

## NMPA Measures - Technical Specification relating to births in 2016-17

### Contents

<b>NMPA Measures - Technical Specification relating to births in 2016-17 .....</b>	<b>1</b>
<b>Potential outlier indicators.....</b>	<b>2</b>
Third or fourth degree perineal tears.....	2
Obstetric haemorrhage of 1500ml or more .....	4
5-minute Apgar score less than 7 .....	5
<b>Other measures .....</b>	<b>7</b>
Induction of labour .....	7
Small-for-gestational-age babies born at or after 40 weeks .....	9
Mode of birth.....	11
Birth without intervention.....	13
Vaginal birth after caesarean section .....	15
Smoking cessation .....	17
Episiotomy .....	18
Maternal readmissions .....	20
Skin to skin contact within one hour of birth .....	22
Breast milk at first feed, and at discharge .....	24
Admissions to neonatal care .....	26
Term babies receiving mechanical ventilation .....	27
Neonatal encephalopathy .....	28
<b>Data item definitions and data sources used.....</b>	<b>29</b>

## Potential outlier indicators

### Third or fourth degree perineal tears

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit (OU)<sup>1</sup>

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women giving birth vaginally to a singleton baby with a cephalic presentation between 37+0 and 42+6 weeks of gestation

#### Exclusions:

Trust/board level:<sup>2</sup>

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Method of delivery	≥70% complete	If trust/board has at least one OU and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;40%</li> </ul> If trust/board has at least one OU and is in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul> If trust/board has no OUs and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is &lt;5%</li> </ul>

<sup>1</sup> Pre-publication review of results by trusts and boards is performed at trust/board level.

<sup>2</sup> The same exclusions are applied at site level for site level results

		<ul style="list-style-type: none"> <li>Spontaneous vaginal rate <math>\geq 90\%</math></li> </ul> If trust/board has no OUs and is in Scotland: <ul style="list-style-type: none"> <li>Any caesarean section rate</li> <li>Spontaneous vaginal rate <math>&gt; 30\%</math></li> </ul>
Perineal tears	N/A	3 <sup>rd</sup> /4 <sup>th</sup> degree tear rate is $\geq 0.1\%$ and $< 15\%$
Number of infants	$\geq 70\%$ complete	N/A
Fetal presentation	$\geq 70\%$ complete within vaginal births	Cephalic rate $\geq 70\%$
Measure under denominator restrictions	N/A	3 <sup>rd</sup> /4 <sup>th</sup> degree tear rate is $\geq 0.1\%$ and $\leq 10\%$

**Record level:**

Records were excluded if they were missing information on: perineal tears, method of delivery, gestational age, number of infants (multiplicity) or fetal presentation

**Numerator:** Number of women giving birth vaginally to a singleton baby with a cephalic presentation between 37+0 and 42+6 weeks (inclusive) of gestation who have a third or fourth degree perineal tear

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

**Obstetric haemorrhage of 1500ml or more**

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women giving birth to a singleton between 37+0 and 42+6 weeks of gestation

**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Estimated blood loss (ml)	≥70% complete	Blood loss of 0ml occurs in ≤5% of births Blood loss >500ml occurs in ≤60% of births
Number of infants	≥70% complete	N/A
Measure under denominator restrictions	N/A	Blood loss ≥1500ml rate is ≥0.5% and ≤20% of births

Record level: records were excluded if they were missing information on estimated blood loss, number of babies (multiplicity), or gestational age

**Numerator:** Number of women giving birth to a singleton baby between 37+0 and 42+6 weeks (inclusive) of gestation who have an obstetric haemorrhage of greater than or equal to 1500ml

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

**5-minute Apgar score less than 7**

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of singleton, liveborn infants born between 37+0 and 42+6 weeks (inclusive) of gestation

**Exclusions:**

Trust/board level:

Trusts/boards Sites were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Apgar score at 5 minutes	≥70% complete	Rate of Apgar scores less than 7 at 5 minutes is ≥0.5%
Number of infants	≥70% complete	N/A
Fetus outcome	If trust/board is not in Scotland: <ul style="list-style-type: none"> <li>• ≥70% complete</li> </ul> If trust/board is in Scotland: <ul style="list-style-type: none"> <li>• Any completeness</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• More than one stillbirth was recorded</li> </ul> If trust/board has no OUs or is in Scotland: <ul style="list-style-type: none"> <li>• Any number of stillbirths</li> </ul>
Measure under denominator restrictions	N/A	Rate of Apgar scores less than 7 at 5 minutes is ≥0.1% and ≤7%

Record level: records were excluded if they were missing information on: Apgar score at 5 minutes, gestational age, number of infants (multiplicity), fetal outcome (stillbirth or livebirth)

