Improving perinatal outcomes; how are we doing?

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The National Ambition

November 2015

The ambition is to reduce the number of stillbirths, neonatal deaths, maternal deaths and brain injuries that occur during or soon after birth by 20% by 2020 and 50% by 2030.

Jeremy Hunt aims to cut number of stillbirths and neonatal deaths

UK ranked 33 out of 35 high-income countries in 2011 study on stillbirths, and has one of highest rates in Europe

November 2017

"Through the Long Term Plan, the NHS will accelerate action to achieve 50% reductions in stillbirth, maternal mortality, neonatal mortality and serious brain injury by 2025".

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How are we doing?

- Target neonatal mortality is 1.5 deaths per live births by 2025.
  - reduced 30% 2010-21
  - 220 fewer neonatal deaths required to meet ambition
- Target stillbirth mortality is 2.6 deaths per live births by 2025.
  - Reduced 21% 2010-21
  - 896 fewer stillbirths required to meet ambition

ONS, Vital Statistics in the UK

SBLCB v1: 2016
SBLCB v2: 2019
SBLCBv3: 2023

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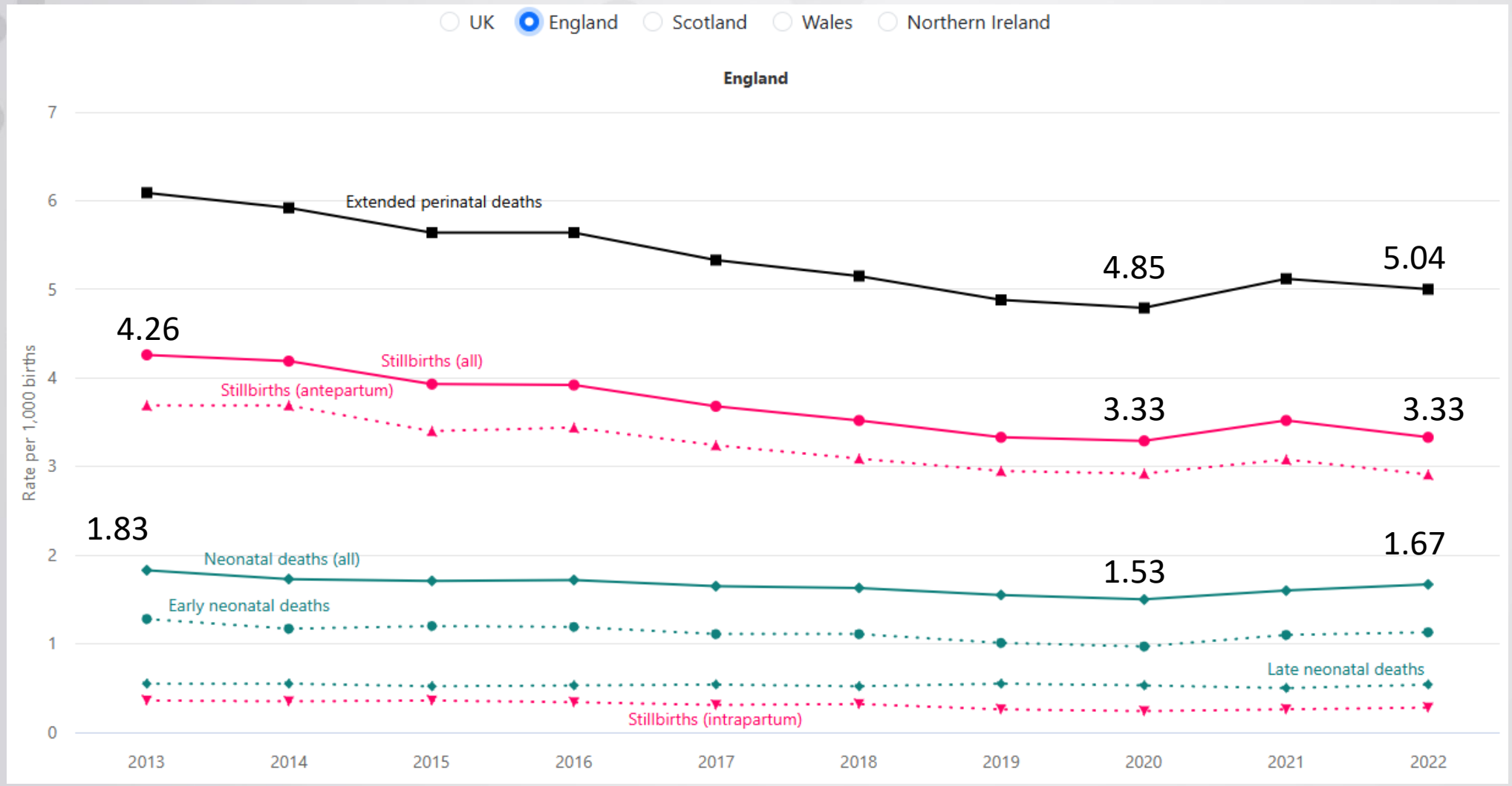
How are we doing?

MBRRACE-UK perinatal mortality surveillance

UK perinatal deaths of babies born in 2022

State of the nation report



Extended perinatal deaths
Per 1,000 total births

Stillbirths (all)
per 1,000 total births

Stillbirths (antepartum)
per 1,000 total births

Neonatal deaths
per 1,000 live births

Stillbirths (intrapartum)
per 1,000 total births

22%

17%

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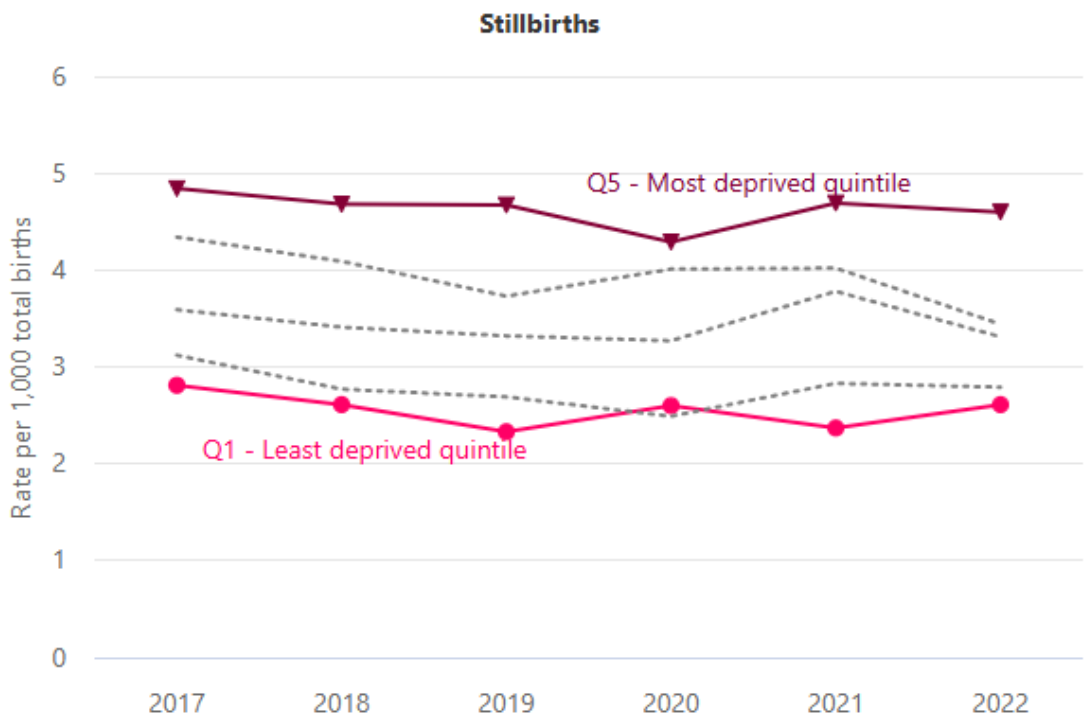
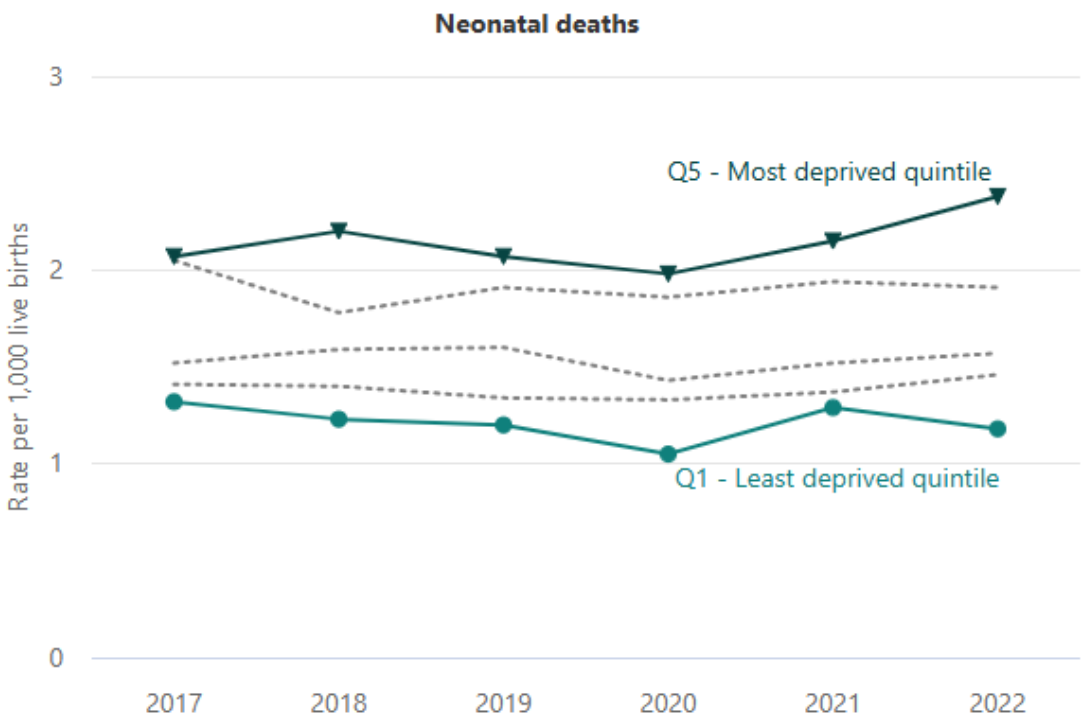
Stillbirths and Neonatal Mortality - Deprivation

Figure 4: Stillbirth and neonatal mortality rates by mothers' socio-economic deprivation quintile of residence: United Kingdom, for births in 2017 to 2022





Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey.

