

Trends in the provision of neonatal care in England: changes in patient volume and staffing since 1996

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BACKGROUND

Since 2003 in England, neonatal services have been reorganised into managed clinical networks (MCNs). [1] Nurse staffing - particularly by those qualified in specialty (QIS) - has been associated with longer term neonatal mortality. [2] Few data are available looking at the effect of MCN reconfigurations on staffing and patient activity. We hypothesised that nurse staffing improved while activity remained stable over time.

OBJECTIVE

To investigate the impact of temporal changes in neonatal service provision on:

- nurse staffing ratios,
- admissions, and
- provision of respiratory support (CPAP or mechanical ventilation).

METHODS

UKNSS: United Kingdom Neonatal Staffing Study, conducted in 1997.

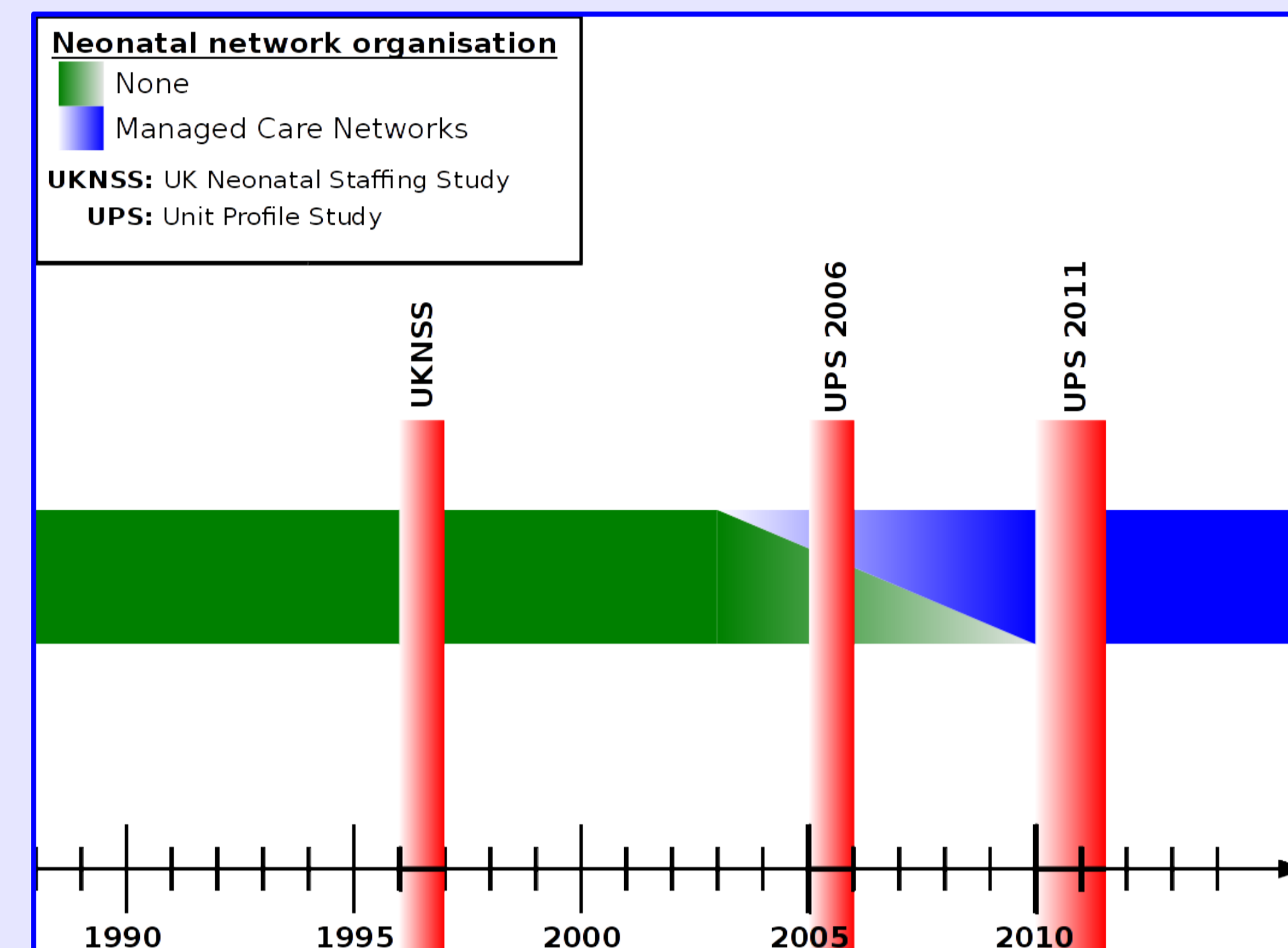
- All neonatal units in Great Britain and Ireland (n=253)
- Postal survey followed by 2 phone calls.
- Data available from English *intensive care* units only (n=145)