**Numerator:** Number of singleton, liveborn infants born between 37+0 and 42+6 weeks (inclusive) of gestation with a 5-minute Apgar score less than 7

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Other measures

### Induction of labour

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women giving birth to a singleton baby between 37+0 and 42+6 weeks of gestation

#### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Mode of labour onset	≥70% complete	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Induction of labour rate is ≥10% and &lt;50%</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Induction of labour rate is &lt;5%</li> </ul> For all trusts/boards: <ul style="list-style-type: none"> <li>• Where labour onset = '2' (caesarean section), mode of delivery should be caesarean section in &gt;70% of records</li> </ul>
Measure under denominator restrictions	N/A	Induction of labour rate is ≥5% and ≤55%

Record level:

Records were excluded if they were missing information on: gestational age, number of infants (multiplicity) or mode of labour onset

**Numerator:** Number of women giving birth to a singleton baby between 37+0 and 42+6 weeks of gestation, who had their labour induced

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios



**Small-for-gestational-age babies born at or after 40 weeks**

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of babies born small for gestational age (defined as less than the 10<sup>th</sup> birthweight centile using the WHO-UK 1990 charts)<sup>3</sup> between 37+0 and 42+6 weeks of gestation

**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Fetus outcome	If trust/board is not in Scotland: <ul style="list-style-type: none"> <li>• ≥70% complete</li> </ul> If trust/board is in Scotland: <ul style="list-style-type: none"> <li>• Any completeness</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• More than one stillbirth was recorded</li> </ul> If trust/board has no OUs or is in Scotland: <ul style="list-style-type: none"> <li>• Any number of stillbirths</li> </ul>
Birthweight	≥70% complete	Birthweight ≥2500g and ≤4500g in ≥80% of infants born between 37 and 42 weeks (inclusive)
Measure under denominator restrictions	N/A	Rate is ≥20% and ≤80%

<sup>3</sup> Cole TJ, Williams AF, Wright CM. Revised birth centiles for weight, length and head circumference in the UK-WHO growth charts. *Annals of Human Biology*. 2010 Jun 9;38(1):7–11.

Record level:

Records were excluded if they were missing information on: gestational age, number of infants, fetus outcome or birthweight

**Numerator:** Number of babies born small for gestational age (defined as less than the 10<sup>th</sup> birthweight centile using the WHO-UK 1990 charts<sup>1</sup>) that are born on or after their estimated due date (between 40+0 weeks and 42+6 weeks (inclusive))

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Mode of birth

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women who give birth to a singleton baby between 37+0 and 42+6 weeks of gestation

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Method of delivery	≥70% complete	If trust/board has at least one OU and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;40%</li> </ul> If trust/board has at least one OU and is in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul> If trust/board has no OUs and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is &lt;5%</li> <li>• Spontaneous vaginal rate is ≥90%</li> </ul> If trust/board has no OUs and is in Scotland: <ul style="list-style-type: none"> <li>• Any caesarean section rate</li> </ul>

		<ul style="list-style-type: none"> <li>Spontaneous vaginal rate &gt;30%</li> </ul>
Measure under denominator restrictions	N/A	<p>Caesarean section rate is <math>\geq 5\%</math> and <math>\leq 50\%</math></p> <p>Spontaneous vaginal rate is <math>\geq 20\%</math> and <math>\leq 95\%</math></p> <p>Instrumental rate is <math>\geq 4\%</math> and <math>\leq 50\%</math></p>

Record level:

Records were excluded if they were missing information on: gestational age, number of infants, or method of delivery

**Numerator:**

Number of women who give birth to a singleton baby between 37+0 and 42+6 weeks of gestation who had the following method of delivery:

1. Spontaneous vaginal birth
2. Instrumental birth
3. Caesarean section

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Birth without intervention

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women who give birth to a singleton baby between 37+0 and 42+6 weeks of gestation

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Mode of labour onset	≥70% complete	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Induction of labour rate is ≥10% and &lt;50%</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Induction of labour rate is &lt;5%</li> </ul> For all trusts/boards: <ul style="list-style-type: none"> <li>• Where labour onset = '2' (caesarean section), mode of delivery should be caesarean section in &gt;70% of records</li> </ul>
Augmentation of labour with oxytocin	≥70% complete within vaginal births ≥70% complete within caesarean births	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Augmentation rate is ≥1% and &lt;80% within non-breech vaginal births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Any augmentation rate</li> </ul>

