

Online supplement.

### Constructing oxygen centile charts.

All SpO<sub>2</sub> data were entered into Microsoft Excel and analysed using Stata (Intercooled 10, Stata Corp, College Station, TX). The SpO<sub>2</sub> centiles were calculated using the LMS method of Cole and Green and fitted using the LMS ChartMaker Light Version 2.3 (Institute of Child Health, London, England).

We used the LMS method to summarise the changing distribution of SpO<sub>2</sub> measurements at varying altitudes and in a priori defined age groups. The LMS method uses three curves representing the median (M), coefficient of variation (S) and skewness (L), the latter is expressed as a Box-Cox power. The process involves five stages: data entry, model fitting, graphical display, model checking and model saving, with the last four stages repeated as often as necessary to obtain smoothed centiles. The data from the centiles in logit format were transferred to Stat where they were back transformed to oxygen saturation values. These values were then used to illustrate the 2.5th, 10th, 25th, 50th, 75th, 90th and 97.5th centile for SpO<sub>2</sub> for each age group according to residential altitude using Stata (Intercooled 10, Stata Corp, College Station, TX).

Table 1. Oxygen saturation measurements (%) by age group and altitude.

Oxygen saturation values by age group and altitude				
altitude (m)	1-5 years	6-17 years	18-50 years	51-80 years
154	98.5 (98.3 to 98.7)	98.8 (98.7 to 98.5)	98.5 (98.4 to 98.6)	97.6 (97.4 to 97.9)
562	98.4 (98.2 to 98.6)	98.8 (98.8 to 98.9)	98.6 (98.6 to 98.8)	98.2 (97.9 to 98.4)
1400	97.6 (97.4 to 97.9)	97.9 (97.8 to 98.5)	98.2 (97.8 to 98.5)	96.9 (96.6 to 97.2)
2000	96.6 (96.1 to 97.2)	97.5 (97.3 to 97.7)	96.4 (96.0 to 96.7)	95.8 (95.5 to 96.2)
2335	95.9 (95.4 to 96.5)	96.8 (96.6 to 97.0)	97.3 (96.0 to 96.7)	96.1 (95.5 to 96.2)
2500	95.7 (95.4 to 95.9)	96.5 (96.4 to 96.7)	95.9 (96.6 to 96.3)	94.3 (93.5 to 95.0)
2880	94.9 (94.6 to 95.0)	95.2 (94.9 to 95.5)	94.7 (94.4 to 95.0)	93.2 (92.7 to 93.8)
3250	92.5 (92.1 to 92.8)	94.2 (93.4 to 94.4)	93.7 (93.2 to 94.3)	91.8 (91.1 to 92.5)
3600	91.9 (90.9 to 92.9)	92.7 (92.4 to 92.9)	91.7 (91.4 to 91.9)	90.1 (89.8 to 90.37)
3950	88 (88.2 to 89.5)	90.2 (89.9 to 90.5)	90.1 (89.3 to 91.0)	87.5 (86.8 to 88.1)
4100	87.0 (86.3 to 87.6)	89.7 (89.3 to 91.0)	90.0 (89.8 to 90.4)	87.0 (86.5 to 87.6)
4338	86 (85.3 to 86.9)	87.2 (86.7 to 87.7)	87 (86.6 to 87.5)	87.2 (86.3 to 88.1)
4500	84.6 (83.4 to 85.8)	84.6 (84 to 85.2)	87.6 (87.3 to 87.9)	86.2 (84.2 to 88.2)
4715	83.8 (82.4 to 85.2)	86.1 (85.5 to 86.7)	85.0 (84.1 to 86.0)	85.4 (84.2 to 86.5)
5100	79.2 (78.3 to 80.1)	80.8 (80.3 to 81.4)	84.2 (83.2 to 85.2)	83.4 (78.7 to 88.0)

Data is presented as mean and 95% confidence interval.

**Table 2 Oxygen saturation (%) by age group and altitude.**

<b>Oxygen saturation (%) by age group and altitude</b>				
<b>Altitude metres</b>	<b>1-5 years</b>	<b>6-17 years</b>	<b>18-50 years</b>	<b>51-80 years</b>
154	99	99	99	98
562	99	99	99	98
1400	98	98	98	97
2000	97	98	96	96
2335	96	97	98	96
2500	96	97	96	95
2880	95	96	95	93
3250	93	94	94	92
3600	93	93	92	90
3950	89	90	90	87
4100	87	90	90	88
4338	86	88	88	88
4500	84	85	88	85
4715	83	86	84	85
5100	80	81	84	84

Data is presented as median.