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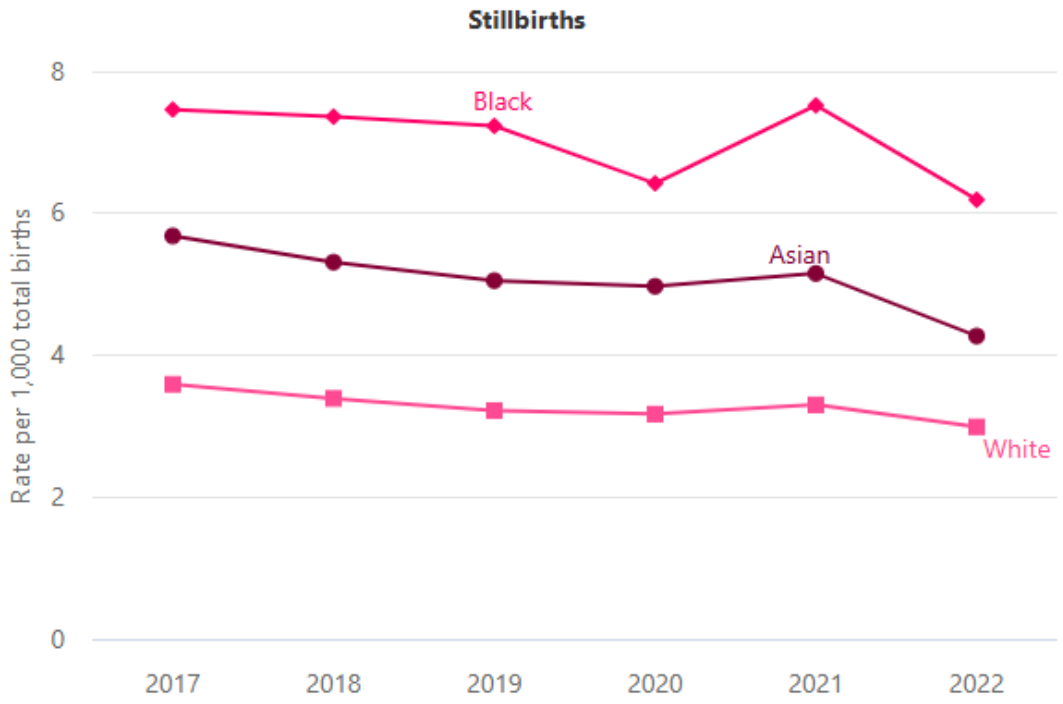
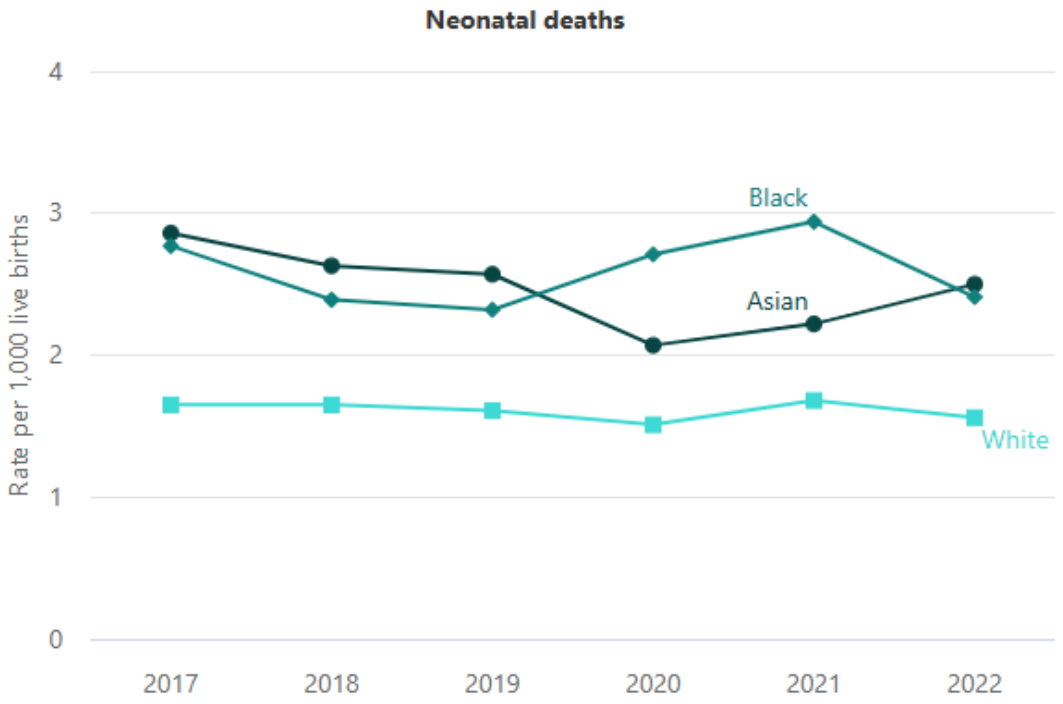
Stillbirths and Neonatal mortality - Ethnicity

Figure 5: Stillbirth and neonatal mortality rates by babies' ethnicity: United Kingdom and Crown Dependencies, for births in 2017 to 2022





Data sources: MBRRACE-UK, PDS, ONS, NRS, PHS, NIMATS, States of Guernsey, States of Jersey.

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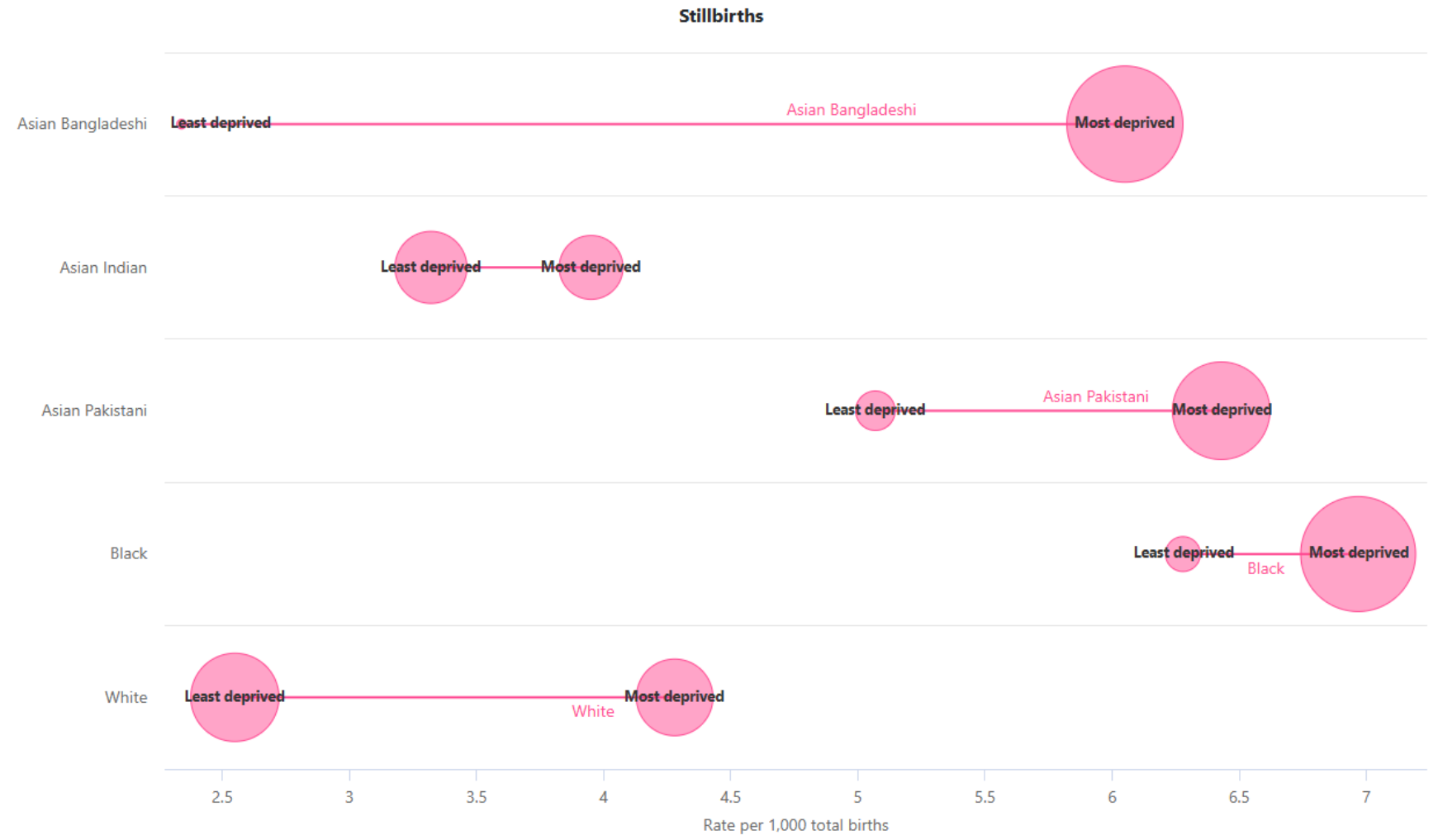
Stillbirths: Deprivation and ethnicity combined

Figure 6: Stillbirth and neonatal mortality rates by babies' ethnicity and mothers' socio-economic deprivation quintile of residence: United Kingdom, for births in 2020 to 2022



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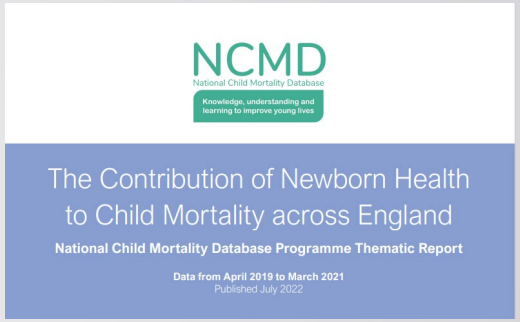
Why focus on Preterm Infants?

MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

- Prematurity is a major cause of both morbidity and mortality in children
  - 8% babies are born preterm (MBRRACE-UK 2022)
    - 75% stillbirths & late fetal losses were preterm
    - 74% neonatal deaths born preterm
  - 49% Neonatal deaths are related to immaturity (ONS 2021)
  - 41% of all child deaths were neonatal deaths (NCMD 2022/23)
  - 1/3rds of all deaths in children <10 have prematurity as a cause or contributing factor on their death certificate (D Odd et al. JAMA Network Open 2023)



- Major morbidities for preterm infants include
  - Brain Injury: Neurodevelopmental delay, cerebral palsy, visual and hearing impairment, cognitive deficit
  - Lung Injury: chronic lung disease and oxygen dependency
  - Gut Injury: Necrotising Enterocolitis (NEC)
  - Retinopathy of Prematurity (ROP)

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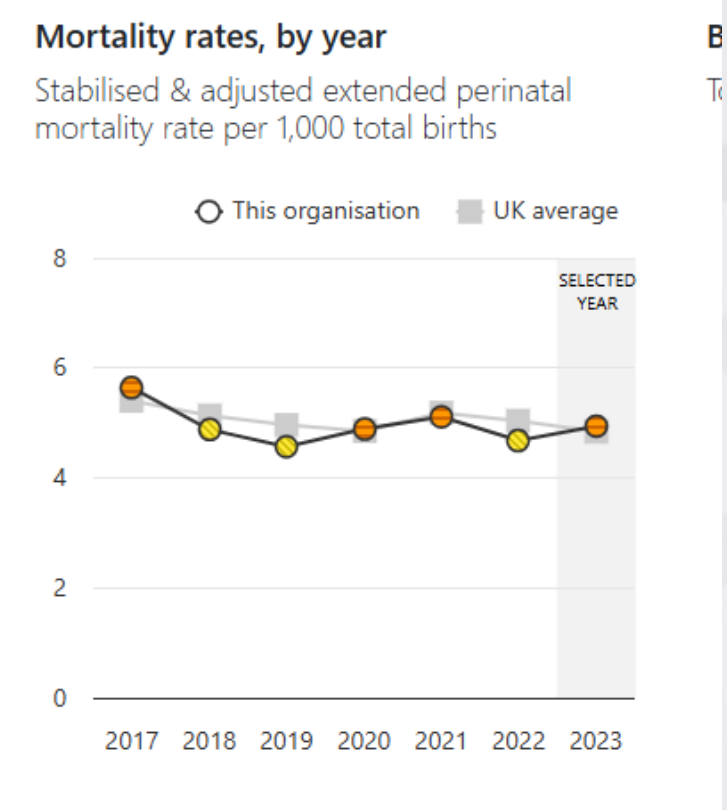
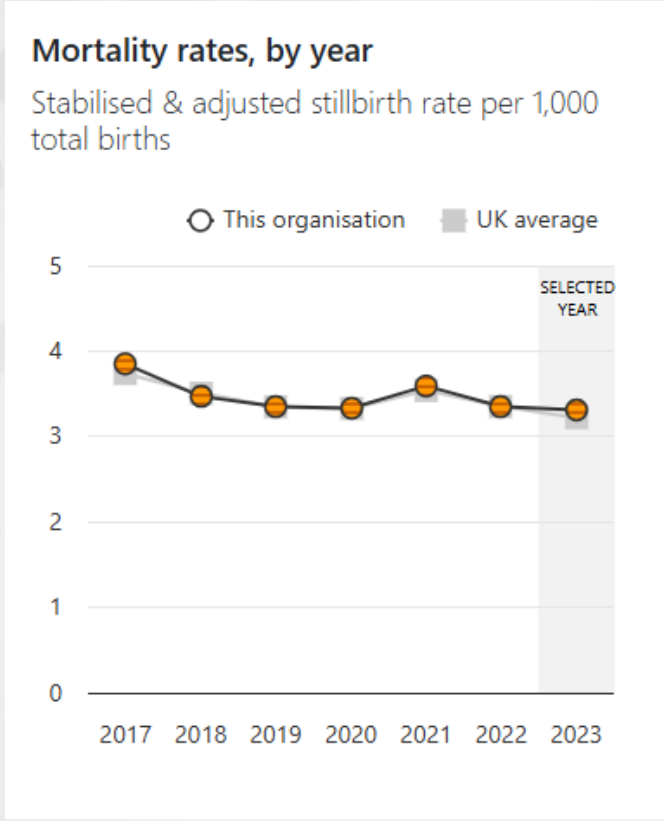
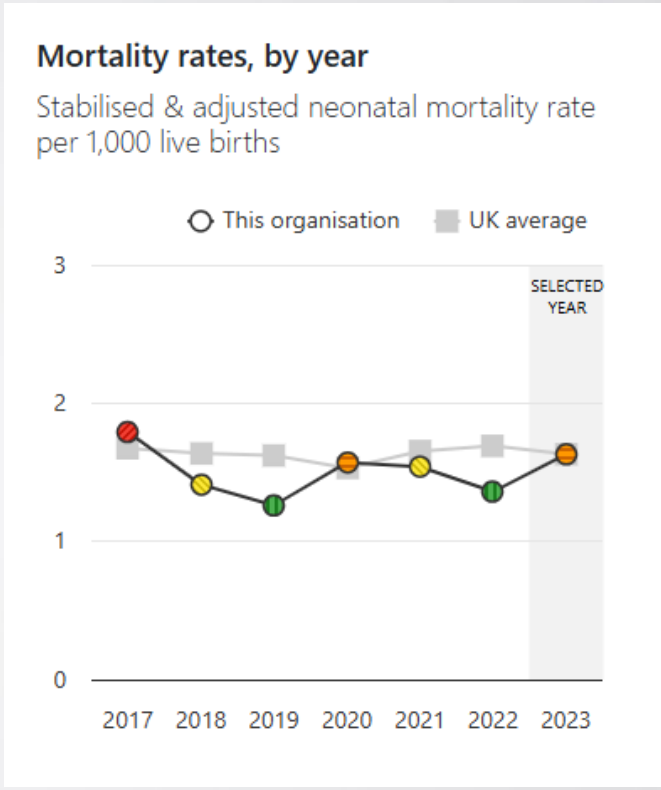
Mortality Trends Thames Valley and Wessex







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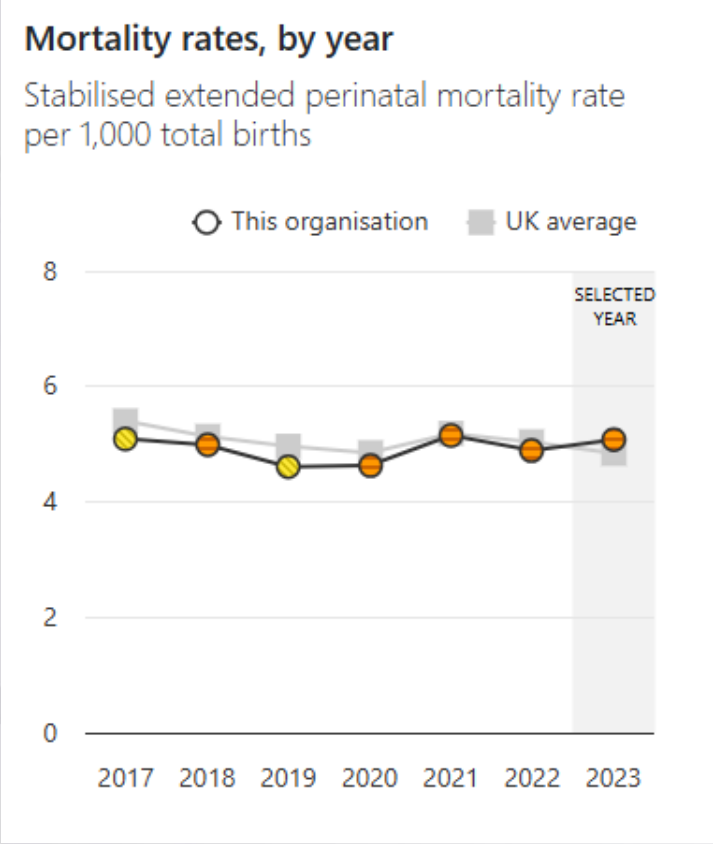
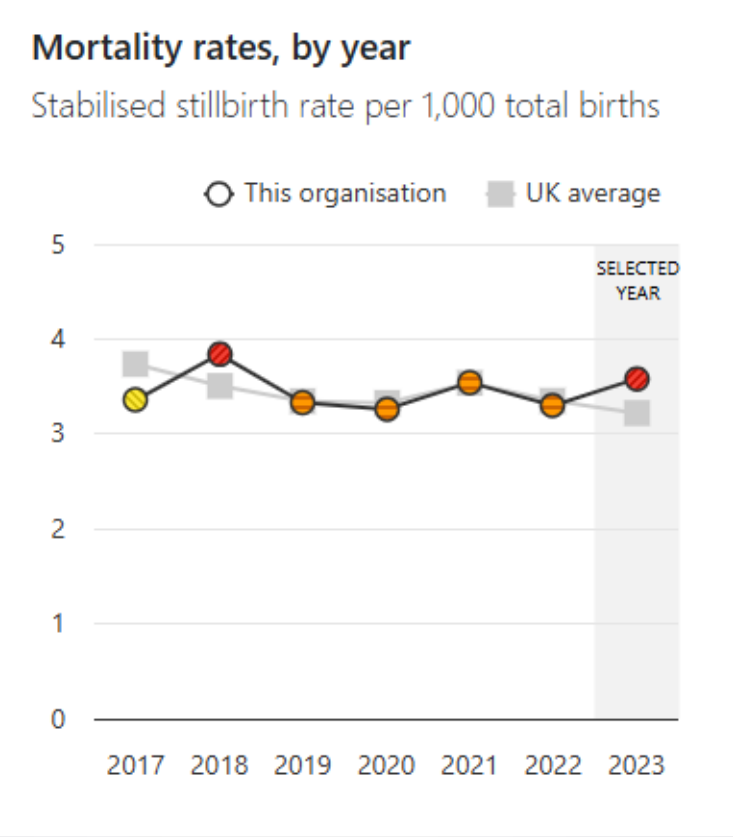
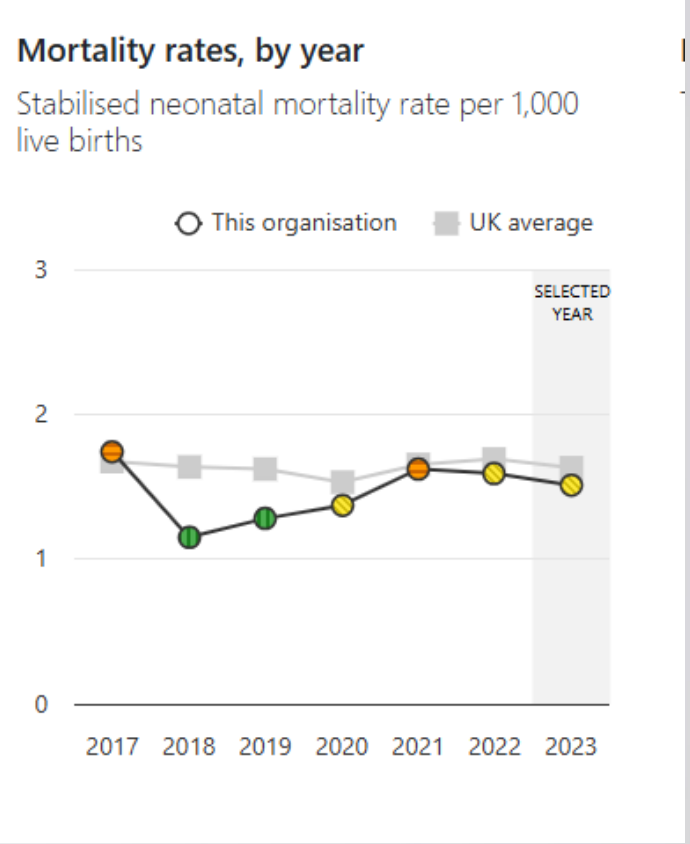
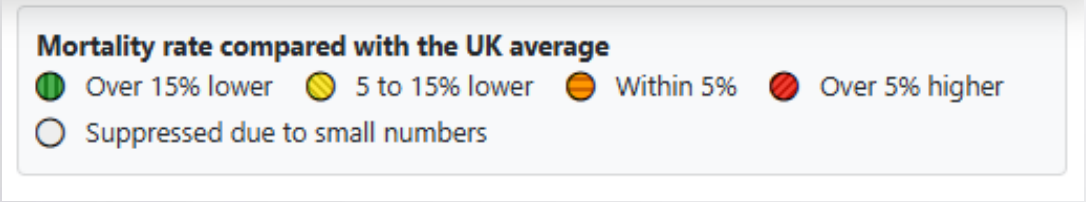
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

