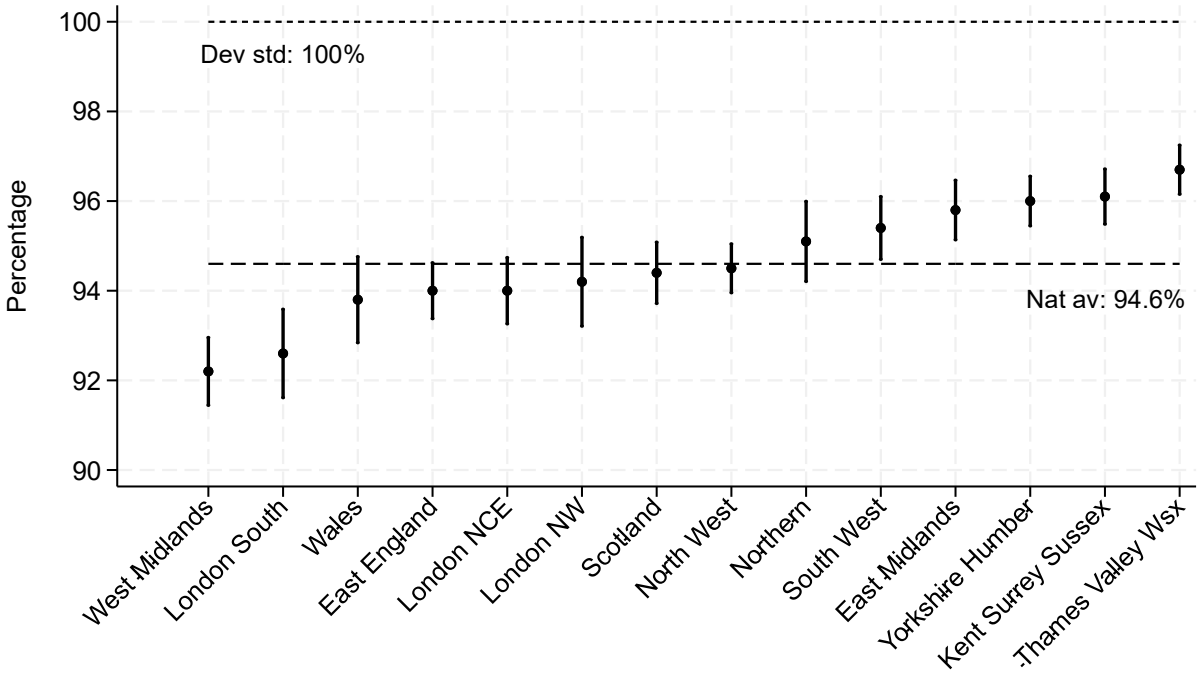


Figure 51: Proportion of admissions where a consultation with parents took place within 24 hours, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

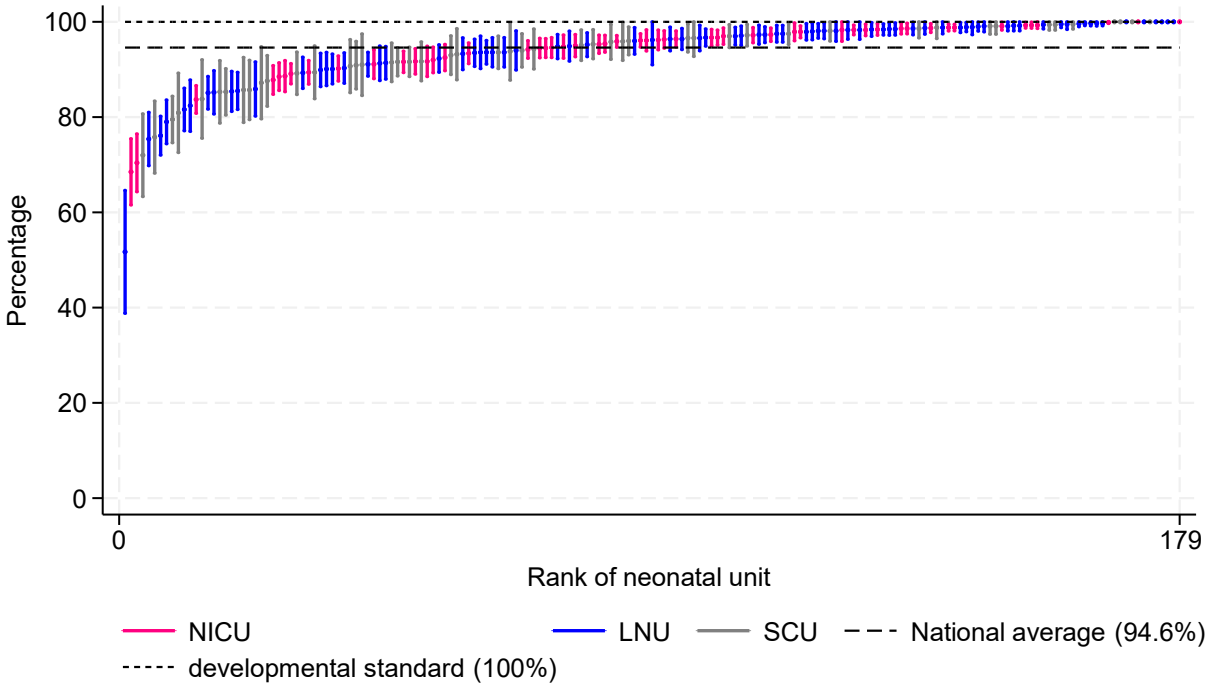
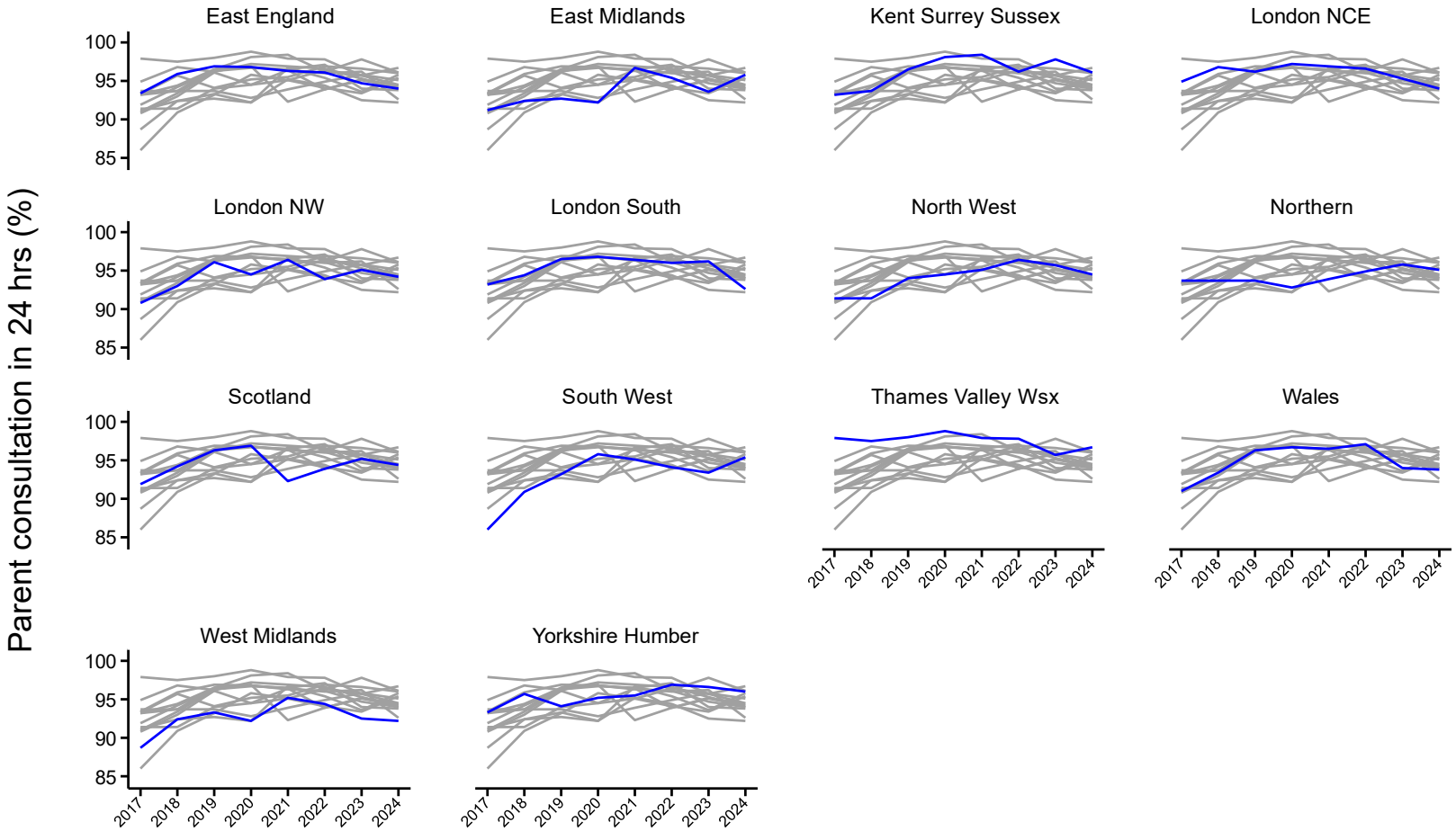


Figure 52: Front and back chart of parent consultation within 24 hours of admission by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- 94.6% (53,817 of 56,864) of families have a consultation with a senior member of the neonatal team within 24 hours of admission. This is a small drop since 2023 (95.1%), coinciding with this measure no longer being subject to the outlier management process (*Figure 49)*.
- However, network variation remains low; all neonatal networks achieve this for over 92% of baby admissions *(Figure 50)*. The front and back chart shows the neonatal network improvement trajectories over time *(*Figure 52*)*.

5.2. Parent inclusion on ward rounds

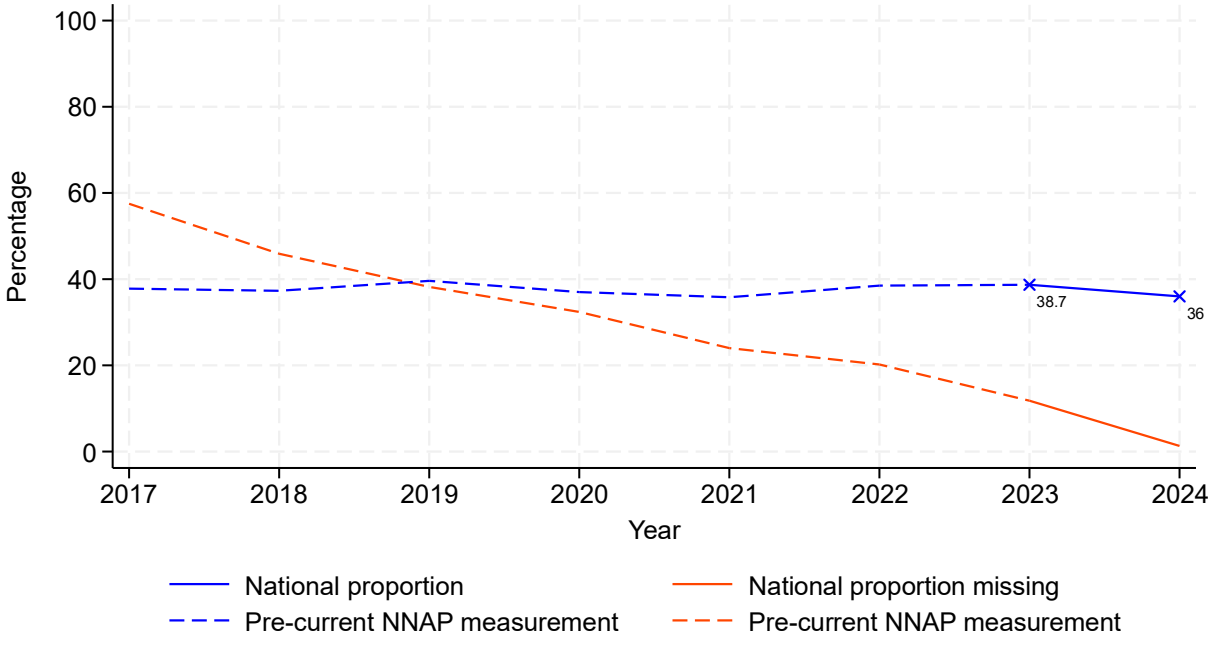
What proportion of baby care days had a consultant-led ward round with at least one parent included?

**Consultant ward round refers to any ward round where a consultant is in attendance, at any time of the day.*

Professionals, parents' advocates, and parents agree that including parents in consultant ward rounds supports parental partnership in care. Consultant ward rounds occur regularly (usually daily, or more often) on neonatal units. This measure looks at the proportion of baby care days that had a consultant-led ward round with at least one parent included.

Results

Figure 53: Proportion of baby care days with a parent included on the consultant-led ward round, 2017-2024, using 2024 data, definitions and methodology*.



**Prior to 2023, the NNAP looked at whether a parent was included on the consultant ward round at least once during a baby's stay.*

Table 11: Proportions of baby care days that had a consultant-led ward round with at least one parent included, by neonatal unit level (2024).

Unit level	Eligible baby care days	Baby care days with an outcome recorded	Baby care days with a parent included in the consultant ward round	Missing
SCU	72,678	72,480	26,179 (36.1%)	198 (.3%)
LNU	278,800	277,098	116,036 (41.9%)	1,702 (.6%)
NICU	430,801	422,759	135,728 (32.1%)	8,042 (1.9%)
National†	782,279	772,337	277,943 (36%)	9,942 (1.3%)

†*'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.*

Figure 54: Proportions of baby care days that had a consultant-led ward round with at least one parent included, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. Confidence intervals in the figure are smaller than other caterpillar plots because the unit of analysis is baby days rather than babies or episodes.

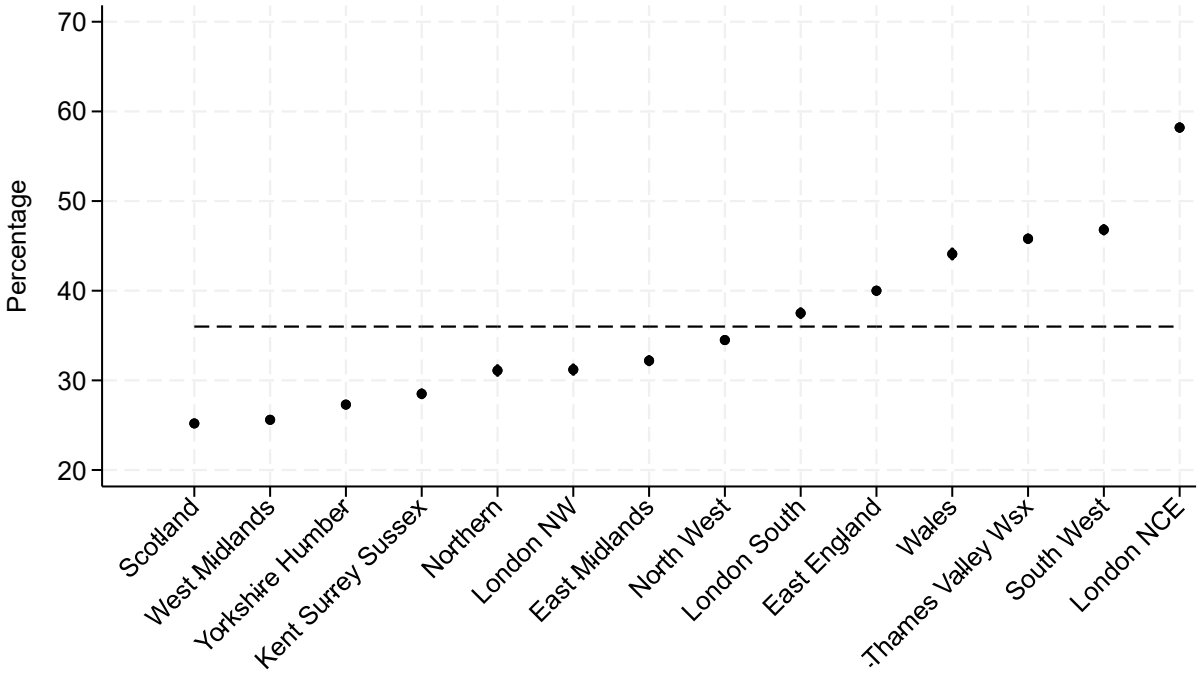
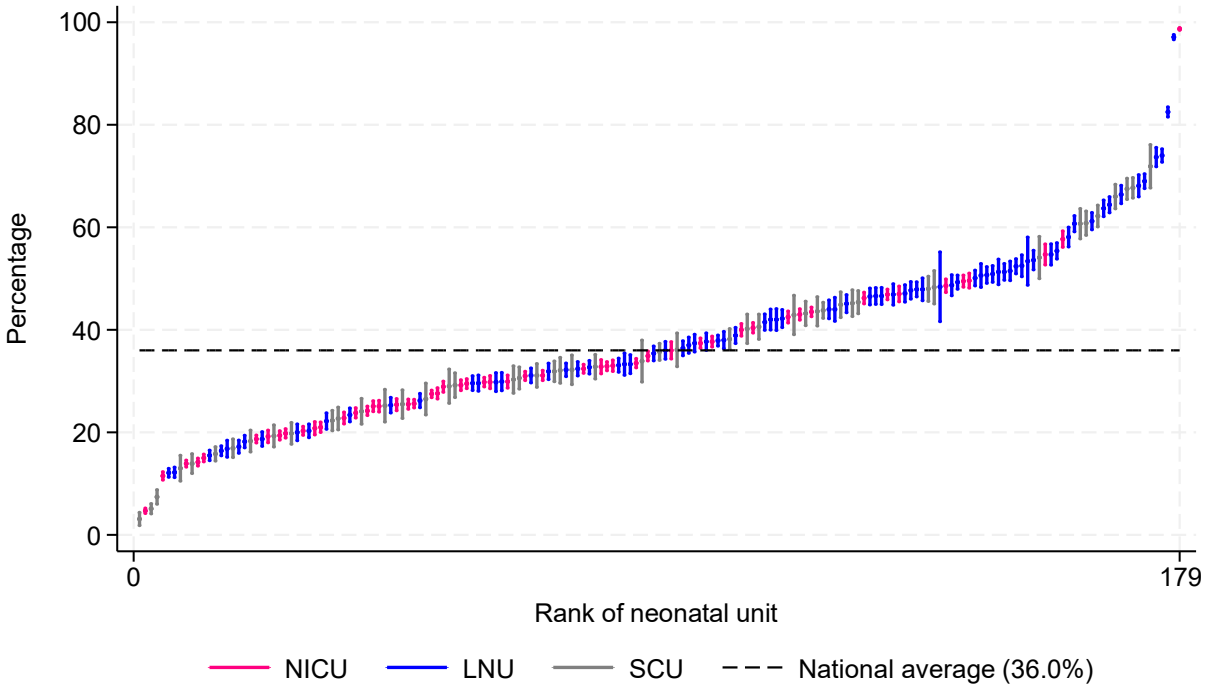


Figure 55: Proportions of baby care days that had a consultant-led ward round with at least one parent included, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online. Confidence intervals in the figure are smaller than other caterpillar plots because the unit of analysis is baby days rather than babies or episodes.



Summary of findings

- The audit has been measuring parental inclusion on daily consultant ward rounds since 2017, and it is now widely accepted that parents should be included in these key decision-making discussions. Initially reporting on whether a parent was involved in the ward round at least once during their baby's stay, the NNAP now looks at whether this happened on each day of a baby's stay.
- Overall, a parent is involved in the ward round for 36% of baby care days (277,943 of 772,337), a reduction from 38.7% in 2023. There has been a rapid reduction in missing data for this measure between 2023 and 2024. The reduction is missing data is almost certainly explained by a change implemented in the BadgerNet clinical system. This change means that if a user confirms that a daily record is complete, then if the "parent included on the consultant ward round today" field is blank, it is auto-completed to indicate that they were not included. This almost certainly will have contributed to the reduction in missing data to almost zero. This reduction in missing data will have contributed to the apparent reduction in adherence seen in this measure. It is not possible to interpret results for this measure prior to 2023 – daily ward round attendance was not the focus of NNAP measurement and therefore the field would not have been routinely completed daily, and results are undermined by the high proportion of missing data.

- There is wide apparent variation in how well this is achieved geographically, from 25.2% to 58.2% between neonatal networks *(*Figure 54*)*.
- There is a high level of variation between neonatal units, between 3.1% to 97.1%, which may be implausibly high (*Figure 55)*. Feedback from audit participants indicates that there are variable interpretations of this measure, with some units responding yes if a parent was not included in the ward round, but had discussions with a consultant that day, or if the ward round was run by a register or ANNP without a consultant present.
- Changes to the way these data are recorded in clinical systems make it difficult to compare data over time, and to effectively interpret the impact of missing data, and therefore the NNAP recommends caution when comparing and interpreting results. Feedback to the audit from some users has indicated that parent partnership could be measured in ways which take better into account other opportunities for parents' inclusion.
- The NNAP is committed to exploring what parent partnership in care means to parents and families, and how this could be better measured in the future. As such, on behalf of the NNAP, the RCPCH Children and Young People's Engagement Team launched a parent partnership project in September 2025. The purpose of this project is to provide insights from families on what "gold standard" parent partnership in care looks like, to identify areas for exploration for a partnership in care measure using routinely collected data, and to increase understanding and awareness of the NNAP amongst families.

6. Breastmilk feeding

6.1. Breastmilk feeding in the first 2 days

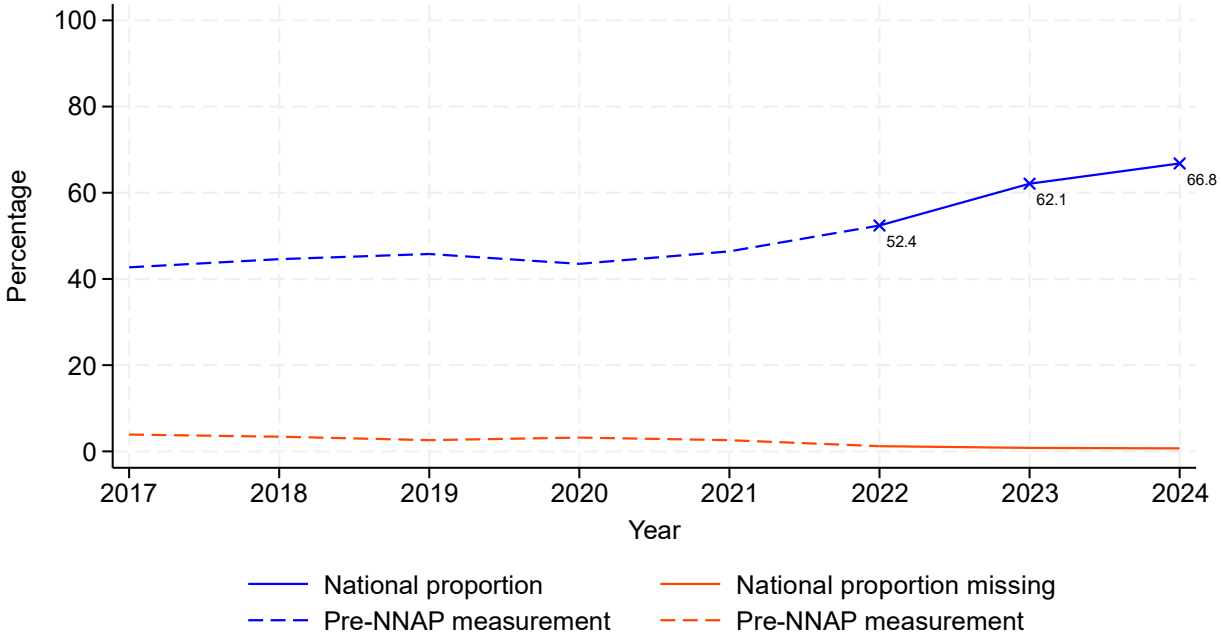
Does a baby born at less than 34 weeks gestational age receive any of their own mother's milk in the first two days of life?

The NNAP is delivering measurement of breastmilk in the first two days of life because currently data describing breastmilk use within 24 hours of birth are insufficiently complete to usefully describe early breastmilk use. Expert opinion suggests that very early breastmilk use is both clinically beneficial and also that high rates of usage in a unit are an indication that early postnatal support to the mothers of preterm babies in expressing breastmilk is successful.

As an important supplement to previously available measures of breastmilk feeding, the NNAP provides measures of exclusive breastmilk use in this report and on NNAP Online.

Results

Figure 56: Proportion of babies born at less than 34 weeks GA receiving any breastmilk (TOP), and exclusive breastmilk (BOTTOM) in the first 2 days, 2017-2024, using 2024 data, definitions and methodology.



