

NNAP

National Neonatal
Audit Programme

✦ RCPCH Audits

National Neonatal Audit Programme (NNAP) Summary report on 2022 data



Photo courtesy of Maddy and Baljit Singh



HQIP

Healthcare Quality
Improvement Partnership

✦ RCPCH

Royal College of
Paediatrics and Child Health

Leading the way in Children's Health



Summary report on 2022 data

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Introduction	3
Results at a glance	4
Key messages & recommendations	6
1. Outcomes of neonatal care	6
2. Optimal perinatal care	7
3. Parental partnership in care	8
4. Neonatal nurse staffing	9
5. Care processes	9
Summary results by network	10



Front cover photo:

“ This is the first picture of Tejveer, Agamjot and Balraaj all together with Daddy. It was amazing to see their breathing synchronise in seconds. ”

Maddy Singh – Mother



NNAP Governance

Details of the NNAP governance structure and membership of the NNAP Project Team, Project Board and Methodology and Dataset Group are available at:

www.rcpch.ac.uk/work-we-do/quality-improvement-patient-safety/national-neonatal-audit-programme/governance-delivery

Introduction

Established in 2006, the National Neonatal Audit Programme (NNAP) is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and delivered by the Royal College of Paediatrics and Child Health (RCPCH).

It assesses whether babies admitted to neonatal units receive consistent high-quality care in relation to the NNAP audit measures that are aligned to a set of professionally agreed guidelines and standards. The NNAP also identifies variation in the provision of neonatal care at local unit, regional network and national levels and supports stakeholders to use audit data to stimulate improvement in care delivery and outcomes.

The audit reports key outcomes of neonatal care, measures of optimal perinatal care, maternal breastmilk feeding, parental partnership, neonatal nurse staffing levels, and other important care processes.

This report summarises the key messages and national recommendations developed

by consensus by the NNAP Project Board and Methodology and Dataset Group, based on NNAP data relating to babies admitted to neonatal care in England and Wales between 1 January and 31 December 2022, and Scotland between 1 April 2022 and 31 December 2022, unless otherwise stated.

Scottish services re-joined the NNAP from 1 April 2022 following a two-year absence from reporting, and because of information governance delays, they were unable to receive data quality and completeness reports through the audit year to support data review and cleaning activities. Therefore, caution should be exercised over the interpretation of results from units in Scotland and comparisons with previous years.



Further information:

Further information about the background, aims, and scope of the NNAP is available at: www.rcpch.ac.uk/about-nnap

Full results:

Full results at unit and network level, interactive reporting tools and unit posters are available on NNAP Online at: nnap.rcpch.ac.uk

Line of Sight Table:

The Line of Sight Table (2022 data) describes the evidence base for the recommendations made in this report, and is available at: www.rcpch.ac.uk/nnap-report-2022-data

Extended analysis report:

The NNAP 2022 data extended analysis report provides results by NNAP measure by unit type, by neonatal network, and for England, Scotland and Wales combined.

There is also a summary of findings for each audit measure, recommended next steps for services seeking to make improvements and links to further resources and case studies. This is available at:

www.rcpch.ac.uk/nnap-report-2022-data

Results at a glance

The National Neonatal Audit Programme (NNAP) assesses whether babies admitted to neonatal units receive consistent high-quality care and identifies areas for improvement.

This poster summarises the results based on NNAP data relating to babies admitted to neonatal care between January and December 2022[†], unless otherwise stated. Results displayed in the horizontal pink bars show the range of neonatal network proportions (lowest and highest) and the pink circle shows the overall audit (England, Scotland and Wales) proportion.

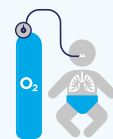
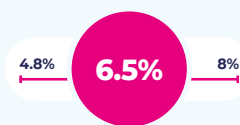
Outcomes of neonatal care



Mortality

6.5% of babies born at less than 32 weeks* died before discharge home.

*born July 2019 to June 2022



Bronchopulmonary dysplasia

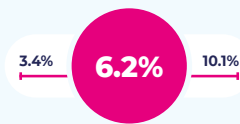
39.7% of babies born at less than 32 weeks* developed BPD or died.

*discharged January 2020 to December 2022



Necrotising enterocolitis

6.2% of babies born at less than 32 weeks developed necrotising enterocolitis.