Regional Mortality Rates - BOB





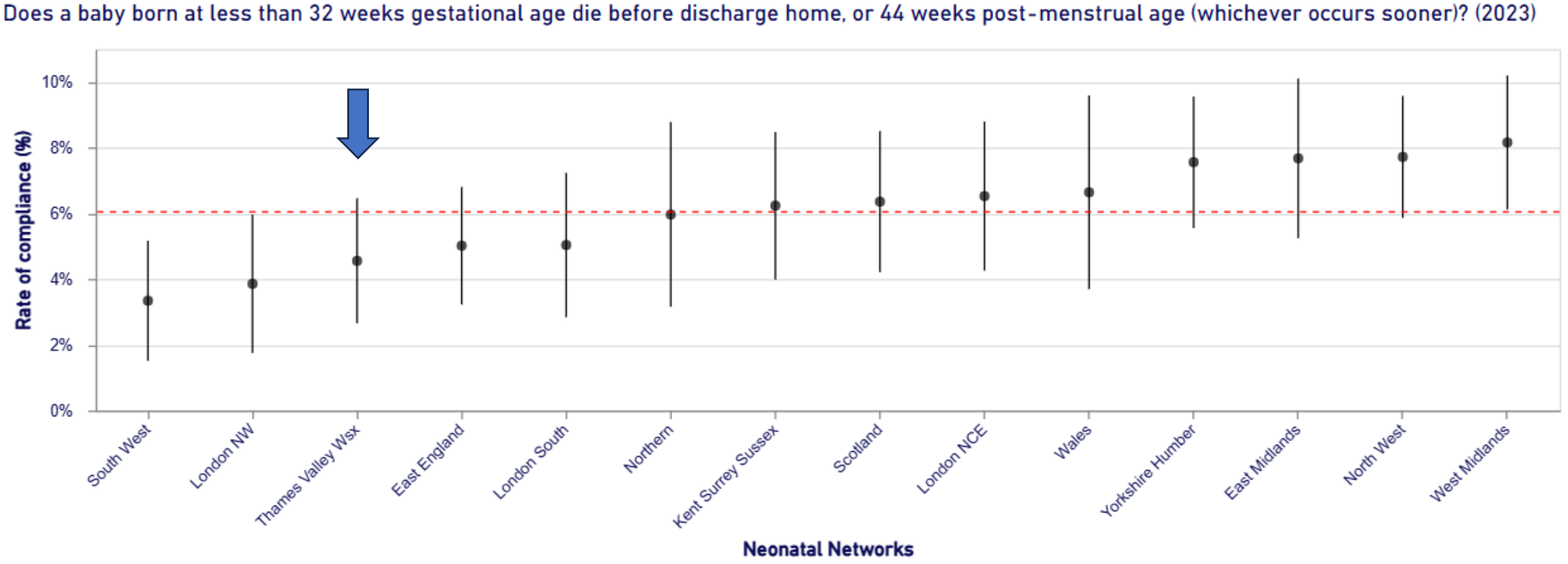




MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

NNAP Preterm (<32 wks) Mortality

NNAP
National Neonatal Audit Programme



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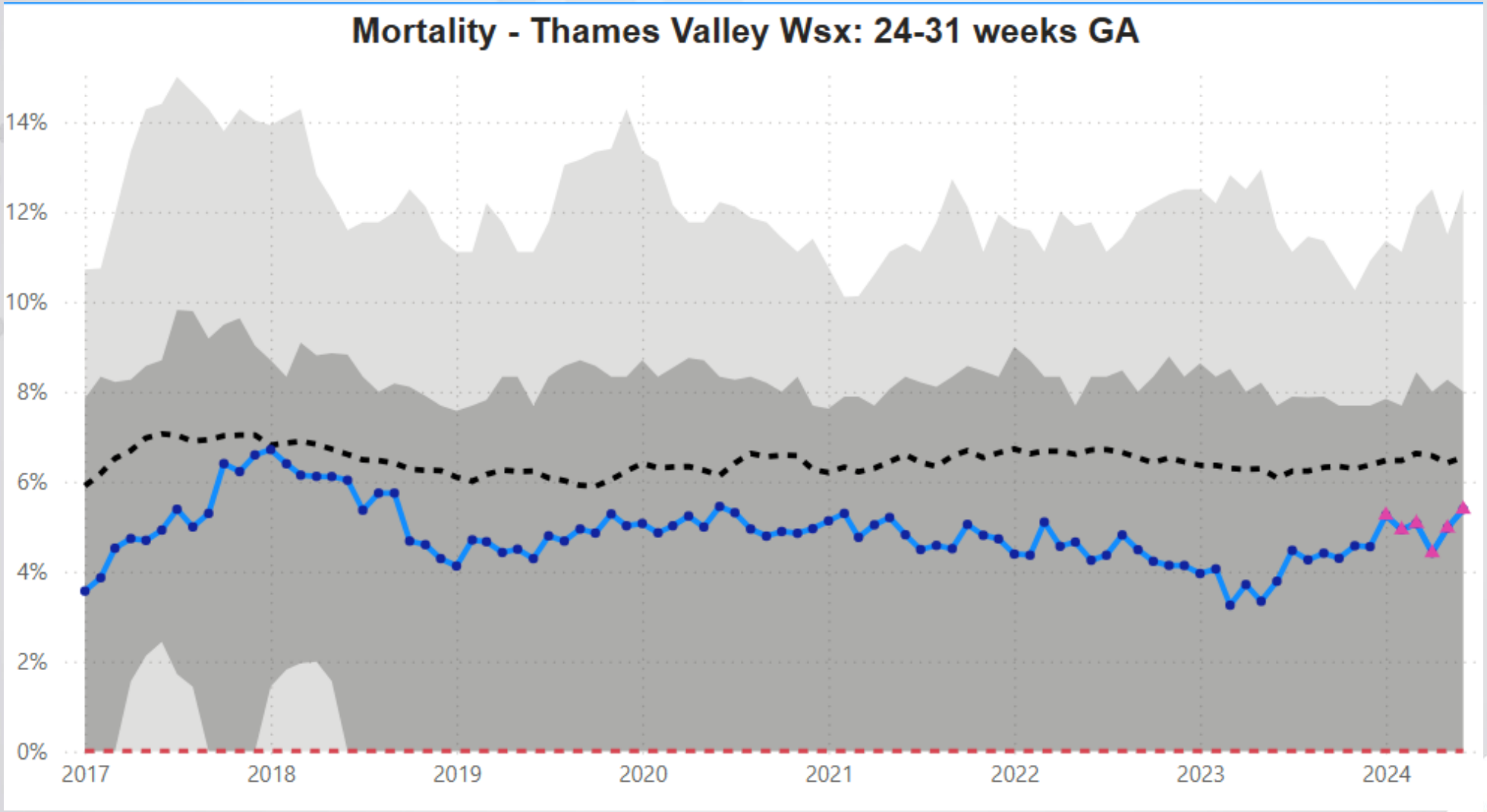
Preterm Mortality Thames Valley Trends



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Saving Babies' Lives Care Bundle v3

Element 5: Reducing preterm birth and optimising care when preterm delivery cannot be prevented- 9 elements

Before Birth	At the time of Birth	After Birth
Optimising Place of Birth	Optimising Cord Management	Caffeine
Antenatal Steroids	Thermoregulation	Volume Targeted Ventilation
Antenatal Magnesium Sulphate		Early maternal breastmilk
Intrapartum Antibiotics		

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Antenatal Optimisation *(BAPM Antenatal QI Toolkit)*

- Place of Birth
  - Risk of death 1.3 times higher if not born in a NICU (NNT 20)
  - Risk of serious brain injury is 2.3 times higher if transferred shortly after birth (NNT 9)
- Antenatal Steroids
  - Risk of death reduces by 30%
  - Risk of NEC reduces by 50%
  - Risk of sIVH reduces by 45%
- Antenatal MgSO4
  - Risk of cerebral palsy reduces by 30%
- Intrapartum Antibiotics
  - Risk of GBS is 25% in preterms
  - Risk of death 10x higher than in term infants

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At Birth *(BAPM & NNAP QI Toolkits)*

- Thermoregulation
  - Admission temperature is a strong predictor of mortality and morbidity in all gestational ages (ILCOR 2015)
  - Hypothermia increases risk of hypoglycaemia, hypoxia, RDS, CLD, NEC and IVH
- Optimising cord management
  - Risk of mortality reduces by 28% for babies ≤32 weeks gestation (NNT 33) with even greater benefit seen in infants <28 weeks (NNT 20)
  - Reduction in need for blood transfusion 10% and reduced need for inotropic support.