Method of delivery	≥70% complete	<p>If trust/board has at least one OU and is not in Scotland:</p> <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;40%</li> </ul> <p>If trust/board has at least one OU and is in Scotland:</p> <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul> <p>If trust/board has no OUs and is not in Scotland:</p> <ul style="list-style-type: none"> <li>• Caesarean section rate is &lt;5%</li> <li>• Spontaneous vaginal rate is ≥90%</li> </ul> <p>If trust/board has no OUs and is in Scotland:</p> <ul style="list-style-type: none"> <li>• Any caesarean section rate</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul>
Anaesthesia	≥70% complete	≥70% of caesarean section births are performed under general anaesthetic, epidural or caudal anaesthetic, or spinal anaesthetic
Episiotomy	≥70% complete in vaginal births	Episiotomy rate >1% and <45% within vaginal births
Measure under denominator restrictions	N/A	Rate is ≥15% and ≤95%

**Record level:**

Records were excluded if they were missing information on: gestational age, number of infants, method of delivery, mode of labour onset, augmentation, anaesthesia or episiotomy

**Numerator:**

Number of women who give birth to a singleton baby between 37+0 and 42+6 weeks of gestation whose birth meets the following criteria:

1. Spontaneous labour onset (no induction of labour)
2. Spontaneous labour progress (no augmentation with oxytocin)
3. Spontaneous vaginal birth (no instrumental birth or caesarean section)
4. No epidural, spinal or general anaesthetic
5. No episiotomy

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Vaginal birth after caesarean section

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women having their second baby between 37+0 and 42+6 weeks of gestation, following a caesarean section for their first baby and without an indication for repeat caesarean section

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Method of delivery	≥70% complete	If trust/board has at least one OU and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;40%</li> </ul> If trust/board has at least one OU and is in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul> If trust/board has no OUs and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is &lt;5%</li> <li>• Spontaneous vaginal rate is ≥90%</li> </ul>

		<p>If trust/board has no OUs and is in Scotland:</p> <ul style="list-style-type: none"> <li>• Any caesarean section rate</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul>
Parity	≥70% complete	Proportion of births to primiparous women ≥20% and ≤70%
Previous caesarean section	≥70% complete	<p>If trust/board has at least one OU:</p> <ul style="list-style-type: none"> <li>• Previous caesarean section rate is &gt;1% among births to multiparous women</li> </ul> <p>If trust/board has no OUs:</p> <ul style="list-style-type: none"> <li>• Previous caesarean section rate is &lt;5% among births to multiparous women</li> </ul>
Measure under denominator restrictions	N/A	Rate is ≥5% and ≤80%

Record level:

Records were excluded if they were missing information on: previous caesarean section, gestational age, number of infants, method of delivery, or parity

**Numerator:** Number of women having their second baby between 37+0 and 42+6 weeks of gestation following a caesarean section for their first baby, who give birth to their second baby vaginally

**Case-mix factors:** maternal age, ethnicity, deprivation, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios



## Smoking cessation

**Lowest level of reporting in NMPA clinical report for 2016-17 births and on NMPA website:**  
All trusts/boards

**Relevant population (denominator):** Number of women recorded as being current smokers at their booking visit

**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Smoking at booking	≥70% complete	Current smokers ≥0.25% and ≤50%
Smoking at delivery	≥70% complete	Current smokers ≥0.25% and ≤50%

Record level:

Records were excluded if they were missing information on: smoking at booking or smoking at delivery

**Numerator:** Number of women recorded as being current smokers at their booking visit who were recorded as non-smokers or ex-smokers by the time of birth

**Case-mix factors:** none

## Episiotomy

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number women giving birth vaginally to a singleton baby with a cephalic presentation 37+0 to 42+6 weeks (inclusive)

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Fetal presentation	≥70% complete within vaginal births	Cephalic rate ≥70%
Method of delivery	≥70% complete	If trust/board has at least one OU and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;40%</li> </ul> If trust/board has at least one OU and is in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is between ≥5% and ≤50%</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul> If trust/board has no OUs and is not in Scotland: <ul style="list-style-type: none"> <li>• Caesarean section rate is &lt;5%</li> <li>• Spontaneous vaginal rate is ≥90%</li> </ul>

		If trust/board has no OUs and is in Scotland: <ul style="list-style-type: none"> <li>• Any caesarean section rate</li> <li>• Spontaneous vaginal rate &gt;30%</li> </ul>
Episiotomy	≥70% complete in vaginal births	Episiotomy rate >1% and <45% within vaginal births
Measure under denominator restrictions	N/A	Episiotomy rate >5% and <40% within vaginal births

**Record level:**

Records were excluded if they were missing information on: gestational age, number of infants, fetal presentation, method of delivery, or episiotomy

**Numerator:** Number women giving birth vaginally to a singleton baby with a cephalic presentation 37+0 to 42+6 weeks (inclusive) who have an episiotomy