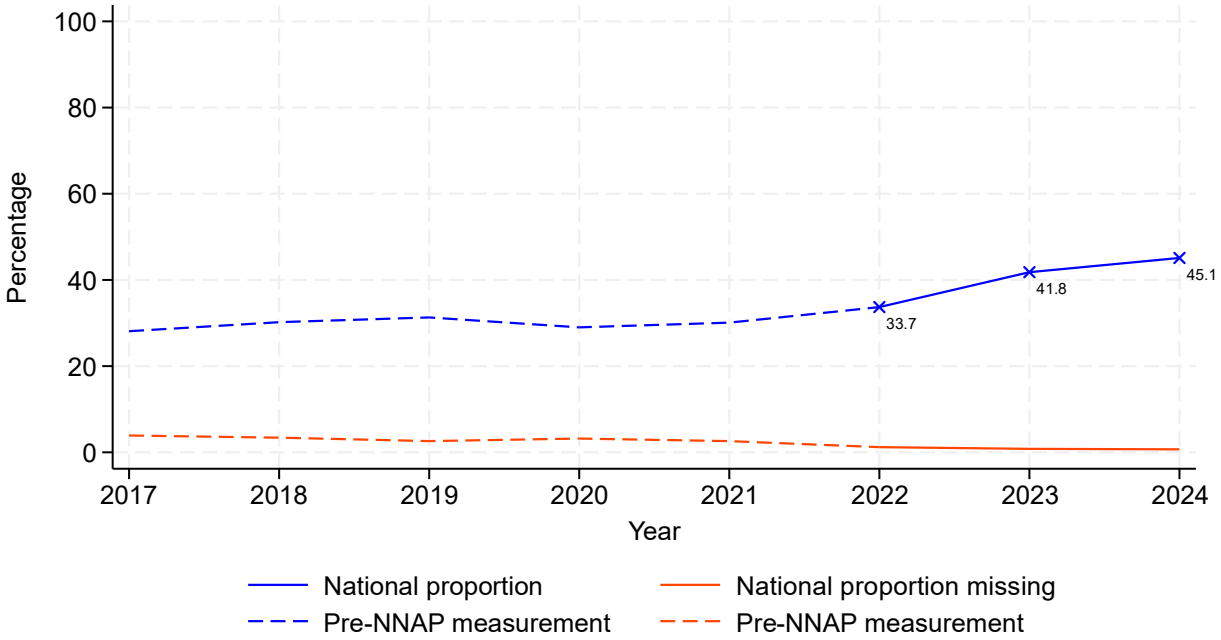


Figure 57: Proportions of any breastmilk feeding in the first two days of life, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

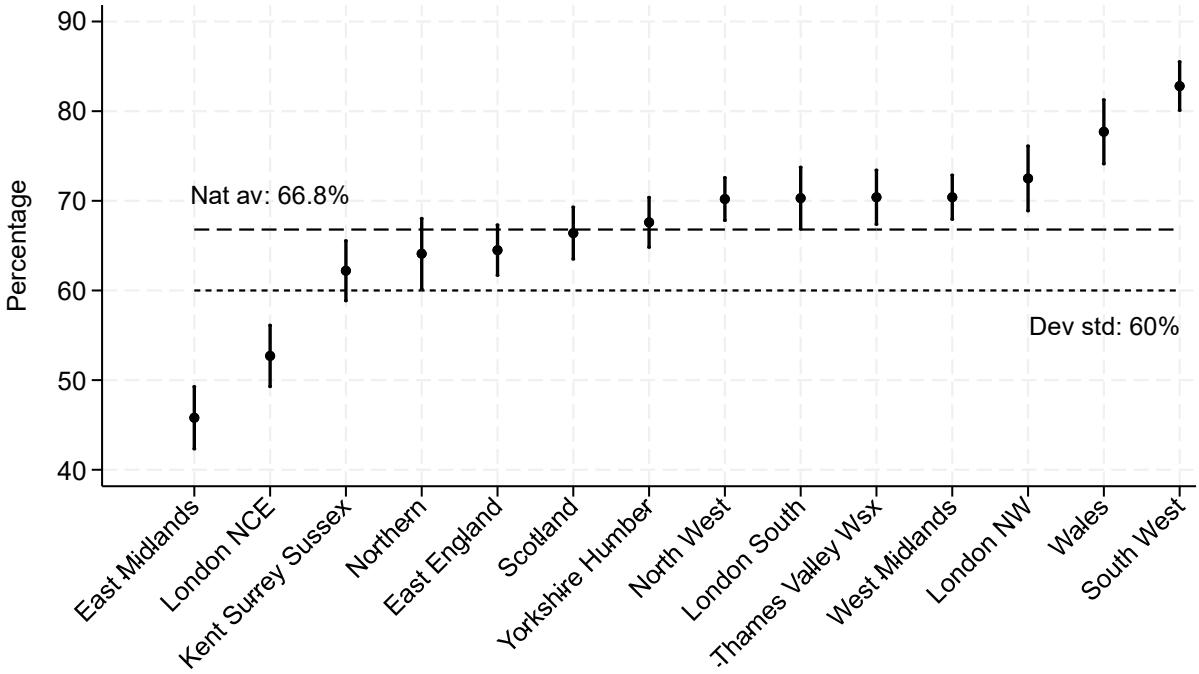


Figure 58: Proportions of exclusive breastmilk feeding in the first two days of life, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

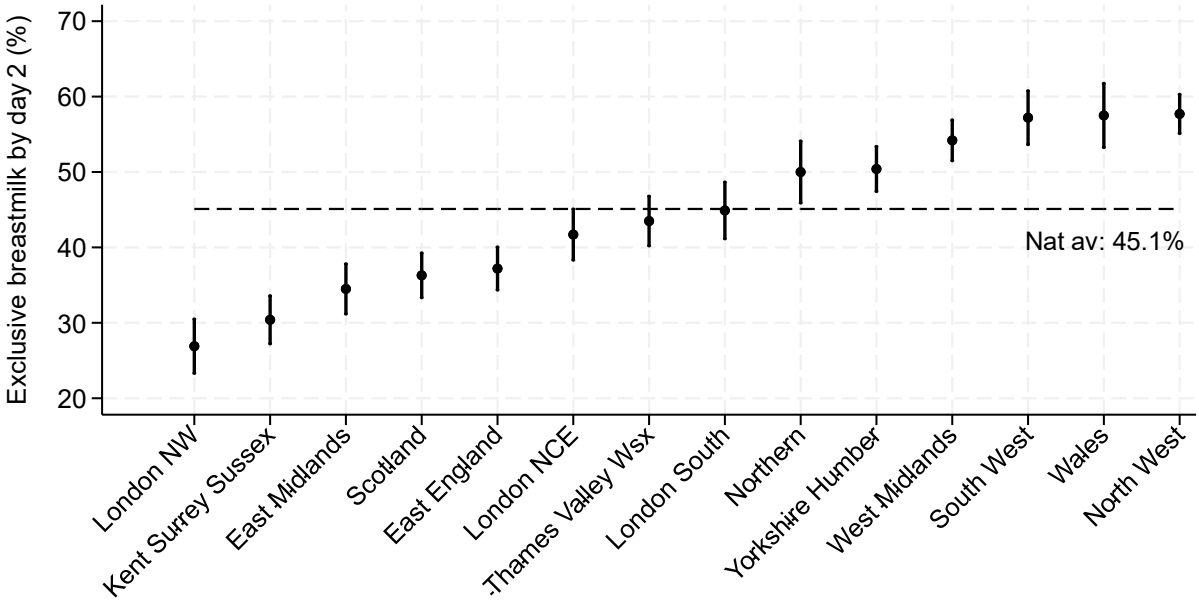


Figure 59: Proportions of any breastmilk feeding in the first two days of life, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

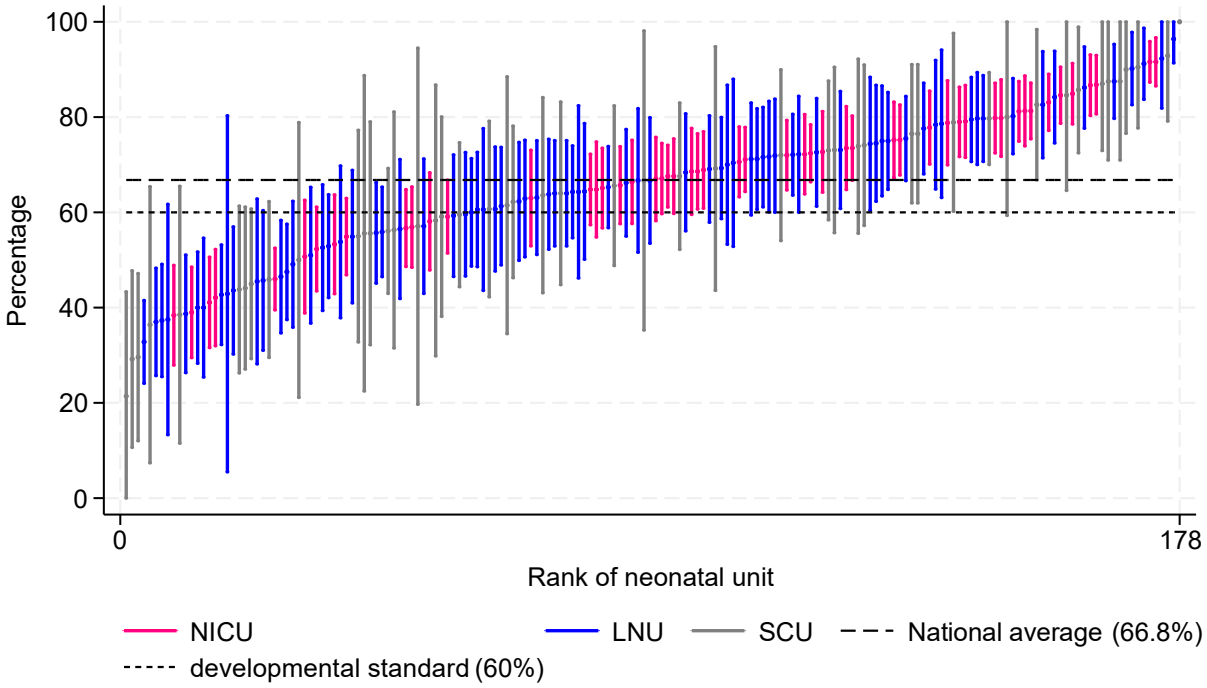


Figure 60: Proportions of exclusive breastmilk feeding in the first two days of life, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.

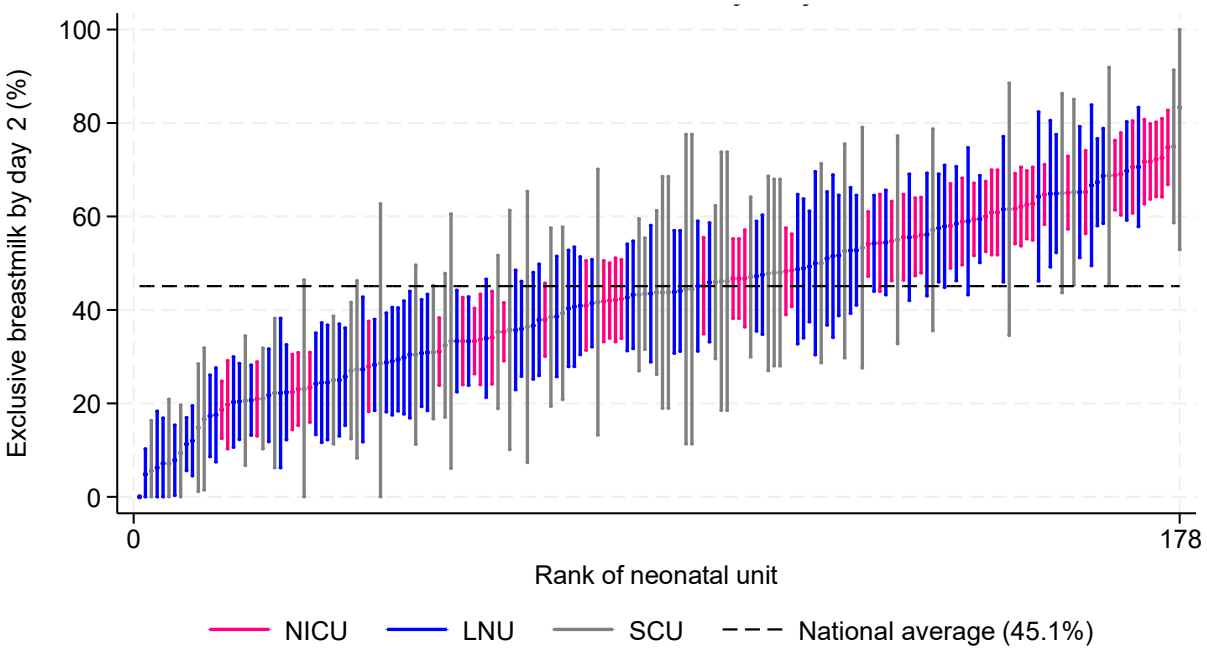


Figure 61: Front and back plot of any breastmilk feeding by day 2 of life, by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The x axis is the NNAP report year, and the y axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.

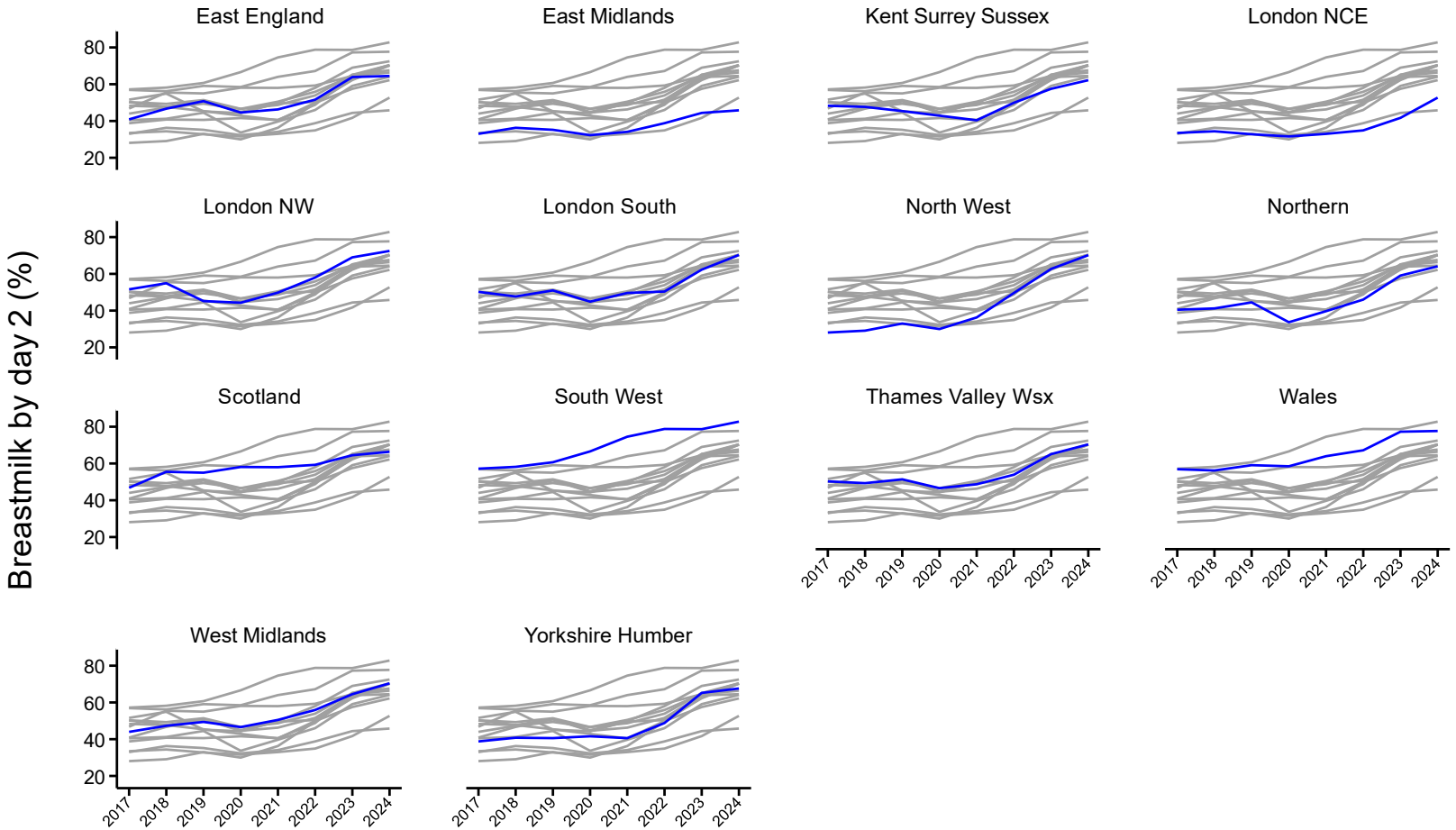


Table 12: Feeding by day 2 of life, by neonatal unit level.

Unit level	Count	With outcome	Mother's milk only (%)	Mixed feeding (%)	Any mother's milk	Nil by mouth (%)	Other (%)	Missing (%)
SCU	1,160	1,156	440 (38.1%)	308 (26.6%)	748 (64.7%)	174 (15.1%)	234 (20.3%)	4 (0.3%)
LNU	4,856	4,835	1,915 (39.6%)	1,185 (24.5%)	3,100 (64.1%)	710 (14.7%)	1,024 (21.2%)	22 (0.5%)
NICU	6,920	6,856	3,445 (50.2%)	1,293 (18.9%)	4,738 (69.1%)	1,026 (15%)	1,091 (15.9%)	65 (0.9%)
National†	12,936	12,847	5,800 (45.1%)	2,786 (21.7%)	8,586 (66.8%)	1,910 (14.9%)	2,349 (18.3%)	91 (0.7%)

†*'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.*

Summary of findings

- There is an encouraging increase in the proportion of babies receiving breastmilk in their first two days of life, from 52.4% in 2022, to 66.8% in 2024, with minimal missing data (0.7% in 2024). However, just 45.1% of babies receive exclusive breastmilk during this time (Figure 56).
- Opportunities exist for improvement; the poorest performing network achieves this for only 45.8% (East Midlands ODN) of eligible babies, and the best performing achieves it for 82.8% (South West ODN) (Figure 57). The front and back chart shows the neonatal network improvement trajectories over time and may inform network level prioritisation of quality improvement activity *(Figure 61)*.
- Similar variation is seen when considering exclusive breastmilk feeding only, ranging from 26.9% (London ODN – North West) to 57.7% (North West ODN) across neonatal networks (Figure 58).
- There is striking unit level variation in use of breastmilk in the first two days of life; from 38.4% to 91.6% across NICUs, and 21.4% to 100% across all levels of neonatal unit *(Figure 59)*. Neonatal units can also consider their rates of exclusive breastmilk feeding by day 2 of life *(Figure 60)*.

National recommendation:

4. Neonatal networks and local maternity and neonatal systems should ask their constituent units with below average rates of breastmilk feeding by day 2 to:
    a. investigate reasons for variation in uptake locally, and
    b. with families, co-design targeted, quality improvement programmes.

Actions for local quality improvement

- Neonatal units and neonatal networks with low rates of breastmilk feeding (within 2 days, at 14 days and at discharge), should identify opportunities to improve, and use existing quality improvement programmes and resources to support their improvement work, such as:
    - The UNICEF UK Baby Friendly Initiative
    - BAPM toolkits and resources:
        - Optimising Maternal Breast Milk for Preterm Infants: A two-part Quality Improvement Toolkit

        - Perinatal Optimisation Passports

    - Bliss resources:

        - Information for parents about feeding and related aspects of neonatal care
        - Emotional and practical support from Bliss
        - Bliss Baby Charter

    - West of England Academic Health Sciences Network, PERIPrem
    - PERIPrem Cymru

6.2. Breastmilk feeding at day 14

Does a baby born at less than 34 weeks gestational age receive any of their own mother's milk on day 14 of age?

For babies to benefit from both early and long term benefits of breastmilk, mothers of very preterm babies have to be successful in establishing expression, and to sustain this expression and intent to breastmilk feed over a long period. This measure is designed to assess the success of initiation of breastmilk expression, to support comparison between units, and quality improvement activities based on this.

Results

Figure 62: Proportion of babies born at less than 34 weeks receiving any breastmilk at day 14 (TOP) and exclusive breastmilk (BOTTOM), 2017-2024, using 2024 data, definitions and methodology.

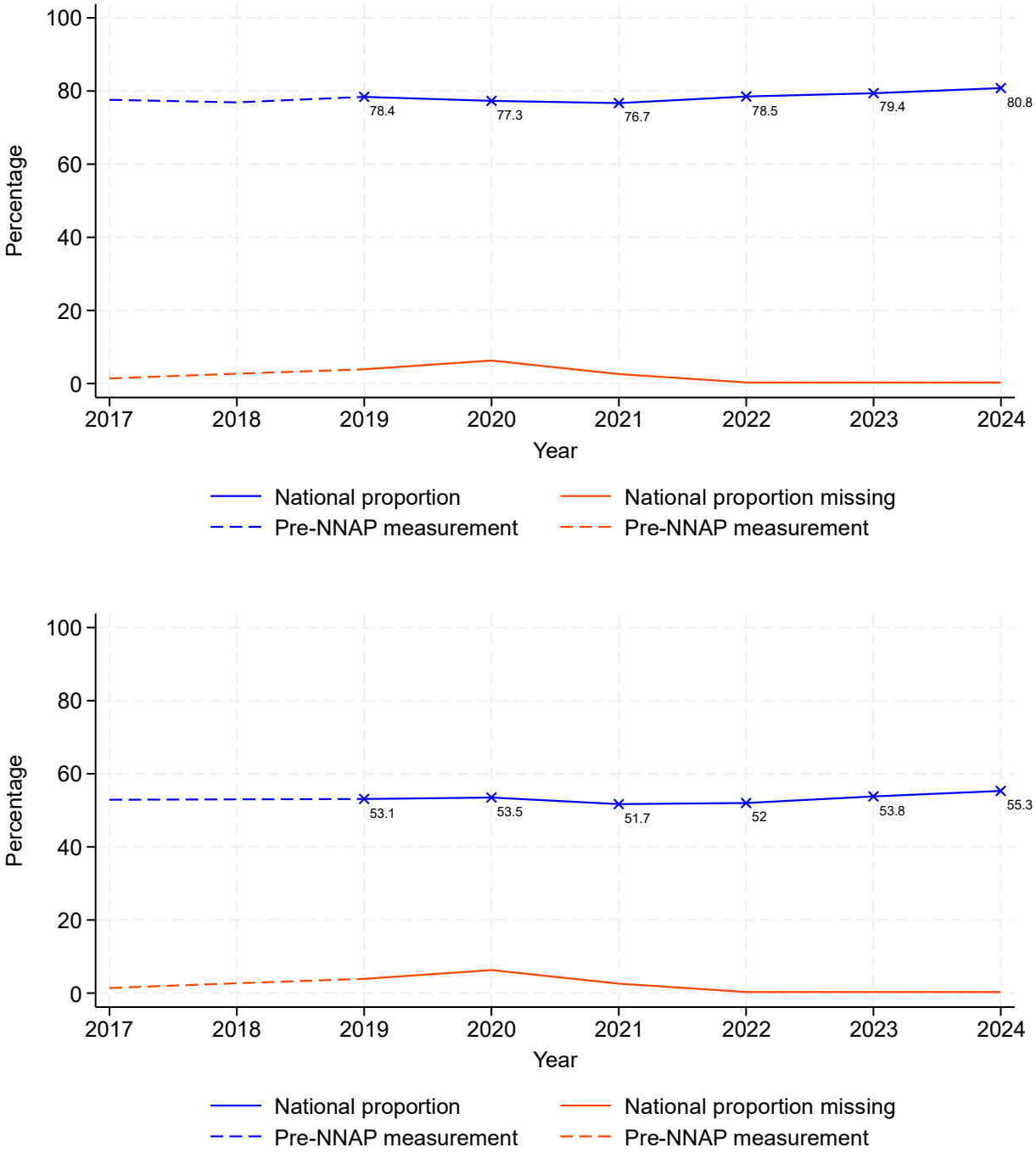


Figure 63: Proportions of any breastmilk feeding on day 14 of life, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

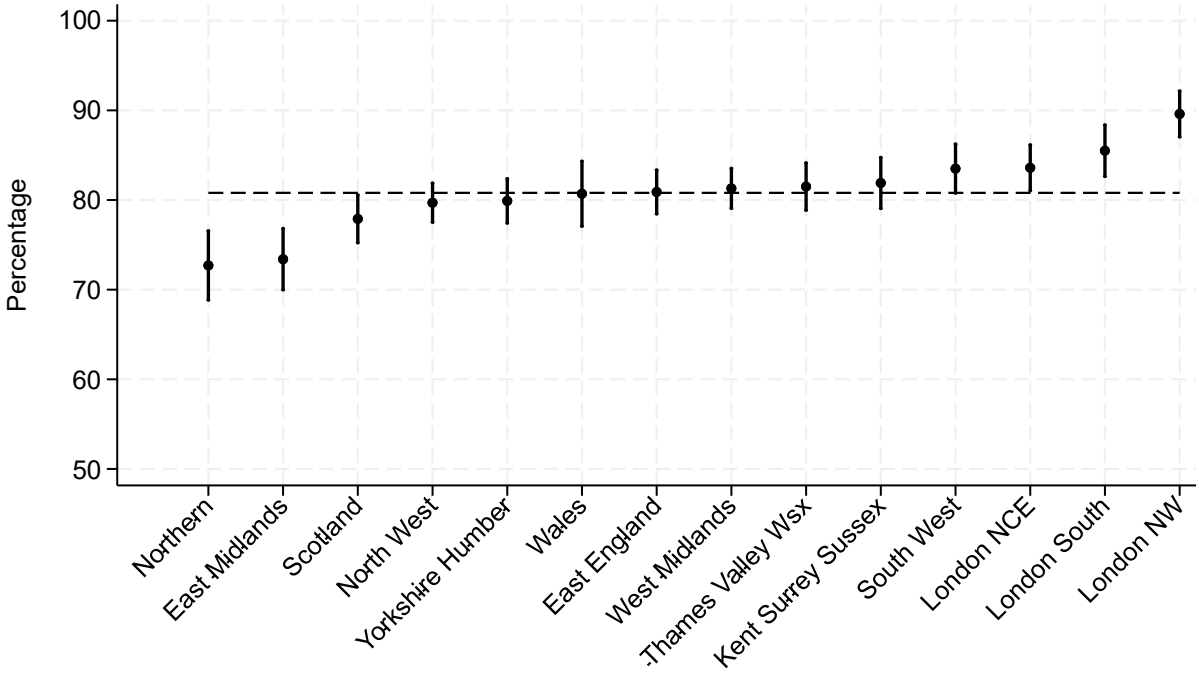


Figure 64: Proportions of exclusive breastmilk feeding on day 14 of life, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

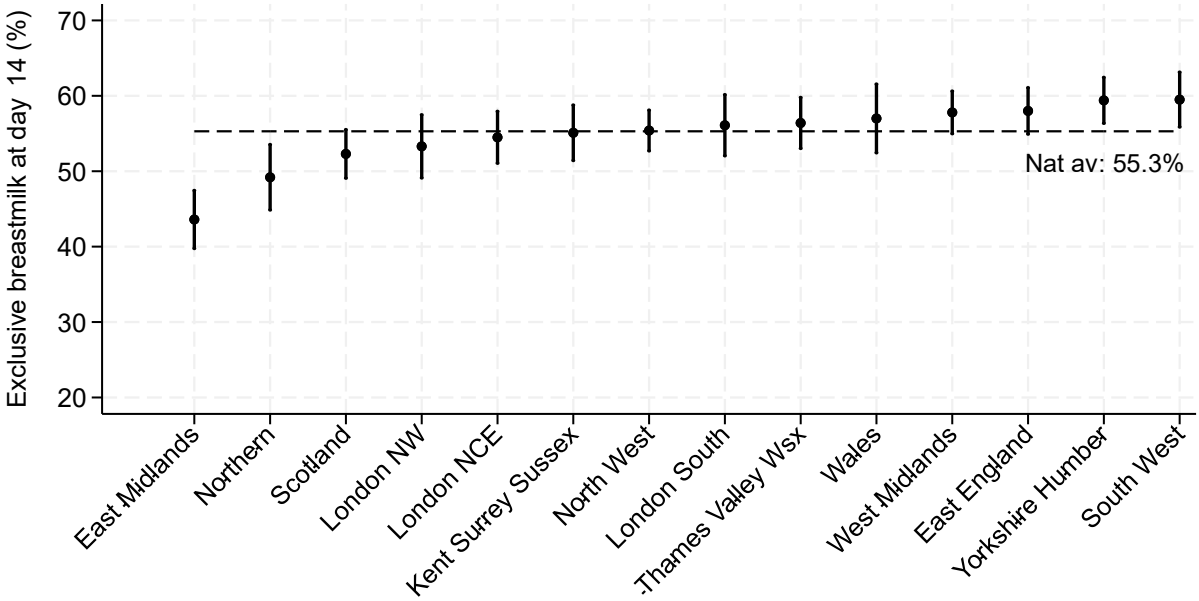


Figure 65: Proportions of any breastmilk feeding on day 14 of life, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

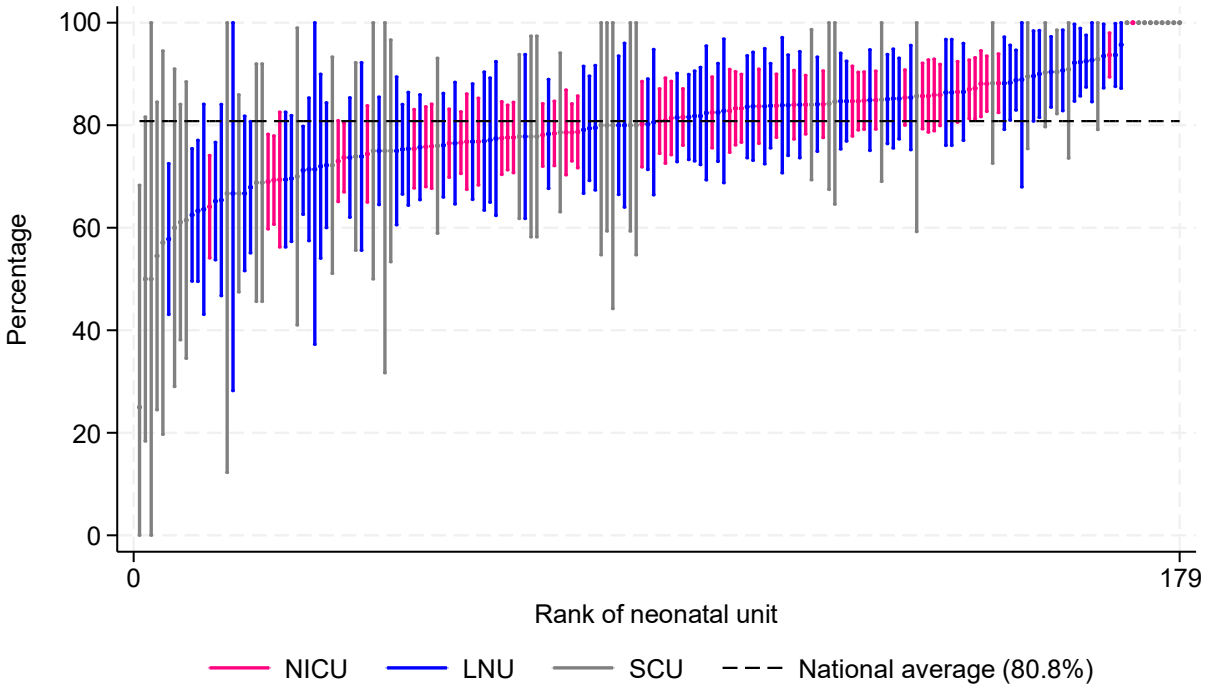


Figure 66: Proportions of exclusive breastmilk feeding on day 14 of life, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online.

