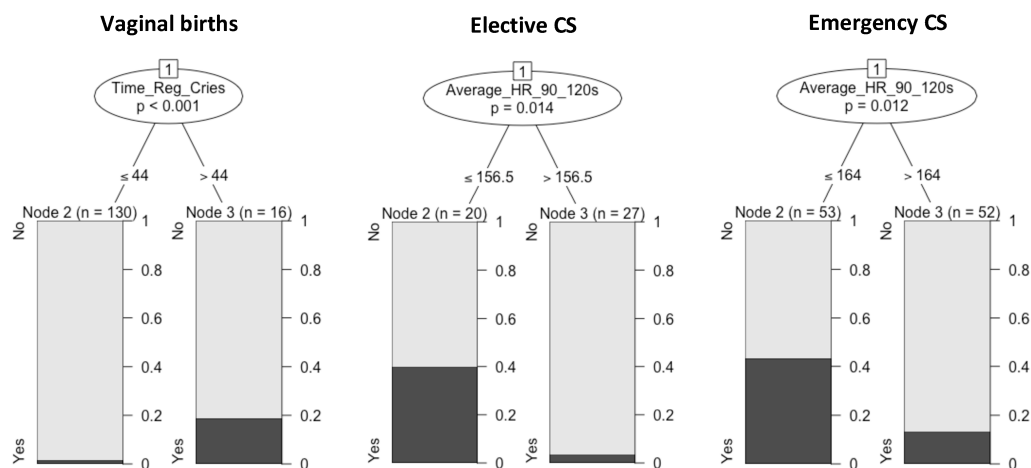
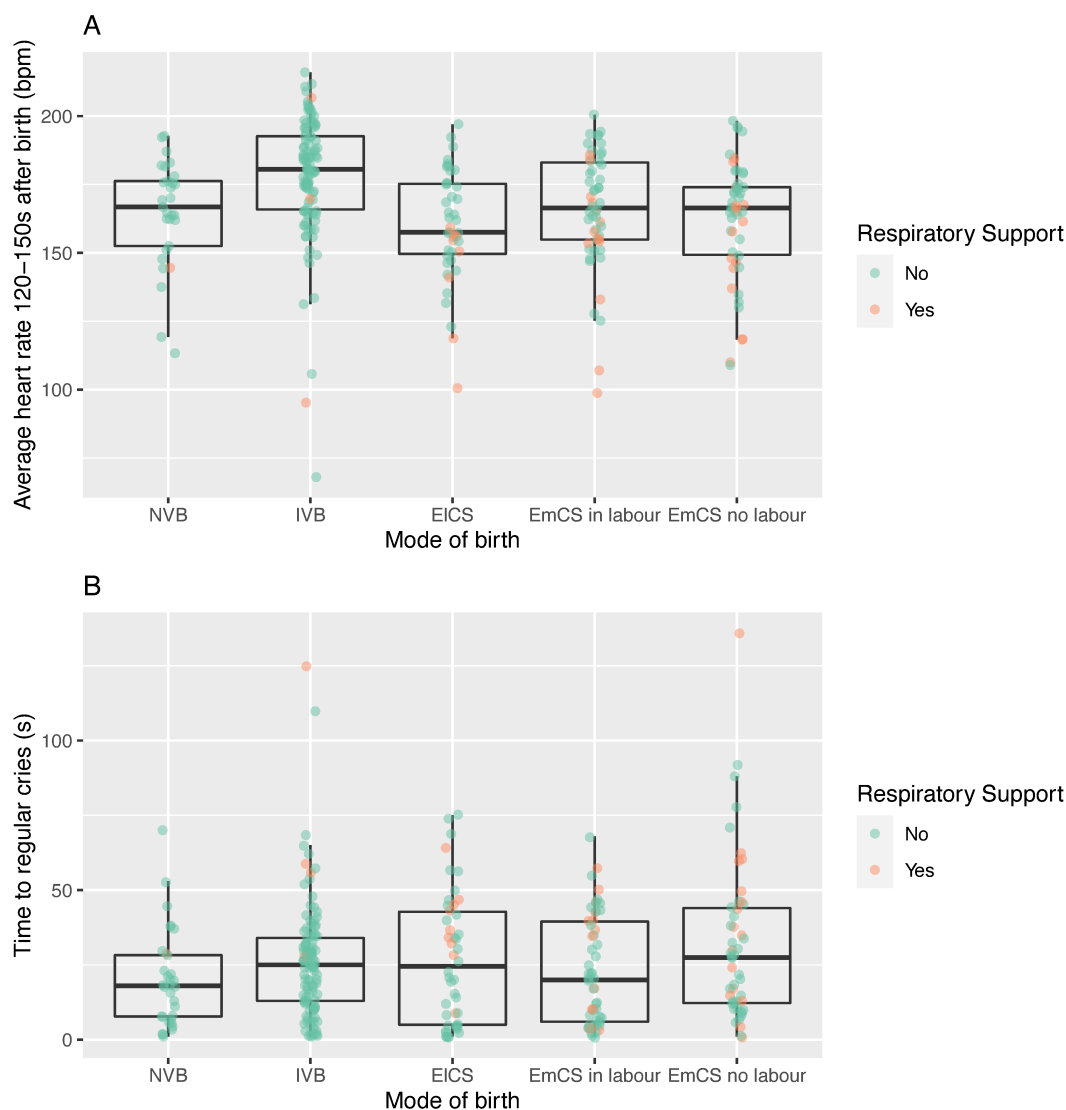