Bloodstream infection

5.4% of babies born at less than 32 weeks had growth of a clearly pathogenic organism.



Preterm brain injury - Intraventricular haemorrhage (IVH)

7.5% of babies born at less than 32 weeks experienced IVH. Missing data was high (13.9%).



Preterm brain injury - cystic periventricular leukomalacia (cPVL)

2.6% of babies born at less than 32 weeks experienced cPVL. Missing data was high (17.2%).

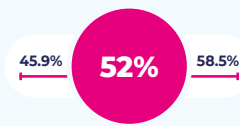


Optimal perinatal care



Antenatal steroids

52% of mothers of babies born at less than 34 weeks were given a full course of antenatal steroids in the week prior to delivery.



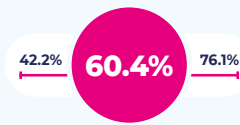
Born in a centre with a NICU

79% of babies born at less than 27 weeks were born in a centre with a NICU on site.



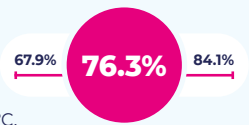
Deferred cord clamping

60.4% of babies born at less than 34 weeks had their cord clamped at or after one minute.



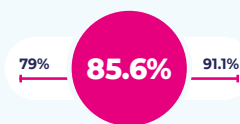
Temperature on admission

76.3% of babies born at less than 32 weeks were admitted with a temperature within the recommended range of 36.5°C-37.5°C.



Antenatal magnesium sulphate

85.6% of mothers of babies born at less than 30 weeks were given antenatal magnesium sulphate.



Breastmilk feeding in first 2 days of life

49% of babies born at less than 34 weeks received their mother's milk in the first 2 days of life.



[†]For Scotland, results relate to babies admitted between April and December 2022.

Parental partnership in care

WITHIN
14
DAYS



Breastmilk feeding at 14 days of life

79% of babies born at less than 34 weeks received their mother's milk at 14 days of life.

71.6% **79%** 87.6%

AT
DISCHARGE



Breastmilk feeding at discharge

62.9% of babies born at less than 34 weeks received their mother's milk at discharge.

48.6% **62.9%** 79.3%



Parent consultation within 24 hours

95.9% of parents had a documented consultation with a senior member of the neonatal team within 24 hours of their baby's admission.

93.7% **95.9%** 98%



Parent inclusion in consultant ward rounds

47.2% of baby care days had a consultant-led ward round with at least one parent included.

36.8% **47.2%** 60.3%

Care processes and nurse staffing



On-time screening for retinopathy of prematurity (ROP)

69% of eligible babies were screened on time for ROP.

49.8% **69%** 77.3%

I am
2



Medical follow up at two years

74.4% of babies born at less than 30 weeks had a documented medical follow up at the right time.

58.8% **74.4%** 83.4%



Non-invasive breathing support

47.6% of babies born at less than 32 weeks received only non-invasive breathing support in the first seven days of life.

39.5% **47.6%** 58.3%



Neonatal nurse staffing

71.1% of nursing shifts were staffed according to recommended levels.

56.8% **71.1%** 85.3%

Further information and resources

For neonatal services, neonatal networks and NHS Health Boards/Trusts

Full annual results

Full annual results at neonatal unit and network levels, interactive reporting tools and unit posters are available on NNAP Online at: www.nnap.rcpch.ac.uk

Extended Analysis Report

The NNAP 2022 Data: Extended Analysis Report, providing in-depth results and a summary of findings by audit measure, along with full national recommendations, local quality improvement recommendations and links to case studies and useful resources is available at: www.rcpch.ac.uk/nnap-report-2022-data

For parents and families

Your Baby's Care Guide 2022

Parents and families can find more information about the NNAP and 2022 results in **Your Baby's Care**, a guide to the NNAP, while **NNAP Online** provides more in-depth results for each neonatal unit and network in England, Scotland and Wales.

Your Baby's Care: www.rcpch.ac.uk/your-babys-care
NNAP Online: www.nnap.rcpch.ac.uk

How we use information



To find out more about how we use information about babies experiencing neonatal care and their parents, visit www.rcpch.ac.uk/your-babys-information or scan the QR code with your phone to read our leaflet Your Baby's Information.