After Birth

- Caffeine *(Schmidt et al. JAMA Pediatr. 2017)*
  - Reduces risk of cerebral palsy by 44% and reduces cognitive delay.
  - Reduces incidence of chronic lung disease
- Volume Targeted Ventilation *(NICE Guideline NG124)*
  - This reduces the chance of death or bronchopulmonary dysplasia by 27%
  - Reduces risk of sIVH by 47% compared with pressure-limited ventilation modes.
- Early Maternal Breastmilk *(BAPM & NNAP QI Toolkits)*
  - Breastmilk reduces risk of NEC, infection and death, and improves IQ and neurodevelopmental outcome. Also reduces maternal postnatal depression

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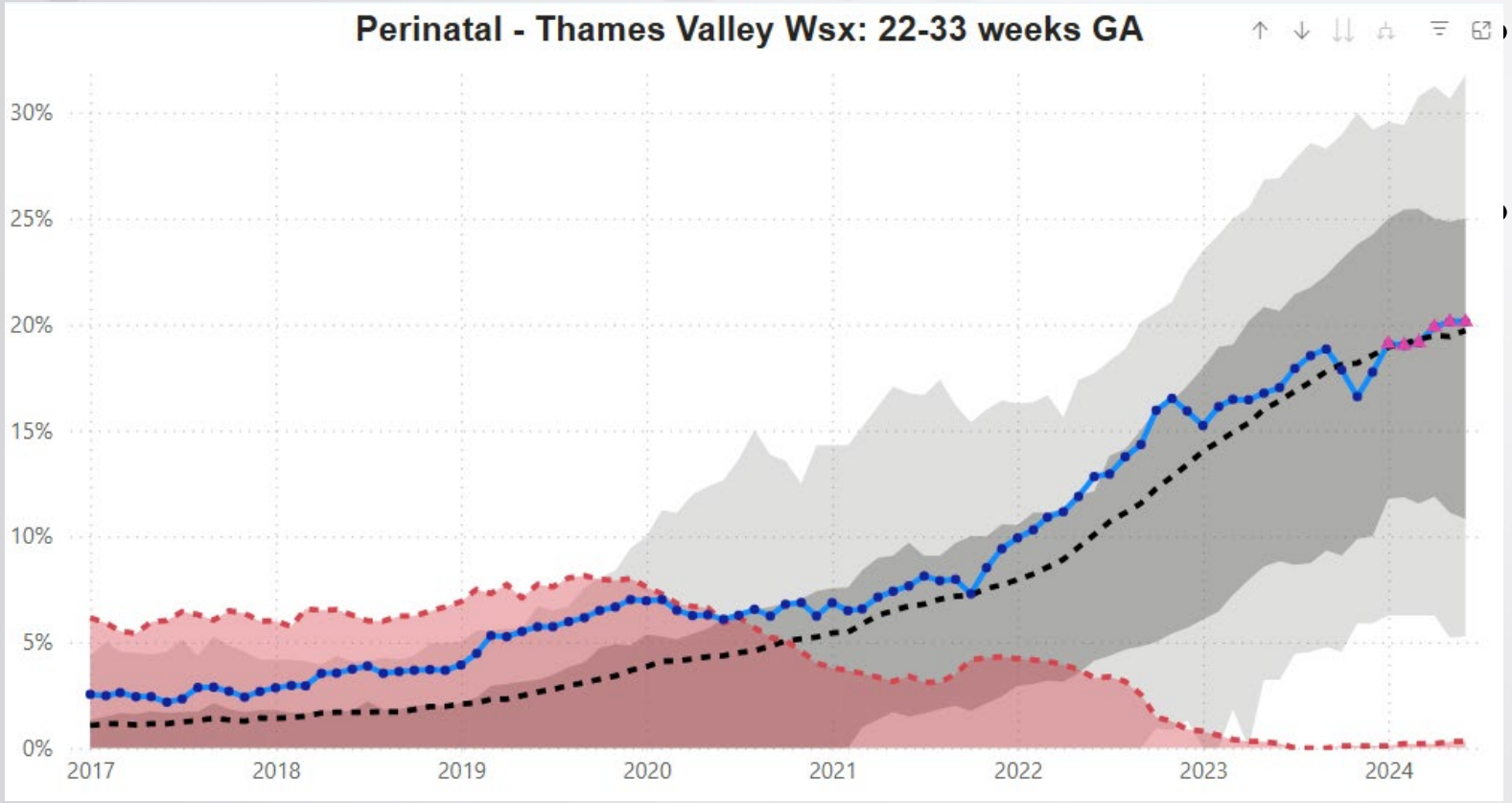
NNAP Optimisation Composite Data

Proportion of babies <34 weeks receiving all 6 relevant optimal start metrics for age- Born in right place/Steroids/MgSO4/DCC/thermal care/milk day 2



- National average and TVW average 20% % June 2024
- We have been making steady progress since 2017 with more rapid improvement since 2021

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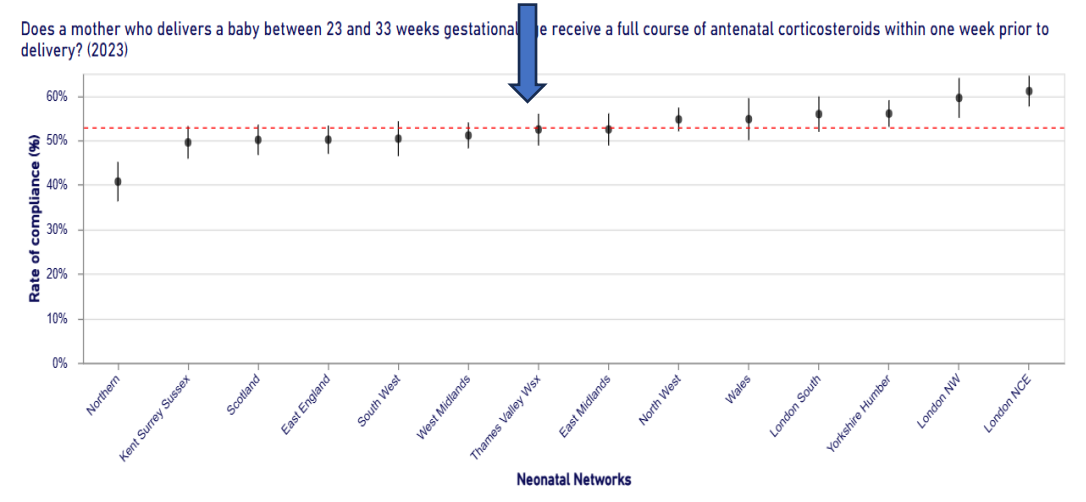
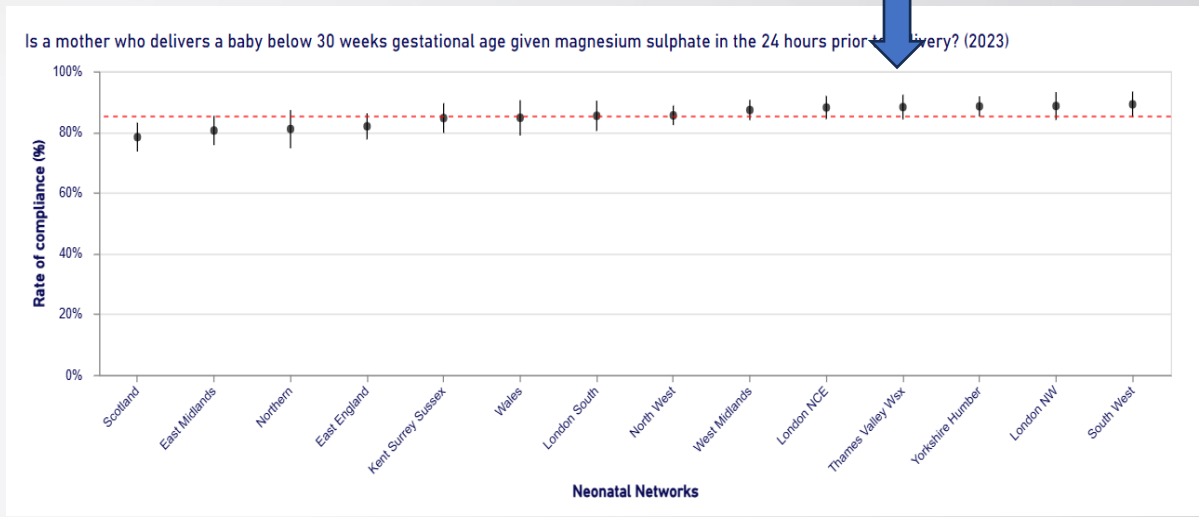
Network Data: Key Process Measures 2023

