

Neonatal survival is improved through use of CPAP Equipment on Neonatal Outcomes in a Teaching Hospital in Rwanda

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Background

Neonatal mortality is a key indicator in the Sustainable Development Goals and the Rwanda Health Strategy. Rwanda has made great strides in reducing child mortality and many of the service utilisation indicators that are associated with reduction in child mortality. However, the Rwanda Demographic Health Survey (2019/20) indicates that neonatal mortality is not reducing at the same rate as child mortality.

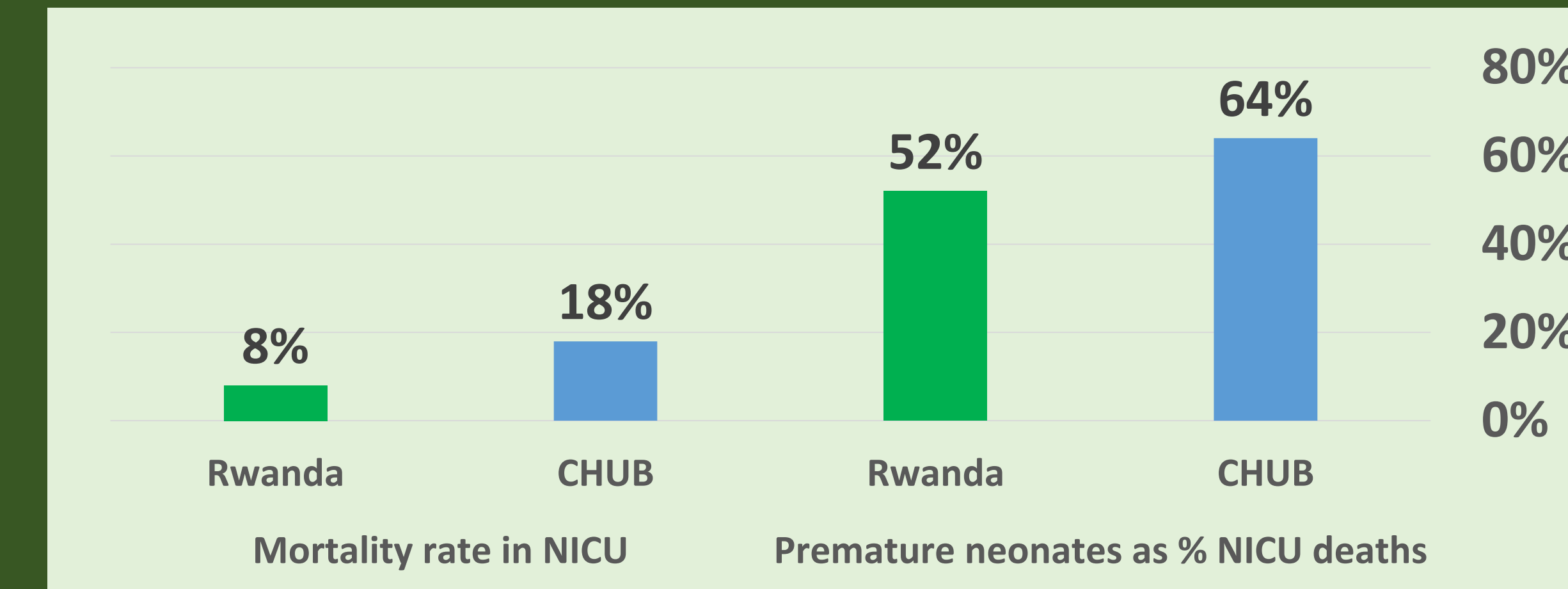


In recent years CPAP machines have been procured for District Hospitals. Enabel current programme are funding eight machines for District Hospitals.

CHUB received ten CPAP machines from different sources and trained the nursing staff in mid April 2022. There are 17 nurses and one doctor allocated to the neonatal unit. In general, this allows for five nurses in the daytime shift and two or three on a night shift.

Key Message: All Neonatal Units should be equipped with CPAP machines and staff trained on their use.

