

# A quality improvement project to mitigate the risk of hypothermia during delayed cord clamping (DCC) among preterm neonates

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## Background

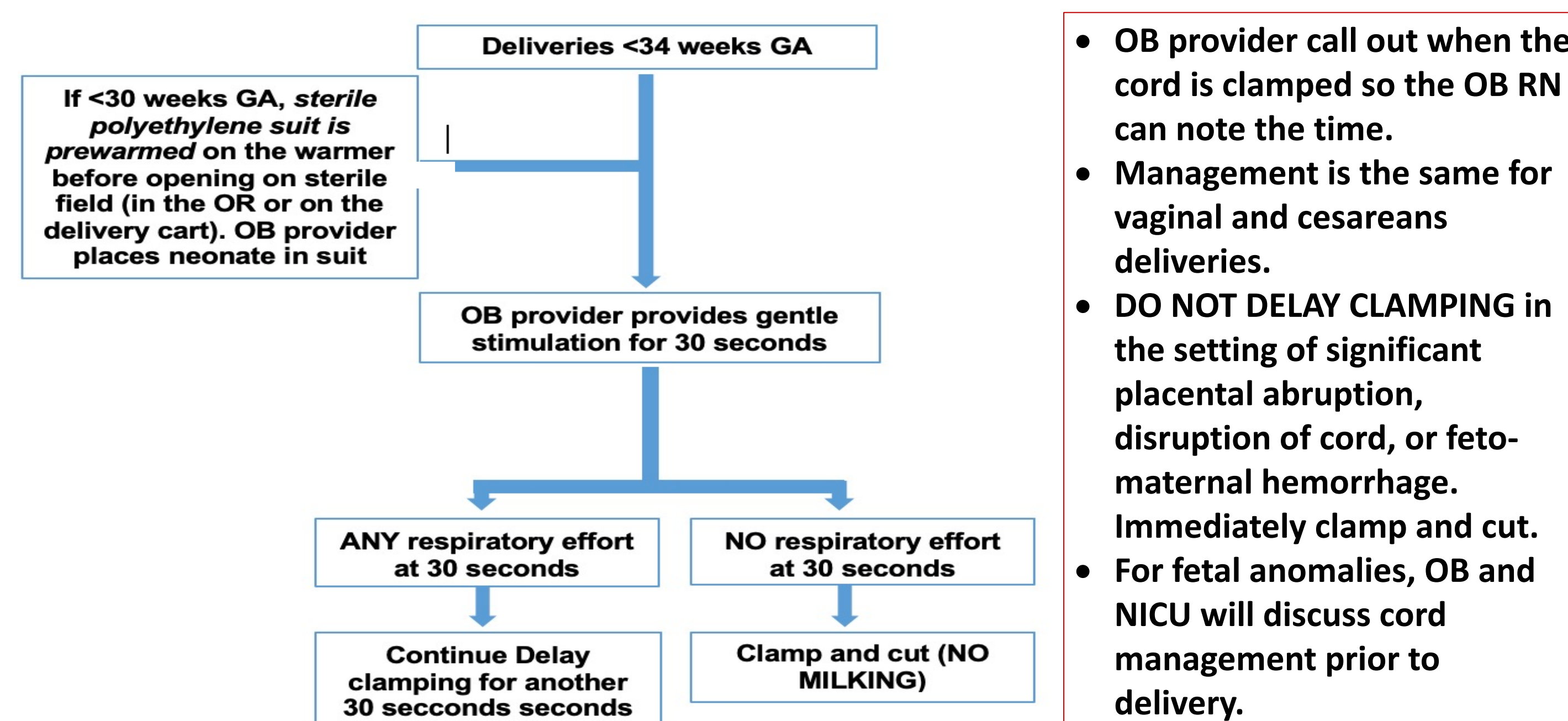
- DCC could prolong placental transfusion and enable adequate postnatal transition time.
- DCC is associated with reduced mortality, morbidities, and blood transfusion.<sup>1-3</sup>
- Adapting DCC practice is slow among preterm neonates. Prolonged heat loss to ambient air temperature and delay resuscitation may induce hypothermia, which may dampen the benefit gain from DCC.

## Specific Aim

- Implementing thermoregulation-focused DCC protocol to improve the **DCC rate from 20% to 50%** while **maintaining admission normothermia** (35.6-37.5°C) among <34 week gestational age (GA) neonates.

## Method

- Multi-disciplinary L&D and NICU formulated DCC protocol.
- Specific thermoregulation measures: **increasing delivery room temperature** and **pre-heating sterile polyethylene suit**.
- Implemented in Oct 2020 at a 52-bed level III NICU after training.
- Collected data 4 months before and 24 months after implementation.

