

## Supplementary data

### Influence of multiple birth

The 2460 babies in this population came from 2175 mothers; 1852 singleton pregnancies and 323 multiple pregnancies. Not all multiple pregnancies resulted in the appropriate number of babies as part of the cohort (some were stillborn having died before the delivery admission. There were 382 mothers transferred antenatally into a Level 3 Service, of whom 319 had singleton pregnancies and 63 had multiple pregnancies. The proportion of multiple pregnancies was similar in Level 2 Services, Level 3 Services, and in those transferred antenatally (Table S1).

**Table S1:** breakdown of multiple pregnancies in the study

	Level 1			Antenatal transfers			Level 2 Service			Level 3 Service			Total
Mothers	212 (10%)			382 (18%)			747 (34%)			834 (38%)			2175
Singleton pregnancies*	172 (81%)			319 (84%)			651 (87%)			710 (85%)			1852
Multiple pregnancies*	40 (19%)			63 (16%)			96 (13%)			124 (15%)			323
	Twins	Triplets	Quads	Twins	Triplets	Quads	Twins	Triplets	Quads	Twins	Triplets	Quads	
	36	4	0	57	6	0	90	6	0	120	2	2	323
Babies of multiples	64	8	0	103	18	0	161	17	0	223	6	8	608
Singleton babies	172			319			651			710			1852

\* (% of all pregnancies by level)

We repeated the analysis of antenatal transfers for all outcomes, excluding multiple pregnancies. For all outcomes, the adjusted odds ratios and confidence intervals for the singleton-only population are very similar to those which include all babies. In addition, since antenatal steroids are given to the mother rather than to the baby directly, the analysis for antenatal steroid use was repeated including only one baby from each multiple pregnancy (which marginally increases the effect size).

**Table S2:** Mortality, morbidity and selected perinatal variables among singleton babies comparing babies managed in Level 2 Services or Level 3 services with babies transferred antenatally to Level 3 Services.

Outcome	aOR (95% CI)		aOR (95% CI)	
	L2 v ANT		L3 v ANT	
	Singletons only	All	Singletons only	All
Antenatal death	1.81 (1.15, 2.85)	1.52 (1.03, 2.26)	1.53 (0.98, 2.40)	1.31 (0.89, 1.93)
Delivery room deaths *	1.67 (0.96, 2.92)	1.67 (1.02, 2.72)	0.90 (0.51, 1.59)	0.89 (0.54, 1.46)
Neonatal unit deaths <7d	1.83 (1.15, 2.90)	1.80 (1.23, 2.63)	1.19 (0.76, 1.89)	1.25 (0.76, 1.89)
All early neonatal deaths	1.85 (1.25, 2.72)	1.85 (1.33, 2.57)	1.07 (0.72, 1.57)	1.12 (0.81, 1.56)
Late neonatal death (7-28d) *	1.11 (0.66, 1.89)	1.08 (0.69, 1.68)	1.09 (0.67, 1.78)	1.01 (0.67, 1.53)
Death 28d to discharge	0.99 (0.53, 1.87)	0.86 (0.50, 1.46)	1.12 (0.63, 2.00)	0.93 (0.57, 1.51)
All deaths	1.53 (1.11, 2.10)	1.44 (1.09, 1.90)	1.19 (0.87, 1.61)	1.08 (0.83, 1.41)
Survival without morbidity	0.66 (0.43, 1.02)	0.65 (0.44, 0.96)	0.76 (0.51, 1.15)	0.74 (0.52, 1.06)
<b>Survivors only:</b>				
No morbidity	0.73 (0.46, 1.15)	0.72 (0.48, 1.08)	0.75 (0.49, 1.15)	0.71 (0.49, 1.04)
<b>Perinatal factors</b>				
Antenatal Steroid (any)	0.09 (0.05, 0.18)	0.20 (0.12, 0.31)	0.13 (0.07, 0.26)	0.23 (0.14, 0.36)
Antenatal Steroid (any) mothers counted once		0.15 (0.09, 0.26)		0.19 (0.11, 0.33)
Resuscitation withheld	1.33 (0.56, 3.17)	1.25 (0.62, 2.55)	0.56 (0.22, 1.40)	0.51 (0.24, 1.09)
Alive with HR>100 at 5m	0.74 (0.46, 1.18)	0.70 (0.46, 1.06)	0.82 (0.52, 1.30)	0.81 (0.53, 1.22)
Admitted to NNU	0.61 (0.42, 0.88)	0.69 (0.50, 0.96)	0.90 (0.62, 1.32)	0.98 (0.70, 1.35)