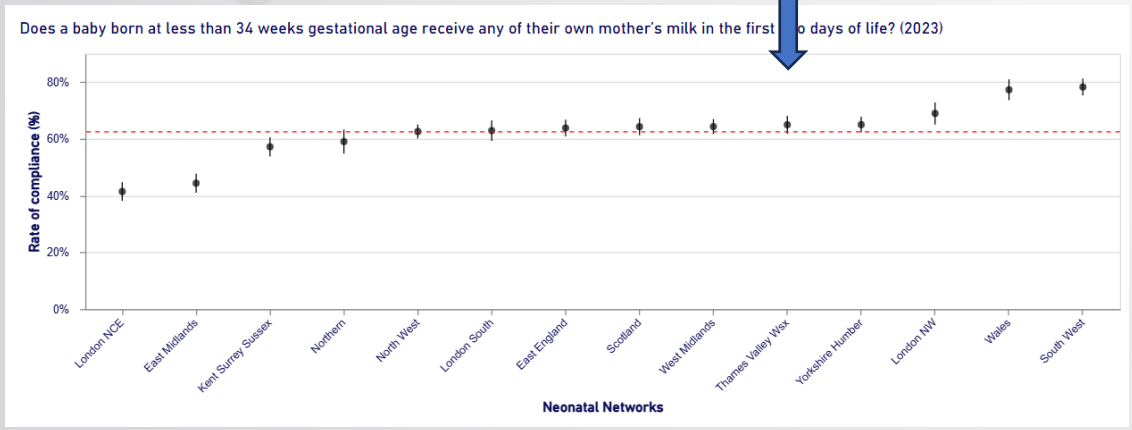
Steroids



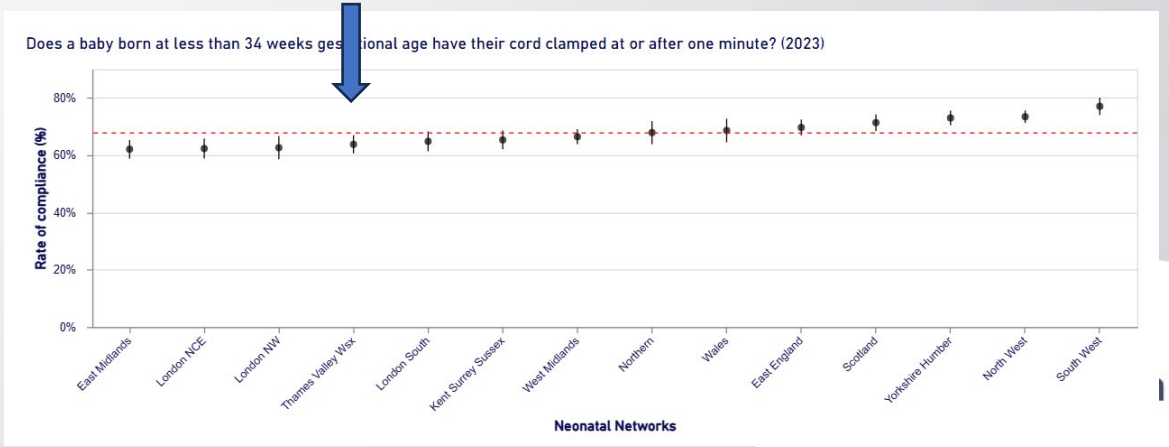
MgSO4



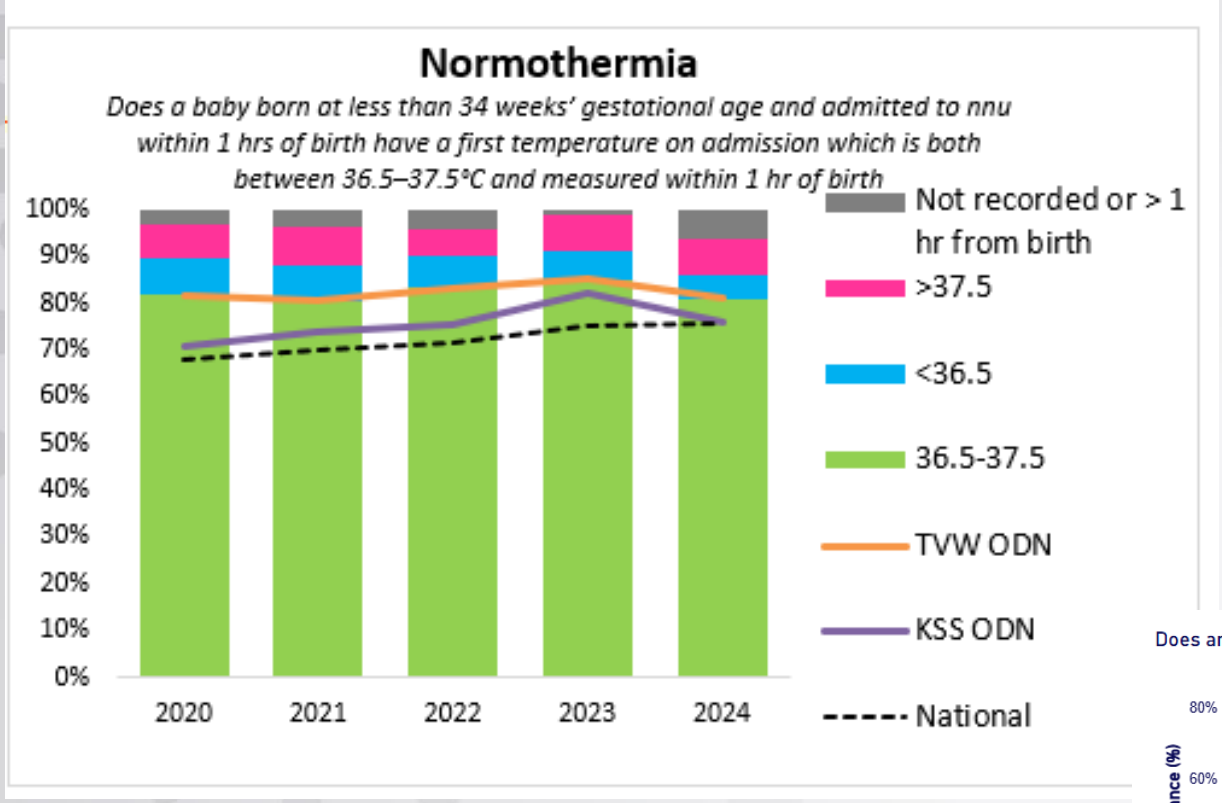
Day 2 milk

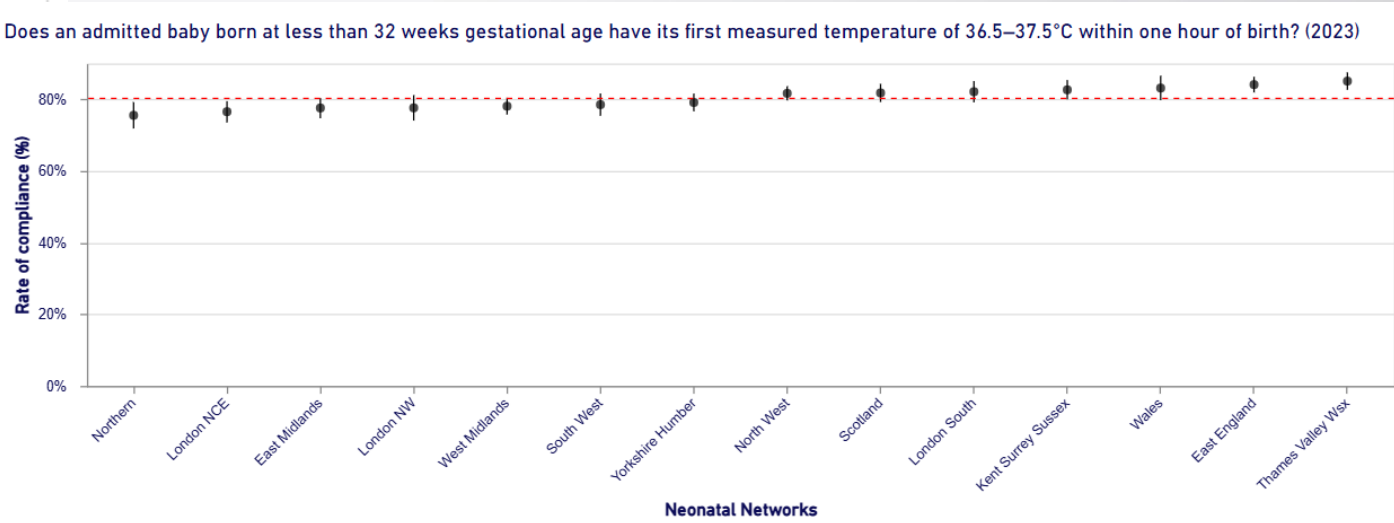


DCC



Thermoregulation





- Difficult to sustain normothermia without ongoing QI
- Watch overheating
- Servo-control in DS should be the norm

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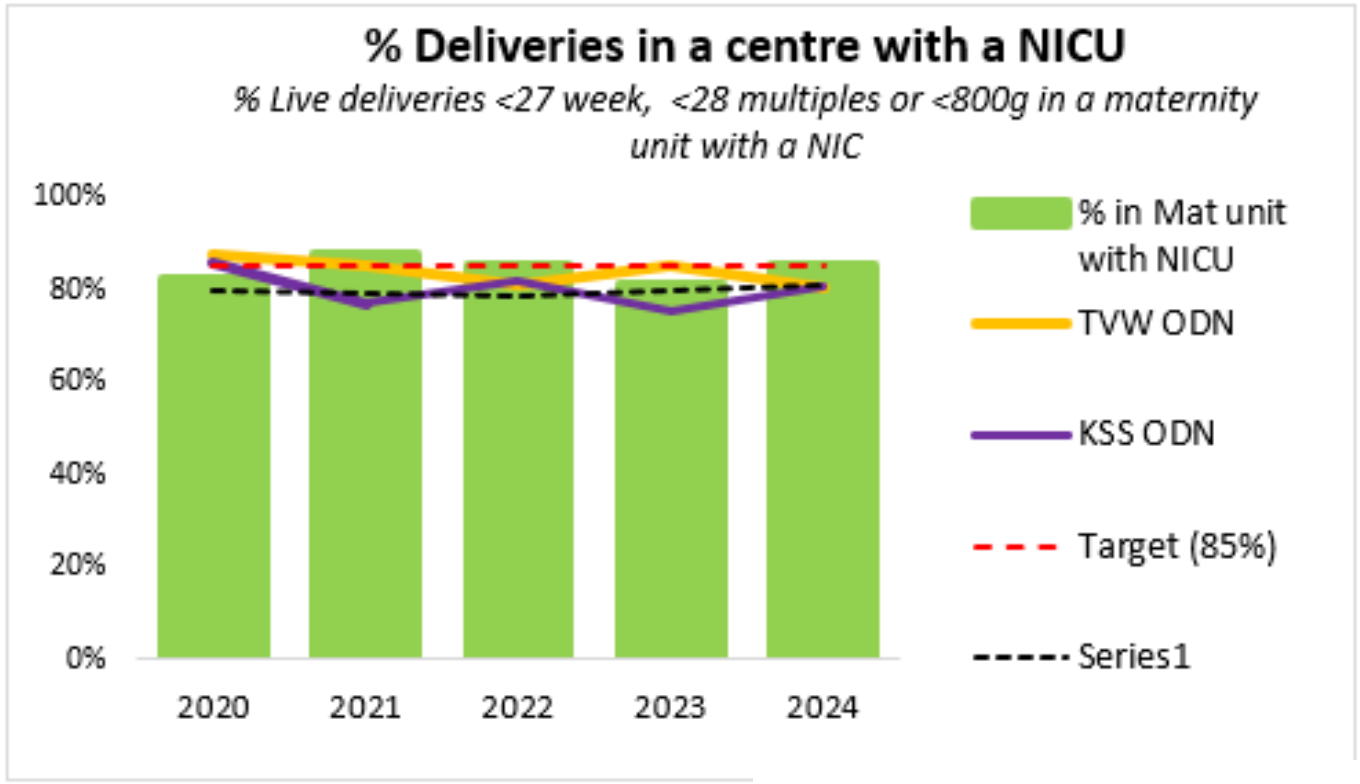
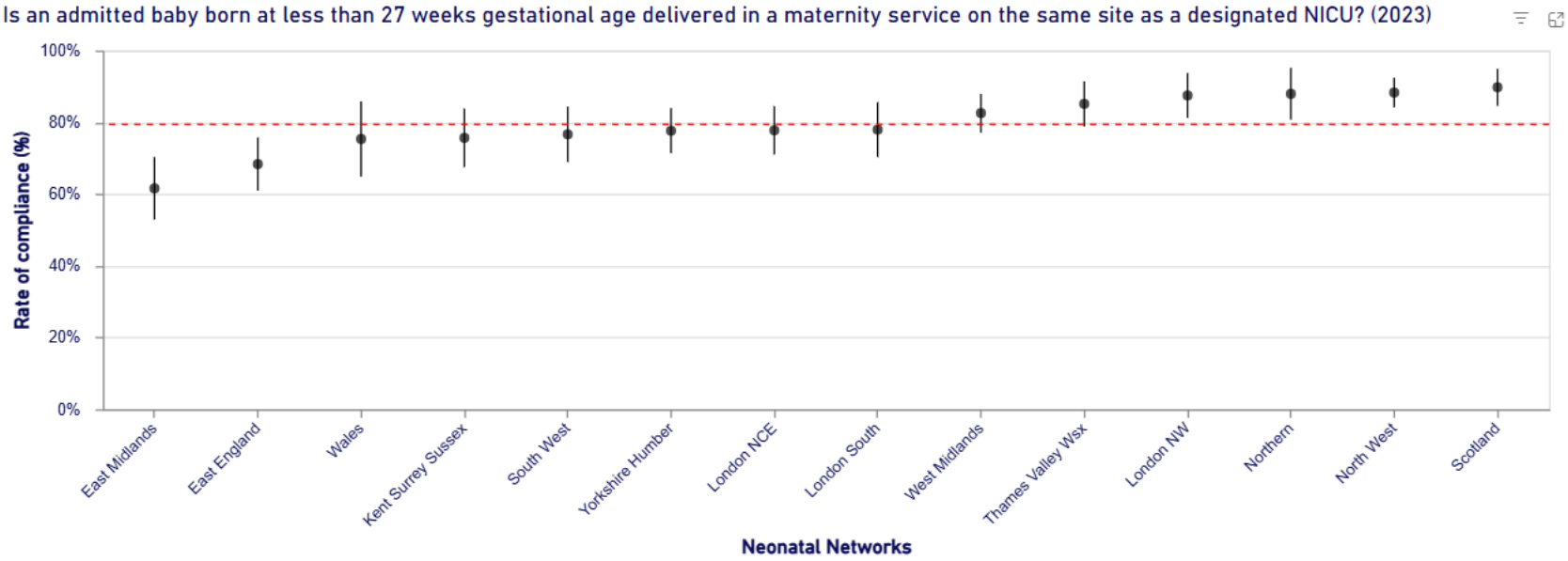
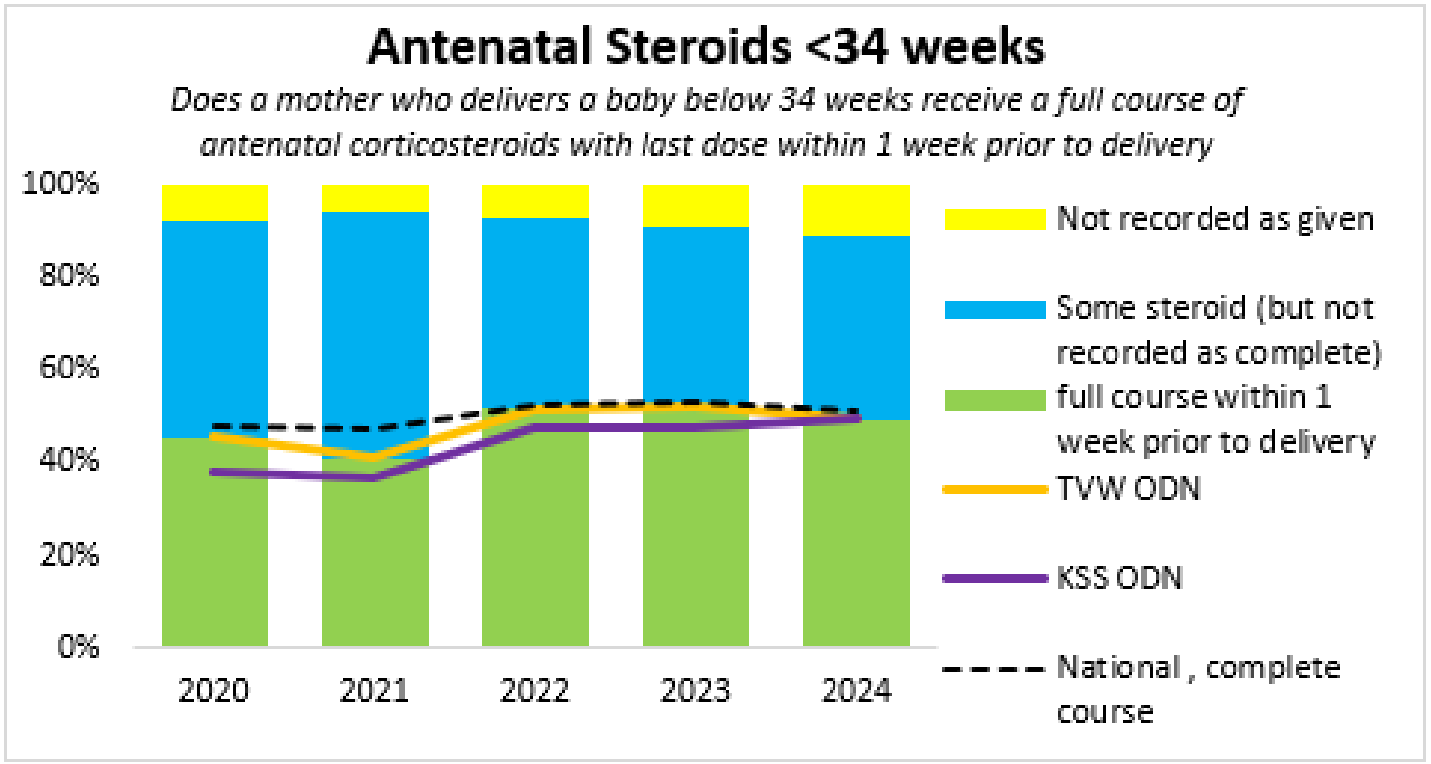