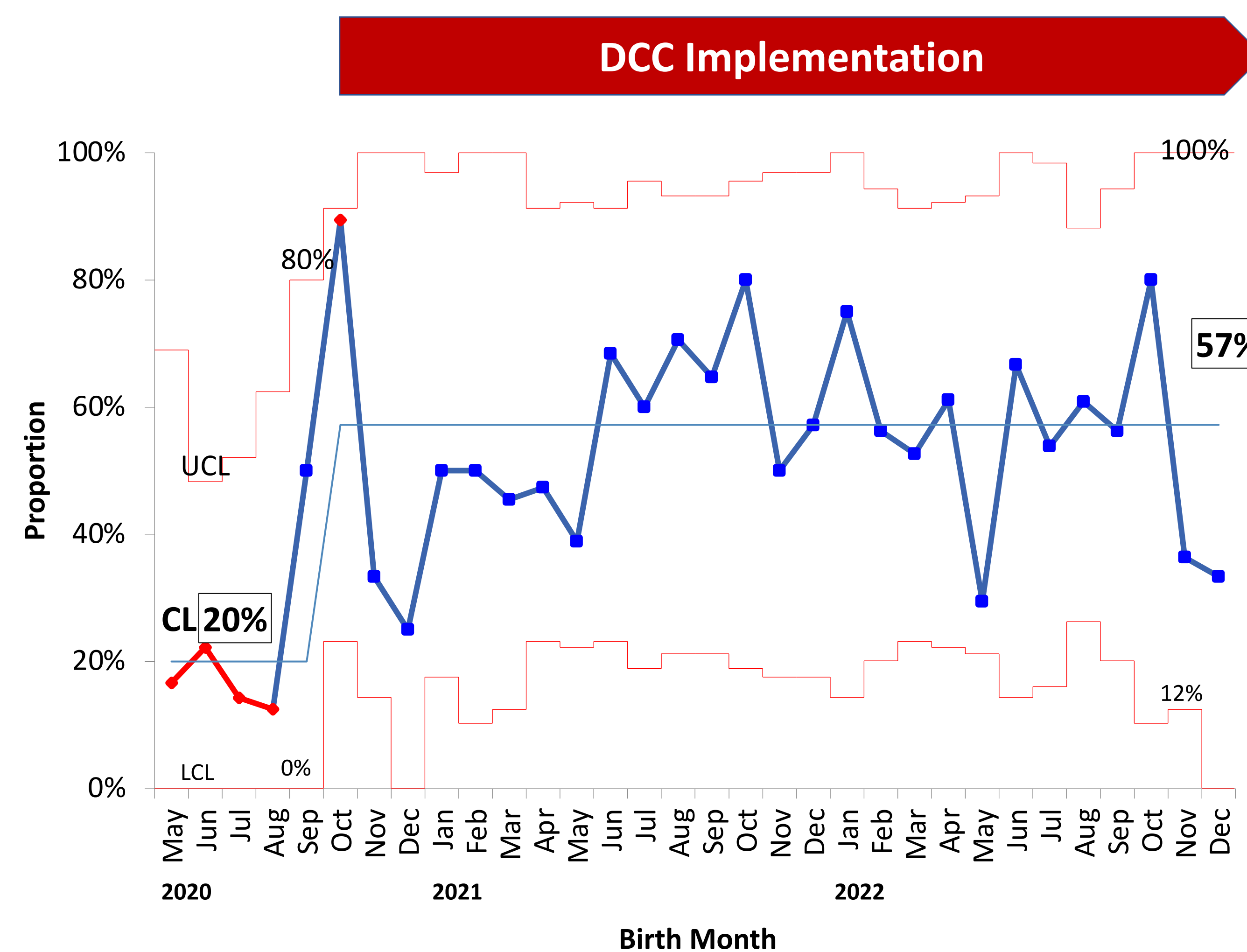


## Results

	4 months Pre-implementation (n=50)	24 months post-implementation (n=389)	P-value
GA (wks), median (IQR)	32 (29,33)	32 (29,33)	0.81 <sup>k</sup>
BW (kg), median (IQR)	1.6 (1.2,2.1)	1.6 (1.2,2)	0.58 <sup>k</sup>
Female, n (%)	21 (42)	162 (42)	0.96 <sup>c</sup>
C-section, n (%)	30 (60)	253 (65)	0.47 <sup>c</sup>
Prenatal steroid, n (%)	31 (62)	258 (66)	0.53 <sup>f</sup>
Chorioamnionitis, n (%)	1 (2)	19 (5)	0.07 <sup>f</sup>