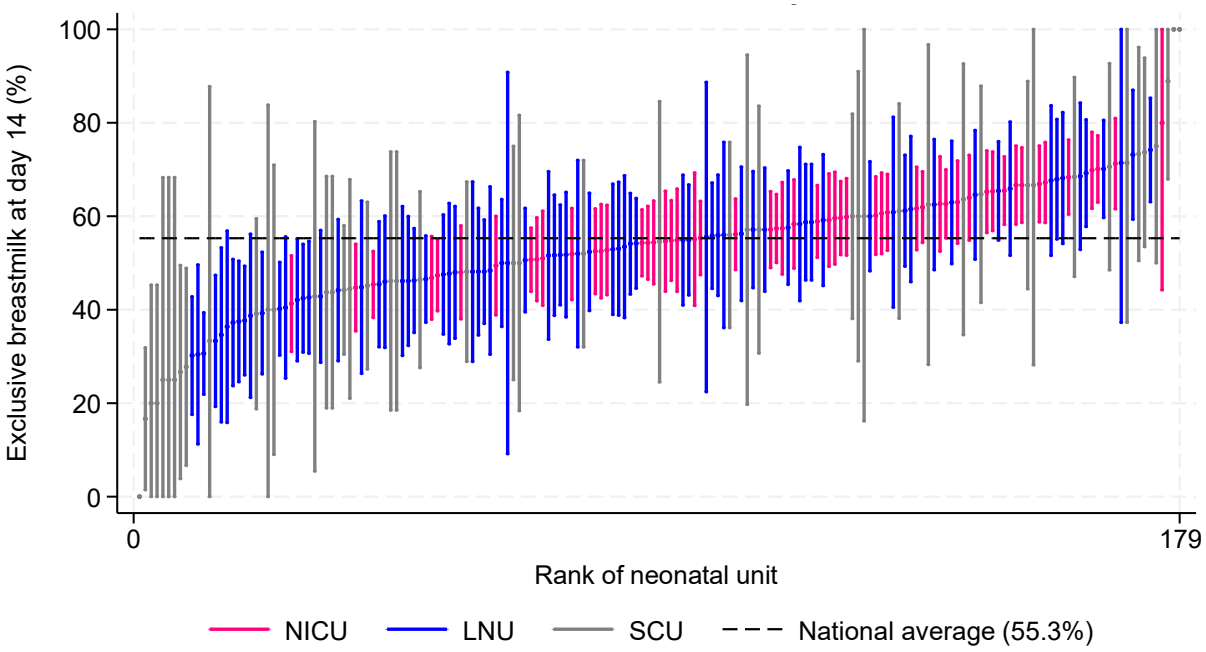


Figure 67: Front and back plot of any breastmilk feeding at day 14, by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.

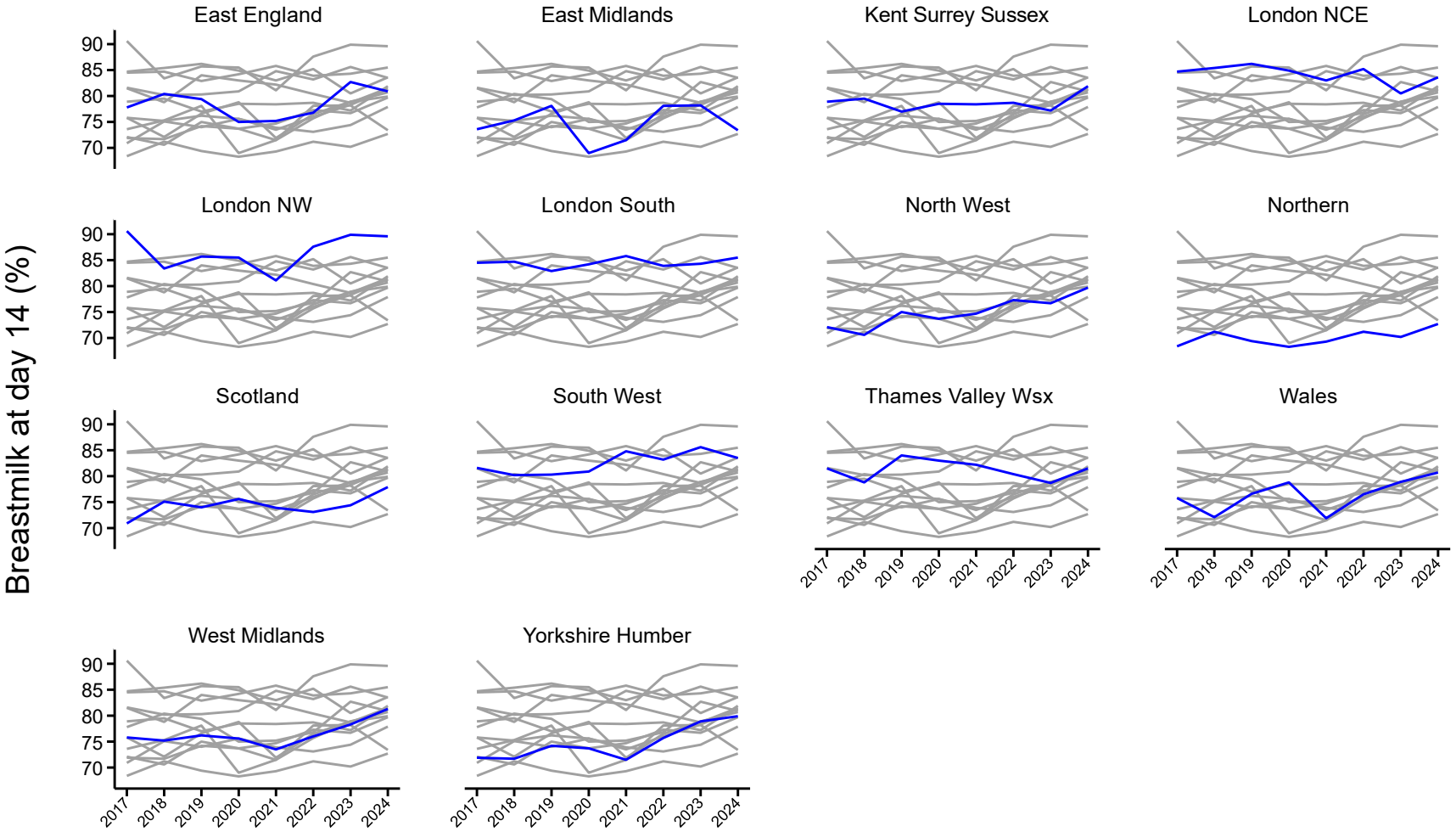


Table 13: Feeding at day 14 of life, by unit type

Unit level	Eligible babies	With outcome	Mother's milk only	Mixed feeding (%)	Any mother's milk (%)	Other (%)	Nil by mouth (%)	Missing (%)
SCU	679	677	342 (50.5%)	196 (29%)	538 (79.5%)	137 (20.2%)	2 (0.3%)	2 (0.3%)
LNU	4,178	4,167	2,158 (51.8%)	1,208 (29%)	3,366 (80.8%)	757 (18.2%)	44 (1.1%)	11 (0.3%)
NICU	6,780	6,757	3,913 (57.9%)	1,554 (23%)	5,467 (80.9%)	991 (14.7%)	299 (4.4%)	23 (0.3%)
National†	11,637	11,601	6,413 (55.3%)	2,958 (25.5%)	9,371 (80.8%)	1,885 (16.2%)	345 (3%)	36 (0.3%)

†*'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.*

6.3. Breastmilk feeding at discharge home

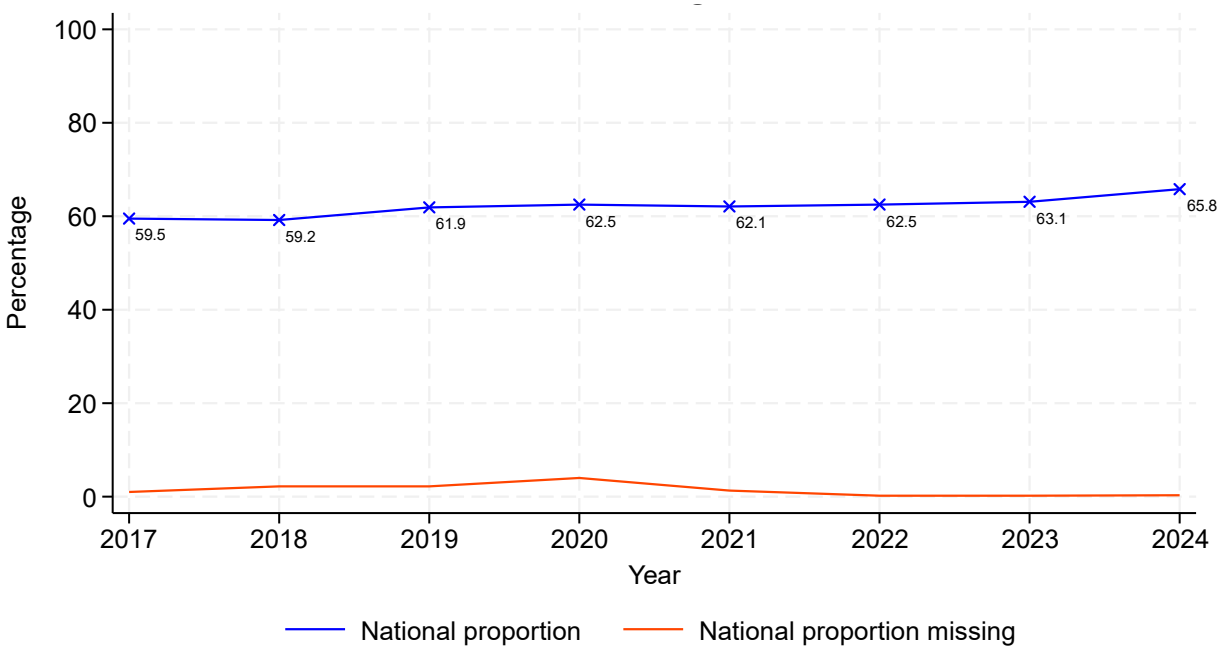
Does a baby born at less than 34 weeks gestational age receive any of their own mother's milk at discharge to home from a neonatal unit?

For babies to benefit from both early risk modification (e.g. reduction in NEC) and long-term benefits of breastmilk, mothers of very preterm babies have to be successful in establishing expression, and to sustain this expression and intent to breastmilk feed over a long period. This measure of the prevalence of any breastmilk feeding at discharge home assesses establishment of expression and its continuation to such a point where a baby can be discharged breastmilk feeding.

From 2022, reporting of breastmilk feeding at discharge home, the upper gestational age limit was increased to include babies born at 32 and 33 weeks gestational age. This change was made to increase the relevance and utility of this measure for units caring for fewer babies born at lower gestational ages, and to align with the MatNeoSIP measurement strategy in England.

Results

Figure 68: Proportion of babies born at less than 34 weeks receiving any breastmilk at discharge (TOP), and exclusive breastmilk (BOTTOM) 2017-2024, using 2024 data, definitions and methodology.



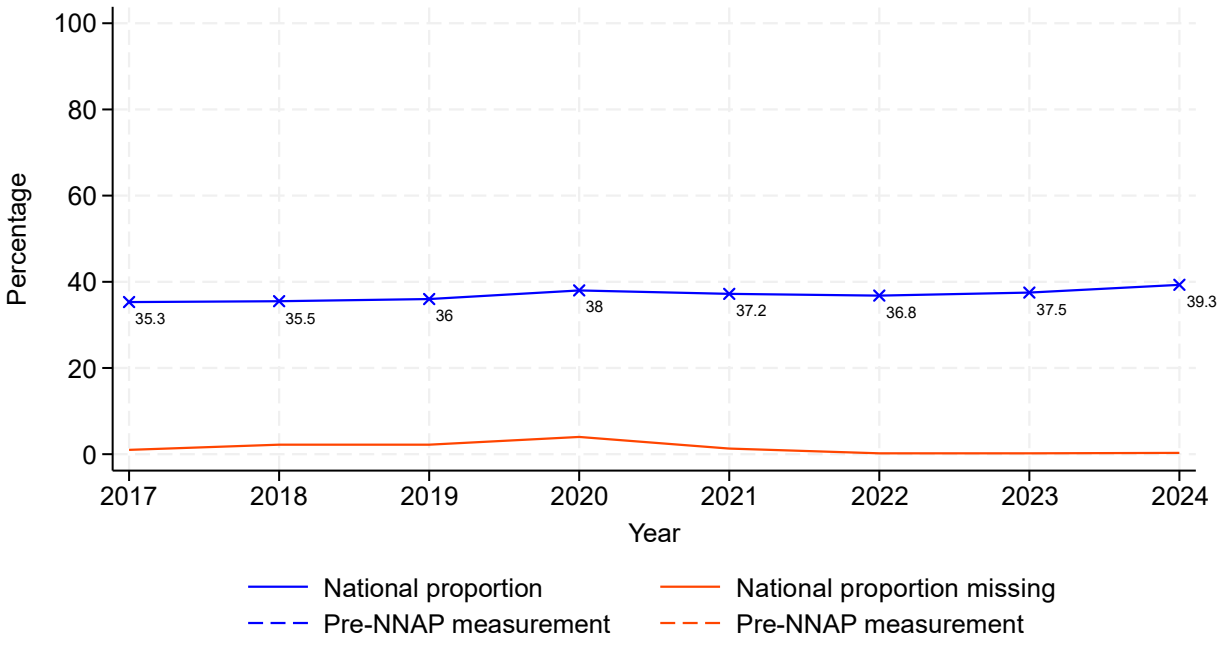


Figure 69: Proportions of any breastmilk feeding at discharge home, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

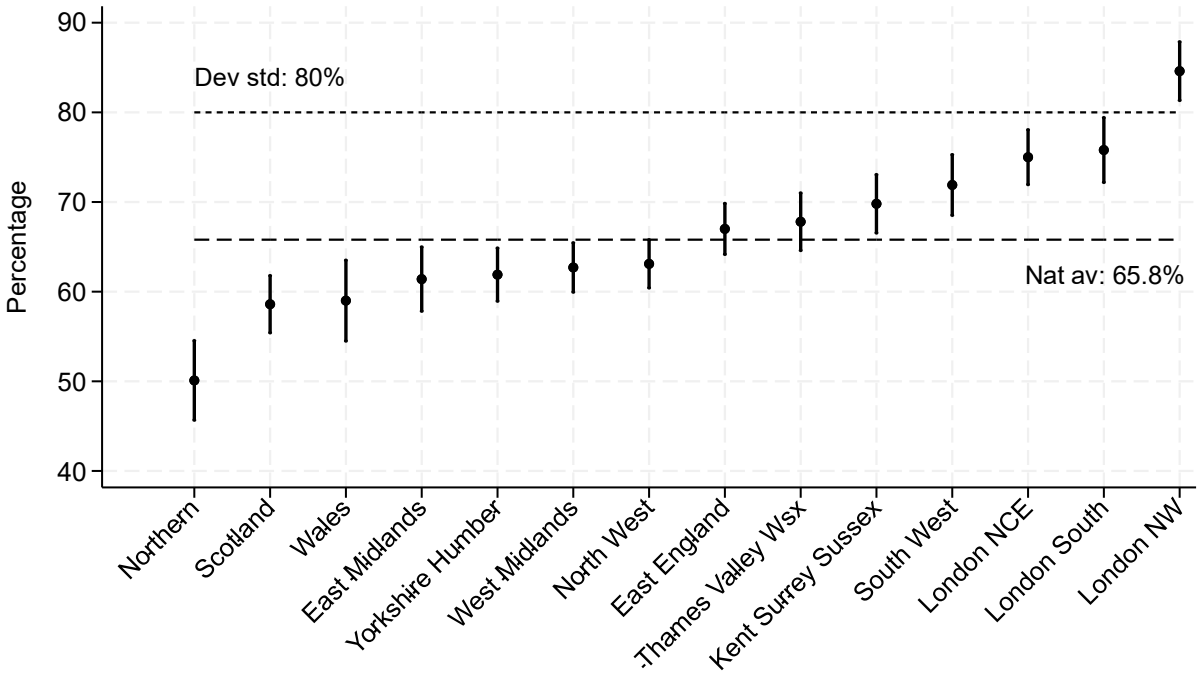


Figure 70: Proportions of exclusive maternal breastmilk feeding at discharge home, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

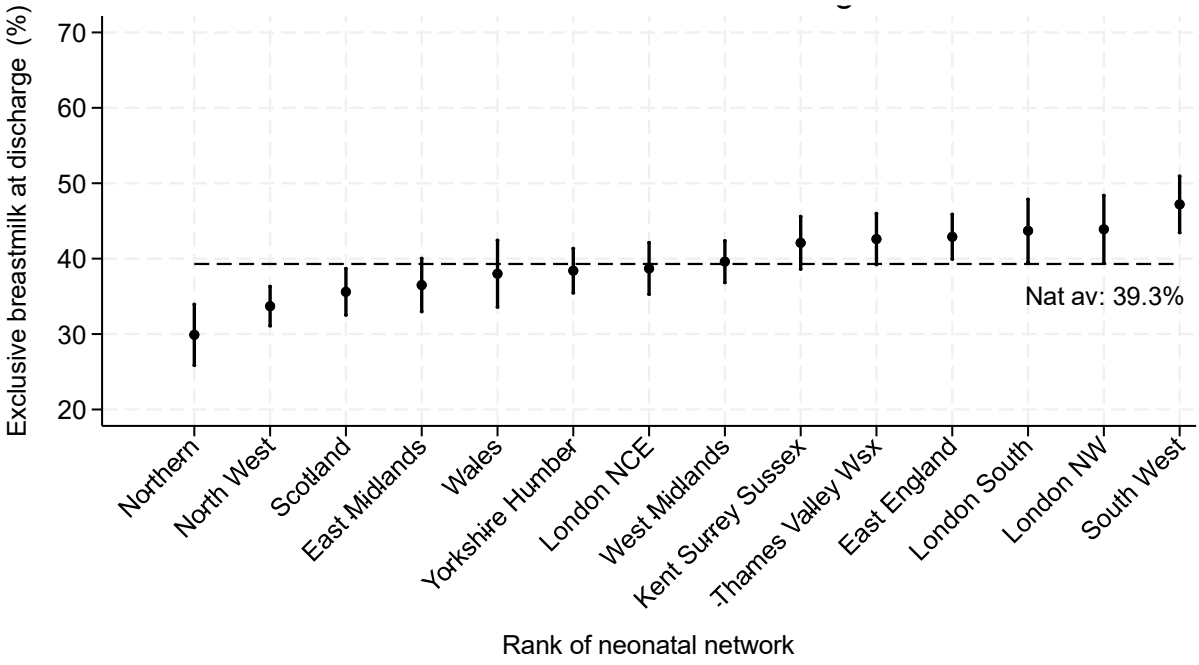


Figure 71: Proportions of any breastmilk feeding at discharge home, by neonatal unit.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

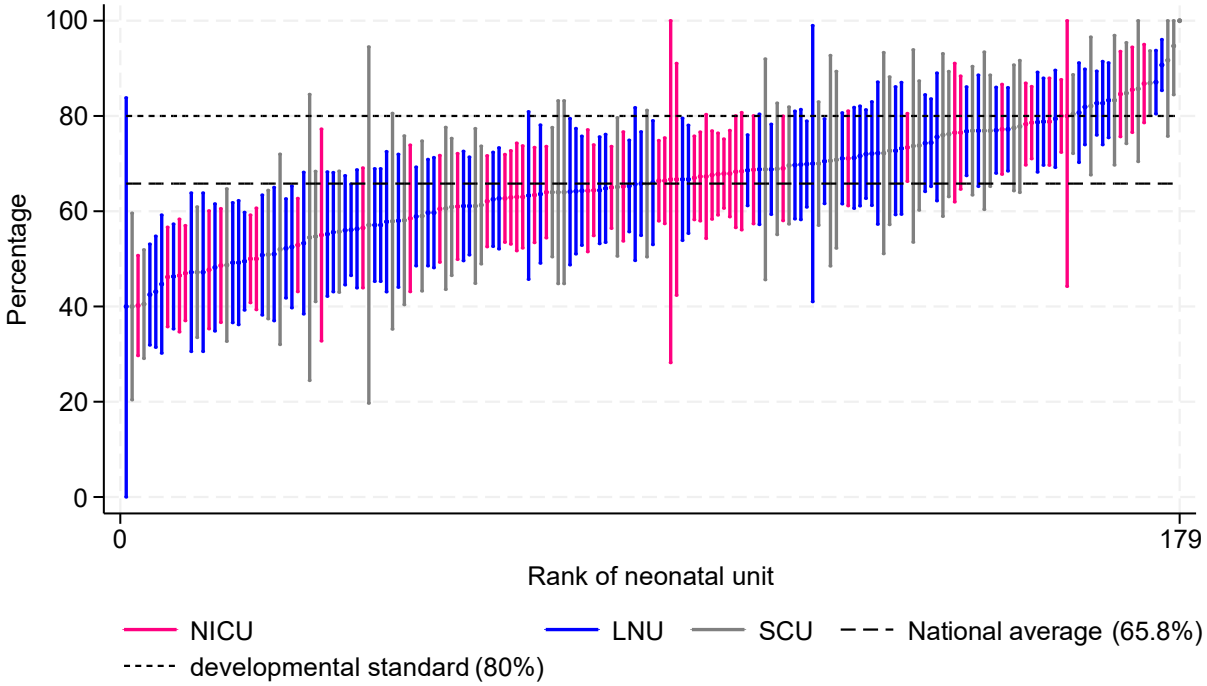


Figure 72: Proportions of exclusive maternal breastmilk feeding at discharge home, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

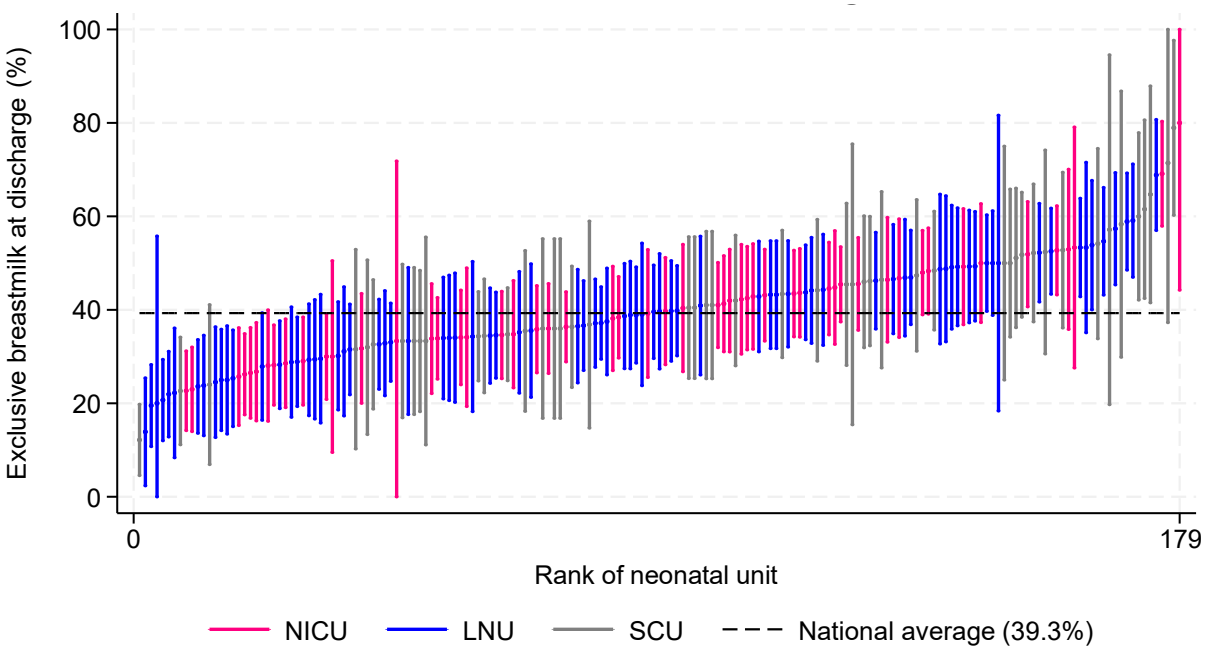


Figure 73: Front and back chart of any breastmilk feeding at discharge home, by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.