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Maternal readmissions

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):** Number of women giving birth to a singleton baby between 37+0 and 42+6 weeks of gestation, excluding those who died before discharge or were not discharged within 42 days of delivery

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Number of infants	≥70% complete	N/A
Type of readmission	≥70% of records could be linked with HES/PEDW/SMR02	N/A

Record level:

Records were excluded if they were missing information on: date of birth, gestational age, number of infants

**Numerator:** Number of women giving birth to a singleton baby between 37+0 and 42+6 weeks of gestation, excluding those who died before discharge or were not discharged within 42 days of delivery, who were readmitted to hospital within 42 days, excluding: planned readmissions, planned transfers, readmissions of less than one day and women accompanying an unwell baby.

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous CS, birthweight, gestational age, BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios



**Skin to skin contact within one hour of birth****Lowest level of reporting in NMPA clinical report for 2016-17 births:** All trusts/boards**Lowest level of reporting on NMPA website:** All sites**Relevant population (denominator):** Number of liveborn babies born between 34+0 and 42+6 weeks of gestation**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Fetus outcome	If trust/board is not in Scotland: <ul style="list-style-type: none"> <li>• ≥70% complete</li> </ul> If trust/board is in Scotland: <ul style="list-style-type: none"> <li>• Any completeness</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• More than one stillbirth was recorded</li> </ul> If trust/board has no OUs or is in Scotland: <ul style="list-style-type: none"> <li>• Any number of stillbirths</li> </ul>
Skin to skin	≥70% complete within vaginal births ≥70% complete within caesarean births	N/A
Measure under denominator restrictions	N/A	Rate is <40%

Record level:

Records were excluded if they were missing information on: gestational age, fetus outcome or skin to skin contact

**Numerator:** Number of liveborn babies born between 34+0 and 42+6 weeks of gestation who received skin to skin contact within one hour of birth

**Case-mix factors:** none

**Breast milk at first feed, and at discharge**

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** All trusts/boards

**Lowest level of reporting on NMPA website:** All sites

**Relevant population (denominator):** Number of liveborn babies born between 34+0 and 42+6 weeks of gestation

**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

<b>Data item</b>	<b>Completeness check</b>	<b>Distribution check</b>
Gestational age	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• ≥70% complete within vaginal births</li> <li>• ≥70% complete within caesarean births</li> <li>• ≥70% complete overall</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• ≥70% complete overall</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births</li> </ul> If trust/board has no OUs: <ul style="list-style-type: none"> <li>• Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥90% of births</li> </ul>
Fetus outcome	If trust/board is not in Scotland: <ul style="list-style-type: none"> <li>• ≥70% complete</li> </ul> If trust/board is in Scotland: <ul style="list-style-type: none"> <li>• Any completeness</li> </ul>	If trust/board has at least one OU: <ul style="list-style-type: none"> <li>• More than one stillbirth was recorded</li> </ul> If trust/board has no OUs or is in Scotland: <ul style="list-style-type: none"> <li>• Any number of stillbirths</li> </ul>
Breast milk at first feed	≥70% complete within vaginal births ≥70% complete within caesarean births	>1% breast milk at first feed rate
Breast milk at discharge	≥70% complete	>1% breast milk at discharge rate
Measure under denominator restrictions	N/A	Breast milk at first feed rate is ≥25% Breast milk at discharge rate is ≥25% and ≤98%



Record level:

Records were excluded if they were missing information on: gestational age, fetus outcome, or breast milk at first feed/breast milk at discharge, respectively

**Numerator:** Number of liveborn babies born between 34+0 and 42+6 weeks of gestation who received:

- a) Any breast milk for their first feed
- b) Any breast milk at discharge from the maternity unit

**Case-mix factors:** none

## Admissions to neonatal care

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

### Relevant population (denominator):

(1) Number of live singleton babies born between 37+0 and 42+6 weeks of gestation

(2) Number of live singleton babies born between 34+0 and 36+6 weeks of gestation

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	≥70% complete within both caesarean and vaginal births	Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births
Number of infants	≥70% complete	N/A
Fetus outcome	≥70% complete	More than one stillbirth was recorded in the financial year
Linkage	≥80% of babies recorded in the NNRD as born in the relevant trust/board link to the NMPA	

Record level:

Records were excluded if they were missing information on: gestational age, number of infants, or fetus outcome.