1-min APGAR, median (IQR)	7 (2, 6)	6 (3, 7)	0.01 <sup>k</sup>
5-min APGAR, median (IQR)	8 (7, 9)	8 (7, 9)	0.14 <sup>k</sup>
Cord milking, n (%)	39 (78)	46(12)	<0.001 <sup>c</sup>
Delayed Cord Clamping, n (%)	<b>10 (20)</b>	<b>222 (57)</b>	<b>&lt;0.001<sup>c</sup></b>
Normothermia, n (%)	<b>25 (50)</b>	<b>227(58)</b>	<b>0.26<sup>c</sup></b>

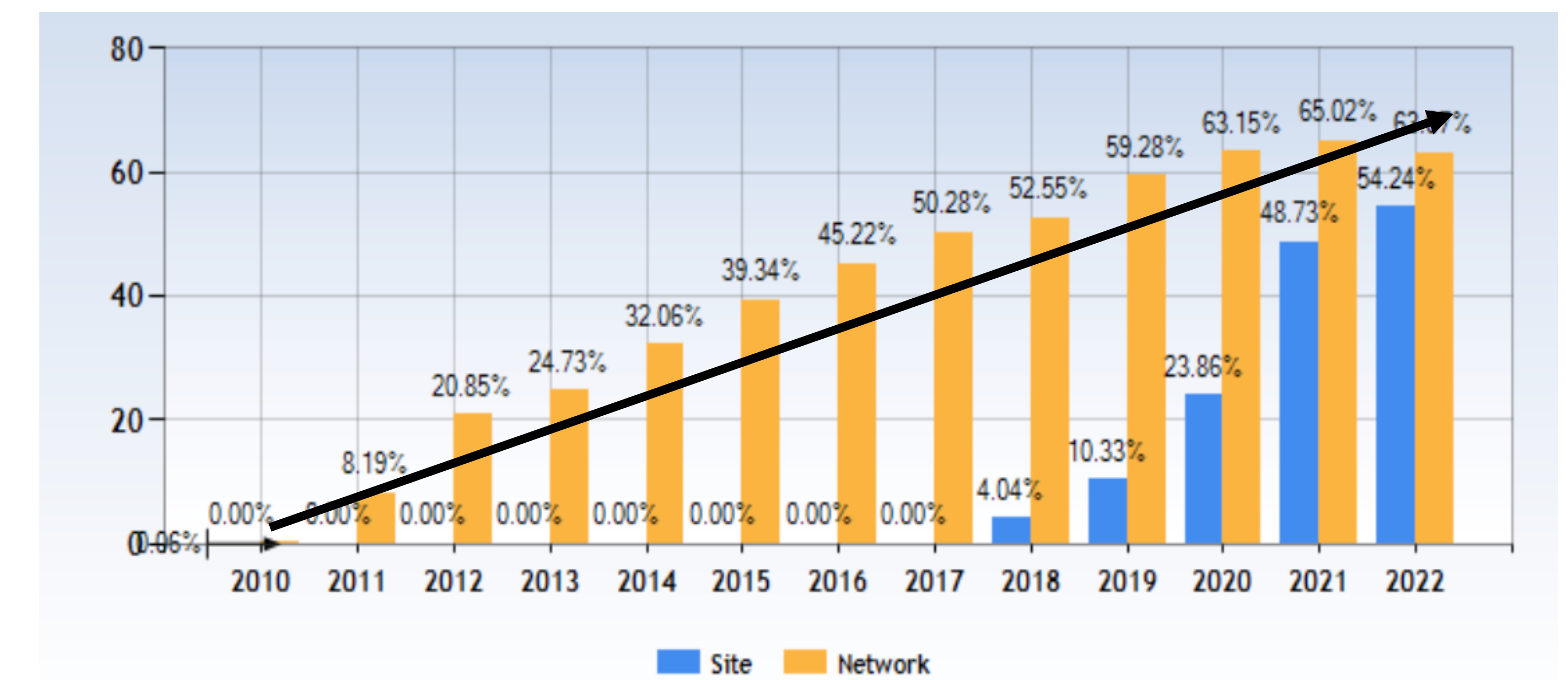
<sup>k</sup> Kruskal-Wallis test, <sup>c</sup> Chi-squared test, <sup>f</sup> Fisher's exact test.