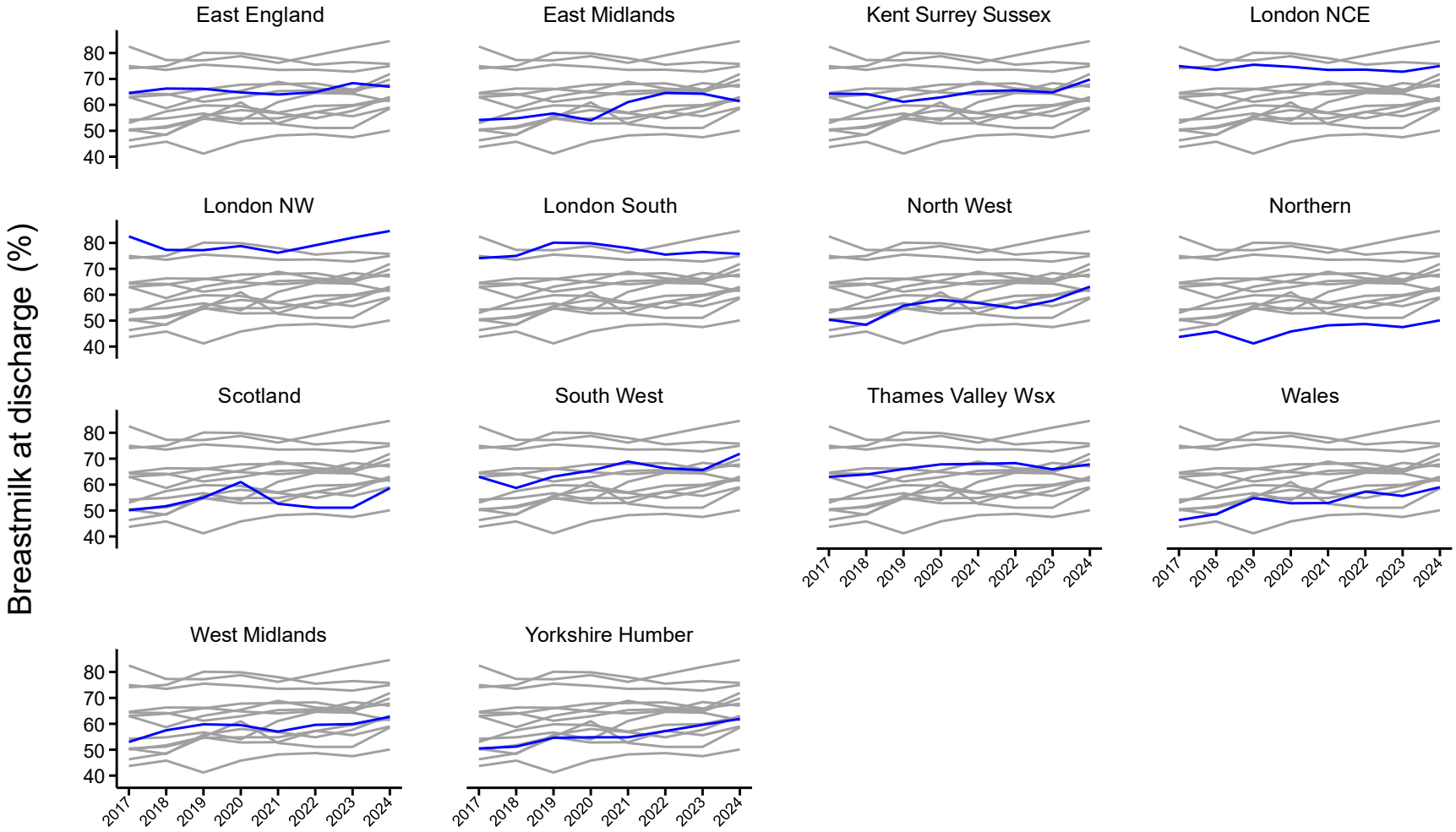


Table 14: Feeding at discharge home, by neonatal unit level.

Unit level	Eligible babies	With outcome	**Mother's milk only (%)**	Mixed feeding (%)	Other (%)	Missing (%)	**Any mother's milk (%)**
SCU	1,791	1,784	730 (40.9%)	473 (26.5%)	581 (32.6%)	7 (0.4%)	1203 (67.4%)
LNU	5,465	5,463	2,134 (39.1%)	1,464 (26.8%)	1,865 (34.1%)	2 (0%)	3,598 (65.9%)
NICU	4,371	4,349	1,693 (38.9%)	1,134 (26.1%)	1,522 (35%)	22 (0.5%)	2,827 (65%)
National†	11,627	11,596	4,557 (39.3%)	3,071 (26.5%)	3,968 (34.2%)	31 (0.3%)	7,628 (65.8%)

Summary of findings – breastmilk feeding at day 14 and at discharge home

- Overall, high rates of any breastmilk feeding are being achieved at 14 days, and this rate has been sustained over the last 5 years; 2019 – 78.4%; 2024 – 80.8% (9,371 of 11,601) (Figure 62).
- Breastmilk feeding rates decrease to 65.8% at discharge home, although this represents an improvement from 59.5% in 2017 (Figure 68). This improvement in the proportion of babies who fed any breastmilk at 14 days going on to be discharged on breastmilk suggests improvement in support for transition to suck feeding in the later weeks of babies' stay in neonatal care.
- Geographical variation exists between networks in the rates of feeding with any mother's milk at day 14, from 72.7% (Northern ODN) to 89.6% (London ODN – North West) (Figure 63). This variation widens further by discharge home, from 50.1% to 84.6% (Figure 69). Networks show very different improvement trajectories over the period 2019 to 2024 for the use of breastmilk.
- Evidence shows that the higher the proportion of breastmilk consumption during the neonatal stay, the better the odds of continued breastfeeding[31, 32,] pointing to real relevance in units' rates of exclusive breastmilk use at 14 days and at discharge. Proportions of exclusive breastmilk feeding at day 14 range from 43.6% (East Midlands ODN) to 59.5% (South West ODN) across networks (Figure 66). Proportions of exclusive breastmilk feeding at discharge range from 29.9% (Northern ODN) to 47.2% (Soth West ODN) (Figure 70).

Actions for local quality improvement

- Neonatal units and neonatal networks with low rates of breastmilk feeding (within 2 days, at 14 days and at discharge), should identify opportunities to improve, and use existing quality improvement programmes and resources to support their improvement work, such as:
    - The UNICEF UK Baby Friendly Initiative
    - BAPM toolkits and resources:

[31] Valentine, G. et al. (2021) Percent mother's own milk feedings for preterm neonates predicts discharge feeding outcomes. *Journal of Perinatology*, *41*(12), 2766–2773. https://doi.org/10.1038/s41372-021-01205-4
[32] Levene, I., et al. (2024). The relationship of early expressed milk quantity and later full breastmilk feeding after very preterm birth: A cohort study. Maternal & Child Nutrition. https://doi.org/10.1111/mcn.13719

        - Optimising Maternal Breast Milk for Preterm Infants: A two-part Quality Improvement Toolkit
        - Perinatal Optimisation Passports

    - Bliss resources:

        - Information for parents about feeding and related aspects of neonatal care
        - Emotional and practical support from Bliss
        - Bliss Baby Charter

    - West of England Academic Health Sciences Network, PERIPrem
    - PERIPrem Cymru

7. Medical follow up at two years old

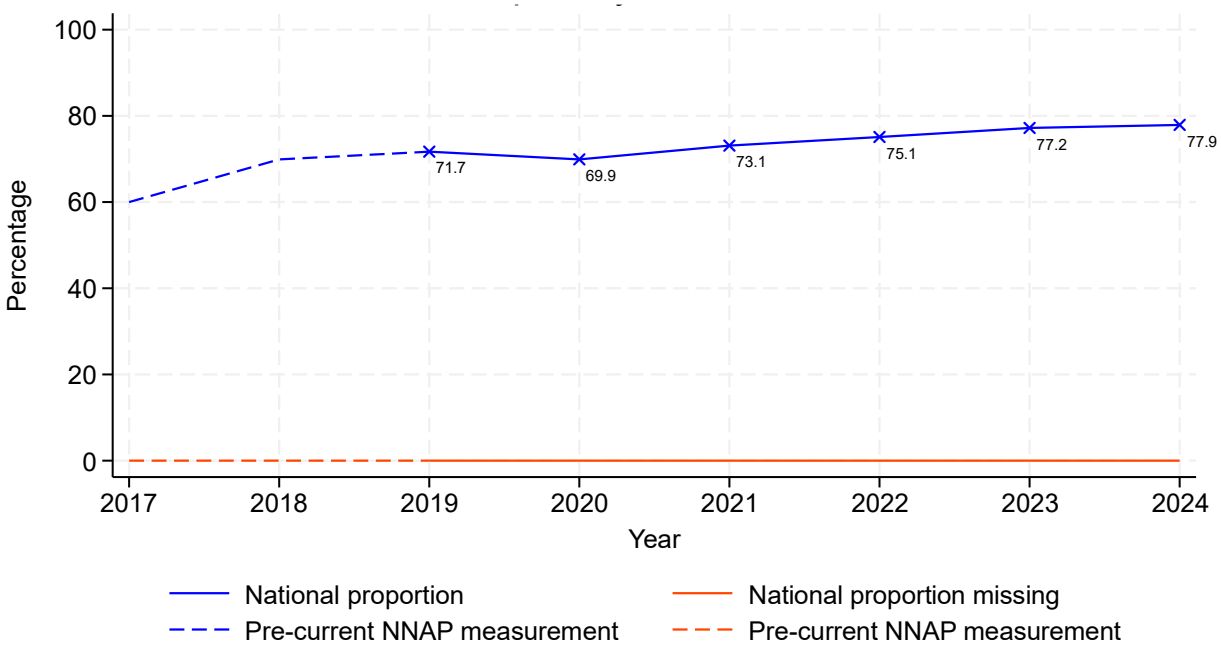
Does a baby born at less than 30 weeks gestational age receive medical follow-up at two years corrected age (18-30 months gestationally corrected age)?

The NICE guideline on the developmental follow-up of children and young people born preterm[33] recommends that all children born at less than 30 weeks gestational age should receive a developmental assessment at two years (corrected age), with follow up also required at high gestational ages where there are additional risk factors. A developmental assessment is also recommended at four years for babies born before 28 weeks gestation.

The NNAP measure currently focusses on whether a follow-up developmental assessment took place at two years of age. The long-term intention of the NNAP is to report the outcomes of this assessment, and the NICE guideline recommends the recording of the results of the assessment for audit purposes.

Results

Figure 74: Proportion of babies born at less than 30 weeks receiving medical follow-up at two years, 2017-2024, using 2024 data, definitions and methodology.



[33] NICE guideline [NG72]. Developmental follow-up of children and young people born preterm. 2017. Available at: https://www.nice.org.uk/guidance/ng72

Figure 75: Proportions of two-year follow-up assessment, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

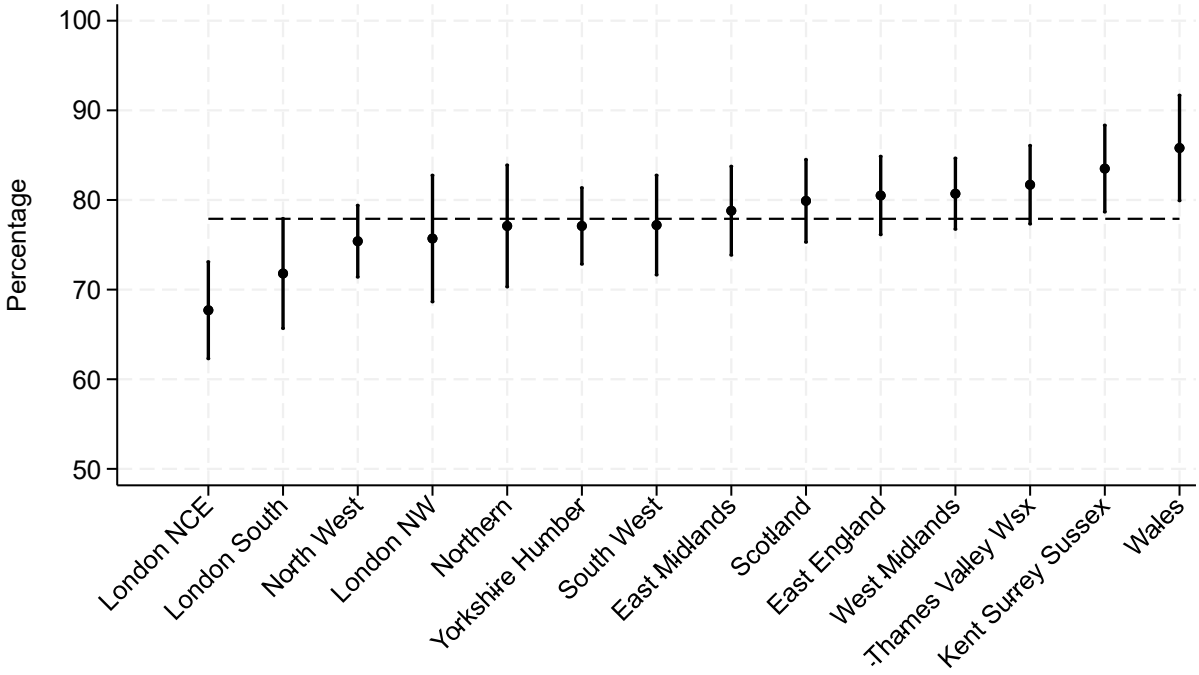


Figure 76: Proportions of two-year follow-up assessment: neonatal units (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

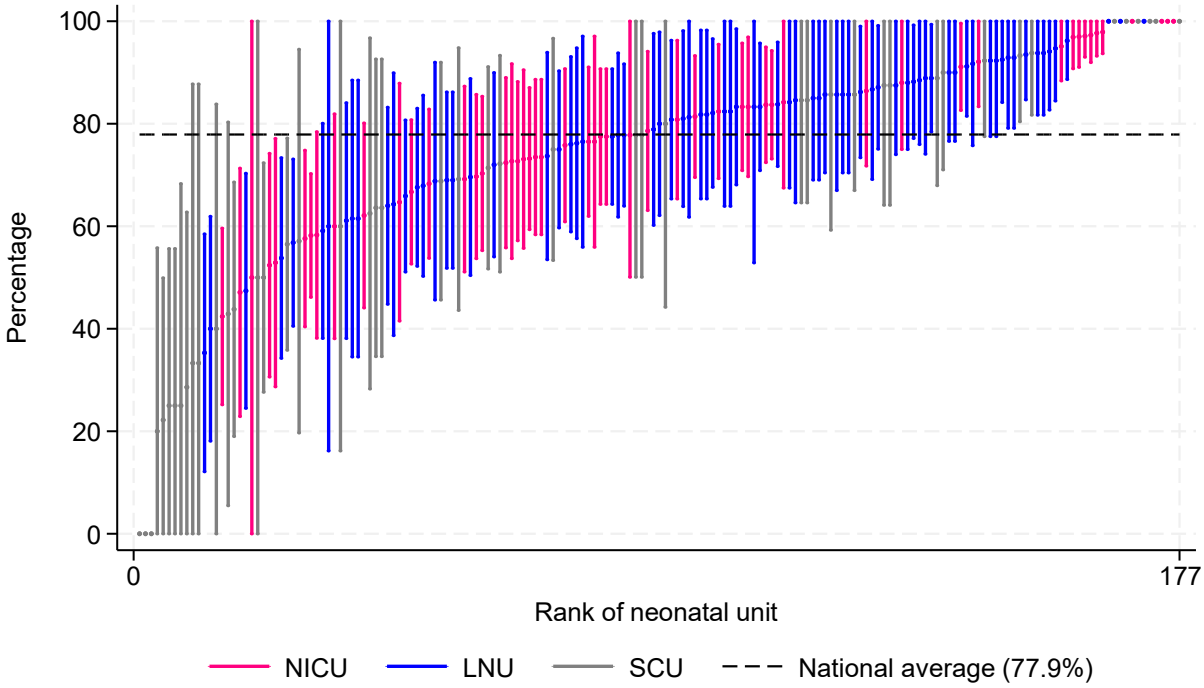


Figure 77: Front and back plot of proportions of two year follow up assessment by neonatal unit, 2019-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.

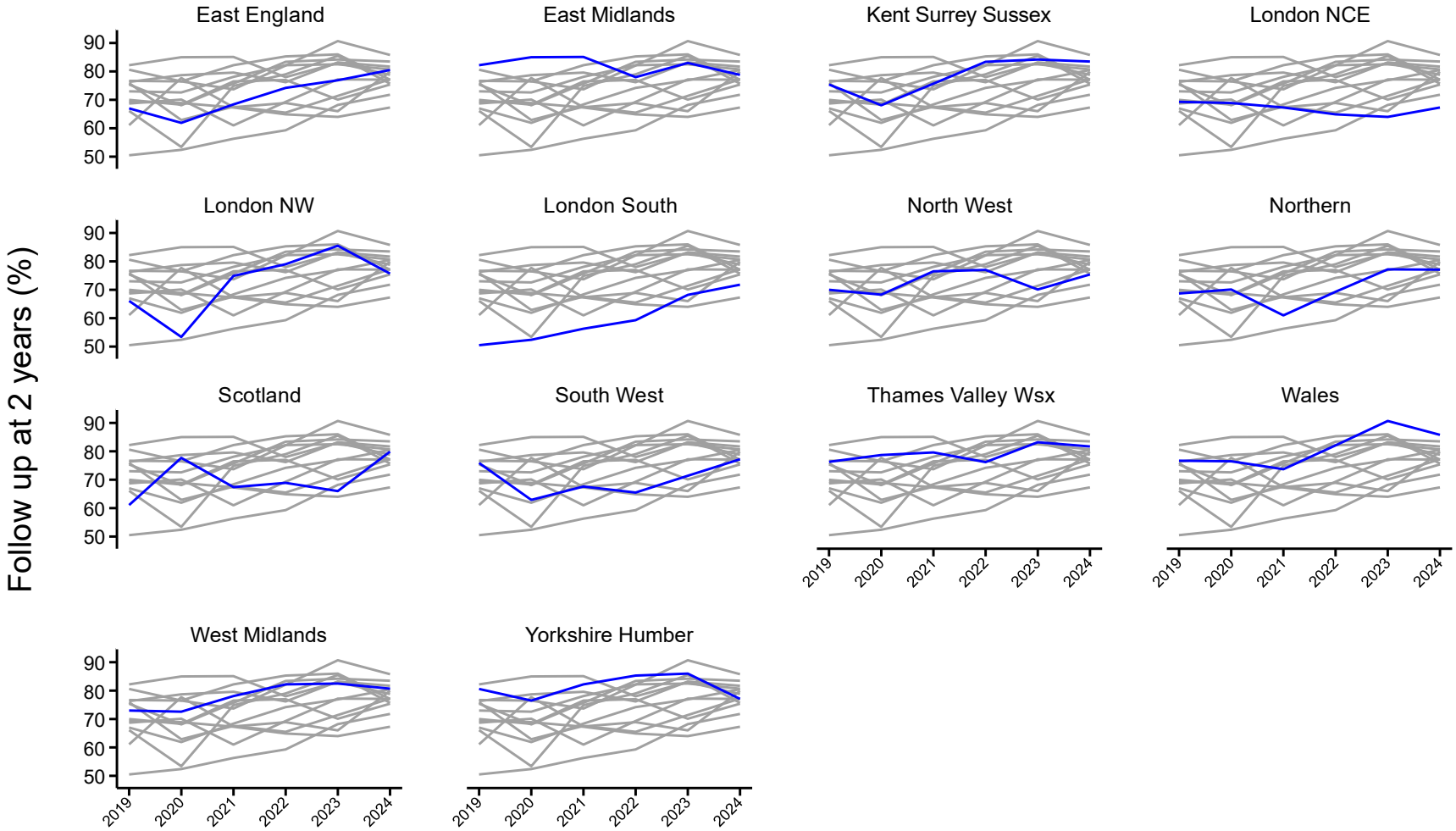


Table 15: Two-year follow up assessment, by neonatal unit level (2024).

Unit level	Eligible babies	Some two-year follow up health data entered (%)	Two-year follow up completed outside of range	No health data entered		
				Lost to follow-up	Not assessed for other reason	No data entered at all
SCU	460	312 (67.8%)	24	6	65	53
LNU	1,742	1,387 (79.6%)	64	10	173	109
NICU	1,688	1,331 (78.9%)	86	21	134	116
National†	3,890	3,030 (77.9%)	174	37	372	278

†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

Summary of findings

- The rate of improvement in the delivery of medical follow-up at two years of age has been slow, from 69.9% in 2018 to 77.9% (3,029 of 3,890) in 2024 (Figure 74).
- Across neonatal networks, regional variation remains, from 67.7% (London ODN – North Central and East) to 85.8% (Wales) (Figure 75). The front and back chart shows the neonatal network improvement trajectories over time (Figure 77).
- However, there is clear evidence of some regional and local good practice – 41 units are achieving the NNAP developmental standard that says that at least 90% of babies should have two-year follow up data entered (Figure 76).
- The NNAP will now consider and consult on reporting rates of survival without severe disability for centres following up over 90% of their babies, which may support improvements in follow-up delivery in other centres.

Actions for local quality improvement

- Neonatal units with low rates of medical follow-up at two years should:
    - seek to learn from high achieving units,
    - ensure that there is a dedicated, named person within the neonatal unit who takes responsibility for ensuring that two year follow up is coordinated, completed, and that data entry is completed, with all babies accounted for.
    - use British Association of Neonatal Neurodevelopmental Follow Up (BANNFU) resources, including BAPM and BANNFU joint webinars, to support local two year follow up completion.

Quality improvement case study

- Using Two-Year Outcome Data to Drive Service Improvement for Preterm Infants in Bradford. Dr Aishin Lok et al., Bradford Teaching Hospitals NHS Foundation Trust. Available at: www.rcpch.ac.uk/resources/NNAP-summary-report-2024-data

8. On-time screening for retinopathy of prematurity

Does a baby born at less than 31 weeks gestational age, or weighing less than 1501g at birth undergo the first ROP screening according to the guideline?[34]

Retinopathy of prematurity (ROP) is a complication of prematurity which is largely treatable. If left undetected and untreated, severe disease can result in visual impairment. Babies at risk of developing severe ROP should be screened according to the UK screening of retinopathy of prematurity guideline.[34]

Prior to 2022, the NNAP reported against the previous guideline, and described screening within an extended window of a week either side of the then target week as adherent.

The updated guideline was published by the RCPCH in March 2022, and the NNAP measure was updated in line with the guideline. The NNAP now reports whether the time of first examination recommendation is met:

- For infants born before 31+0 weeks' GA, the first ROP examination should be performed between 31+0 and 31+6 weeks' postmenstrual age (PMA), or at 4 completed weeks' postnatal age (PNA) (28 – 34 days), whichever is later.
- For infants born from 31+0 weeks' GA, the first ROP examination should be performed at 36 weeks' PMA or 4 completed weeks' PNA (28 – 34 days), whichever is sooner.

The guideline recommends that all eligible babies should receive screening according to the guideline; the NNAP has set a developmental standard of 80%.

[34] Royal College of Paediatrics and Child Health. 2022. UK Screening of Retinopathy of Prematurity Guideline. Available at: https://www.rcpch.ac.uk/resources/screening-retinopathy-prematurity-rop-clinical-guideline

Results

Figure 78: Proportion of babies receiving on time ROP screening, 2017-2024, using 2024 data, definitions and methodology.

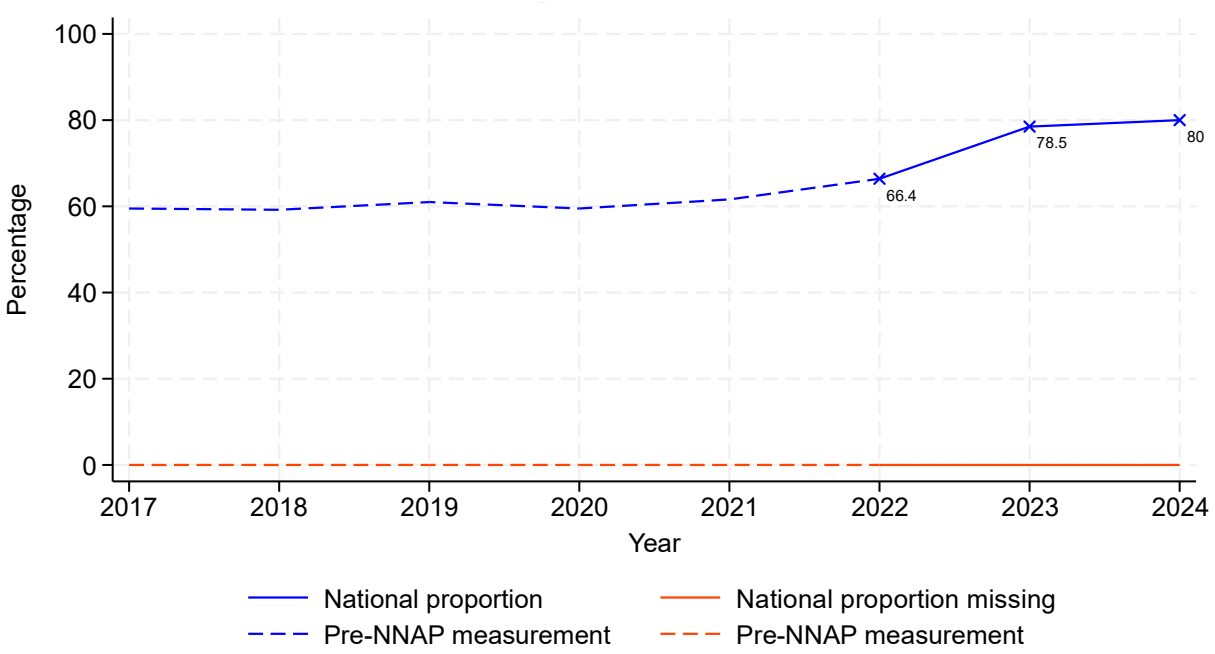


Figure 79: Proportions of on-time ROP screening, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online.

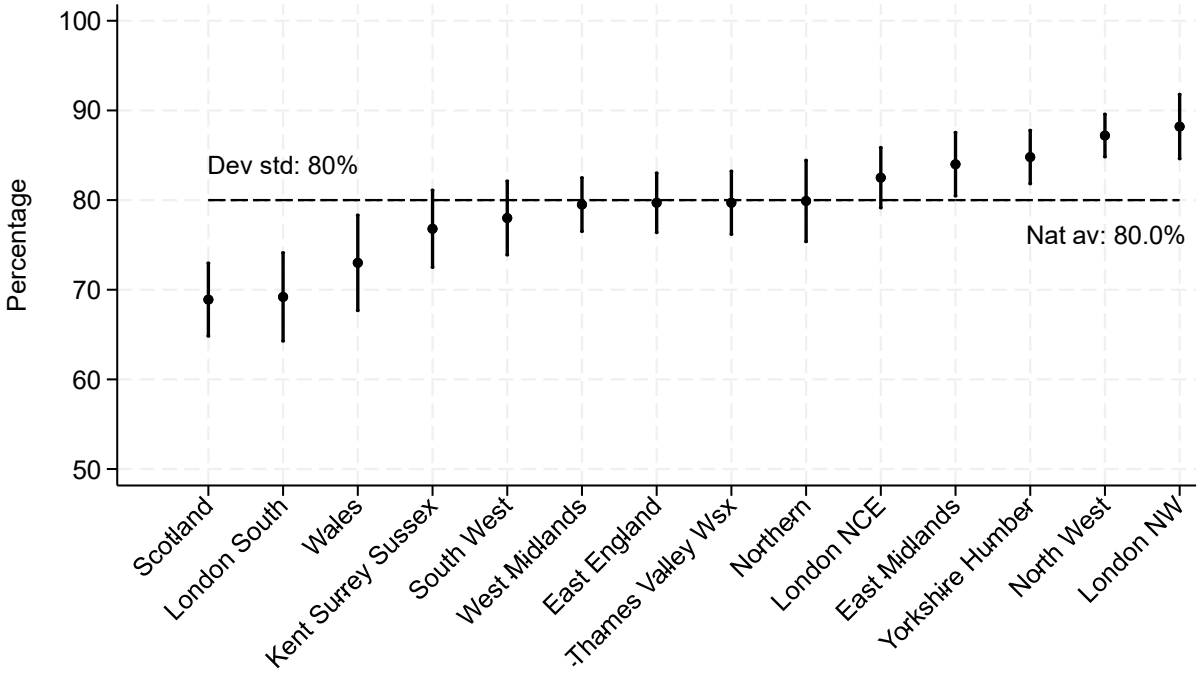


Figure 80: Proportions of on-time ROP screening: neonatal units (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online.