UPS: Unit Profile Studies - carried out by EPIcure Research Group with questions based on UKNSS.

- 2006: Data from all English neonatal units (n=182)
- 2011: Data from 159/165 English units.

Statistical methods

- Simple descriptive statistics including rates and 95% confidence intervals (CI).
- Linear regression of standardised ratios using a forward, stepwise technique.



Standardised ratios:

- BAPM cot criteria: $IC + HD/2 + SC/4$
 - Nurse staffing recommendation:
 $5.5 * (1 + IC + HD/2 + SC/4)$
- [IC: intensive care; HD: high dependency; SC: special care]

RESULTS

Unit numbers

	L1	L2	L3
1997	-	145	
2006	62	74	46
2011	43 (7)	72	44

123 units had data available at each time point. 7 Special Care (level 1) Units did not respond to the 2011 survey [level 2 = Local Neonatal Unit; level 3 = Network Intensive Care Unit].

Cot numbers

	SC	HD	IC	BAPM total
1997	1445	650	637	1929
2006	1455	420	602	1816
2011	1554	516	650	1974

Activity

Between 1997 and 2006, respiratory support provided for each cot increased by 36.4 (17.5 - 55.2) days (d), and by 1.17d (0.67 - 1.67) per admission; neither measure changed thereafter.

The ratio of babies provided with respiratory support to the number of babies admitted increased from 0.23 (95% CI 0.21 - 0.25) in 1997 to 0.33 (0.30 - 0.35) in 2006 and to 0.39 (0.37 - 0.42) in 2011 - an increase of 69.6%.

	'97 - '06	'06 - '11
Nurses / cot	↑	↑
Admissions / cot / year	↔	↑
Respiratory support / year		
Days support / cot	↑	↔
Babies supported / admissions	↑	↑
Days support / admissions	↑	↔

Nurse staffing

The number of whole-time equivalent nurses per cot (WTE/cot) increased between 1997 (baseline 0.50 WTE/cot, 95% CI 0.45 - 0.55, recommended 0.80) and 2006 by 0.10 WTE/cot (95% CI 0.07 - 0.14) and by 0.08 WTE/cot (0.04 - 0.12) between 2006 and 2011. The ratio of nurses QIS increased by 0.07 WTE/cot (0.00 - 0.13) between 1997 and 2006, then by a further 0.05 WTE/cot (0.01 - 0.09) from 2006 to 2011.

Throughput

The number of admissions per cot per year was similar in 1995 (41.6, 95% CI 31.5 - 55.0) and 2006 (41.6, 33.1 - 52.3) but increased by 23.2% (10.3 - 37.6) from 2006 to 2011, to 51.0 (40.6 - 64.1) admissions per cot per year.

Sensitivity analyses

Three populations were used for analyses: all intensive care units at all time points; all units in 2006 and 2011; and units with data at all time points (n=123). Results were consistent between populations.

CONCLUSION

Overall, the results show there were improvements in nurse staffing and better cot utilisation (more admissions per cot) between 1997 and 2011 in England. However, the ratio of actual to predicted numbers of nurses is lower - despite our using a more conservative formula [3] - than the recommended 80% level. [4]

There was an increase in the number of babies requiring ventilatory support during this time. This was accompanied by an increase in the amount of support provided per baby and per cot, suggesting resources are being used appropriately.

REFERENCES

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FURTHER INFORMATION

This poster can be downloaded from <https://www.andreimorgan.net>
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