Delivery in a NICU



Very challenging
Multiple services must work together

Antenatal Steroids



- Is the target correct?
- Unintended consequences of aiming for the target or not
- Keep accurate data
- Understand and fully interrogate your own data

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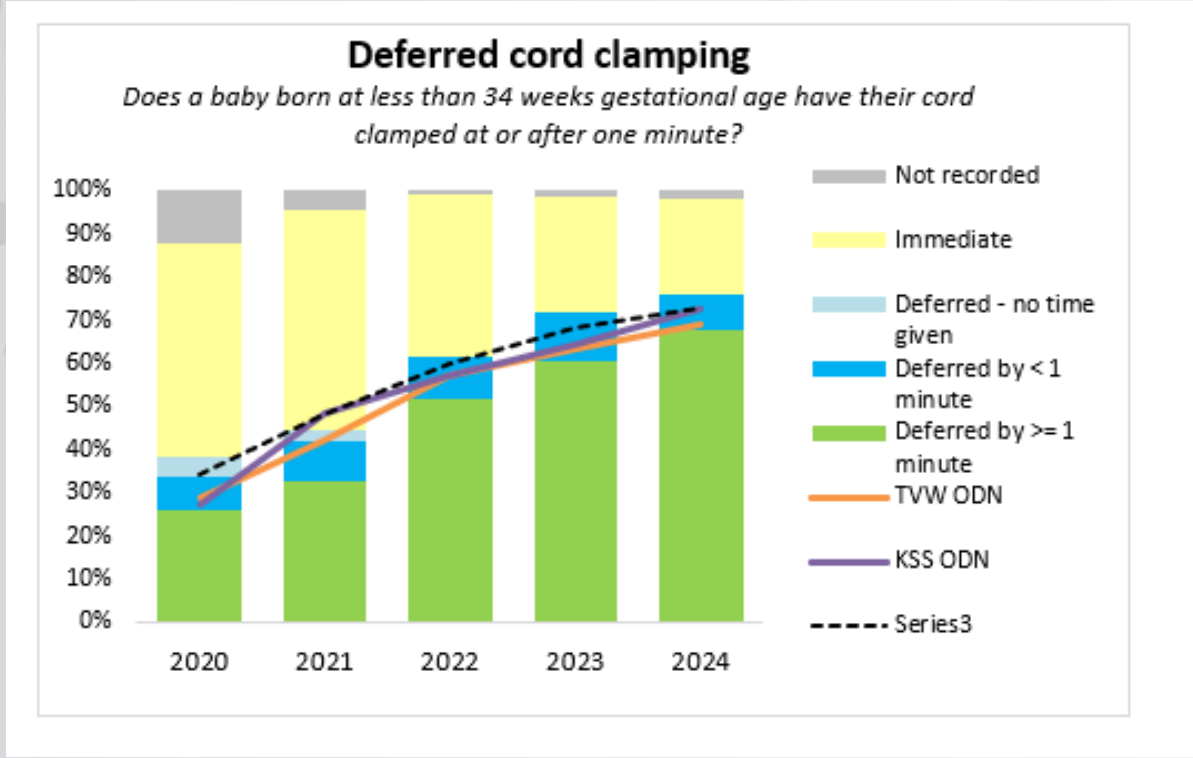
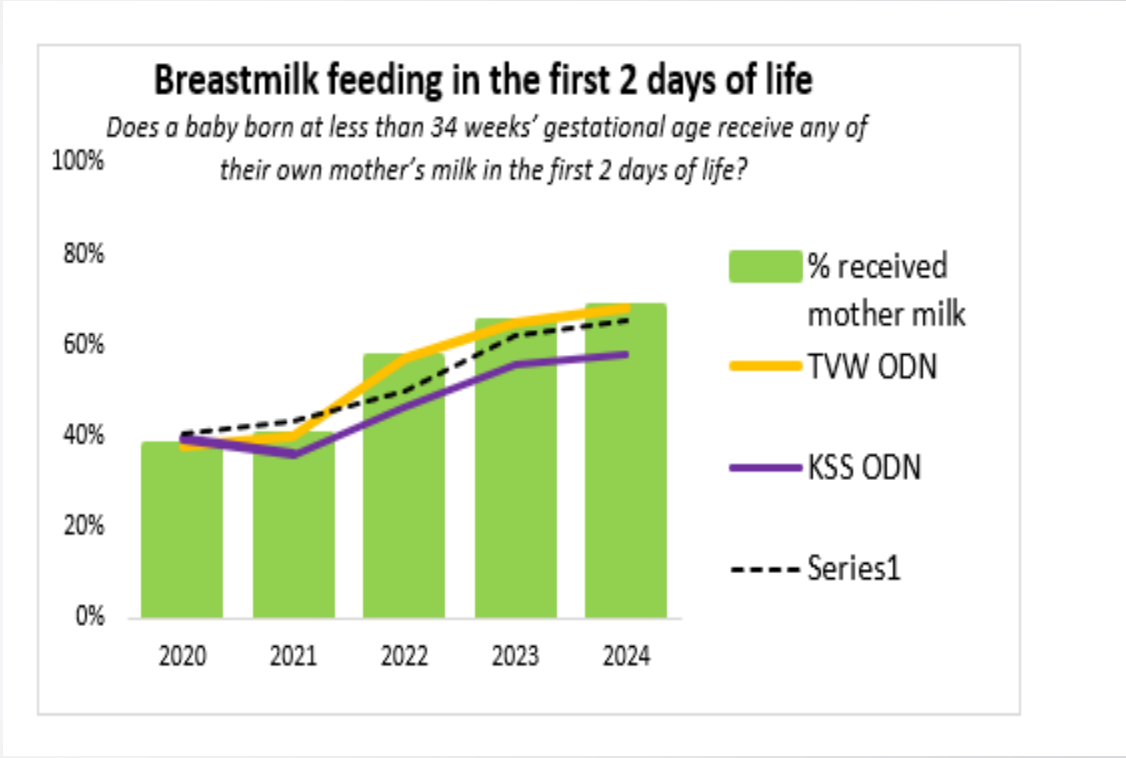
Optimal Cord Clamping



Breastmilk day 2



- Is the target correct for OCC?
- Low hanging fruit for further improvements in many units