## Proportion of 23-33 wks GA neonates who received DCC p-chart



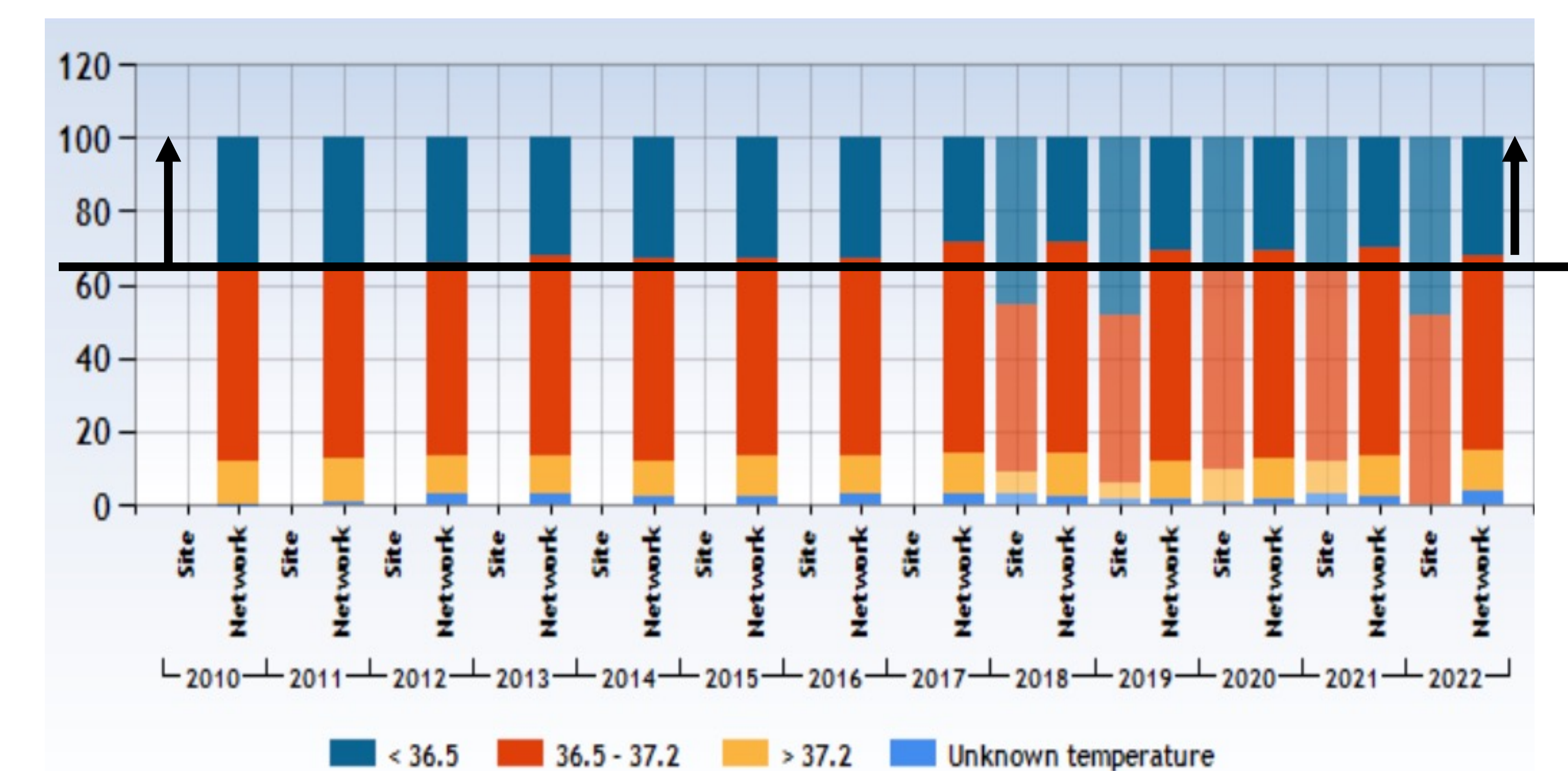
- Increased the DCC rate from 20% to 57%.
- Admission normothermia rate was the same.
- In sub-analysis, neonates who received DCC had a lower rate of hypothermia (<36°C) (8.5% vs 15%, p=0.048).

## Canadian Neonatal Network Data



Number of patients who had delay cord clamping attempted / Total number of patients

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- CNN data shows a similar lower admission hypothermia rate with increasing DCC practice.

## Conclusions

- DCC practice on preterm neonates is safe and feasible while maintaining normothermia.
- Next step is to perform comparative analysis on neonates who received DCC vs no DCC in terms of mortality, interventricular hemorrhage rate, and blood transfusion occurrence.

## References

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- Kateria et al. *JAMA*, 2019; 322(19), 1877–1886.