Type of study	Study	Study participation	Study attrition	Prognostic factor measurement	Outcome measurement	Study confounding
In-utero vs. ex-utero transfer to level 3 or regional perinatal centre	Miller et al.	• Single network study • Defined exclusion criteria (BW <1000g and >1500g, lethal congenital anomalies) • Comparison of baseline characteristics (GA, presentation, premature ROM, vaginal bleeding, cervix >3cm, premature labour, mode of delivery, admission-delivery time, SGA)	• Retrospective • Completeness of data on demographic/confounding factors 76-100% • Outcome analysis for all babies meeting inclusion criteria	• Undefined birth location for transferred babies (from all referring hospitals to perinatal tertiary centre)	• Pre-discharge mortality	• Unadjusted for confounding factors
	Watkinson et al.	• Single network study • Defined exclusion criteria (BW>2000g, lethal congenital anomalies) • Comparison of baseline characteristics (preterm labour, pre-eclampsia, APH, PROM, abnormal CTG, IUGR)	• Retrospective • Completeness of data on demographic/confounding factors 100% • Outcome analysis for all babies with BW 1000g-1499g meeting inclusion criteria	• Undefined birth location for transferred babies (from all referring hospitals to perinatal tertiary centre)	• Neonatal mortality	• Unadjusted for confounding factors
	Obladen et al.	• Single network study • Defined exclusion criteria (BW>1500g) • Comparison of baseline characteristics (maternal age, parity, nationality, marital status, social index, anternatal steroids, time and mode of delivery, Apgar scores, umbilical artery pH, plurality, male gender, BW, GA, person providing primary care, endotracheal intubation, admission age, systolic BP, temperature, pH, BE, blood glucose)	• Prospective • Completeness of data on demographic/confounding factors 100% • Number of babies for which IVH outcomes given does not match total number of VLBW infants - data missing for 30% (maybe due to babies who did not have cranial US) • Figures for survival correspond to singleton births only, therefore multiple births (27% of VLBW population) excluded	• Undefined birth location for transferred babies (from all referring hospitals to perinatal tertiary centre, outborn infants may not have paediatrician present at birth and transported using in-house staff)	• Survival to discharge, IVH (grade III or IV)	• Adjusted for confounding factors (RDS, BW, IVH, pH at admission, GA, gender)
	Mohamed et al.	• Population based study • Defined exclusion criteria (BW>1500g, missing data for transport, transport >48 hours of age, congenital anomalies which can contribute to IVH or outcomes) • Comparison of baseline characteristics (ELBW, gender, ethnicity, RDS, sepsis, NEC, PDA, pulmonary haemorrhage, apnoea of prematurity, perinatal asphyxia, pneumothorax, PPHN, maternal hypertension, chorioamnionitis, breech delivery)	• Retrospective • Completeness of data on demographic/confounding factors 99.9% • From data provided not able to assess study attrition • ICD-9 diagnostic codes for grade of IVH not available for all patients, no details provided for how many patients had cranial US	• Undefined birth location for transferred babies (inter-hospital transfers, direction of transfer not defined)	• All IVH, severe IVH (grade III or IV)	• Adjusted for confounding factors (gender, ethnicity, ELBW, birth asphyxia, fetal acidaemia, apnoea of prematurity, RDS, PPHN, pneumothorax, pulmonary haemorrhage, PDA, sepsis, NEC, maternal hypertension, chorioamnionitis, APH, cord prolapse, breech presentation, instrumental delivery)