The routine data shows over a half of these deaths occur in premature neonates. **Butare University Teaching Hospital (CHUB) has a Neonatal Intensive Care Unit (NICU) that admits between 50 and 80 neonates each month.** Of these over 37% are premature. The mortality rate of those admitted to the ward in FY 2021/22 was 18%. The survival rate for premature neonates was 31%, 64% of all deaths in Neonatal Unit.



Methods

Nursing Skills

Data collection

- A checklist was designed based on the Rwandan Neonatal Protocol (2020) with 12 competency areas
- All nurses on night and day duty on the day of assessment were included
- Assessments were conducted by external Neonatal Nurses

Data Analysis

- Data entered into excel. Individual scores calculated against total potential score

Neonatal outcomes

Data collection

- Data from registers April to June 2021 and April to June 2022
- Dependant variables were 'Death' or 'Survival' and length of time requiring CPAP
- Independent variables: Birthweight, gestational age, place of birth and mode of delivery were included in the analysis as potential confounding factors.

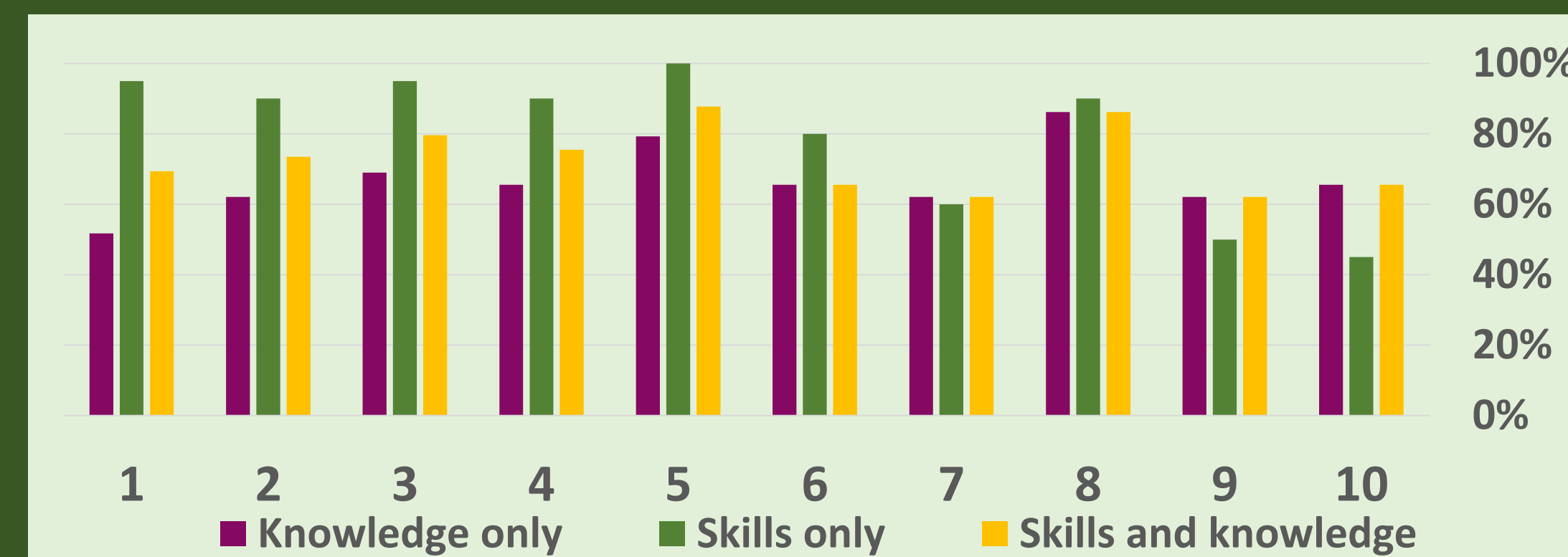
Data Analysis

- Data imported into STATA 17. Fisher's exact test was used to identify variables with a likely impact on survival, then logistic regression was used to produce final adjusted results.

