

Text S1. Details of trust-level data quality checks and comparison of included and excluded records

NHS trusts were excluded from the analysis if they failed one or more of the following assessments:

Birthweight

- More than 30% of birth records were missing the birthweight field

Number of trusts excluded: 12

Gestational age

- More than 30% of birth records were missing the gestational age field

and/or

- The proportion of all births that took place between 39 and 42 completed weeks of gestation was less than 60% or more than 90%

Number of trusts excluded: 5

NAOI component procedures and diagnoses

- The trust had a recorded incidence of one or more of the NAOI components that was above or below 5 standard deviations of the national mean incidence.

Number of trusts excluded: 6

¹ Manktelow BN, Smith LK, Seaton SE, et al. MBRRACE-UK Perinatal Mortality Surveillance Report, UK Perinatal Deaths for Births from January to December 2014. Leicester: The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester; 2016.

Table S1. Definition of E-NAOI component procedures and diagnoses and incidence (per 100 births) among all eligible infants (n = 484,007)

Component	Codes	Incidence
Birthweight <1500g	HES baby tail: birthweight <1500g	0.81
Gestational age <32 weeks	HES baby tail: gestational age <32 weeks	0.89
Neonatal death within 28 days (includes deaths after 28 days if the infant was never discharged home)	HES: Discharge method 4; ONS: death within 28 days of birth;	0.18
Respiratory distress syndrome	ICD-10: P22.0	1.99
Seizure	ICD-10: P90; R56	0.16
Intraventricular haemorrhage (grades 3 and 4)	ICD-10: P52.2	0.04
Cerebral infarction	ICD-10: I63	0.01
Periventricular leukomalacia	ICD-10: P91.2	0.01
Birth trauma (intracranial haemorrhage paralysis due to brachial plexus injury, skull or long bone fracture)	ICD-10: P10.0-3; P13.0; P13.2-3; P14.0-1	0.08
Hypoxic ischemic encephalopathy	ICD-10: P91.6; P91.8; P91.5	0.22
Necrotising enterocolitis	ICD-10: P77	0.11
Sepsis/septicaemia (streptococcus staphylococcus, E.coli, unspecified gram negative)	ICD-10: P36.0-8; B95.1; B96.2	0.41
Pneumonia	ICD-10: P23; J12-18	0.24
Other respiratory (primary atelectasis, respiratory failure)	ICD-10: P28.0; P28.5	0.13
Chronic respiratory disease originating in the perinatal period	ICD-10: P27	0.25
Bacterial meningitis	ICD-10: G00-03; G05	0.06
Resuscitation	OPCS: X50; X56; HES baby tail: biresus 5 - 6	0.58
Ventilatory support (mechanical ventilation and/or CPAP)	OPCS: E85.1-2; E85-8-9	3.63
Central venous or arterial catheter	OPCS: L91.0-5; O15.2; O15.3	0.97
Pneumothorax requiring intercostal catheter	OPCS: T12.2; T12.4 ICD-10: P25.1	0.26
Any IV fluids	OPCS: X29; X35.8-9	0.37
Transfusion of blood or blood products	OPCS: X33; X34.0-3; X32.1; X32.8-9; X47	0.03
Any body cavity surgical procedure	OPCS: A01-08; A10-22; A38-51; A57; B01-25; C01-09; G01-22; G24-82; H01-50; H62-70; J01-09; J16; J18-23; J26-72; J76; K01-12; K14; K17-48; K52-56; K66-75; L01-02; L04-12; L16-25; L29-30; L33-34; L37-38; L41-42; L45-46; L48-53; L56-62; L65-70; L73-82; M01-08; M16-83; Q03-11; Q22-54; T01-17; T28-57; V03-68; X45-46; X53-55; X58	0.44
Therapeutic hypothermia	OPCS: X51.1-2	0.11

Table S2. Characteristics of included and excluded records

Characteristic	Included records (%)	Excluded records (%)	P value
Maternal age <20	3.71	3.18	<0.001
Maternal age 20-34	75.88	73.71	
Maternal age >=35	20.41	23.12	
Primiparous	36.46	42.25	<0.001
Male infant	51.30	51.26	<0.001
Multiple birth	2.77	2.32	<0.001
Short gestation/low birth weight (ICD-10 P07)	7.64	8.45	<0.001