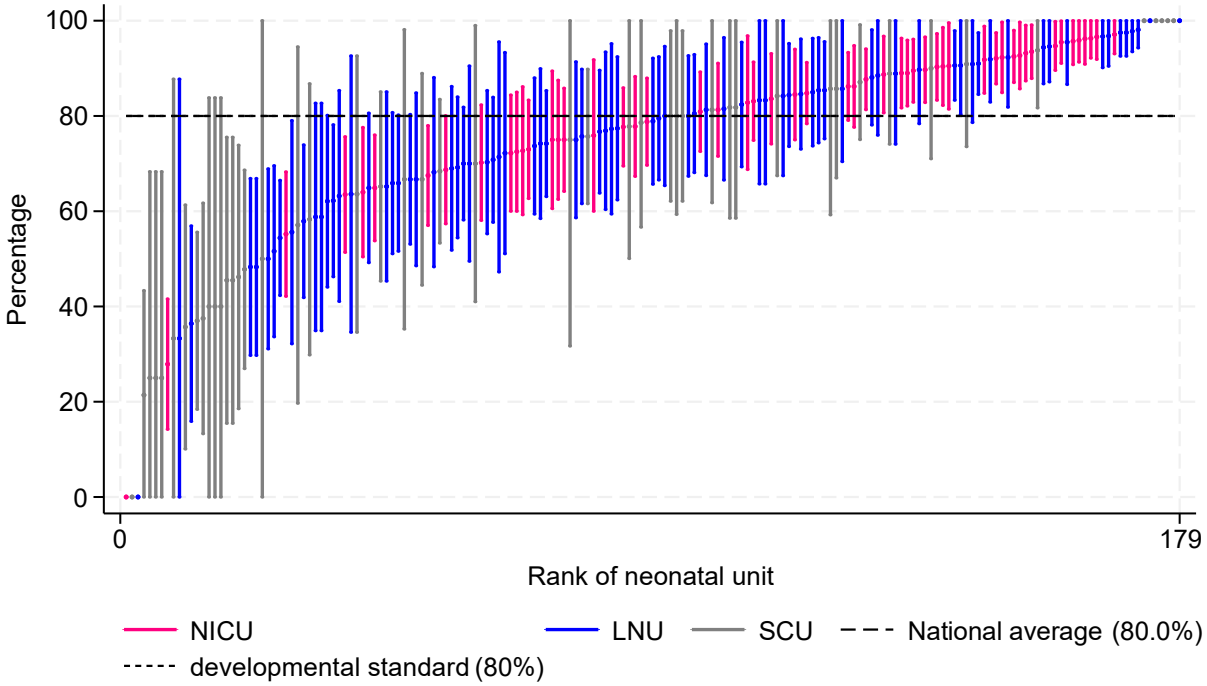


Table 16: Proportions of on time screening for ROP by unit level, 2024.

Unit level	Count	Any screen	Screened on time			Screened early	Screened late	No screen
			Total (%)	During care	After discharge			
SCU	613	601	420 (68.5%)	395	25	84	97	12
LNU	2,569	2,543	2,002 (77.9%)	1891	111	229	312	26
NICU	3,543	3,497	2,955 (83.4%)	2,856	99	263	279	46
National†	6,725	6,641	5,377 (80%)	5,142	235	576	688	84

†*'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.*

Summary of findings

- Since the publication of new ROP screening guidance in March 202235 there has been a clear increase in the proportion of eligible babies receiving on time screening in line with the new recommendations; from 66.4% in 2022 to 80% (5,377 of 6,725) in 2024 (Figure 78). This important screening needs to be delivered within a precise time window by highly specialised staff, and this challenge has been increasingly met by the neonatal community.
- Opportunities for further improvement exist at a regional and local level; there is nearly 20 percentage point difference between the best and poorest performing networks (London ODN – North West – 88.2%, Scotland – 68.9%) (Figure 79). The NNAP outlier management process will support neonatal units with outlying performance to develop action plans for improvement.
- At national level, approximately equal numbers of babies appear to be screened too early as too late. Interrogating local data as to the eventual timing of screening may assist teams to plan quality improvement planning.
- Delivery of ROP screening also differs by type of unit; NICUs screen 83.4% (2,955 of 3,543) of babies according to the guideline, compared to 77.9% (2,002 of 2,569) at LNUs and 68.5% (420 of 613) at SCUs (Table 16). This may reflect lower levels of ophthalmology provision outside NICUs, which in turn will require some units to reconsider care pathways.

Actions for local quality improvement

- Neonatal services with low adherence to recommended clinical practices such as non-invasive breathing support and ROP screening should:
    - use NNAP Online to identify comparable services with better adherence to identify opportunities for shared learning.
    - use quality improvement methodology and available resources to develop and deliver an action plan to improve adherence in their hospitals. For example,
        - Royal College of Paediatrics and Child Health. UK Screening of Retinopathy of Prematurity Guideline
        - RCPCH ROP Screening Calculator

[35] Royal College of Paediatrics and Child Health. 2022. UK Screening of Retinopathy of Prematurity Guideline. Available at: https://www.rcpch.ac.uk/resources/screening-retinopathy-prematurity-rop-clinical-guideline

9. Neonatal nurse staffing

What proportion of nursing shifts are numerically staffed according to guidelines and service specification? [36,37,38]

Recommended nurse staffing levels are defined in the Neonatal Critical Care Service Specification, Toolkit for High Quality Neonatal Services[37] and the BAPM Service Standards for Hospitals Providing Neonatal Care[38] according to the level of care being provided. The NNAP looks at the total nurses required per shift and reports the proportion of shifts with sufficient nurses to meet the requirements of the Service Specification and Standards.

Results

Figure 81: Proportion of nursing shifts staffed according to guidelines, 2017-2024, using 2024 data, definitions and methodology.

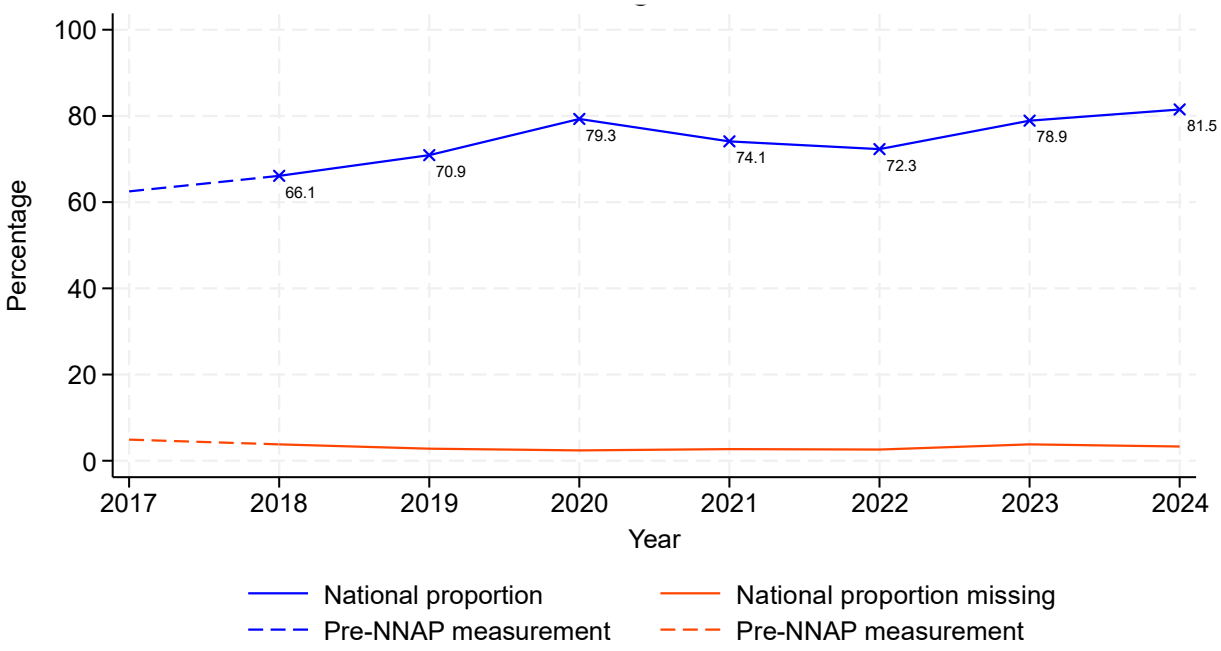


Figure 82: Proportion of nurse shifts sufficiently staffed, by neonatal unit (2024).

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Neonatal units can be identified on NNAP Online. Confidence intervals in the figure are smaller than other caterpillar plots because the unit of analysis is nursing shifts rather than babies or episodes.

[36] NHS England. *Neonatal Critical Care Service Specification*. 2016. Available from https://www.england.nhs.uk/commissioning/spec-services/npc-crg/group-e/e08/.

[37] Department of Health. *Toolkit for high quality neonatal services*. 2009. Available from https://webarchive.nationalarchives.gov.uk/ukgwa/20100604134939/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

[38] British Association of Perinatal Medicine. *Service Standards for Hospitals Providing Neonatal Care (3rd edition)*. 2010. Available at: https://www.bapm.org/resources/32-service-standards-for-hospitals-providing-neonatal-care-3rd-edition-2010

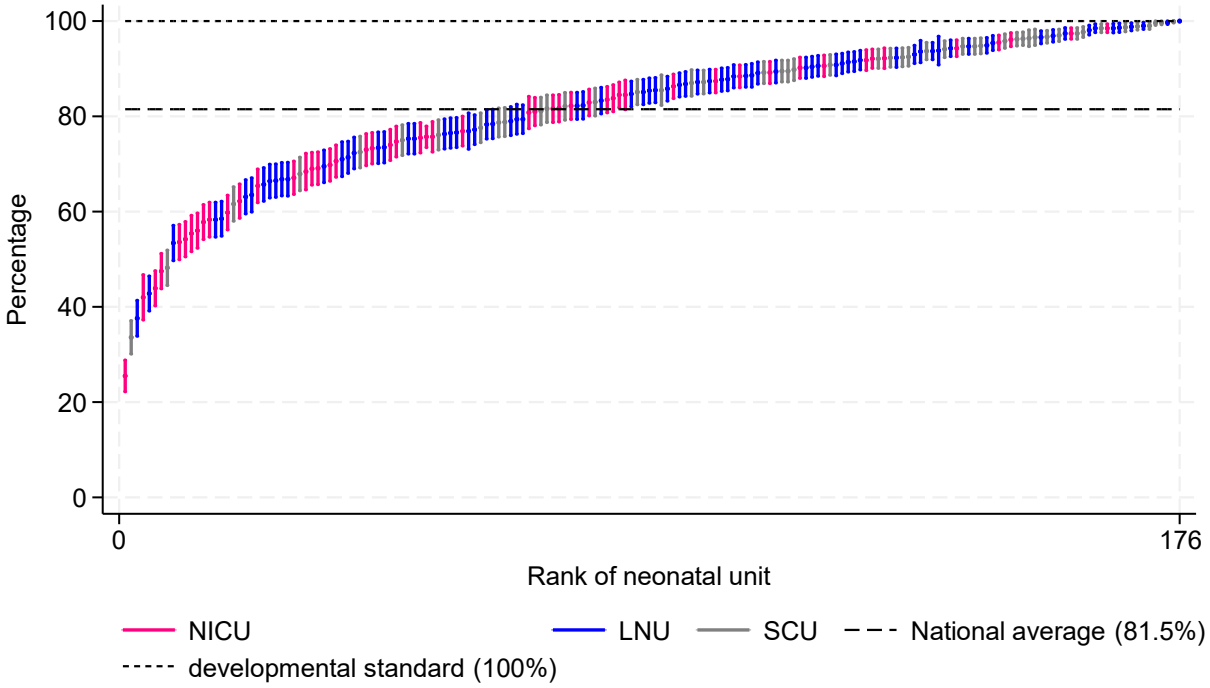


Figure 83: Proportion of nurse shifts sufficiently staffed, by neonatal network (2024).

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. Confidence intervals in the figure are smaller than other caterpillar plots because the unit of analysis is nursing shifts rather than babies or episodes.

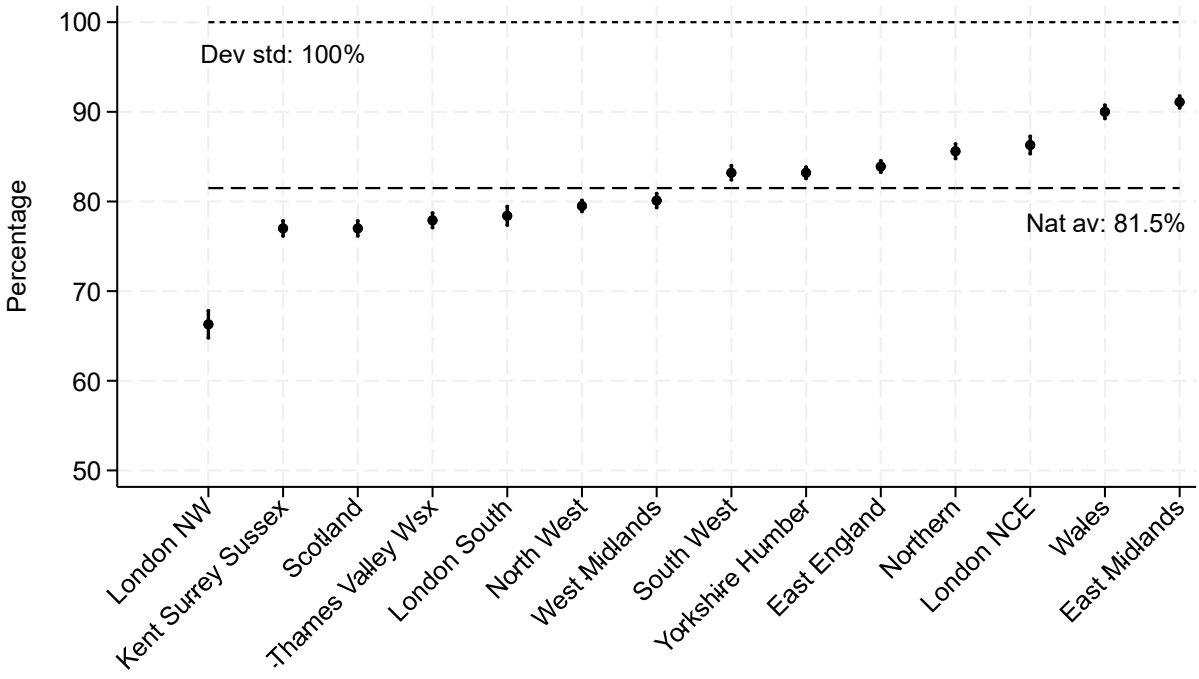


Table 17: Proportion of nurse shifts sufficiently staffed, by neonatal unit level (2024).

Unit level	Total eligible shifts	Sufficiently staffed shifts (%)
SCU	33,807	29,494 (87.2%)
LNU	54,372	44,867 (82.5%)
NICU	36,802	27,560 (74.9%)
National†	124,981	101,921 (81.5%)

†'National' figures are calculated from participating neonatal units/ networks in England, Wales, Scotland, and the Isle of Man.

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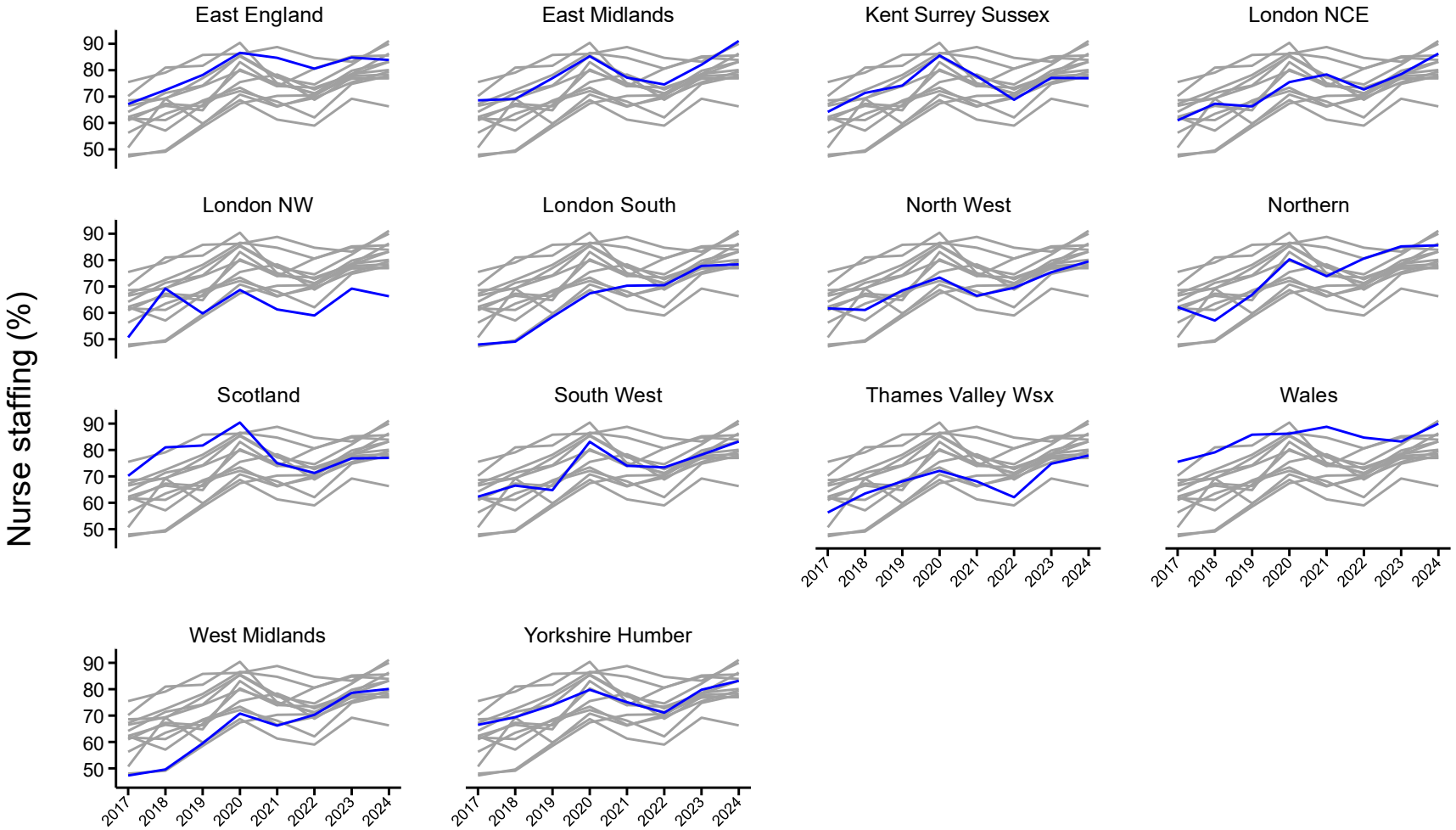
Figure 84: Front and back plot of neonatal nurse staffing according to specification by neonatal network, 2017-2024.

The "front and back" plot is a time series chart showing all networks as individual lines. The horizontal axis is the NNAP report year, and the vertical axis shows the percentage of babies with a given outcome in that network. The chart is split into tiles, with each tile showing the same set of lines, but with a particular network's results highlighted by a blue line in each case.



Summary of findings

- There is an overall trend towards improving compliance with nurse staffing levels over time, from 62.5% in 2017 to 81.5% (101,921 shifts of 124,981) in 2024, with evidence of a recovery following the aftermath of the COVID pandemic (2020 – 79.3%, 2021 – 74.1%, 2022 – 72.3%) *(Figure 81)*.
- Among neonatal units, there is wide variation in the proportion of shifts staffed according to guideline recommendations, from 25.5% to 100% *(Figure 82)*.
- Compliance with guideline recommendations is more readily achieved in SCUs (87.2% - 29,494 of 33,807) than in LNUs (82.5% - 44,867 of 54,372) and NICUs (74.9% - 27,560 of 36,802) *(Table 17)*.
- Nurse staffing levels also vary by neonatal network, from 66.3% (London ODN – North West) to 91.1% (East Midlands ODN) *(Figure 83)*. The front and back chart shows the neonatal network improvement trajectories over time *(Figure 84)*.

10. Non-invasive breathing support

What proportion of babies born at less than 32 weeks gestational age only receive non-invasive breathing support during the first week of life?*

**Invasive respiratory support is defined as that delivered through an endotracheal tube.*

Bronchopulmonary Dysplasia (BPD) is the most common form of chronic lung disease in infancy associated with preterm birth. Despite the advances in perinatal care such as administration of antenatal corticosteroids, surfactant and gentler ventilation strategies, the proportion of babies with BPD has remained constant. However, there is substantial variation in the proportions of BPD among neonatal networks even after comparing the proportions with a matched group of babies with very similar case mix.

One the contributing factors to BPD is the type and duration of respiratory support provided to the babies. Provision of non-invasive respiratory support, to avoid mechanical ventilation through endotracheal tube, and early extubation of very preterm infants onto non-invasive support have been shown to reduce the risk of BPD[39]. Variations in respiratory care practices (the type and duration of respiratory support) may contribute to these variations in proportions of BPD.

The NICE guidance (NG 124) recommends provision of non-invasive respiratory support through nasal CPAP or high flow humidified oxygen therapy as primary mode of respiratory support for preterm infants[40]. Through the identification of variation in the extent of adoption of NICE guidance between neonatal networks, and units of a similar designation, the NNAP can support quality improvement.

Unit and network results for this measure are balanced on gestational age. Balancing is a process that compares the outcome or exposure of babies at a unit to a sample of babies from the national population whose gestational ages are comparable to those of the unit of comparison. The weighted national result (referred to as the "balanced proportion") is then compared to the unit's result (referred to the "observed proportion"), with the difference between their proportions referred to as the "treatment effect". A positive treatment effect indicates that babies at the unit would have been more likely to receive only non-invasive respiratory support had they been treated elsewhere, and a negative treatment effect indicates that they would have been less likely to receive only non-invasive respiratory support elsewhere.

For a unit or network, a high observed rate of non-invasive breathing support and a negative treatment effect reflect positively on a unit or network's adherence to NICE guidance.

[39] Jensen EA. Prevention of bronchopulmonary dysplasia: A summary of evidence-based strategies. NeoReviews 2019;20:e189-e201

[40] National Institute for Health and Care Excellence (NICE). Specialist neonatal respiratory care for babies born preterm. NICE guideline [NG124]. April 2019. Available at: https://www.nice.org.uk/guidance/ng124

Results

Figure 85: Proportion of babies born at less than 32 weeks who only receive non-invasive breathing support, 2017-2024, using 2024 data, definitions and methodology.

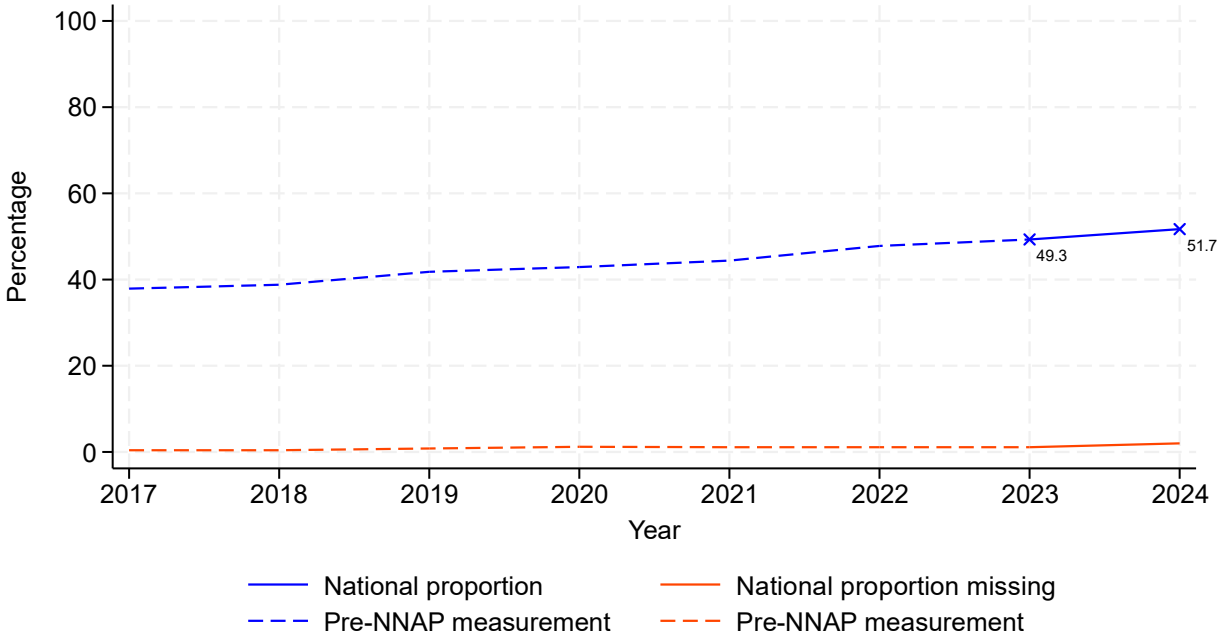


Figure 86: Observed proportion (TOP) and treatment effect (BOTTOM) of babies receiving only non-invasive ventilation in the first 7 days by neonatal network, 2024.

Network proportions are represented by dots. The 95% confidence intervals for a network are shown by a vertical line with each dot. Full results are available on NNAP Online. See page 125 for a description of the methodology used to report non-invasive ventilation treatment effect. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology.