Key messages & recommendations

1 Outcomes of neonatal care

- Mortality varied between neonatal networks; from 4.8% to 8%. The difference in the proportion of babies born between 24 and 31 weeks gestational age who were admitted to a neonatal unit and die before discharge home represents major unwarranted variation. Differences in the measured background characteristics of babies cared for by networks does not fully explain this variation.
- For other adverse outcomes, such as bronchopulmonary dysplasia (BPD), necrotising enterocolitis (NEC), and bloodstream infection, variation between neonatal units and networks persists from previous years, even when measured background characteristics are accounted for. There is evidence of a significant upward trend ($p < 0.001$) in the overall proportion of babies experiencing BPD or death (2015-2017 – 36.3%, 2020-2022 – 39.7%), rather than the desired decrease over time.
- In 2022, 71.8% (127/177) of NNAP neonatal unit clinical leads were able to assure their NNAP data on preterm brain injury (intraventricular haemorrhage (IVH) grades 3 and 4, cystic periventricular leukomalacia and post-haemorrhagic ventricular dilatation), an increase from 66.3% in 2021. Proportions of missing 2022 data were high; 13.9% for IVH 3 or 4, and 17.2% for cPVL, and were variable between neonatal networks. Enhanced completeness and quality of data is required so that outcomes of neonatal care can be described more effectively both locally and nationally, and to inform reporting against the national ambition to reduce rates of brain injury during, or soon after, birth.
- The number of babies born at 22 weeks gestation and admitted annually to neonatal care has risen 6-fold between July 2017 and June 2022 (from 15 to 90). The proportion surviving to 44 weeks postmenstrual age (PMA) over this period was 27.2% (65 of 239). New guidance recommending active life sustaining treatment, based on a risk assessment, at the lower gestational ages was published by the British Association of Perinatal Medicine (BAPM) in October 2019¹. The BAPM guidance describes a higher rate of survival to one year (54%) than the short term survival currently seen in the audit (27.2%), among babies admitted for intensive care.



The NNAP makes the following national recommendation:

1. **Neonatal networks** should review their rates of adverse outcomes (mortality, BPD, NEC, bloodstream infection and preterm brain injury), and develop locally prioritised action plans to respond to these results with their constituent **neonatal units**, and:
 - share these with **Neonatal Network Boards, Local Maternity and Neonatal System (LMNS) Boards** (and devolved nation equivalents), and with **Trust/Health Board Governance Boards** via ward-to-board **Maternity or Neonatal Safety Champions**.
 - work with their constituent **neonatal units** to ensure that all services have a plan in place to validate their data entry for outcomes such as necrotising enterocolitis, bloodstream infection, and preterm brain injury.

1. BAPM. Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation: A Framework for Practice. October 2019. Available at: https://hubble-live-assets.s3.amazonaws.com/bapm/file_asset/file/30/Extreme_Preterm_28-11-19_FINAL.pdf

Key messages & recommendations

2

Optimal perinatal care

- Adherence to timely administration of a full course of antenatal steroids is highly variable, ranging from 45.9% to 58.5% across neonatal networks. Overall, 52% (5,861 of 11,272) of mothers who delivered a baby between 23 and 33 weeks gestational age received a full course of antenatal steroids within one week prior to delivery. This reflects the challenge of delivering antenatal steroids in a timely fashion to maximise clinical benefit. It also illustrates the challenges of measuring timely administration of steroids without concurrent description of the number of women treated with antenatal steroids through maternity data.
- In 2022, 76.3% (5,157 of 6,755) of babies had a temperature within the normal range that was measured on time. There has been a sustained year on year improvement in the proportion of babies admitted with a normal temperature, from 58.1% in 2015². There has been no associated significant increase in the proportion of babies admitted with hyperthermia³.
- In 2022, 60.4% (7,768 of 12,871) of babies born at less than 34 weeks gestation had deferred cord clamping (DCC). In 2021 the proportion was 43%, although the 2021 DCC measure only included babies at less than 32 weeks gestation. When 2022 data is analysed only including babies born at less than 32 weeks gestation in line with the 2021 analysis, the proportion for 2022 is 55.4% compared to 43% in 2021; indicating a 12% improvement in the delivery of DCC over the past year. Variation between neonatal networks remains wide – from 42.2% to 76.1%.