### Numerator:

(1) Number of live born singleton babies born between 37+0 and 42+6 weeks gestation admitted to a neonatal unit<sup>4</sup>

(2) Number of live born singleton babies born between 34+0 and 36+6 weeks gestation admitted to a neonatal unit<sup>4</sup>

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, gestational age (by week), BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

<sup>4</sup> Babies admitted to neonatal transitional care were not included in admissions to a neonatal unit

### Term babies receiving mechanical ventilation

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Sites with an obstetric unit

**Relevant population (denominator):**

Number of singleton babies born between 37+0 and 42+6 weeks of gestation

**Exclusions:**

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	≥70% complete within both caesarean and vaginal births	Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births
Number of infants	≥70% complete	N/A
Fetus outcome	≥70% complete	More than one stillbirth was recorded in the financial year
Linkage	≥80% of babies recorded in the NNRD as born in the relevant trust/board link to the NMPA	

Record level:

Records were excluded if they were missing information on: gestational age, number of infants, or fetus outcome.

**Numerator:**

Number of live born singleton babies born between 37+0 and 42+6 weeks gestation admitted to a NNU who have a recorded episode of mechanical ventilation within the first 72 hours of life

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, gestational age (by week), BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios

## Neonatal encephalopathy

**Lowest level of reporting in NMPA clinical report for 2016-17 births:** Trusts/boards with at least one obstetric unit

**Lowest level of reporting on NMPA website:** Trusts/boards with at least one obstetric unit

### Relevant population (denominator):

Number of singleton babies born between 35+0 and 42+6 weeks of gestation

### Exclusions:

Trust/board level:

Trusts/boards were excluded if they did not meet the following criteria:

Data item	Completeness check	Distribution check
Gestational age	≥70% complete within both caesarean and vaginal births	Gestational age at birth is between 37 and 42 weeks (inclusive) in ≥70% of births
Number of infants	≥70% complete	N/A
Fetus outcome	≥70% complete	More than one stillbirth was recorded in the financial year
Linkage	≥80% of babies recorded in the NNRD as born in the relevant trust/board link to the NMPA	

Record level:

Records were excluded if they were missing information on: gestational age, number of infants, or fetus outcome.

### Numerator:

Number of singleton babies born between 35+0 and 42+6 weeks of gestation who have two or more of the following neurological signs recorded in the same daily data summary within the first 72 hours of life:

- Tone: Abnormal
- Consciousness: Lethargic or Comatose
- Convulsions: Yes

**Case-mix factors:** maternal age, ethnicity, deprivation, parity, previous caesarean section, gestational age (by week), BMI, smoking status, diabetes, hypertension, preeclampsia, placental problems, poly/oligo/anhydramnios, financial year

## Data item definitions and data sources used

Data item	Coding and data source(s)		
	England	Wales	Scotland
<b>Data items used for indicator construction</b>			
Singleton	MIS: Number of infants this delivery (NumberInfants) = 1	MIDs: Number of infants this delivery (Number of Foetus at Onset of Labour) = 1. If number of infants was missing in MIDs we used number_bornche = 1 in Child Health data (CHE).	SMR-02: Number of infants this delivery (Number of Births this Pregnancy) = 1
Term	MIS: gestational age at birth (GestationLengthBirth) = 37+0 weeks to 42+6 weeks inclusive If gestational age was missing in the MIS record we used gestational age as recorded in HES (gestat_1)	CHE: gestational_ageche = 37+0 weeks to 42+6 weeks inclusive If gestation was missing in CHE, we used MIDs (Gestation at onset of labour).	SMR-02: gestational age at birth = 37+0 weeks to 42+6 weeks inclusive
Cephalic	MIS: Fetal presentation at delivery (DeliveryPresentation) = 01 (Cephalic). If presentation was missing, we used method of delivery (DeliveryMethodBaby) to determine presentation where possible (e.g. if spontaneous vertex delivery, recoded as 01 (Cephalic)).	MIDs: Fetal presentation at delivery (Foetal Presentation at Onset of Labour) = 1 (Cephalic).	SMR-02: Fetal presentation at delivery = 1 (Occipito-anterior); 2 (Occipito-posterior) or 3 (Occipito-lateral)