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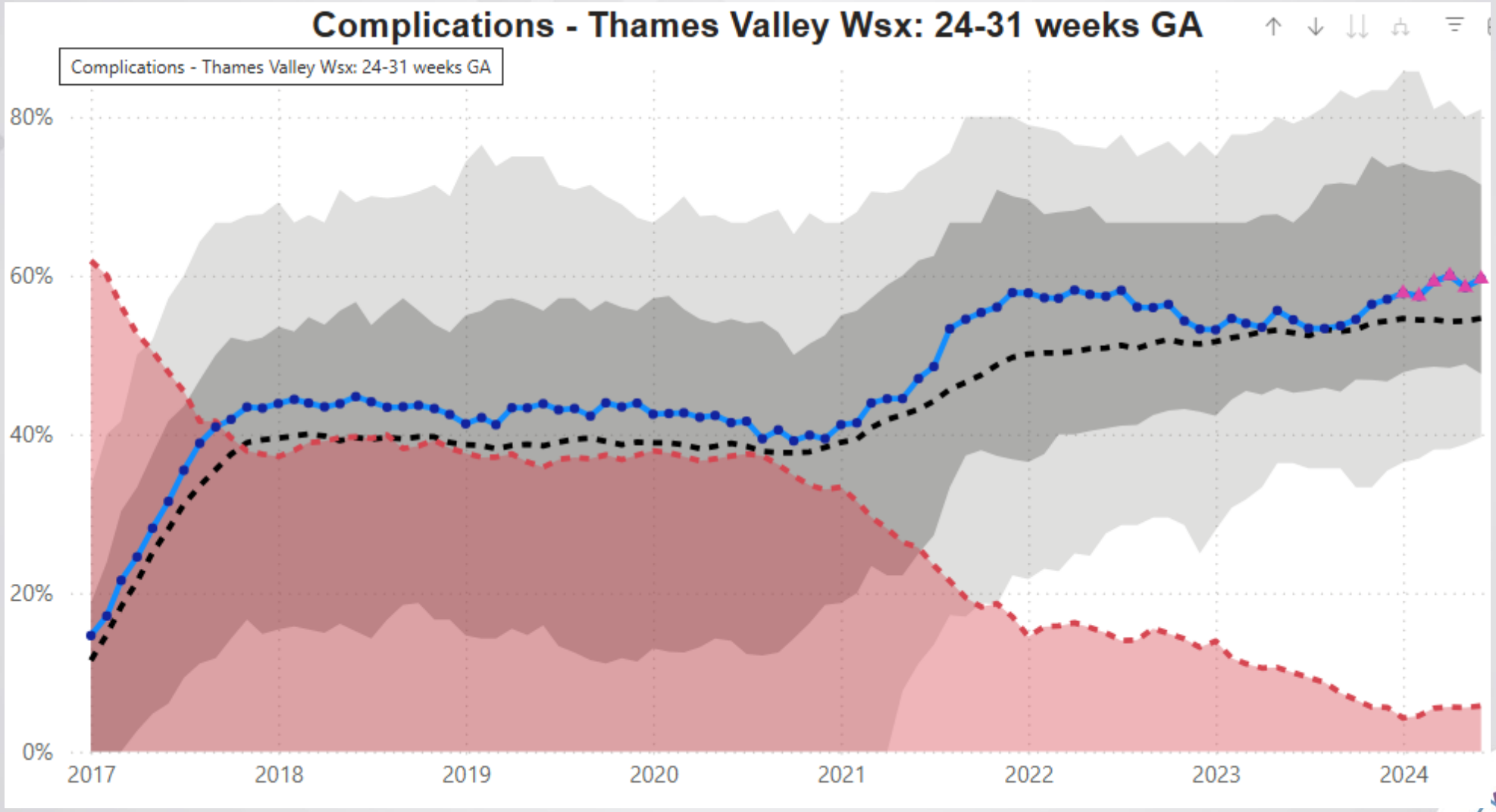
Complications of Prematurity (LOS, NEC, BPD, Brain injury/mortality)



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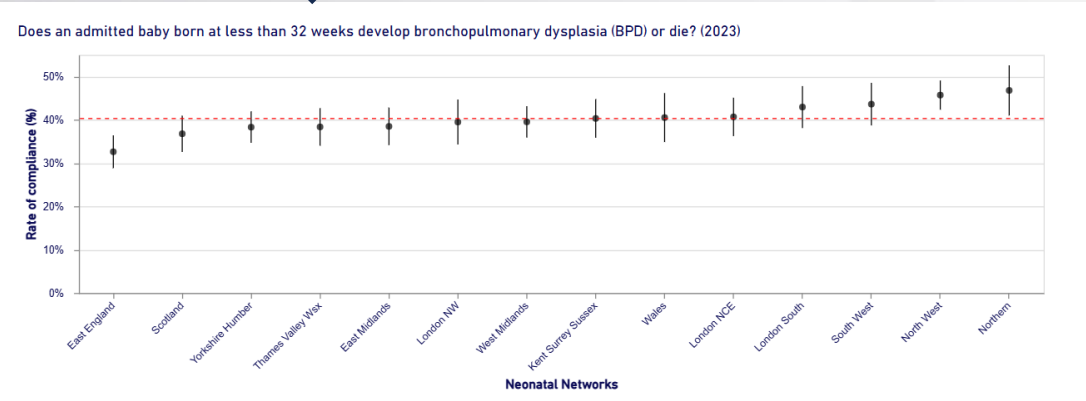
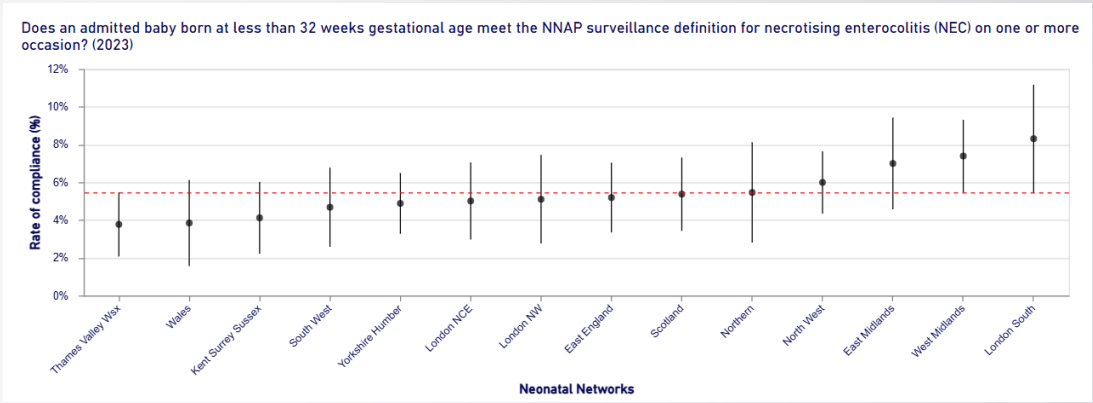
NNAP Outcome Measures

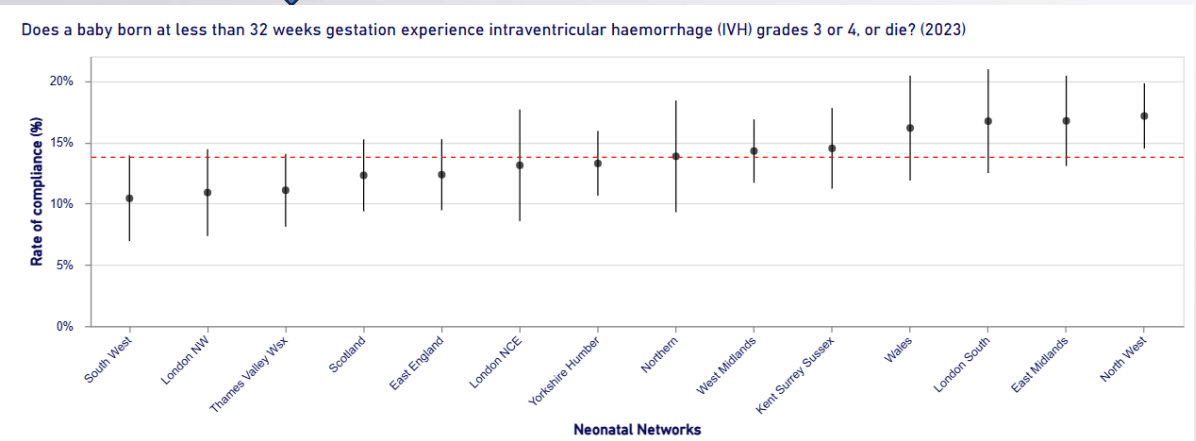
Chronic Lung Disease



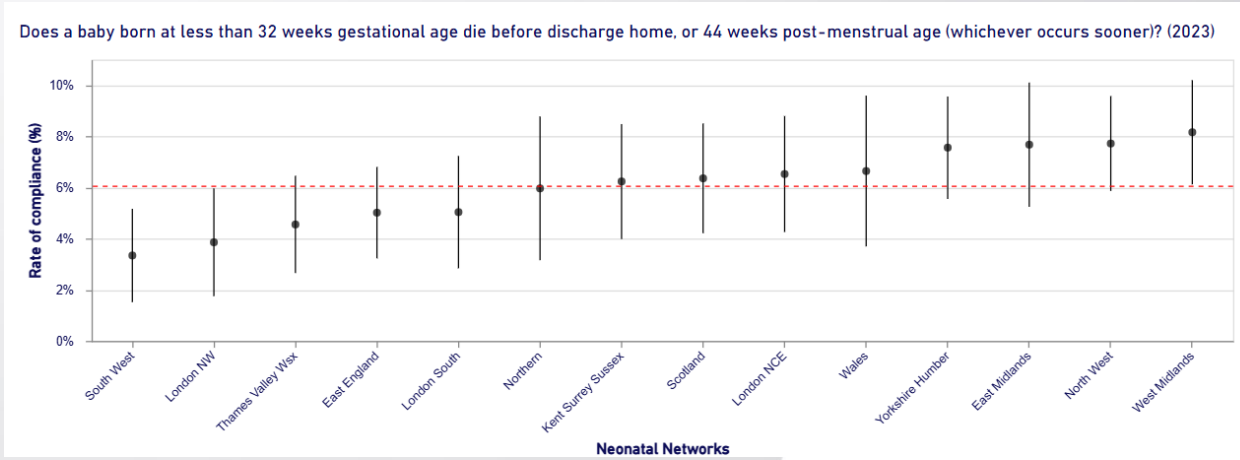
NEC



Severe IVH



Mortality



Summary

- Prematurity is a major cause of morbidity and mortality in neonates and children and 75% stillbirths are born preterm.
- We need to better understand why mortality is so different in different ethnic groups
- Antenatal steroids and born in the right place are key measures for reducing mortality.
- Predicting preterm birth is difficult and optimal timing of antenatal steroids is currently challenging. Do not hit the target but miss the point!!
- We are doing well on most optimal start measures but there is ongoing room for improvement, particularly OCC and early BM. Do not stop focusing on thermal care!
- We are doing well on all key outcome measures for preterm infants

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Team culture and working together are important
QI is everyone's responsibility