2. Cochran-Armitage test for trend, $P < 0.001$

3. Cochran-Armitage test for trend, $P = 0.06$

4. Kirkup, B. [Reading the Signals: Maternity and neonatal services in East Kent – the Report of the Independent Investigation](#).

5. NHS England. [Saving Babies Lives Care Bundle version 3](#) (England).

6. Scottish Patient Safety Programme, Maternity and Children Quality Improvement Collaborative. [Preterm Perinatal Wellbeing Package](#).

7. Wales Maternity & Neonatal Network. [PERIPrem Cymru](#).



The NNAP makes the following national recommendations:

2. **NHS England, Scottish and Welsh Governments** should ensure that maternity data flows describe the administration of antenatal steroids, and other perinatal optimisation interventions, and that maternity and perinatal data are linked nationally in order to:
 - understand rates of timely exposure of preterm infants to perinatal optimisation interventions in the context of the number of women treated with steroids, magnesium sulphate and who require antenatal transfer, regardless of whether they go on to deliver significantly preterm,
 - improve reporting of neonatal outcomes of maternity care, in line with the recommendation made in 'Reading the signals'⁴ and to support national improvement initiatives.^{5,6,7}
3. **NHS England, Scottish and Welsh Governments** should ensure that pre-term birth is optimally managed by a multidisciplinary team by:
 - ensuring that preterm birth lead teams (including an obstetrician, neonatologist, neonatal nurse and midwife) are commissioned at all neonatal services,
 - requiring that **Integrated Care Systems (ICS), Health Boards in Scotland and Local Health Boards in Wales** ensure that all neonatal services take a perinatal team approach to design and delivery of care that includes parents with diverse backgrounds and diverse experiences of neonatal care,
 - ensuring that **perinatal teams** conduct reviews of preterm birth cases to identify opportunities for improvement to maximise quality of care, and the delivery of the interventions identified by national improvement initiatives.^{5,6,7}

Key messages & recommendations

3

Parental partnership in care

- In 2022, the proportion of babies receiving breastmilk feeding at discharge home ranged from 48.6% to 79.3% between neonatal networks. Over time, there has been no overall change in this measure. For the first time in 2022, the NNAP also reports the proportion of babies receiving breastmilk within the first two days of life; this ranges from 34% to 76.7% between neonatal networks. Improving rates of initiation of breastmilk feeding may maximise the early benefits of breastmilk and increase the chances of establishing longer term breastmilk feeding.
- There is wide variation at all levels of neonatal unit and between networks in the proportion of consultant ward rounds with parental involvement. Parents were included in ward rounds on 47.2% (269,706 of 571,415) of care days where a ward round happened on that day, ranging from 36.8% to 60.3% between neonatal networks. A ward round is recorded as not taking place on 10% (85,408 of 854,944) of baby care days, and data was missing for 23.2% (198,121 of 854,944) of baby care days.
- The proportion of neonatal admissions where a consultation with parents took place within 24 hours of admission has remained static over the past five years, with parents having a consultation with a senior member of the team for 95.9% (52,957 of 55,231) of admissions in 2022.



The NNAP makes the following national recommendation:

4. All **Royal Colleges** associated with preterm perinatal care (the **Royal College of Paediatrics and Child Health**, the **Royal College of Obstetricians and Gynaecologists**, the **Royal College of Nursing** and the **Royal College of Midwives**) should include a focus on the importance of early breastmilk feeding, and guidance on how to support parents to establish and sustain breastmilk feeding, in training relating to intrapartum care, fetal medicine care and perinatal care.

Key messages & recommendations

4

Neonatal nurse staffing

- The proportion of neonatal nurse shifts staffed according to recommended levels in 2022 across England, Wales and Scotland is 71.1% - 86,118 of 121,203 (England and Wales only – 71.1%), having fallen for a second year in a row (2021 – 73.9%, 2020 – 78.6% - England and Wales only). The continuing decline in neonatal nurse staffing levels is a matter of serious concern to those providing and commissioning neonatal services, given its association with increased mortality.⁸



The NNAP makes the following national recommendation:

- The **UK Government, Welsh Government** and **Scottish Government** should consider ways to ensure that the implementation of medium-to-long-term NHS-wide workforce plans (such as the NHS Long Term Workforce Plan in England⁹) deliver the recruitment, training, development and retention of neonatal nurses to improve the proportion of shifts with sufficient staffing and therefore improve survival rates and the quality of care in neonatal units.