Data item	Coding and data source(s)		
	England	Wales	Scotland
Induction of labour	MIS: Labouronset = 3,4 or 5	MIDs: Mode of Onset of Labour = 3, 4 or 5. If mode of labour onset was missing in MIDs, we used onset_of_labourche = 2 (Induced)	Induction of Labour = 2,3,4,5,6,7
Augmentation of labour	MIS: Augmentation="yes" or "y"	MIDs: Augmentation of Labour=1	Not recorded independently of induction, therefore not available
Anaesthesia	MIS: Labouranaesthesia contains 01 (General anaesthetic), 02 (Epidural or caudal anaesthetic), or 03 (Spinal anaesthetic) Where this was supplied as free text or information about labour analgesia such as epidural was presented in the LabourPainReliefMethod field, this was supplemented in data cleaning.	MIDs: Epidural Status=1, supplemented with CHE pain_relief_duringche = 3 (General anaesthetic), 4 (Epidural or caudal), 5 (Spinal), or combinations of these (6, 7, 8).	Anaesthesia during labour or delivery= 2,4,5
Vaginal birth	MIS: method of delivery (DeliveryMethodBaby) = 0 (Spontaneous Vertex), 1 (Spontaneous, other cephalic), 2, (Low forceps, not breech), 3 (Other forceps, not breech) or 4 (Ventouse, vacuum extraction). If method of delivery was missing in the MIS record we used method of delivery as recorded in HES (delmethd)	MIDs: method of delivery (DeliveryMethodBaby) = 1 (Spontaneous Vaginal Birth), 2 (Ventouse), 3 (Forceps). If method of delivery was missing in MIDs, we used mode_of_deliveryche in CHE = 0 (Normal vertex), 1 (Other cephalic), 2, (Forceps - low), 3 (Forceps - other) or 4 (Ventouse).	SMR-02: Method of delivery = 0 (Spontaneous Vertex), 1 (Spontaneous, other cephalic), 2 (Low forceps, no rotation), or A-E (Mid cavity forceps; Rotational forceps; Ventouse; Ventouse with rotation; Other forceps)

Data item	Coding and data source(s)		
	England	Wales	Scotland
Livebirth	MIS: Delivery outcome (FetusOutcome) = 10 (Live birth)	MIDs: Delivery outcome (Outcome of Birth) = 1 (Live birth)	SMR-02: Outcome of pregnancy = 1 (Live birth)
3 <sup>rd</sup> or 4 <sup>th</sup> degree perineal tear	MIS: Perineal tears (GentialTractTraumaticLesion) = 6 (Third degree tear) or 7 (Fourth degree tear) OR HES: OPCS = R32.2/R32.5 OR ICD10 = O70.2/O70.3	MIDs: Perineal tears (Perineal Trauma) = 1 (Yes) OR PEDW: OPCS = R32.2/R32.5 OR ICD10 = O70.2/O70.3	SMR-02: Perineal tears (Tears) = 3 (Third degree tear) or 4 (Fourth degree tear) <u>OR</u> SMR-02: OPCS = R32.2/R32.5 OR ICD10 = O70.2/O70.3
Obstetric haemorrhage ≥1500ml	MIS: Estimated blood loss ≥1500ml	MIDs: Estimated blood loss ≥1500ml	N/A

Data item	Coding and data source(s)		
	England	Wales	Scotland
Maternal readmission	<p>HES admission date &gt;= MIS delivery date</p> <p>HES admission date &lt;= MIS delivery date + 42</p> <p>Excluded HES admission methods corresponding to non-emergency admissions (admission methods &lt; 20, admission methods greater than 80 and less than 90)</p> <p>Excluded HES admissions not due to illness (any diagnosis code of Z763)</p> <p>Excluded any HES admissions within the delivery spell</p> <p>Excluded transfers (admission source of 30, between 48 and 53 inclusive and 87)</p> <p>MIS delivery date was substituted with HES operation date of the HES operation corresponding to a delivery OPCS code</p> <p>Excluded readmissions of less than one day (discharge date = admission date and there were no other records within the same spell as this record with a later discharge date)</p>	<p>PEDW Admission date &gt;= MIDs delivery date</p> <p>PEDW admission date &lt;= MIDs delivery date + 42</p> <p>Only PEDW admissions methods corresponding to emergency admissions were included (admission method codes: 30, 31, 32, 33, 34, 35, 36)</p> <p>Excluded PEDW admissions not due to illness (any diagnosis code of Z763)</p> <p>Excluded any PEDW admissions within the delivery spell</p> <p>Excluded transfers (admission methods: 81, 18, 24, 40, 41, 42, 43, 44 / discharge methods: 8, 49, 51, 52, 53, 54, 55, 56, 57, 98)</p> <p>MIDs delivery date was substituted with PEDW admission date of the PEDW operation codes corresponding to a delivery</p> <p>Excluded readmissions of less than one day (discharge date = admission date and there were no other records within the same spell as this record with a later discharge date)</p>	<p>SMR-01 Admission date &gt;= delivery date (derived from date of birth in NRS and substituted with SMR-01 admission date where admission corresponded to a delivery)</p> <p>SMR-01 Admission date &lt;= delivery date + 42</p> <p>Only SMR-01 admission methods corresponding to emergency admissions were included (admission type codes 30-39)</p> <p>Excluded SMR-01 admissions not due to illness (any diagnosis code of Z763)</p> <p>Excluded any SMR-01 admissions within the delivery spell</p> <p>Excluded transfers (using admission transfer and discharge variables where transfer was from a Health Care Provider, admission type 18 and discharge type 13)</p> <p>Excluded readmissions of less than one day (discharge date = admission date and there were no other records within the same spell as this record with a later discharge date)</p>