**Supplemental Figure 1.** ROC curve for heart rate in relation to the outcome of respiratory support. For average heart rate at 90-120s (Ave HR 90-120s, solid line), area under the curve = 0.76 (95% confidence interval 0.67-0.84), and optimal threshold was 164 beats per minute. For average heart rate at 120-150s after birth (Ave HR 120-150s, dashed line), area under the curve = 0.75 (95% confidence interval 0.67-0.83), and optimal threshold was 161 beats per minute.

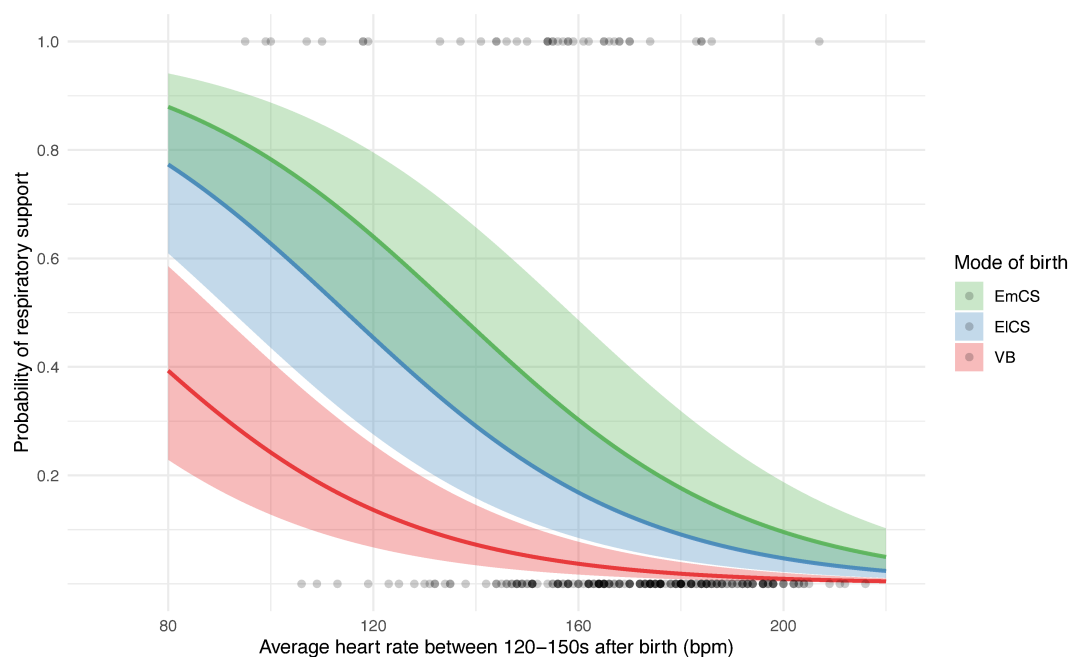


**Supplemental Figure 2.** Decision trees for each subgroup of type of birth. The best predictor of respiratory support at vaginal births (that included both normal vaginal births and instrumental births) was time to regular cries (Time\_Reg\_Cries)  $\geq 45$ s. At planned elective caesarean sections and at unplanned emergency caesarean sections, the best predictor of respiratory support was average heart rate (beats per minute) between 90-120s after birth (Average\_HR\_90\_120s) at the thresholds shown. The probability of receiving respiratory support at each terminal node is shaded in black. CS, caesarean section.

**Supplemental Figures 3-5** show the results of a post-hoc sensitivity analysis. Here, we used average heart rate between 120-150s after birth (i.e., immediately after cord clamping in most infants) as a predictor variable, rather than 90-120s after birth.