Care processes

5

- The NNAP introduced a new measure for 2022 in order to identify any variation in the exclusive use of non-invasive breathing support, which is recommended by NICE for support of the least mature infants¹⁰. The proportion of babies in NICUs receiving only non-invasive breathing support in the first 7 days varies from 16.5% to 71.4%, and analysis shows this variation is unexplained by gestational age mix.
- The NNAP reports adherence to the updated UK screening for retinopathy of prematurity (ROP) guideline, published in March 2022, for the first time this year. Overall, 69% (3,509 of 5,083) of eligible babies were screened appropriately according to the new guideline, a proportion that should not be compared to previously published audit results which reported against the previous ROP guideline. The variation between neonatal networks in on-time screening is wide (49.8% to 77.3%) and concerning, as it was under the previous guideline.

8. Hamilton KE, Redshaw ME, Tarnow-Mordi W. Nurse staffing in relation to risk-adjusted mortality in neonatal care. Arch Dis Child Fetal Neonatal Ed. 2007. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2675478/>

9. NHS England. NHS Long Term Workforce Plan. 30 June 2023. Available at: <https://www.england.nhs.uk/long-read/accessible-nhs-long-term-workforce-plan/>

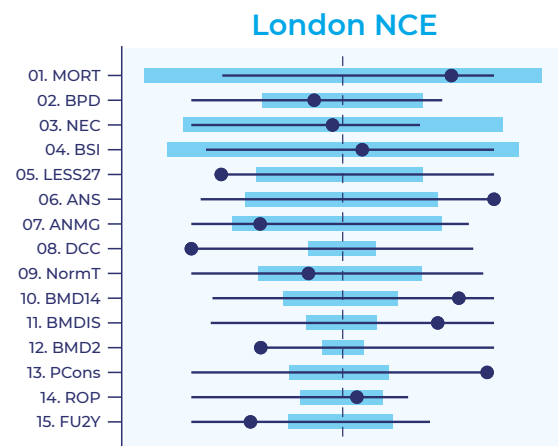
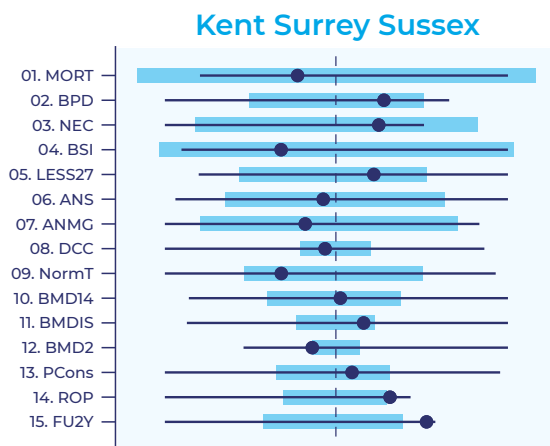
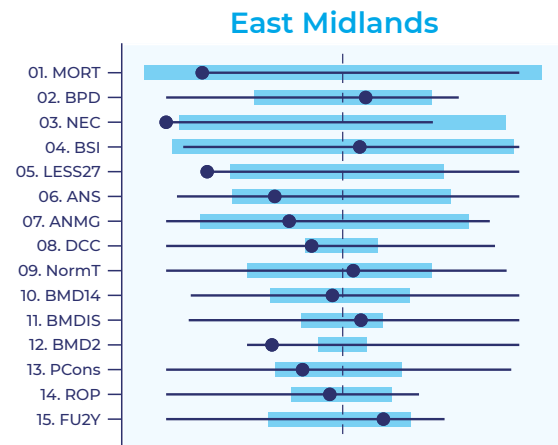
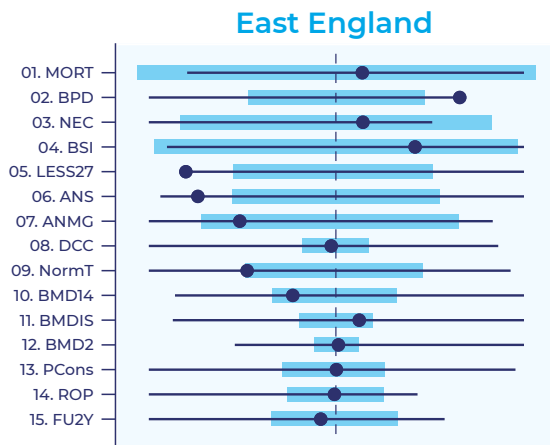
10. NICE Quality Standard [QS193]. Specialist neonatal respiratory care for babies born preterm. 15 July 2020. Available at: <https://www.nice.org.uk/guidance/qs193>

