Methodology

Interpreting caterpillar plots

Neonatal unit level:

Rates of administration/compliance are presented by dots. NICUs are shown in pink, LNUs in blue and SCUs in grey. The 95% confidence intervals for a unit are shown by a vertical line with each dot. The developmental standard is shown by a bold dashed line, and the national rate is indicated by a grey dotted line. Neonatal units are presented in the ascending order of the rates and can be identified on *NNAP Online*.

Network level:

Rates of administration/compliance are presented by black dots and the 95% confidence intervals are indicated by vertical bars. The networks are presented in the ascending order of the rates. The national rate is represented by the line with short dashes and the developmental standard is represented by the line with long dashes.

Treatment effect:

Rates of treatment effect are marked with black dots and the 95% confidence intervals are indicated by vertical bars. 'Treatment effect' is the difference between the rate of BPD or death in babies cared for in a neonatal network compared to the observed rate for a matched group of babies with very similar case mix, cared for in all neonatal units. A 'positive' treatment effect indicates that the rate of significant BPD or death is higher in the network of interest than for a comparable group of babies cared for in all neonatal units. Where the 95% confidence interval for this effect does not include zero, the treatment effect is unlikely to be a chance finding.

Risk adjustment of bronchopulmonary dysplasia (BPD) or death

Risk adjustment for the combined outcome of bronchopulmonary dysplasia (BPD) or death is conducted by comparing the rate of BPD in a network or a unit to the rate of BPD in a subset of the babies in the NNAP cohort. This subset is selected carefully to be well matched on an extensive list of background variables with the babies from the network or unit.

BPD in a network is assessed by comparing its rate with the rate of BPD or death seen in a comparable set of babies cared for in the UK (or NNAP) as a whole.

The results (known as 'treatment effect') are suitable for comparing a network against the national result, but not for comparisons of two networks, because the background profiles of two networks differ.

'Treatment effect' is the difference between the rate of BPD or death in babies cared for in a neonatal network compared to the observed rate for a matched group of babies with a very similar case mix, cared for in all neonatal units. A positive treatment effect indicates that the rate of BPD or death is higher in the network of interest than for a comparable group of babies cared for in all neonatal units. Where the 95% confidence interval for this effect excludes zero, the treatment effect is unlikely to be a chance finding.

A detailed description of the risk adjustment method used is available in the Statistical Analysis Plan for the NNAP, available at www.rcpch.ac.uk/national-neonatal-audit-programme.

Mortality and BPD analysis

Mortality rates are analysed by the same method, propensity matching, as BPD.

For each network's caseload, a set of babies from the entire NNAP is found that matches it closely on all the following background variables: gestational age (weeks), birthweight, sex, birth year, multiplicity of birth, mothers' age, ethnic group (4 categories), any previous pregnancies, mother's smoking status (during pregnancy), placenta abruption and a single indicator of Pregnancy induced hypertension, Pre-eclampsia or Maternal HELLP (codes 30-32 for Problems during pregnancy in NNRD)

The treatment effect for a network is defined as the difference of the network's mortality rate (evaluated with no adjustment) and the matched rate. Negative values of the treatment effect are desirable -- they indicate that the babies in the network have fared better than in they were cared for in the country at large.