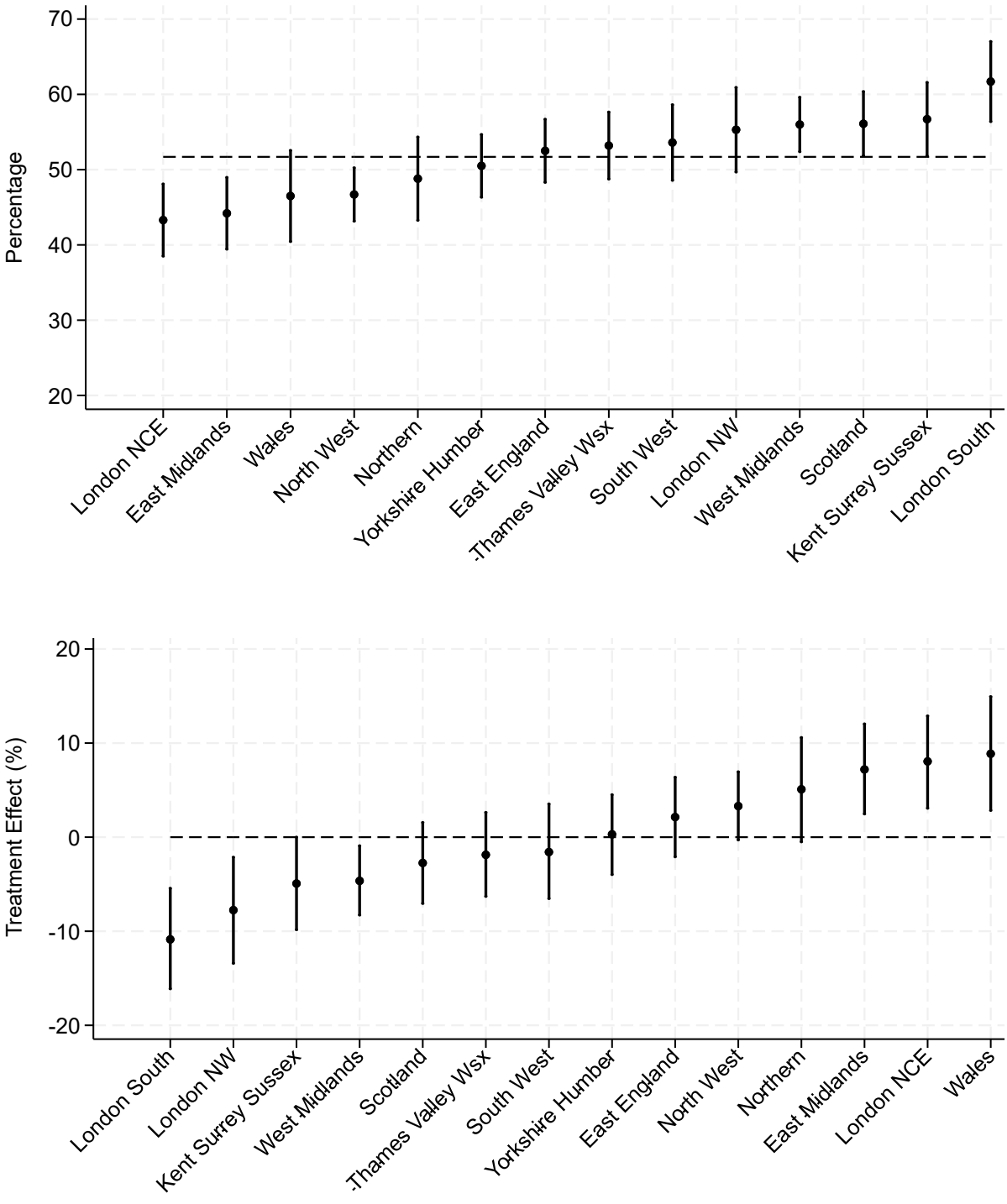
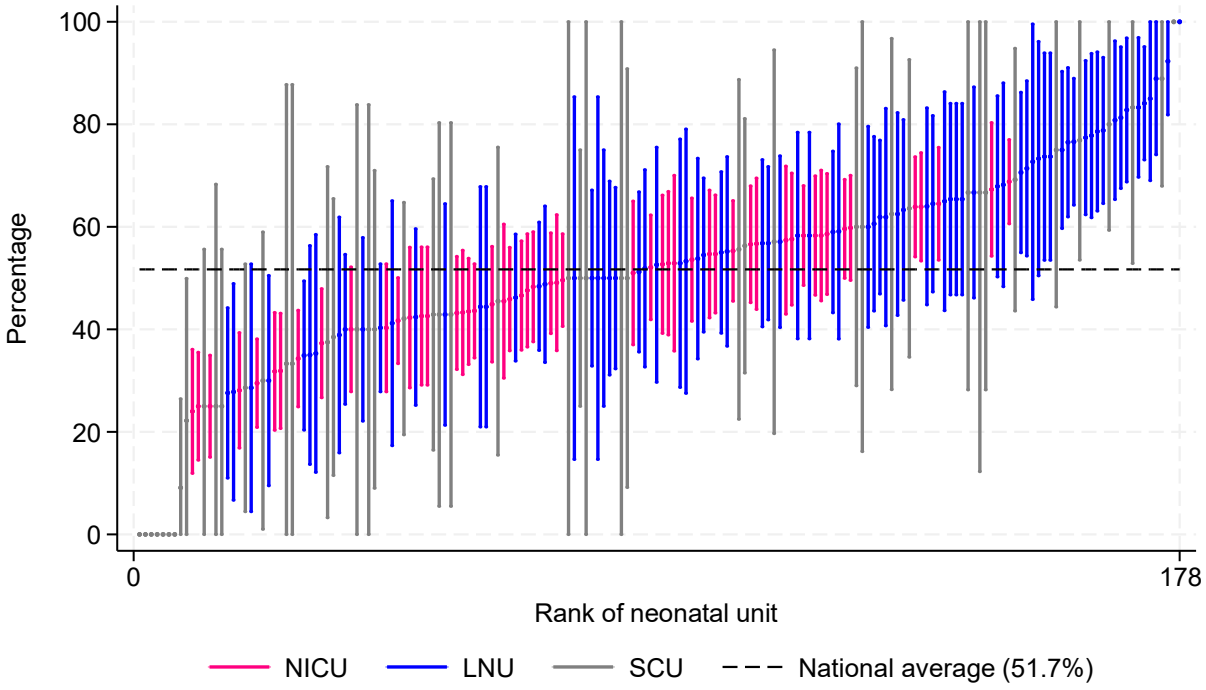
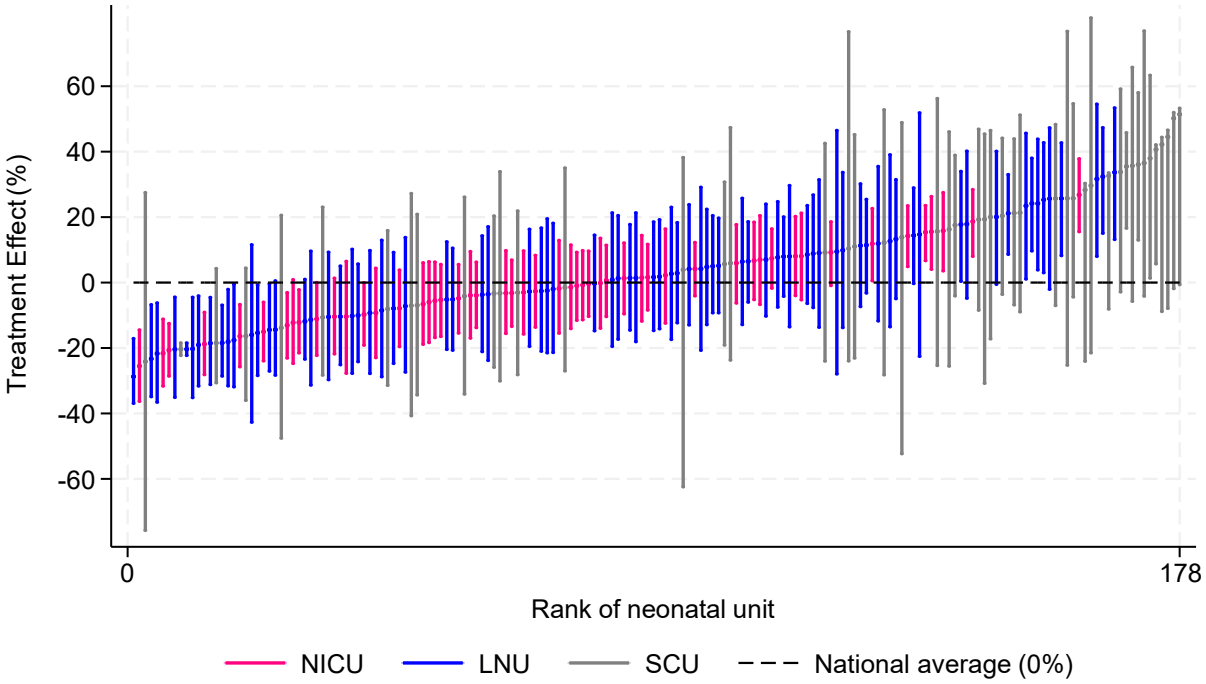


Figure 87: Observed proportion (TOP) and treatment effect (BOTTOM) of babies receiving non-invasive ventilation by neonatal unit, 2024.

Unit proportions are represented by dots. The 95% confidence intervals for a unit are shown by a vertical line with each dot. Full results are available on NNAP Online. For a full description case mix adjustment and outlier analysis methodology used to calculate treatment effect, see: www.rcpch.ac.uk/nnap-data-flow-methodology. SCUs are not included in outlier management for this measure since it is not usual practice for SCUs to treat babies requiring breathing support.





Summary of findings

- Use of non-invasive breathing support is recommended where clinically appropriate to reduce the risk of mortality and incidence of BPD[41]. There is a continued overall improvement in the proportion of babies receiving only non-invasive breathing support during their first week of life; rising to 51.7% (3,437 of 6,642) in 2024 (2023 – 49.3%; 2022 – 47.8%) (Figure 85).
- However, there is significant variation in adherence to NICE guidance among neonatal units and networks. Network proportions range between 43.3% and 61.7% *(Figure* 86*)*; and among NICUs, 24% - 68.8% *(Figure* 87*)*. Differences in treatment effect indicate that regional and local variation is not explained by differences in the gestational age of the babies being cared for *(Figure* 86*, Figure* 87*)*.

Actions for local quality improvement

- Neonatal networks should look at variation in the use of non-invasive ventilation across their constituent units, seeking to identify and implement regional quality improvement opportunities through shared best practice.

[41] NICE. Specialist neonatal respiratory care for babies born preterm. Quality standard QS193. 15 July 2020. Available at: https://www.nice.org.uk/guidance/qs193/chapter/About-this-quality-standard

11. Equity in neonatal care

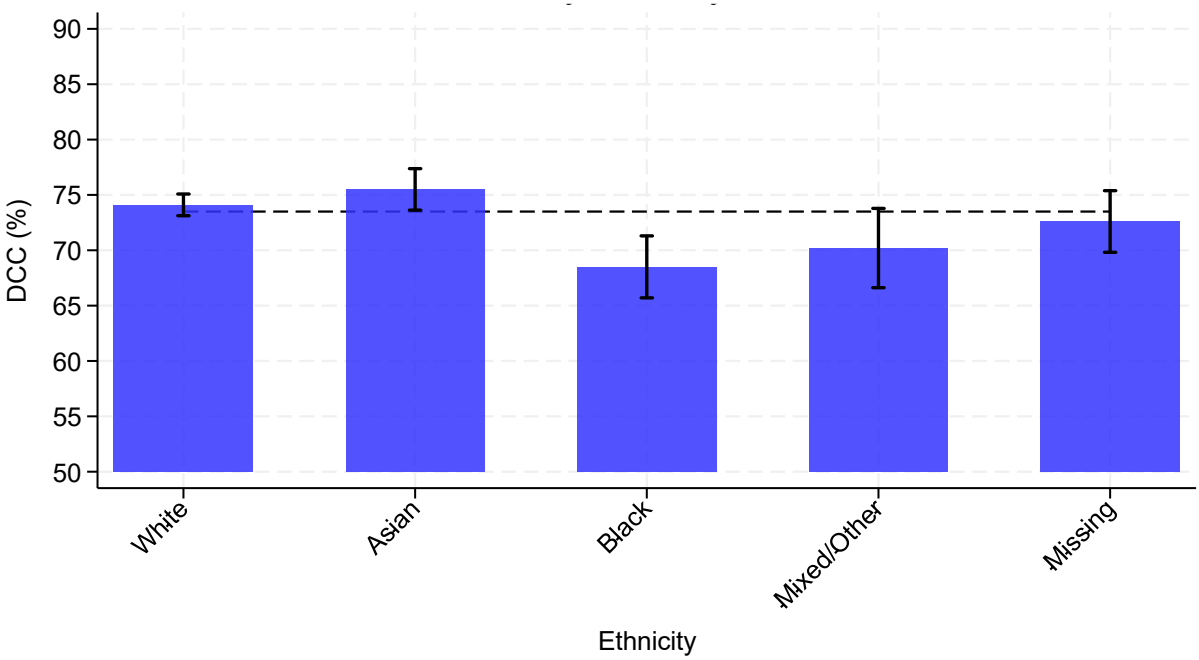
This year, for the first time, the NNAP has also undertaken analysis of data for areas where differences in the delivery of important neonatal care interventions according to ethnicity have been demonstrated.[42] More detailed results are available on NNAP Online and the NNAP Dashboard. The results presented are not adjusted for differences in case mix. This is to ensure transparency and enable the independent interpretation of results. Neonatal units and networks can access their own data via the NNAP Restricted Access Dashboard.

Robust reporting of equity in neonatal care relies on accurate and complete reporting of patient demographics. The NNAP is driving improvements in completeness of demographic data through its dashboard. Among babies born in 2024 and admitted to a neonatal unit, 11.4% had missing ethnicity (8.5% of babies born at less than 34 weeks gestational age), after using baby's ethnicity if a mother's ethnicity was not recorded.

Equity of care is a new area of focus in the NNAP Quality Improvement Strategy. For details of the related improvement goal, and the wider rationale for its inclusion and supporting objectives, access the Strategy at: www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/healthcare-improvement-strategy

Results

Figure 88: Proportion of babies born at less than 34 weeks GA receiving deferred cord clamping by ethnicity, 2024.



[42] Pettinger K, Perez SP, Legge H, Ojha S, Odd D, Oddie S. Does neonatal care delivery in England and Wales vary by deprivation and ethnicity: a retrospective cohort study. *BMJ Paediatrics Open*. 2025;9:e003585. Available at: https://doi.org/10.1136/bmjpo-2025-003585

Figure 89: Proportion of babies born at less than 34 weeks gestational age with normal temperature on admission by ethnicity, 2024.

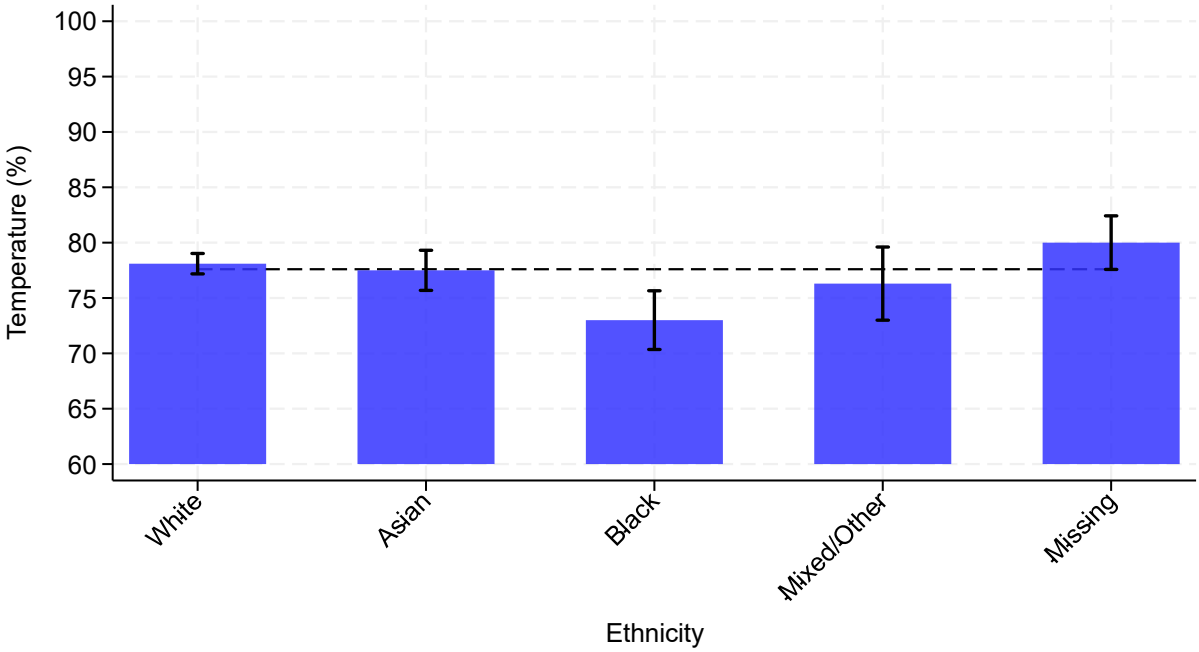


Figure 90: Proportion of extremely preterm babies born a centre with a NICU by ethnicity, 2024.

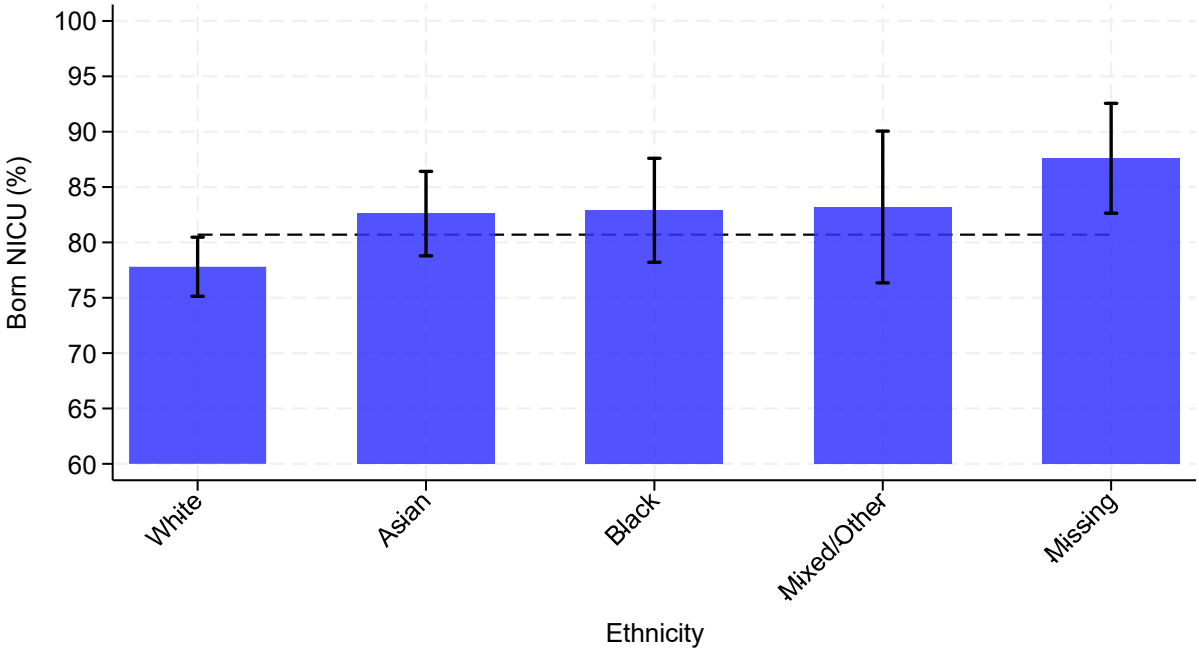


Figure 91: Proportion of admissions where a consultation with parents took place within 24 hours by ethnicity, 2024.

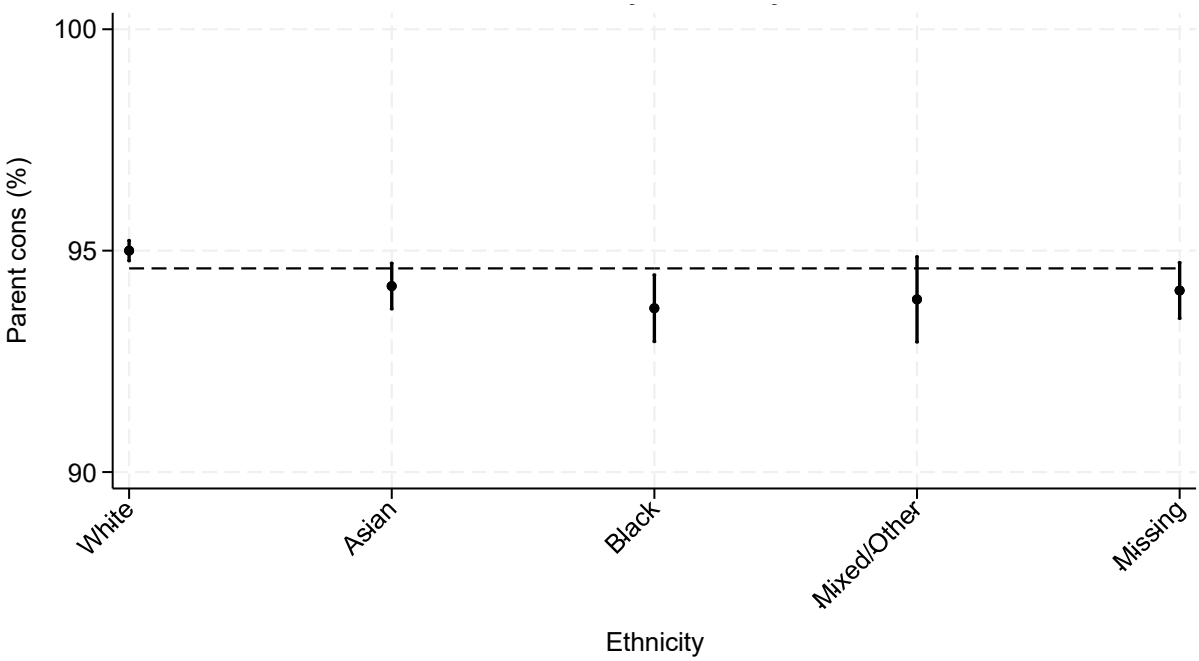


Figure 92: Proportion of baby days with a parent included on a ward round, by ethnicity (2024).

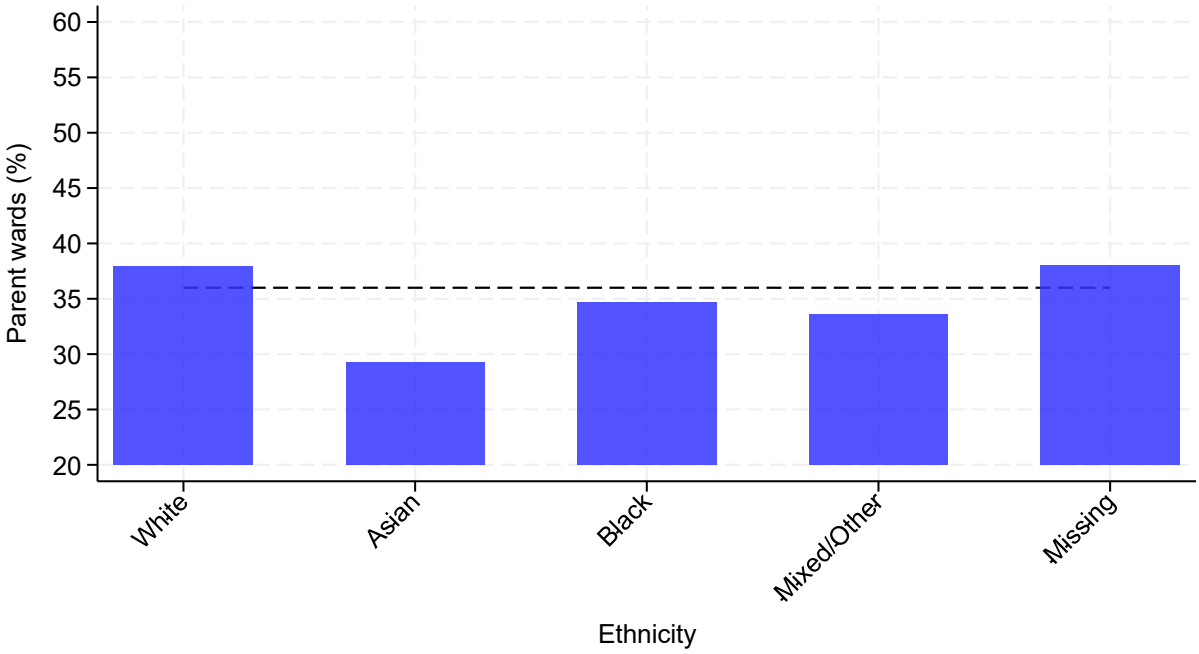


Figure 93: Proportion of babies born at less than 34 weeks gestational age receiving any breastmilk by day 2 by ethnicity, 2024.

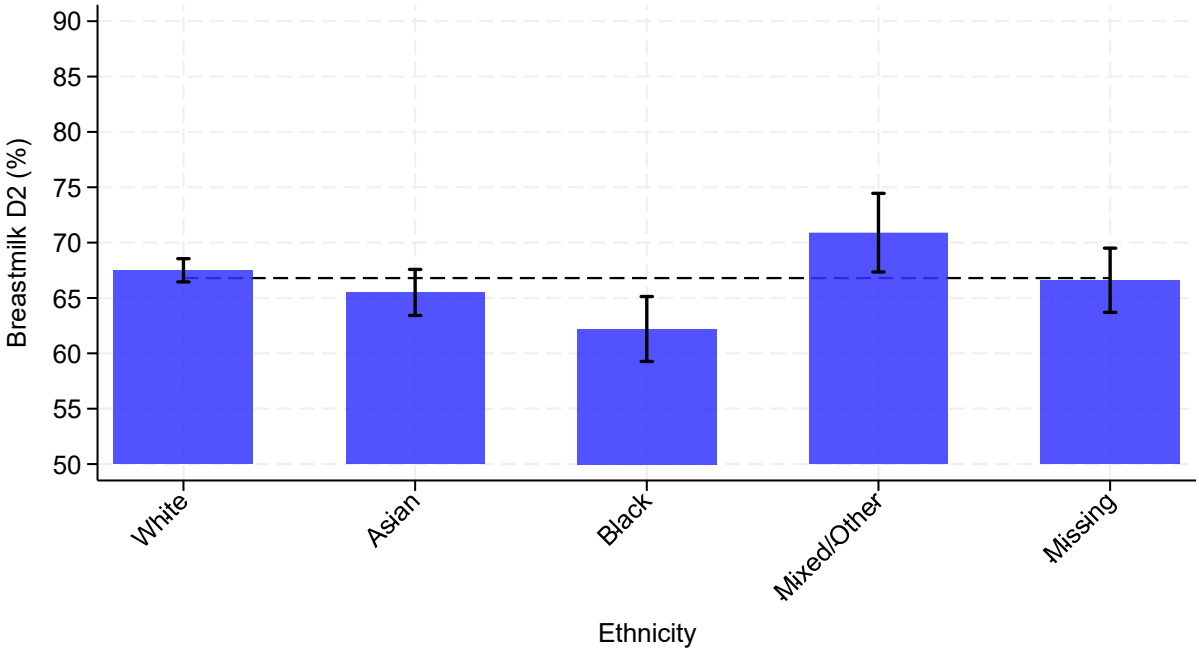


Figure 94: Proportion of babies born at less than 34 weeks gestational age receiving any breastmilk at day 14 by ethnicity, 2024.