Summary results by network

The spine plots below give an overview of overall neonatal network performance across NNAP measures and support the management of quality improvement priorities.

Performance is shown with a blue dot positioned on a horizontal line for each measure. The horizontal line extends from the lowest to the highest value for that measure among all networks.

Proportions are scaled so the overall mean for each measure is aligned along a single vertical line, with better performance oriented to the right-hand side. The light blue bar indicates two standard deviations either side of the overall proportion. The measures of NEC, BSI, BPD or death and mortality are represented by treatment effect (see the extended analysis report for further information, available at: www.rcpch.ac.uk/nnap-report-2022-data)



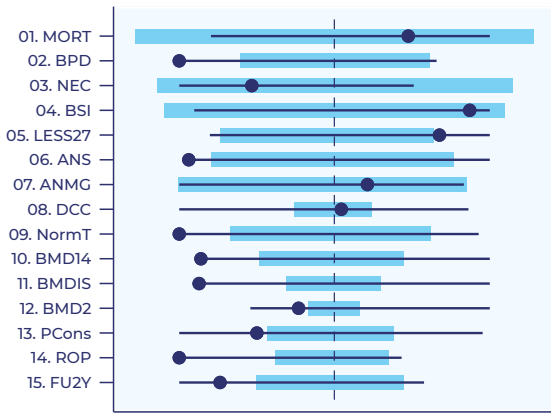
KEY:

MORT: Treatment effect of mortality
BPD: Treatment effect of bronchopulmonary dysplasia/death
NEC: Treatment effect of necrotising enterocolitis
BSI: Treatment effect of bloodstream infection
LESS27: Birth in a centre with a NICU

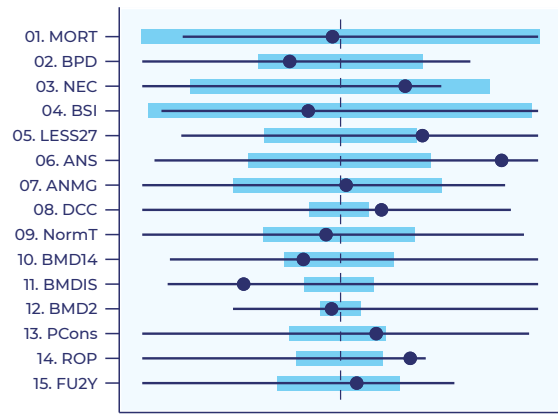
ANS: Antenatal steroids
ANMG: Antenatal magnesium sulphate
DCC: Deferred cord clamping
NormT: Normal temperature
BMD14: Breastmilk day 14

BMDIS: Breastmilk at discharge
BMD2: Breastmilk at day 2
PCons: Parental consultation in 24h
ROP: Retinopathy of prematurity
FU2Y: Two year follow up