Data item	Coding and data source(s)		
	England	Wales	Scotland
Apgar score <7 at 5 mins	MIS: Apgar score at 5 minutes of 0 to 6	CHE: Apgar score at 5 minutes of 0 to 6	SMR-02: Apgar score at 5 minutes of 0 to 6
Breast milk at first feed	MIS: breast milk at first feed = 1 (maternal breast milk) or 2 (donor breast milk)	N/A	SMR-02: breast milk at first feed = 1 (maternal breast milk) or 2 (donor breast milk)
Breast milk at discharge	MIS: breast milk at discharge = 1 (exclusively breast milk) or 2 (partially breast milk)	N/A	SMR-02: breast milk at discharge = 1 (exclusively breast milk) or 2 (partially breast milk)
Episiotomy	MIS: Episiotomy = y	MIDs: Episiotomy = 1 (Yes)	SMR-02: Episiotomy = y
Skin-to-skin contact within one hour	MIS: Skin-to-skin = y	N/A	N/A

Data item	Coding and data source(s)		
	England	Wales	Scotland
Smoking status at delivery	MIS: Mother's smoking status at delivery (SmokingStatusDelivery), categorised as: Yes; No, and unknown	MIDs: Mother's smoking status at 36-38 weeks/onset of labour, categorised as: Yes; No, and unknown	SMR-02: Mother's smoking status at delivery, categorised as: Current; No, and unknown
Neonatal unit admission	<p>NNRD: Location of care was NNU on at least one occasion in the first 7 days after birth</p> <p>LocationofCare = 01 (neonatal unit)</p> <p>DayDateAnon to define timing within 7 days</p>	N/A	<p>NNRD: Location of care was NNU on at least one occasion in the first 7 days after birth</p> <p>LocationofCare = 01 (neonatal unit)</p> <p>DayDateAnon to define timing within 7 days</p>
Mechanical ventilation	<p>NNRD: ModeofRespiratorySupport = 1 (Ventilation via endotracheal tube or trachestomy) on at least one occasion in the first 72 hours after birth. DayDateAnon to define timing within 72 hours.</p>	N/A	<p>NNRD: ModeofRespiratorySupport = 1 (Ventilation via endotracheal tube or trachestomy) on at least one occasion in the first 72 hours after birth. DayDateAnon to define timing within 72 hours.</p>

Data item	Coding and data source(s)		
	England	Wales	Scotland
Neonatal encephalopathy	NNRD with two or more of the following neurological signs recorded in the same daily data summary within the first 72 hours of life: <ul style="list-style-type: none"> <li>- CentralTone = 1 (abnormal)</li> <li>- Consciousness = 2 or 3 (lethargic or comatose)</li> <li>- Convulsions = 1 (yes)</li> <li>- DayDateAnon to define timing within 72 hours.</li> </ul>	N/A	NNRD with two or more of the following neurological signs recorded in the same daily data summary within the first 72 hours of life: <ul style="list-style-type: none"> <li>- CentralTone = 1 (abnormal)</li> <li>- Consciousness = 2 or 3 (lethargic or comatose)</li> <li>- Convulsions = 1 (yes)</li> </ul> DayDateAnon to define timing within 72 hours.
<b>Data items used as case mix adjustors</b>			
Maternal age	MIS: Derived from mother's date of birth (PersonBirthDateMother) – date of birth (baby) (BabyBirthDateTime) in completed years of age. Categorised as: 12-15; 16-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50+, and unknown	CHE: Maternal age (maternal_ageche), categorised as: 12-15; 16-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50+, and unknown.	SMR-02: Mother's age at delivery in completed years of age. Categorised as: 12-15; 16-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50+, and unknown
Ethnicity	MIS: Derived from mother's ethnicity (EthnicCategoryMother) and categorised as: white; black; Asian; other, and unknown	CHE: Derived from mother's ethnicity (ethnicgroupcleancodeche), and categorised as: white; black; Asian; other, and unknown. If ethnicity missing in CHE, we used MIDs Ethnic Group, categorized as above.	SMR-02: Derived from mother's ethnicity (Ethnic Group) and categorised as: white; black; Asian; other, and unknown