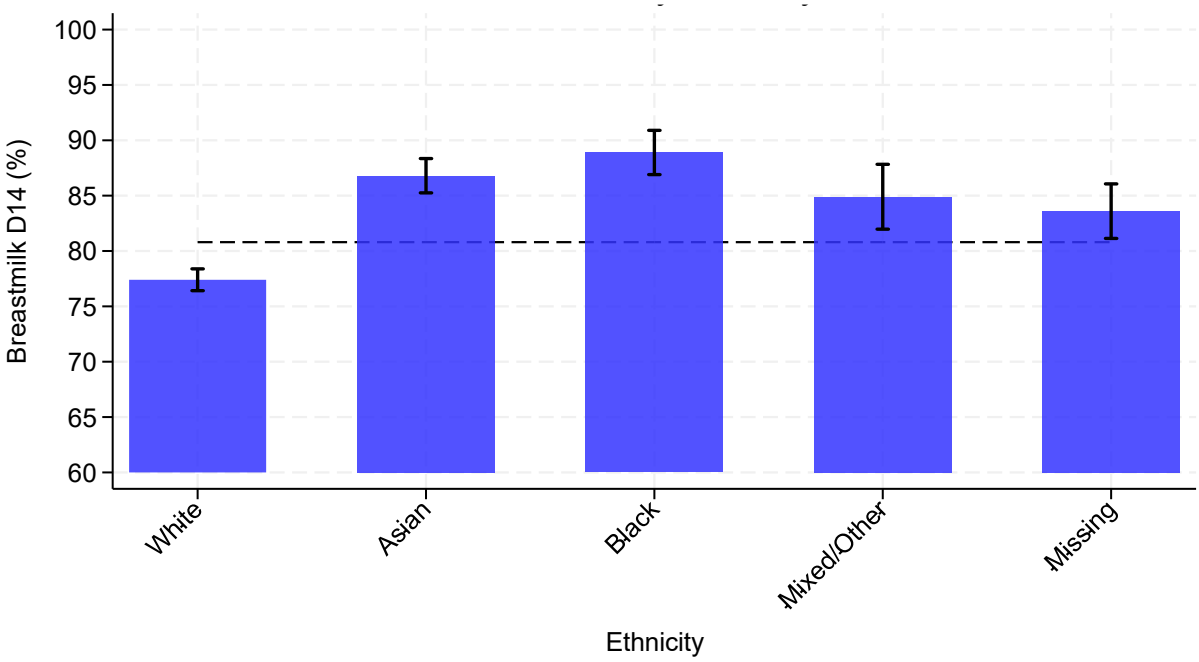


Figure 95: Proportion of babies born at less than 34 weeks gestational age receiving any breastmilk at discharge by ethnicity, 2024.

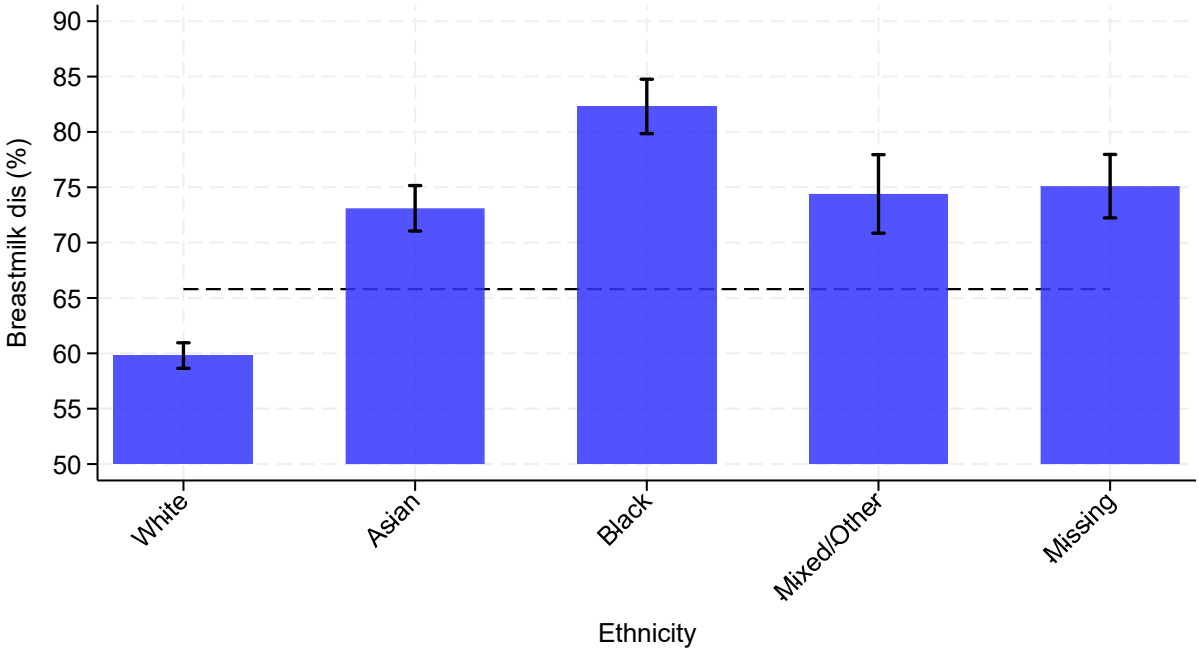


Figure 96: Proportion of babies born at less than 30 weeks gestational age receiving medical follow-up at two years by ethnicity, 2024.

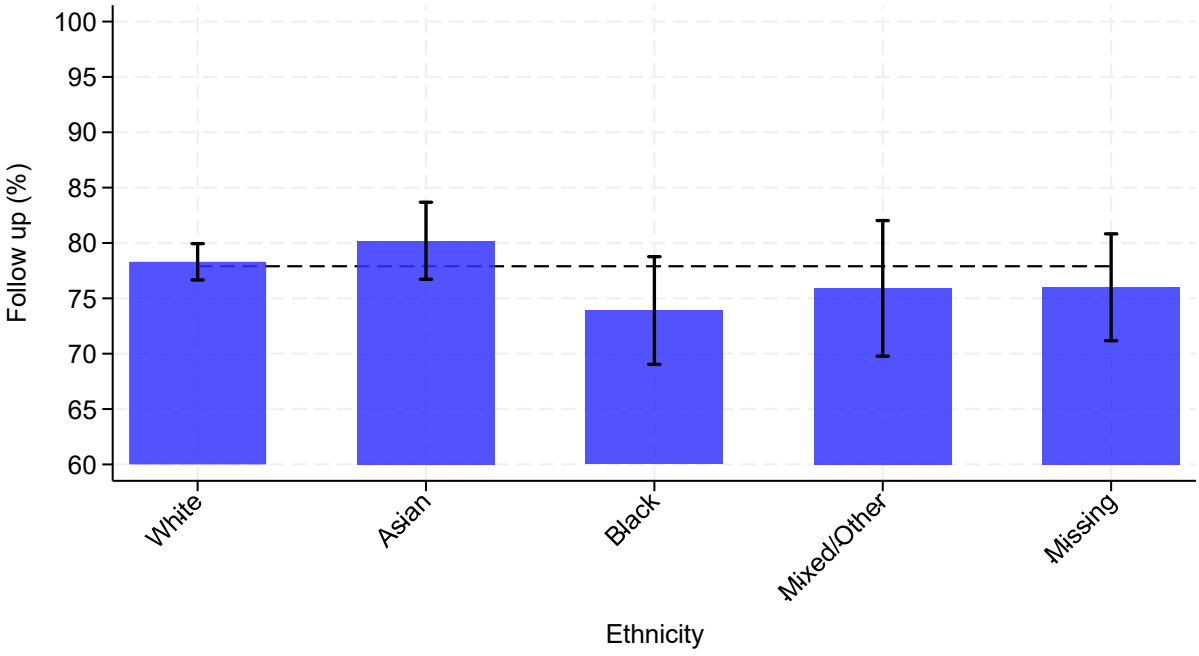
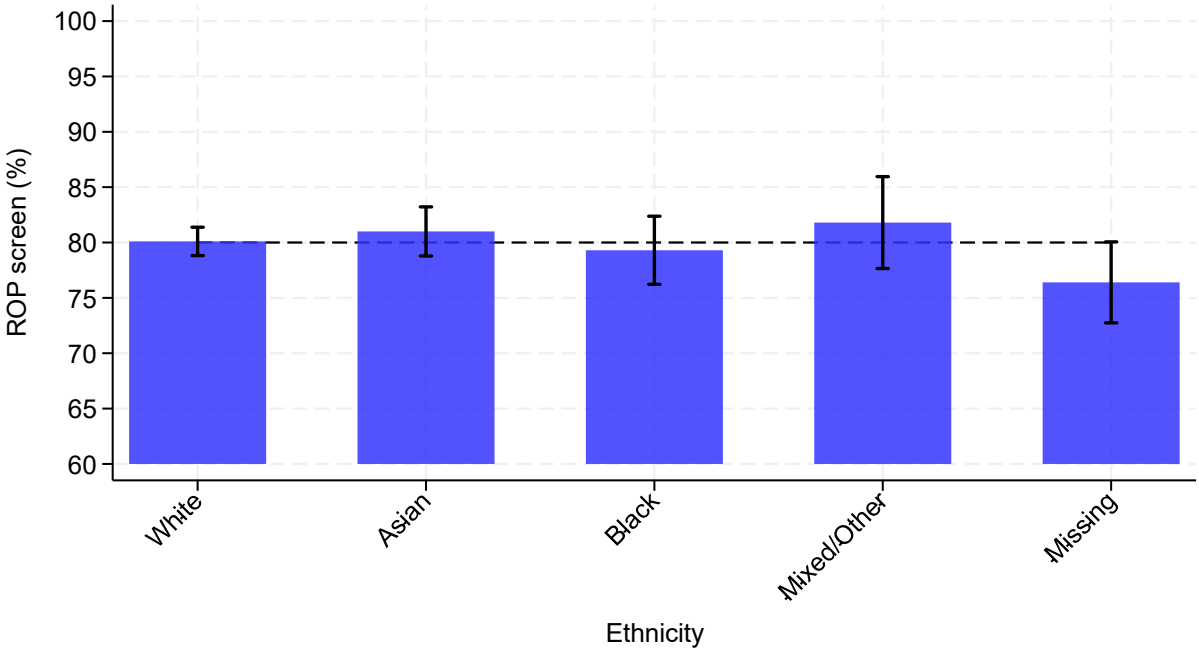


Figure 97: Proportion of eligible babies receiving on time ROP screening by ethnicity, 2024.



Summary of findings

Optimal perinatal care

- Nationally, a lower proportion of babies of Black mothers received deferred cord clamping (68.5%, 755 of 1,102) than White (74.1%, 5,927 of 8,002), Asian (75.5%, 1,594 of 2,112) and mothers classified as Mixed/Other (70.2%, 458 of 652) *(Figure 88)*. These results are not adjusted to account for differences in gestational age among babies born to different ethnic groups. That said, the rates of deferred cord clamping are known to vary by ethnicity even when gestation is adjusted for. The reasons for presenting unadjusted rates include the fact that, in addressing health inequality at local level, it will be important for units to be aware of the unadjusted data for their own populations. This result is unexplained, and should form an urgent priority for improvement activity relating to health equity.
- Nationally, a lower proportion of babies with Black mothers had a normal temperature on admission (73%, 818 of 1,120), than White (78.1%, 6,302 of 8,072), Asian (77.5%, 1,649 of 2,129), and mothers grouped as Mixed/Other (76.3%, 505 of 662) *(Figure 89)*. Similar to timing of cord clamping, unadjusted results are presented. The factors through which this disparity is mediated remain unexplained.
- A lower proportion of babies with White mothers were born in a centre with a NICU (77.8%, 755 of 971), when compared to Black (82.9%, 213 of 257), Asian (82.6%, 327 of 396) and Mixed/Other (83.2%, 99 of 119) *(Figure 90)*. This difference is not fully understood, but

may be related to the concentration of minoritised ethnicity populations in more urban areas where NICUs are typically sited.

Parent partnership in care

- Parental consultation within 24 hours took place for a lower proportion of admissions when the mother was Black (93.7%, 3,886 of 4,147) Asian (94.2%, 7,783 of 8,261) or grouped as Mixed/Other (93.8%, 2,343 of 2,498) than for White mothers (95%, 34,656 of 36,483) *(Figure 91)*.
- Parental inclusion on the consultant ward round took place for a lower proportion of baby care days when the mother was Asian (29.3%, 38,083 of 129,969 baby care days), Black (34.7%, 23,743 of 68,423 baby care days), or Mixed or other ethnic background (33.6%, 12,989 of 38,651 baby care days) than for White mothers (37.9%, 178,111 of 469,391 baby care days) *(Figure 92)*.
- Whether language or other components of organisational or structural racism explain these observed differences is, as yet, unexplained.
- Use of breastmilk amongst preterm babies varies by ethnicity. A lower proportion of babies born to Black and Asian mothers (62.2%, 680 of 1,093; and 65.5%, 1,370 of 2,091 respectively) received any of their **mother's milk in their first 2 days of life** than babies born to White mothers (67.5%, 5,367 of 7,949) and those grouped as Mixed/Other (70.9%, 464 of 654) *(Figure 93)*.
- Conversely, breastmilk feeding was established and sustained through the neonatal stay for a higher proportion of babies born to Black mothers (day 14 – 88.9%, 876 of 985; discharge – 82.3%, 795 of 966), than for babies born to White mothers (day 14 – 77.4%, 5,581 of 7,213; discharge – 59.8%, 4,335 of 7,249), Asian mothers (day 14 – 86.8%, 1,652 of 1,903; discharge – 73.1%, 1,362 of 1,863), and mothers grouped as Mixed/Other (day 14 – 84.9%, 507 of 597; discharge – 74.4%, 451 of 606) (Figure 94 and Figure 95). This suggests there may be opportunities to improve the equity of early support provided to women of minoritised ethnicity.

National recommendation:

5. Neonatal networks and local maternity and neonatal systems should work with the perinatal teams in their constituent neonatal units to:

    a. ensure that staff receive appropriate and consistent training to confidently ask families about their ethnicity and that of their baby, and to accurately record demographic information,

b. use the NNAP dashboard to review how well NNAP process measures are delivered locally, and whether this differs by ethnicity

c. where differences exist, seek to understand the underlying causes, and

d. with families, co-design quality improvement programme that directly address those causes.

12. Audit questions, standards and associated guidelines

NNAP question	Cohort	Measure type	Developmental standard	Associated guidelines
Mortality until discharge home Does a baby born at 24 to 31 weeks gestational age inclusive die before discharge home, or 44 weeks post-menstrual age (whichever occurs sooner)?	Reaching 44 weeks PMA in 2024.	Outcome	No developmental standard.	
Bronchopulmonary dysplasia (BPD) Does an admitted baby born at less than 32 weeks' gestational age develop bronchopulmonary dysplasia (BPD) or die?	Final discharge in 2024	Outcome	No developmental standard.	
Necrotising enterocolitis (NEC) Does an admitted baby born at less than 32 weeks' gestational age meet the NNAP surveillance definition for necrotising enterocolitis (NEC) on one or more occasion?	Final discharge in 2024	Outcome	No developmental standard.	
Late onset bloodstream infection Does an admitted baby have one or more episodes of bloodstream infection, characterised by one or more positive blood cultures taken, after 72 hours of age?	Final discharge in 2024	Outcome	No developmental standard.	

Neonatal preterm brain injury Does a baby born at less than 32 weeks' gestational age experience any of the following forms of brain injury? • *Germinal matrix/ intraventricular haemorrhage* • *Post haemorrhagic ventricular dilatation* • *Cystic periventricular leukomalacia*	Final discharge in 2024	Outcome	No developmental standard.	
Birth in a centre with a NICU Is a baby: • born at less than 27 weeks gestational age, or • less than 800 grams at birth, or • born as a multiple at less than 28 weeks gestational age delivered in a maternity service on the same site as a designated NICU?	First admission in 2024	Process	Eighty-five (85%) of babies born at less than 27 weeks gestational age should be delivered in a maternity service on the same site as a NICU.	British Association for Perinatal Medicine. Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation A Framework for Practice NHS England. Neonatal Critical Care Service Specification
Antenatal steroids Does a mother who delivers a baby between 22 and 33 weeks' gestational age receive a full course of antenatal corticosteroids within 1 week prior to delivery?	First admission in 2024	Process	No developmental standard.	NICE guideline [NG25], Preterm Labour and Birth

Antenatal magnesium sulphate Does a mother who delivers a baby below 30 weeks' gestational age receive magnesium sulphate in the 24 hours prior to delivery?	First admission in 2024	Process	Ninety percent (90%) of eligible mothers should receive antenatal magnesium sulphate.	NICE guideline [NG25], Preterm Labour and Birth
Deferred cord clamping Does a baby born at less than 34 weeks' gestational age have their cord clamped at or after one minute?	First admission in 2024	Process	Seventy-five percent (75) of babies born at less than 34 weeks' should have deferred cord clamping.	NICE guideline [NG25], Preterm Labour and Birth
Normal temperature on admission Does a baby born at less than 32 weeks' gestational age have a first temperature on admission which is both between 36.5–37.5°C and measured within one hour of birth?	First admission in 2024	Process	Timeliness and normal temperature should be met for at least ninety percent (90%) of babies.	NHS England, Neonatal Critical Care Service Specification
Breastmilk feeding in first 2 days of life Does a baby born at less than 34 weeks' gestational age receive any of their own mother's milk in the first 2 days of life?	First admission in 2024	Process		UNICEF UK. The Baby Friendly Initiative
Breastmilk feeding at day 14 Does a baby born at less than 34 weeks' gestational age receive any of their own mother's milk at day 14 of life?	Final discharge in 2024	Process	No developmental standard.	UNICEF UK. The Baby Friendly Initiative
Breastmilk feeding at discharge home Does a baby born at less than 34 weeks' gestational age receive any of their own mother's milk at discharge to home from a neonatal unit?	Final discharge in 2024	Process	Eighty percent (80%) of babies born at less than 34 weeks' gestational age should receive at least some of their mother's milk at discharge home from the neonatal unit.	UNICEF UK. The Baby Friendly Initiative

Parental consultation within 24 hours of admission Is there a documented consultation with parents by a senior member of the neonatal team*, within 24 hours of admission? **By senior member of the neonatal team, NNAP means a consultant or middle grade doctor, or a nurse practitioner acting in such a role.*	First admission in 2024	Process	A consultation should take place within 24 hours of admission for every baby (100%).	Scottish Government. Neonatal Care in Scotland: A Quality Framework NHS Wales. All Wales Neonatal Standards – 3rd Edition. Department of Health. Toolkit for high quality neonatal services
Parental inclusion in consultant ward rounds What proportion of baby care days had a consultant-led ward round* with at least one parent included? **Consultant ward round refers to any ward round where a consultant is in attendance, at any time of the day.*	Final discharge in 2024	Process	No developmental standard.	UNICEF UK. The Baby Friendly Initiative. Scottish Government. Neonatal Care in Scotland: A Quality Framework Bliss Baby Charter
Nurse staffing on neonatal units What proportion of nursing shifts are numerically staffed according to guidelines and service specification?	Shifts in 2024	Structure	100% of shifts staffed according to guidelines and service specification.	NHS Wales. All Wales Neonatal Standards – 3rd Edition. NHS England. Neonatal Critical Care Service Specification BAPM. Service Standards for Hospitals Providing Neonatal Care
On-time screening for retinopathy of prematurity (ROP) Does a baby born at less than 31 weeks gestational age, or weighing less than 1501g at birth undergo the first ROP screening according to the guideline?	Final discharge in 2024	Process	Eighty percent (80%) of eligible babies should receive ROP screening within the recommended time windows for first screening. Note that the Guideline recommends that all (100%) of eligible babies should receive ROP screening within the	Royal College of Paediatrics and Child Health. UK screening of retinopathy of prematurity guideline: Summary of recommendations, March 2022.

			recommended time windows for first screening.	
Follow-up at two years of age Does a baby born at less than 30 weeks gestational age receive medical follow-up at two years gestationally corrected age (18-30 months' gestationally corrected acceptable age range)?	Born July 2021 to June 2022	Process	Ninety percent (90%) of babies with two-year follow-up data entered.	NICE guideline [NG72]. Developmental follow-up of children and young people born preterm.
Type and duration of respiratory support What proportion of babies born at less than 32 weeks' gestation only receive non-invasive breathing (or respiratory) support* during the first week of life? **Invasive respiratory support is defined as that delivered through an endotracheal tube.*	First admission in 2024	Process	No developmental standard.	NICE Quality standard [QS193] Specialist neonatal respiratory care for babies born preterm

13. Unit participation

*IC days – Total number of intensive care days delivered by the neonatal unit in the calendar year. Intensive care days are those recorded as HRG XA01Z. [43]

**HD days – Total number of high dependency days delivered by the neonatal unit in the calendar year. High dependency days are those recorded as HRG XA02Z.[43]

***SC days – Total number of special care days delivered by the neonatal unit in the calendar year. Special care days are those recorded as HRG XA03Z. [43]

†Neonatal intensive care units providing surgery.

‡This unit has known issues relating to data completeness for the 2024 dataset, which affects their results for some NNAP measures.

Unit Name	Trust/Health Board	Unit Type	IC days*	HD days**	SC days***	All days
East Midlands ODN						
Leicester Neonatal Service (Leicester Royal Infirmary & Leicester General Hospital)	University Hospitals of Leicester NHS Trust	NICU†	2917	3009	6873	12799
Nottingham University Hospital (QMC)	Nottingham University Hospitals NHS Trust	NICU	2100	1969	1999	6068
Nottingham City Hospital	Nottingham University Hospitals NHS Trust	NICU†	1532	1573	2982	6087
Royal Derby Hospital	University Hospitals of Derby & Burton NHS Foundation Trust	LNU	485	1819	4338	6642
Northampton General Hospital	Northampton General Hospital NHS Trust	LNU	465	1545	3037	5047
Lincoln County Hospital	United Lincolnshire Hospitals NHS Trust	LNU	289	971	1871	3131
King's Mill Hospital	Sherwood Forest Hospitals NHS Foundation Trust	LNU	260	879	2011	3150
Kettering General Hospital	Kettering General Hospital NHS Foundation Trust	LNU	69	295	2410	2774
Queen's Hospital, Burton on Trent	University Hospitals of Derby & Burton NHS Foundation Trust	SCU	37	58	1463	1558
Pilgrim General Hospital	United Lincolnshire Hospitals NHS Trust	SCU	15	75	995	1085
East of England Perinatal ODN						

[43] NHS England. Service specification 240301: Neonatal Critical Care. Available at: https://www.england.nhs.uk/wp-content/uploads/2015/01/Neonatal-critical-care-service-specification-March-2024.pdf

Rosie Maternity Hospital, Addenbrookes	Cambridge University Hospitals NHS Foundation Trust	NICU†	3446	4135	5229	12810
Luton and Dunstable University Hospital	Bedfordshire Hospitals NHS Foundation Trust	NICU	2032	3260	4229	9521
Norfolk & Norwich University Hospital	Norfolk & Norwich University Hospitals NHS Foundation Trust	NICU†	1640	2411	3929	7980
Basildon University Hospital	Mid & South Essex NHS Foundation Trust	LNU	594	1430	2195	4219
Peterborough City Hospital	North West Anglia NHS Foundation Trust	LNU	385	1177	2915	4477
Lister Hospital	East & North Hertfordshire NHS Trust	LNU	370	1163	2733	4266
Broomfield Hospital, Chelmsford	Mid & South Essex NHS Foundation Trust	LNU	246	1189	2514	3949
Princess Alexandra Hospital	The Princess Alexandra Hospital NHS Trust	LNU	236	994	2484	3714
Ipswich Hospital	East Suffolk & North Essex NHS Foundation Trust	LNU	304	939	2317	3560
Colchester General Hospital	East Suffolk & North Essex NHS Foundation Trust	LNU	264	847	1486	2597
Watford General Hospital	West Hertfordshire Teaching Hospitals NHS Trust	LNU	143	900	1512	2555
Southend Hospital	Mid & South Essex NHS Foundation Trust	LNU	188	671	1367	2226
Queen Elizabeth Hospital, King's Lynn	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	LNU	205	518	1136	1859
Bedford Hospital	Bedfordshire Hospitals NHS Foundation Trust	SCU	63	357	2017	2437
West Suffolk Hospital	West Suffolk NHS Foundation Trust	SCU	41	654	1315	2010
Hinchingbrooke Hospital	North West Anglia NHS Foundation Trust	SCU	49	344	1293	1686
James Paget Hospital	James Paget University Hospitals NHS Foundation Trust	SCU	51	386	1051	1488
Kent, Surrey, Sussex ODN						
Royal Sussex County Hospital	University Hospitals Sussex NHS Foundation Trust	NICU†	2000	1981	3762	7743
Medway Maritime Hospital	Medway NHS Foundation Trust	NICU	1424	2489	2660	6573
St Peter's Hospital	Ashford & St Peter's Hospitals NHS Foundation Trust	NICU	1341	2049	2073	5463
William Harvey Hospital	East Kent Hospitals University NHS Foundation Trust	NICU	1008	1117	2612	4737
Tunbridge Wells Hospital	Maidstone & Tunbridge Wells NHS Trust	LNU	269	1732	2916	4917
East Surrey Hospital	Surrey & Sussex Healthcare NHS Trust	LNU	260	1304	2244	3808
Frimley Park Hospital	Frimley Health NHS Foundation Trust	LNU	329	962	1992	3283

Darent Valley Hospital	Dartford & Gravesham NHS Trust	SCU	91	624	2707	3422
Princess Royal Hospital, Haywards Heath	University Hospitals Sussex NHS Foundation Trust	SCU	39	357	1564	1960
Worthing Hospital	University Hospitals Sussex NHS Foundation Trust	SCU	27	366	1479	1872
Queen Elizabeth The Queen Mother Hospital	East Kent Hospitals University NHS Foundation Trust	SCU	23	262	1371	1656
Royal Surrey County Hospital	Royal Surrey County Hospital NHS Foundation Trust	SCU	23	363	1066	1452
Conquest Hospital	East Sussex Healthcare NHS Trust	SCU	20	296	1016	1332
London ODN – North Central & East						
The Royal London Hospital	Barts Health NHS Trust	NICU†	3842	4340	4474	12656
Homerton University Hospital	Homerton Healthcare NHS Foundation Trust	NICU	3595	4431	5001	13027
University College London Hospital‡	University College London Hospitals NHS Foundation Trust	NICU†	1659	2358	3045	7062
Queen's Hospital, Romford	Barking, Havering & Redbridge University Hospitals NHS Trust	LNU	481	1856	5973	8310
North Middlesex University Hospital	North Middlesex University Hospital NHS Trust	LNU	388	1703	3297	5388
Newham University Hospital	Barts Health NHS Trust	LNU	569	829	4259	5657
Barnet Hospital	Royal Free London NHS Foundation Trust	LNU	464	1810	2642	4916
Whittington Hospital	Whittington Health NHS Trust	LNU	293	1465	3343	5101
Whipps Cross University Hospital	Barts Health NHS Trust	LNU	200	725	2459	3384
Royal Free Hospital	Royal Free London NHS Foundation Trust	SCU	17	114	1359	1490
London ODN - North West						
Chelsea & Westminster Hospital	Chelsea & Westminster Hospital NHS Foundation Trust	NICU†	3248	3707	3388	10343
Queen Charlotte and Chelsea Hospital	Imperial College Healthcare NHS Trust	NICU	2017	3270	2270	7557
Hillingdon Hospital	The Hillingdon Hospitals NHS Foundation Trust	LNU	273	1647	2457	4377
Northwick Park Hospital	London North West University Healthcare NHS Trust	LNU	212	1029	3418	4659
St Mary's Hospital, London	Imperial College Healthcare NHS Trust	LNU	244	975	3239	4458
West Middlesex University Hospital	Chelsea & Westminster Hospital NHS Foundation Trust	SCU	79	701	3298	4078