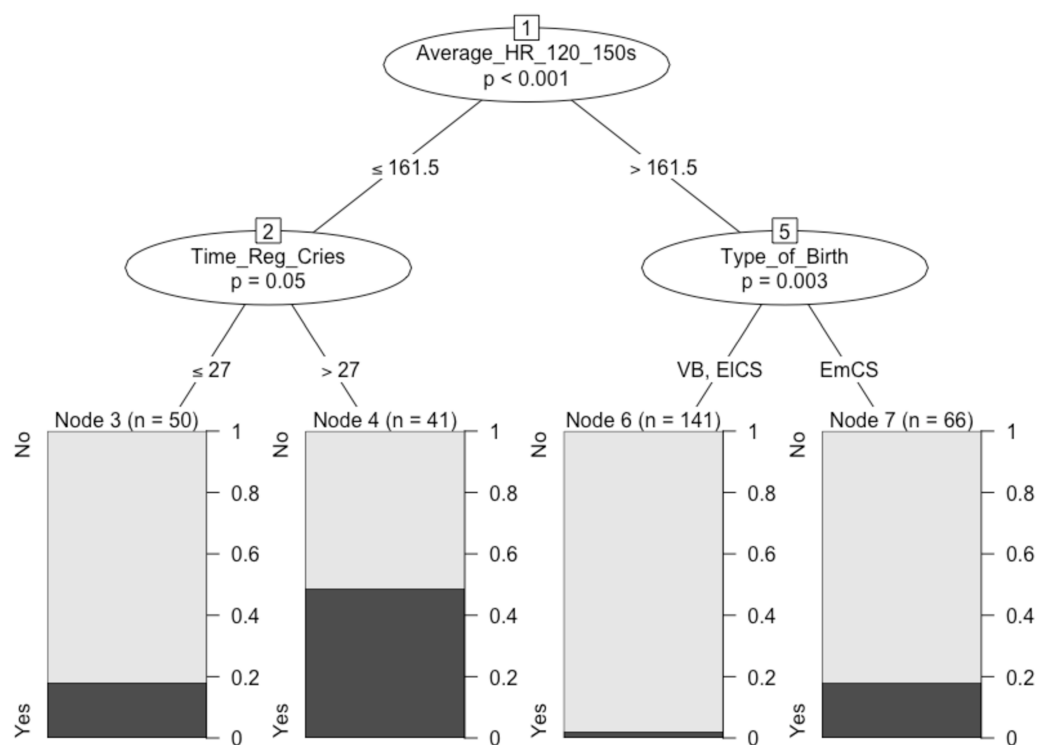


**Supplemental Figure 3.** Boxplots showing (A) the distribution of average heart rate 120-150s after birth and (B) time to regular cries for each mode of birth. Dots represent individual infants who either did (red) or did not receive respiratory support (green). NVB, normal vaginal birth; IVB, instrumental vaginal birth; EICS, planned (elective) caesarean section; EmCS, unplanned (emergency) caesarean section; bpm, beats per minute.



| HR range (beats per min)               | <120          | 120-140       | 140-160        | 160-180         | 180-200      | >200         |
|--|---------------|---------------|----------------|-----------------|--------------|--------------|
| Unadjusted risk of respiratory support | 8/13<br>(62%) | 2/13<br>(15%) | 16/59<br>(27%) | 11/106<br>(10%) | 4/77<br>(5%) | 1/15<br>(7%) |

**Supplemental Figure 4.** Probability of delivery room respiratory support in relation to identified risk factors from the regression model. Each curve describes the predicted probability of respiratory support in relation to average heart rate between 120-150s after birth for the following modes of birth- unplanned emergency caesarean sections both in and not in labour grouped together (EmCS, green), planned elective caesarean sections (EICS, blue), and normal and instrumental vaginal births grouped together (VB, red). The upper margin of the shaded area for each mode of birth corresponds with the modelled probability of respiratory support when time to regular cries = 60s, the lower margin the modelled probability when time to regular cries = 0s, and the middle line the probability when time to regular cries = 30s. Ninety-five percent of infants in the cohort had time to regular cries within this range. Dots represent individual infants who either did (plotted at  $y=1$ ) or did not receive respiratory support (plotted at  $y=0$ ).  $N=15$  infants had no data for average heart rate between 120-150s.



**Supplemental Figure 5.** Decision tree. Average heart rate between 120-150s after birth (Average\_HR\_120\_150s) in beats per minute, time to regular cries (Time\_Reg\_Cries) in seconds and type of birth were the most discriminatory variables in the study population. The probability of receiving respiratory support at each terminal node is shaded in black. VB, normal or instrumental vaginal birth; EICS, planned elective caesarean section; EmCS, unplanned emergency caesarean section.