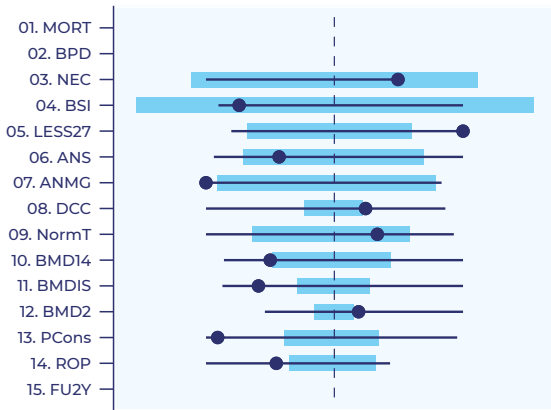
Northern



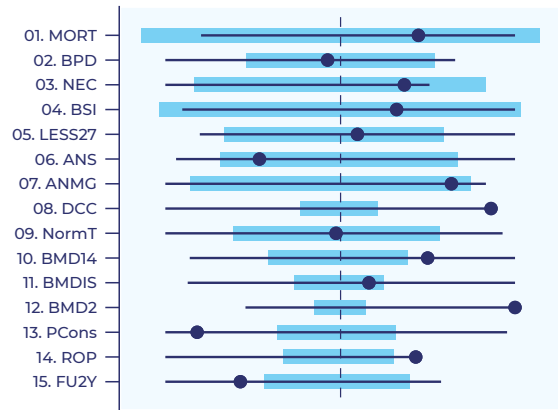
North West



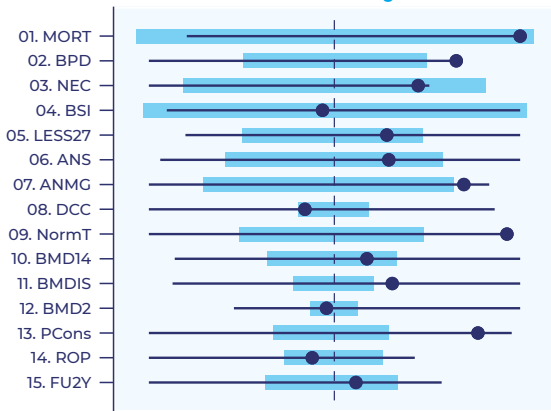
Scotland



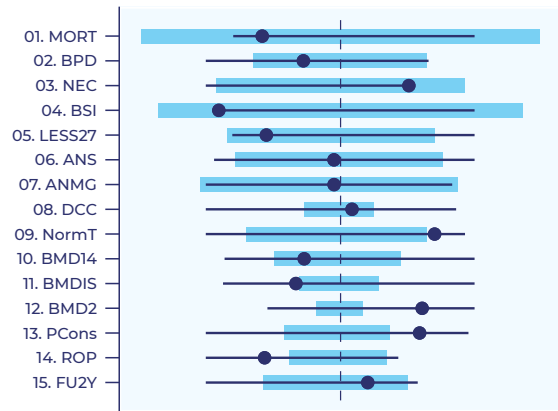
South West



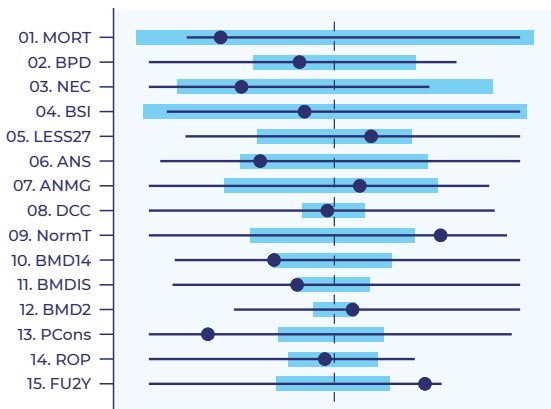
Thames Valley Wsx



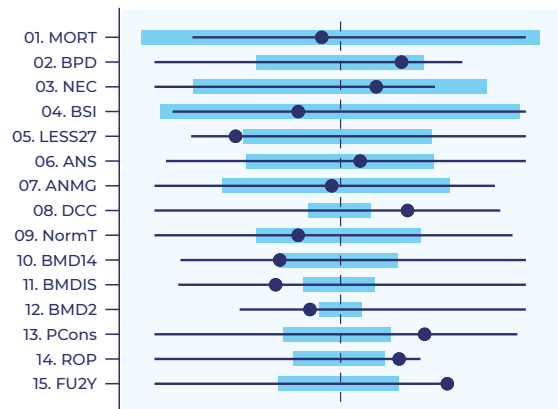
Wales



West Midlands



Yorkshire Humber



FULL RESULTS:

Full results at unit and network level, including unit level spine plots are available on NNAP Online at: <https://nnap.rcpch.ac.uk/>

National Neonatal Audit Programme

Summary report
on 2022 data, v2



The National Neonatal Audit Programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices.

Its aim is 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 holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies. www.hqip.org.uk/national-programmes



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