London ODN – South						
St George's Hospital	St George's University Hospitals NHS Foundation Trust	NICU†	4025	4039	3863	11927
King's College Hospital	King's College Hospital NHS Foundation Trust	NICU†	3127	3353	3211	9691
Evelina London Children's Hospital‡	Guy's and St Thomas' NHS Foundation Trust	NICU†	2537	1530	1224	5291
Queen Elizabeth Hospital, Woolwich	Lewisham & Greenwich NHS Trust	LNU	403	1200	3102	4705
University Hospital Lewisham	Lewisham & Greenwich NHS Trust	LNU	333	1258	2895	4486
Croydon University Hospital	Croydon Health Services NHS Trust	LNU	239	1066	3077	4382
Kingston Hospital	Kingston Hospital NHS Foundation Trust	LNU	318	784	2150	3252
St Helier Hospital	Epsom & St Helier University Hospitals NHS Trust	LNU	88	677	2472	3237
Epsom General Hospital	Epsom & St Helier University Hospitals NHS Trust	SCU	6	82	722	810
Princess Royal University Hospital, Farnborough‡	King's College Hospital NHS Foundation Trust	LNU	34	157	228	419
Isle of Man						
Noble's Hospital	Manx Care	LNU	18	18	327	363
North West ODN						
St Mary's Hospital, Manchester	Manchester University NHS Foundation Trust	NICU*	5210	6006	6496	17712
Liverpool Women's Hospital	Liverpool Women's NHS Foundation Trust	NICU*	3708	2828	4400	10936
Royal Bolton Hospital	Bolton NHS Foundation Trust	NICU	1371	3499	4192	9062
Royal Oldham Hospital	Northern Care Alliance NHS Foundation Trust	NICU	2022	2632	3126	7780
Lancashire Women and Newborn Centre, Burnley General Hospital	East Lancashire Hospitals NHS Trust	NICU	1630	2277	3920	7827
Royal Preston Hospital	Lancashire Teaching Hospitals NHS Foundation Trust	NICU	1304	2150	3793	7247
Arrowe Park Hospital	Wirral University Teaching Hospital NHS Foundation Trust	NICU	1193	1758	1268	4219
Wythenshawe Hospital	Manchester University NHS Foundation Trust	LNU	250	1180	3551	4981
Alder Hey Children's Hospital	Alder Hey Children's NHS Foundation Trust	NICU†	742	1382	389	2513
North Manchester General Hospital	Manchester University NHS Foundation Trust	LNU	124	845	3192	4161
Whiston Hospital	Mersey & West Lancashire Teaching Hospitals NHS Trust	LNU	145	768	2410	3323
Warrington Hospital	Warrington & Halton Teaching Hospitals NHS Foundation Trust	LNU	223	775	1717	2715

Royal Albert Edward Infirmary	Wrightington, Wigan & Leigh NHS Foundation Trust	LNU	104	828	1747	2679
Victoria Hospital, Blackpool	Blackpool Teaching Hospitals NHS Foundation Trust	LNU	209	581	1717	2507
Stepping Hill Hospital	Stockport NHS Foundation Trust	LNU	124	640	1653	2417
Leighton Hospital	Mid Cheshire Hospitals NHS Foundation Trust	LNU	199	522	1578	2299
Ormskirk District General Hospital	Mersey & West Lancashire Teaching Hospitals NHS Trust	LNU	129	554	1719	2402
Tameside General Hospital	Tameside & Glossop Integrated Care NHS Foundation Trust	LNU	105	487	1643	2235
Royal Lancaster Infirmary	University Hospitals of Morecambe Bay NHS Foundation Trust	LNU	76	560	1248	1884
Countess of Chester Hospital	Countess of Chester Hospital NHS Foundation Trust	LNU	22	355	1029	1406
Macclesfield District General Hospital	East Cheshire NHS Trust	SCU	16	73	583	672
Furness General Hospital	University Hospitals of Morecambe Bay NHS Foundation Trust	SCU	13	16	388	417
Northern ODN						
Royal Victoria Infirmary	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	NICU†	2532	3660	4051	10243
The James Cook University Hospital	South Tees Hospitals NHS Foundation Trust	NICU	1503	2799	3666	7968
Sunderland Royal Hospital	South Tyneside & Sunderland NHS Foundation Trust	NICU	926	1330	2271	4527
University Hospital of North Tees	North Tees & Hartlepool NHS Foundation Trust	SCU	34	211	2180	2425
Northumbria Specialist Emergency Care Hospital	Northumbria Healthcare NHS Foundation Trust	SCU	34	167	1613	1814
University Hospital of North Durham	County Durham & Darlington NHS Foundation Trust	SCU	27	116	1620	1763
Queen Elizabeth Hospital, Gateshead	Gateshead Health NHS Foundation Trust	SCU	5	132	1201	1338
Darlington Memorial Hospital	County Durham & Darlington NHS Foundation Trust	SCU	20	159	936	1115
Cumberland Infirmary	North Cumbria Integrated Care NHS Foundation Trust	SCU	24	143	941	1108

West Cumberland Hospital	North Cumbria Integrated Care NHS Foundation Trust	SCU	17	113	571	701
Scotland						
Royal Hospital for Children, Glasgow	NHS Greater Glasgow & Clyde	NICU†	3586	3819	4700	12105
Simpson Centre for Reproductive Health, Edinburgh	NHS Lothian	NICU†	2128	3180	3582	8890
Aberdeen Maternity Hospital	NHS Grampian	NICU†	1096	2254	3509	6859
Princess Royal Maternity Hospital, Glasgow	NHS Greater Glasgow and Clyde	NICU	999	2258	3003	6260
Wishaw General Hospital	NHS Lanarkshire	NICU	1233	1759	2939	5931
Ninewells Hospital, Dundee	NHS Tayside	NICU	694	1417	2640	4751
Royal Alexandra Hospital, Paisley	NHS Greater Glasgow and Clyde	LNU	284	1193	2545	4022
Victoria Hospital, Kirkcaldy	NHS Fife	LNU	252	1390	1743	3385
Ayrshire Maternity Unit, Crosshouse	NHS Ayrshire & Arran	LNU	257	789	2562	3608
Forth Valley Royal Hospital	NHS Forth Valley	LNU	178	804	1985	2967
Raigmore Hospital, Inverness	NHS Highland	LNU	133	718	1397	2248
St John's Hospital, Livingston	NHS Lothian	SCU	15	495	1413	1923
Dumfries & Galloway Royal Infirmary	NHS Dumfries and Galloway	SCU	18	203	576	797
Borders General Hospital, Melrose	NHS Borders	SCU	4	74	738	816
South West ODN						
St Michael's Hospital	University Hospitals Bristol & Weston NHS Foundation Trust	NICU†	3405	2786	3176	9367
Southmead Hospital	North Bristol NHS Trust	NICU	1722	2328	3799	7849
Derriford Hospital	University Hospitals Plymouth NHS Trust	NICU	1264	1975	1505	4744
Gloucestershire Royal Hospital	Gloucestershire Hospitals NHS Foundation Trust	LNU	482	1865	3227	5574
Great Western Hospital	Great Western Hospitals NHS Foundation Trust	LNU	174	1050	2949	4173
Royal United Hospital	Royal United Hospitals Bath NHS Foundation Trust	LNU	275	1138	2270	3683
Royal Cornwall Hospital	Royal Cornwall Hospitals NHS Trust	LNU	287	1234	1761	3282
Musgrove Park Hospital	Somerset NHS Foundation Trust	LNU	283	818	2454	3555
Royal Devon & Exeter Hospital	Royal Devon University Healthcare NHS Foundation Trust	LNU	190	1146	1750	3086

Torbay Hospital	Torbay & South Devon NHS Foundation Trust	SCU	28	186	711	925
North Devon District Hospital	Royal Devon University Healthcare NHS Foundation Trust	SCU	14	104	607	725
Yeovil District Hospital	Somerset NHS Foundation Trust	SCU	13	116	461	590
Thames Valley & Wessex ODN						
John Radcliffe Hospital	Oxford University Hospitals NHS Foundation Trust	NICU†	3555	3930	4743	12228
Princess Anne Hospital	University Hospital Southampton NHS Foundation Trust	NICU†	3095	2757	3907	9759
Queen Alexandra Hospital	Portsmouth Hospitals University NHS Trust	NICU	2291	2113	4575	8979
Poole General Hospital	University Hospitals Dorset NHS Foundation Trust	LNU	313	1324	3040	4677
Stoke Mandeville Hospital	Buckinghamshire Healthcare NHS Trust	LNU	319	1206	3127	4652
Milton Keynes University Hospital	Milton Keynes University Hospital NHS Foundation Trust	LNU	328	1152	2632	4112
Wexham Park Hospital	Frimley Health NHS Foundation Trust	LNU	261	1200	2168	3629
Royal Berkshire Hospital	Royal Berkshire NHS Foundation Trust	LNU	223	1262	1955	3440
Royal Hampshire County Hospital	Hampshire Hospitals NHS Foundation Trust	SCU	140	468	1467	2075
Salisbury District Hospital	Salisbury NHS Foundation Trust	LNU	83	596	1311	1990
Basingstoke & North Hampshire Hospital	Hampshire Hospitals NHS Foundation Trust	SCU	91	426	1426	1943
St Richard's Hospital	University Hospitals Sussex NHS Foundation Trust	SCU	29	193	1315	1537
Dorset County Hospital	Dorset County Hospital NHS Foundation Trust	SCU	27	299	706	1032
St Mary's Hospital, Isle of Wight	Isle Of Wight NHS Trust	SCU	6	82	365	453
Wales						
University Hospital of Wales	Cardiff & Vale University LHB	NICU	2368	3511	3598	9477
The Grange University Hospital	Aneurin Bevan University LHB	NICU	1616	2259	3638	7513
Singleton Hospital	Swansea Bay University LHB	NICU	1563	2566	1909	6038
Glan Clwyd Hospital	Betsi Cadwaladr University LHB	LNU	410	1222	1432	3064
Prince Charles Hospital	Cwm Taf Morgannwg University LHB	SCU	59	690	1717	2466
Glangwili General Hospital	Hywel Dda University LHB	SCU	25	462	1288	1775
Wrexham Maelor Hospital	Betsi Cadwaladr University LHB	SCU	31	183	1528	1742

Ysbyty Gwynedd	Betsi Cadwaladr University LHB	SCU	47	247	1001	1295
Princess of Wales Hospital, Bridgend	Swansea Bay University LHB	SCU	31	276	893	1200
West Midlands ODN						
Birmingham Women's Hospital	Birmingham Women's & Children's NHS Foundation Trust	NICU†	3547	3355	5047	11949
University Hospital Coventry	University Hospitals Coventry & Warwickshire NHS Trust	NICU	2155	2346	4130	8631
New Cross Hospital	The Royal Wolverhampton NHS Trust	NICU	2223	2376	3357	7956
Birmingham Heartlands Hospital	University Hospitals Birmingham NHS Foundation Trust	NICU	1431	2106	5513	9050
Royal Stoke University Hospital	University Hospitals of North Midlands NHS Trust	NICU	1581	2184	3832	7597
Birmingham City Hospital	Sandwell & West Birmingham Hospitals NHS Trust	LNU	554	2177	3930	6661
Princess Royal Hospital, Telford	The Shrewsbury & Telford Hospital NHS Trust	LNU	414	1266	3773	5453
Russell's Hall Hospital	The Dudley Group NHS Foundation Trust	LNU	312	1234	3636	5182
Manor Hospital	Walsall Healthcare NHS Trust	LNU	314	1020	2959	4293
Worcestershire Royal Hospital	Worcestershire Acute Hospitals NHS Trust	LNU	255	1101	2516	3872
Good Hope Hospital	University Hospitals Birmingham NHS Foundation Trust	SCU	41	145	2593	2779
George Eliot Hospital	George Eliot Hospital NHS Trust	SCU	27	129	1430	1586
Warwick Hospital	South Warwickshire University NHS Foundation Trust	SCU	31	87	1437	1555
Hereford County Hospital	Wye Valley NHS Trust	SCU	23	162	1056	1241
Yorkshire & Humber ODN						
Leeds Neonatal Service (Leeds General Infirmary and St James's Hospital)	Leeds Teaching Hospitals NHS Trust	NICU†	3499	3600	4920	12019
Jessop Wing, Sheffield	Sheffield Teaching Hospitals NHS Foundation Trust	NICU†	2417	2802	5134	10353
Bradford Royal Infirmary	Bradford Teaching Hospitals NHS Foundation Trust	NICU	1741	2565	4972	9278
Hull Royal Infirmary	Hull University Teaching Hospitals NHS Trust	NICU†	2029	2439	3040	7508
Calderdale Royal Hospital	Calderdale & Huddersfield NHS Foundation Trust	LNU	321	1054	3734	5109

Pinderfields General Infirmary (Pontefract)	Mid Yorkshire Teaching NHS Trust	LNU	502	1014	2768	4284
Doncaster Royal Infirmary	Doncaster & Bassetlaw Teaching Hospitals NHS Foundation Trust	LNU	368	1016	2481	3865
Chesterfield Royal Hospital	Chesterfield Royal Hospital NHS Foundation Trust	LNU	156	797	2203	3156
Rotherham District General Hospital	The Rotherham NHS Foundation Trust	LNU	170	778	2019	2967
Diana Princess of Wales Hospital	Northern Lincolnshire & Goole NHS Foundation Trust	LNU	373	572	1581	2526
Barnsley District General Hospital	Barnsley Hospital NHS Foundation Trust	LNU	201	484	2240	2925
York District Hospital	York & Scarborough Teaching Hospitals NHS Foundation Trust	LNU	139	723	1787	2649
Scunthorpe General Hospital	Northern Lincolnshire & Goole NHS Foundation Trust	LNU	225	610	1250	2085
Airedale General Hospital	Airedale NHS Foundation Trust	SCU	16	52	1209	1277
Bassetlaw District General Hospital	Doncaster & Bassetlaw Teaching Hospitals NHS Foundation Trust	SCU	22	64	890	976
Harrogate District Hospital	Harrogate & District NHS Foundation Trust	SCU	14	80	672	766
Scarborough General Hospital	York & Scarborough Teaching Hospitals NHS Foundation Trust	SCU	10	53	484	547

14. Outlier management

The NNAP undertakes an annual process for the detection and management of outlier status for a selection of NNAP measures. The NNAP Outlier Management Policy for 2024 data is available at: https://www.rcpch.ac.uk/work-we-do/clinical-audits/nnap/data-flow#outlier-management-policy. The NNAP policy follows the process set out in the HQIP outlier guidance for England and Wales, available at: https://www.hqip.org.uk/outlier-management-for-national-clinical-audits/

In line with the policy, Table 18 details the neonatal units that have been identified as outliers at alarm level, by measure, for NNAP 2024 data, and provided the outlier status and the Trust response to the outlier management process.

Units with a ‡ symbol have known issues relating to data completeness for the 2024 dataset, which affects their results for some NNAP measures.

Table 18: Outlying neonatal units (alarm level only), by NNAP measure

Unit name	Trust/Health Board	Level	Response to outlier management process
Deferred cord clamping			
Cumberland Infirmary	North Cumbria Integrated Care NHS Foundation Trust	Alarm	Acknowledgement received, investigation being undertaken.
King's College Hospital	King's College Hospital NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Manor Hospital	Walsall Healthcare NHS Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Poole General Hospital	University Hospitals Dorset NHS Foundation Trust	Alarm	Acknowledgement received, improvement work already underway, further action plan to be developed.
Queen Alexandra Hospital	Portsmouth Hospitals University NHS Trust	Alarm	Acknowledgement received, action plan developed.
Royal Derby Hospital	University Hospitals of Derby & Burton NHS Foundation Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Temperature on admission			
Evelina London Children's Hospital	Guy's & St Thomas' NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting.

Unit name	Trust/Health Board	Level	Response to outlier management process
Leicester Neonatal Service (Leicester Royal Infirmary & Leicester General Hospital)	University Hospitals of Leicester NHS Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Ninewells Hospital, Dundee	NHS Tayside	Alarm	Acknowledgement received, investigation will be undertaken.
Princess Anne Hospital	University Hospital Southampton NHS Foundation Trust	Alarm	Acknowledgement received, investigation and action plan development underway.
Princess Royal University Hospital, Farnborough	King's College Hospital NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting. PRUH have undertaken independent analysis to provide local assurance.
University College London Hospital	University College London Hospitals NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting. UCLH have undertaken independent analysis to provide local assurance.
Wishaw General Hospital	NHS Lanarkshire	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
ROP screening			
Evelina London Children's Hospital	Guy's & St Thomas' NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting.
George Eliot Hospital	George Eliot Hospital NHS Trust	Alarm	Acknowledgement received, investigation and action plan development underway.
Newham University Hospital	Barts Health NHS Trust	Alarm	Acknowledgement received, investigation and action plan development underway.
Royal Sussex County Hospital	University Hospitals Sussex NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Salisbury District Hospital	Salisbury NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.

Unit name	Trust/Health Board	Level	Response to outlier management process
St John's Hospital, Livingston	NHS Lothian	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Breastmilk feeding in the first two days of life			
King's Mill Hospital	Sherwood Forest Hospitals NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Leicester Neonatal Service (Leicester Royal Infirmary and Leicester General Hospital)	University Hospitals of Leicester NHS Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Manor Hospital	Walsall Healthcare NHS Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Newham University Hospital	Barts Health NHS Trust	Alarm	Acknowledgement received, investigation and action plan development underway.
North Middlesex University Hospital	North Middlesex University Hospital NHS Trust	Alarm	Acknowledgement received.
Nottingham City Hospital	Nottingham University Hospitals NHS Trust	Alarm	Acknowledgement received, investigation being undertaken.
Nottingham University Hospital (QMC)	Nottingham University Hospitals NHS Trust	Alarm	Acknowledgement received, investigation being undertaken.
Pinderfields General Infirmary (Pontefract)	Mid Yorkshire Teaching NHS Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Royal Derby Hospital	University Hospitals of Derby & Burton NHS Foundation Trust	Alarm	Acknowledgement received, investigation will be undertaken.
University College London Hospital	University College London Hospitals NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting. UCLH NHS FT have undertaken independent analysis to provide local assurance.
Whiston Hospital	Mersey & West Lancashire Teaching Hospitals NHS Trust	Alarm	Acknowledgement received, investigation being undertaken.
Wishaw General Hospital	NHS Lanarkshire	Alarm	Acknowledgement received, investigation undertaken and action plan developed.

Unit name	Trust/Health Board	Level	Response to outlier management process
Follow up at two years of age			
Birmingham Women's Hospital	Birmingham Women's & Children's NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Harrogate District Hospital	Harrogate & District NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
The Royal London Hospital	Barts Health NHS Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
IVH missing data			
Cumberland Infirmary	North Cumbria Integrated Care NHS Foundation Trust	Alarm	Acknowledgement received, investigation being undertaken.
Evelina London Children's Hospital	Guy's & St Thomas' NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting.
Queen Elizabeth Hospital, Woolwich	Lewisham & Greenwich NHS Trust	Alarm	Confirmation of receipt received from the Clinical Lead, advising that further investigation is being undertaken. However, no further acknowledgement received from the CEO or MD.
Queen's Hospital, Romford	Barking, Havering & Redbridge University Hospitals NHS Trust	Alarm	Acknowledgement received.
University College London Hospital	University College London Hospitals NHS Foundation Trust	Alarm	Acknowledgement received, outlier status was expected due to the implementation of a new EPRS and challenges with re-establishing the required data follow for NNAP reporting. UCLH NHS FT have undertaken independent analysis to provide local assurance.
University Hospital Lewisham	Lewisham & Greenwich NHS Trust	Alarm	Confirmation of receipt received from the Clinical Lead, advising that further investigation is being undertaken. However, no further acknowledgement received from the CEO or MD.
Bronchopulmonary dysplasia			
Royal Stoke University Hospital	University Hospitals of North Midlands NHS Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
Non-invasive breathing support			

Unit name	Trust/Health Board	Level	Response to outlier management process
Derriford Hospital	University Hospitals Plymouth NHS Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Ipswich Hospital	East Suffolk & North Essex NHS Foundation Trust	Alarm	Acknowledgement received, investigation will be undertaken.
Queen Alexandra Hospital	Portsmouth Hospitals University NHS Trust	Alarm	Acknowledgement received, action plan developed.
Queen's Hospital, Romford	Barking, Havering & Redbridge University Hospitals NHS Trust	Alarm	Response received, outlier status not acknowledged. The NNAP team continue to liaise with the Clinical Lead to review their data.
Russell's Hall Hospital	The Dudley Group NHS Foundation Trust	Alarm	Acknowledgement received, investigation undertaken and action plan developed.
The Grange University Hospital	Aneurin Bevan University Local Health Board	Alarm	Acknowledgement received, investigation will be undertaken.
Whipps Cross University Hospital	Barts Health NHS Trust	Alarm	Acknowledgement received, investigation will be undertaken.

15. Glossary of terms

BAPM	The British Association for Perinatal Medicine improves standards of perinatal care by supporting all those involved in perinatal care to optimise their skills and knowledge, promote high quality, safe and innovative practice, encourage research, and speak out for the needs of babies and their families. https://www.bapm.org/
Bliss	Bliss is a national charity for babies born premature or sick. It exists to give every baby born premature or sick in the UK the best chance of survival and quality of life. Bliss supports families, campaigns for change, and supports professionals, and enables life-changing research. https://www.bliss.org.uk
BPD	Bronchopulmonary dysplasia
BSI	Bloodstream infection
cPVL	Cystic periventricular leukomalacia
DCC	Deferred Cord Clamping
GIRFT	Getting It Right First Time (GIRFT) is a national programme designed to improve the treatment and care of patients through in-depth review of services, benchmarking, and presenting a data-driven evidence base to support change.
HQIP	The Healthcare Quality Improvement Partnership (HQIP) aims to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. https://www.hqip.org.uk/
HRG	Healthcare resource group: Standard groupings of clinically similar treatments which use common levels of healthcare resource.
Hyperthermia	A body temperature more than 37.5°C
Hypothermia	A body temperature less than 36.5°C
IVH	Intraventricular haemorrhage
LNU	Local neonatal units (LNUs) provide neonatal care for their own catchment population, except for the sickest babies. They provide all categories of neonatal care, but they transfer babies who require complex or longer-term intensive care to a NICU, as they are not staffed to provide longer-term intensive care. Most babies over 27 weeks gestational age will usually receive their full care, including short periods of intensive care, within their LNU. Some networks have agreed variations on this policy, due to local requirements. Some LNUs provide high dependency care and short periods of intensive care for their network population. LNUs may receive transfers

	from other neonatal services in the network if these fall within their agreed work pattern.[44]
MatNeoSIP	The Maternity and Neonatal Safety Improvement Programme (MatNeoSIP), formerly known as the Maternal and Neonatal Health Safety Collaborative, is the programme supporting improvement in the quality and safety of maternity and neonatal units across England. https://www.england.nhs.uk/mat-transformation/maternal-and-neonatal-safety-collaborative/
MBRRACE-UK	Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK. https://www.npeu.ox.ac.uk/mbrrace-uk
NCAPOP	National Clinical Audit and Patient Outcomes Programme
NEC	Necrotising enterocolitis
NHSE	NHS England
NICE	National Institute for Health and Care Excellence
NICU	Neonatal intensive care units (NICUs) are sited alongside specialist obstetric and feto-maternal medicine services and provide the whole range of medical neonatal care for their local population, along with additional care for babies and their families referred from the neonatal network. Many NICUs are co-located with neonatal surgery services and other specialised services. Medical staff in a NICU should have no clinical responsibilities outside the neonatal and maternity services.[44]
NMPA	The National Maternity and Perinatal Audit is a national clinical audit of NHS maternity services in England, Scotland and Wales. The audit, commissioned by HQIP, is led by the Royal College of Obstetricians and Gynaecologists in partnership with the Royal College of Midwives (RCM, the Royal College of Paediatrics and Child Health (RCPCH) and the London School of Hygiene and Tropical Medicine (LSHTM). www.maternityaudit.org.uk
NNAP	National Neonatal Audit Programme
Normothermia	A body temperature between 36.5°C and 37.5°C
ODN	Operational delivery network: In England, managed clinical networks for the coordination of neonatal critical care.
Outlier	A result that is statistically above or below expected performance. The NNAP defines outliers in four categories: • outstanding: three or more standard deviations above expected performance • excellent: between two and three standard deviations above expected performance • alert: between two and three standard deviations below expected performance • alarm: three or more standard deviations below expected performance.

[44] Department of Health. *Toolkit for high quality neonatal services*. 2009. Available from https://webarchive.nationalarchives.gov.uk/ukgwa/20100604134939/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

PERIPrem	Perinatal Excellence to Reduce Injury in Premature Birth https://www.weahsn.net/our-work/transforming-services-and-systems/periprem/
PHVD	Post haemorrhagic ventricular dilation
PReCePT	The Prevention of Cerebral Palsy in PreTerm Labour. https://www.weahsn.net/our-work/transforming-services-and-systems/precept/
Preterm	Preterm is defined by the World Health Organisation as a baby born alive before 37 weeks of pregnancy are completed. This definition is sub-categorised by gestational age: • extremely preterm (less than 28 weeks) • very preterm (28 to 32 weeks) • moderate to late preterm (32 to 37 weeks).
QI	Quality improvement
RCPCH	The Royal College of Paediatrics and Child Health (RCPCH) was founded in 1996 and now has over 17,000 members across the world. The RCPCH plays a major role in postgraduate medical education, professional standards, research and policy. https://www.rcpch.ac.uk
RCOphth	Royal College of Ophthalmologists
ROP	Retinopathy of prematurity
SCU	Special care units (SCUs) provide special care for their own local population. Depending on arrangements within their neonatal network, they may also provide some high dependency services. In addition, SCUs provide a stabilisation facility for babies who need to be transferred to a neonatal intensive care unit (NICU) for intensive or high dependency care, and they also receive transfers from other network units for continuing special care.[45]

[45] Department of Health. *Toolkit for high quality neonatal services*. 2009. Available from https://webarchive.nationalarchives.gov.uk/ukgwa/20100604134939/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845