Level of unit of birth (level 3 or perinatal regional centre vs. lower level or local unit)	Gortmaker et al.	• Population based study • Defined exclusion criteria (BW>1501g) • No comparison of baseline characteristics	• Retrospective • Data from linked birth and death certificates • Completeness of data on demographic/confounding factors 99% • From data provided not able to assess study attrition • Figures for 750g-1500g BW do not correspond to total infants meeting inclusion criteria (by 33%) - could be due to numbers of infants with BW<750g	• Comparing outcome of level 3 and rural/urban units (grouping level 1 and 2) • No explanation of facilities available in different levels of units	• Early neonatal (0-4 days), neonatal, and infant mortality	• Adjusted for confounding factors (GA, plurality)
	Powell et al.	• Population based • Defined exclusion criteria (BW<501g and >2000g) • No comparison of baseline characteristics of population by level of unit	• Retrospective patient • identification with prospective follow-up • Completeness of data on demographic/confounding factors 53-100% • Outcome analysis for 97.7% of babies meeting inclusion criteria (32 lost to follow up) • Mortality figures only available for infants with BW<1500g, therefore 70 infants unaccounted for - probable deaths in 1501-2000g BW category	• Comparing outcome of regional and district hospitals • No explanation of facilities available in different levels of units	• Survival to 2 years of age	• Unadjusted for confounding factors
	Powell et al.	• Population based • Defined exclusion criteria (BW<500g and >2499g, hospitals without obstetric services, lethal congenital anomalies) • Comparison of baseline characteristics (plurality, maternal age, ethnicity, marital status, residence, smoking status, antenatal care, parity)	• Retrospective • Completeness of data on demographic/confounding factors 3.1-81.5% • Outcome analysis for 27.7% of babies meeting inclusion criteria	• Comparing outcomes of level 3 and level 2 units • Explanation of facilities available in different level units (e.g. level 2 units have ≥500 births/year, obstetricians and paediatricians, 1:4 maximum nurse:patient ratio)	• Infant survival	• Unadjusted for confounding factors
	Yeast et al.	• Population based study • Defined exclusion criteria (BW<500g, lethal congenital anomalies) • No comparison of baseline characteristics	• Retrospective • Outcome analysis for potentially all VLBW births meeting inclusion criteria	• Comparing outcomes of level 3 and level 2 units • Explanation of facilities available in different level units (e.g. level 2 units have >1000 births/year, anaesthetics available at all times)	• Neonatal mortality	• Adjusted for confounding factors (BW, ethnicity, plurality)
	Sanderson et al.	• Population based study • Defined exclusion criteria (BW<500g and >1499g, lethal congenital anomalies, births outside a delivery hospital, missing data on GA or birth hospital) • Comparison of baseline characteristics (maternal transfer, infant transfer, ethnicity, marital status, age, residence, education, antenatal care, year of birth, multiple birth, gender, BW, GA)	• Retrospective • Completeness of data on demographic/confounding factors 96.3-100% • Outcome analysis for all babies meeting inclusion criteria	• Comparing outcomes of level 3 and level 2 units • Explanation of facilities available in different level units (e.g. level 2 units have >500 births/year, care for infants >1500g BW and >32 weeks GA, can provide resuscitation, short term ventilation, exchange transfusion)	• Neonatal mortality	• Adjusted for confounding factors (ethnicity)

	Gould et al.	• Population based study • Defined exclusion criteria (BW<500g, non-hospital births, missing data on BW) • No comparison of baseline characteristics	• Retrospective • Multiple births and deaths due to congenital anomalies excluded (numbers undefined), therefore not possible to assess study attrition	• Comparing outcomes of regional NICUs (level 3) and intermediate NICUs (level 2) • Explanation of facilities available in different level units (e.g. level 2 units care for infants >1500g BW not requiring assisted ventilation)	• Neonatal mortality	• Unadjusted for confounding factors
	Warner et al.	• Population based • Defined exclusion criteria (BW<499g and >1499g, lethal congenital anomalies) • Comparison of baseline characteristics (BW, GA, ethnicity, sex, SGA, multiple gestation, Apgar score, maternal hypertension or preeclampsia, CRIB score, antenatal steroids, ante/intrapartum antibiotics)	• Retrospective • Completeness of data on demographic/confounding factors 100% • Outcome analysis for all babies with BW 1000g-1499g meeting inclusion criteria	• Comparing outcome of perinatal centres vs referring hospitals • Explanation of facilities available in different levels of units (e.g. non-perinatal centres do not have 24-hour on site physician for newborn care, some provide CPAP, mechanical ventilation only to stabilise for transport)	• Pre-discharge mortality or <120 days, BPD or death, severe IVH (grade III or IV) or death, ROP (requiring laser or cryotherapy) or death, NEC (Bell stage II or III) or death, mortality or major morbidity (BPD, severe IVH, severe NEC, severe ROP)	• Adjusted for confounding factors (GA, BW, gender, ethnicity, SGA, Apgar score, plurality, maternal hypertension/pre-eclampsia, antenatal antibiotics, glucocorticoids, CRIB score)

Table S2 Quality assessment of studies characterising neonates by birthweight using modified QUIPS tool

GA (gestational age), BW (birthweight), NICU (neonatal intensive care unit), CTG (cardiotocograph), ROM (rupture of membranes), BP (blood pressure), BE (base excess), SGA (small for gestational age), IUGR (intrauterine growth retardation), VLBW (very low birthweight), ELBW (extremely low birthweight), APH (antepartum haemorrhage), PPHN (persistent pulmonary hypertension of the newborn), RDS (respiratory distress syndrome), NEC (necrotising enterocolitis), PDA (patent ductus arteriosus), IVH (intraventricular haemorrhage), ICD-9 (International Classification of Diseases, Ninth Revision) [REF], CRIB (clinical risk index for babies) [REF], BPD (bronchopulmonary dysplasia), ROP (retinopathy of prematurity)