Data item	Coding and data source(s)		
	England	Wales	Scotland
Deprivation	MIS: mother's postcode (Postcode) was converted to Lower Super Output Area (LSOA) and linked to its Index of Multiple Deprivation (IMD) ranking. This was then categorised into quintiles and an unknown category	PEDW: Patientregisteredgpclustername was converted into each GP cluster's IMD average. These averaged IMDs were then categorised into quintiles.	SMR-02: SMID quintile
Parity	MIS: Number of previous registerable birth (Prevtotalbirths), categorised as 0 (primiparous); 1 (parous), and unknown We also checked for evidence of previous births in HES and infilled parity with 1 if we found one or more previous delivery records for that woman	MIDs: Number of previous registerable birth (Parity), categorised as 0 (primiparous); 1 (parous), and unknown. If parity was missing we used parityche, recategorised as above. We also checked for evidence of previous births in PEDW and infilled parity with 1 if we found one or more previous delivery records for that woman.	Number of previous registerable birth, categorised as 0 (primiparous); 1 (parous), and unknown
Previous caesarean section (CS)	HES: We checked for evidence of previous caesarean sections in HES and categorised this as: 0 (no previous CS) and 1 (one or more previous CS), unknown	PEDW: We checked for evidence of previous caesarean sections in PEDW and categorised this as: 0 (no previous CS) and 1 (one or more previous CS), unknown	SMR-02: number of previous caesarean sections, categorised this as: 0 (no previous CS) and 1 (one or more previous CS), unknown

Data item	Coding and data source(s)		
	England	Wales	Scotland
Birthweight	<p>MIS: Baby's birthweight (BirthWeight), categorised as: &lt;2500g; 2500-4000g; &gt;4000g, and unknown.</p> <p>If birthweight was missing in the MIS record we used birthweight as recorded in HES (birweit_1)</p>	<p>CHE: Weight_at_birthche categorised as: &lt;2500g; 2500-4000g; &gt;4000g, and unknown.</p> <p>If birth weight was missing in CHE, we used MIDs (Birth Weight (g)), categorized as above.</p>	<p>SMR-02: Baby's birthweight, categorised as: &lt;2500g; 2500-4000g; &gt;4000g, and unknown.</p>
Gestational age	<p>MIS: gestational age at birth (GestationLengthBirth), categorised in completed weeks: 37; 38; 39; 40; 41; 42, and unknown.</p> <p>If gestational age was missing in the MIS record we used gestational age as recorded in HES (gestat_1)</p>	<p>CHE: gestational age at birth (gestational_ageche), categorised in completed weeks: 37; 38; 39; 40; 41; 42, and unknown.</p> <p>If gestation was missing in CHE, we used MIDs (Gestation at onset of labour).</p>	<p>SMR-02: gestational age at birth, categorised in completed weeks: 37; 38; 39; 40; 41; 42, and unknown.</p>
BMI	<p>MIS: Mother's BMI at booking (MotherBMI), categorised as: &lt;18.5; 18.5 to 25; &gt;25 to &lt;30; &gt;=30, and unknown</p>	<p>MIDs: Mother's BMI at booking (Maternal Weight at Initial Assessment / Maternal Height at Initial Assessment<sup>2</sup>), categorised as: &lt;18.5; 18.5 to 25; &gt;25 to &lt;30; &gt;=30, and unknown</p>	<p>SMR-02: Mother's BMI at booking, categorised as: &lt;18.5; 18.5 to 25; &gt;25 to &lt;30; &gt;=30, and unknown</p>

Data item	Coding and data source(s)		
	England	Wales	Scotland
Smoking status at booking	MIS: Mother's smoking status at booking (SmokingStatusBooking), categorised as: Yes; No, and unknown	MIDs: Mother's smoking status at booking (Smoker at Initial Assessment), categorised as: Yes; No, and unknown	SMR-02: Mother's smoking status at booking (Booking Smoking History), categorised as: Current; No (any history), and unknown
Diabetes	HES: ICD-10 codes O24.0-O23.4; O24.4; O24.9; E10-E11	PEDW: ICD-10 codes O24.0-O23.4; O24.4; O24.9; E10-E11	SMR-02: ICD-10 codes O24.0-O23.4; O24.4; O24.9; E10-E11 SMR-02: If variable diabetes has value 1, 2 or 3
Hypertension	HES: ICD-10 codes O10-O11; I10	PEDW: ICD-10 codes O10-O11; I10	SMR-02: ICD-10 codes O10-O11; I10
Preeclampsia	HES: ICD-10 codes O14-O15	PEDW: ICD-10 codes O14-O15	SMR-02: ICD-10 codes O14-O15
Placental problems	HES: ICD-10 codes O44-O45	PEDW: ICD-10 codes O44-O45	SMR-02: ICD-10 codes O44-O45
Poly/oligo/anhydramnios	HES: ICD-10 codes O40	PEDW: ICD-10 codes O40	SMR-02: ICD-10 codes O40