Results

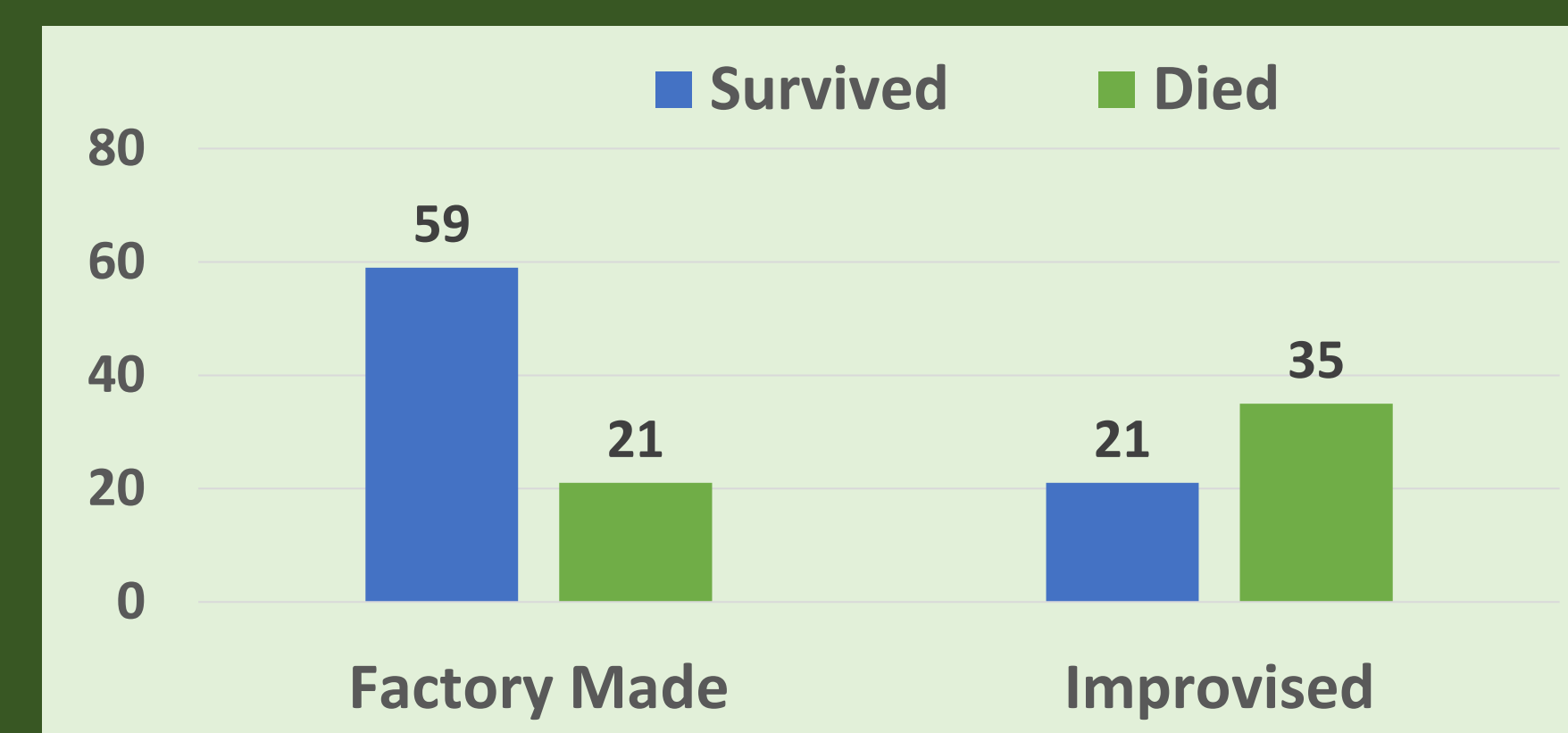
Nursing Skills

- 10 nurses were tested
- Range of scores was 62%-88%
- Practical skill scores were higher (average 80%) than theoretical knowledge (average 67%)
- 6 out of 10 nurses scored over 90% in skills assessment

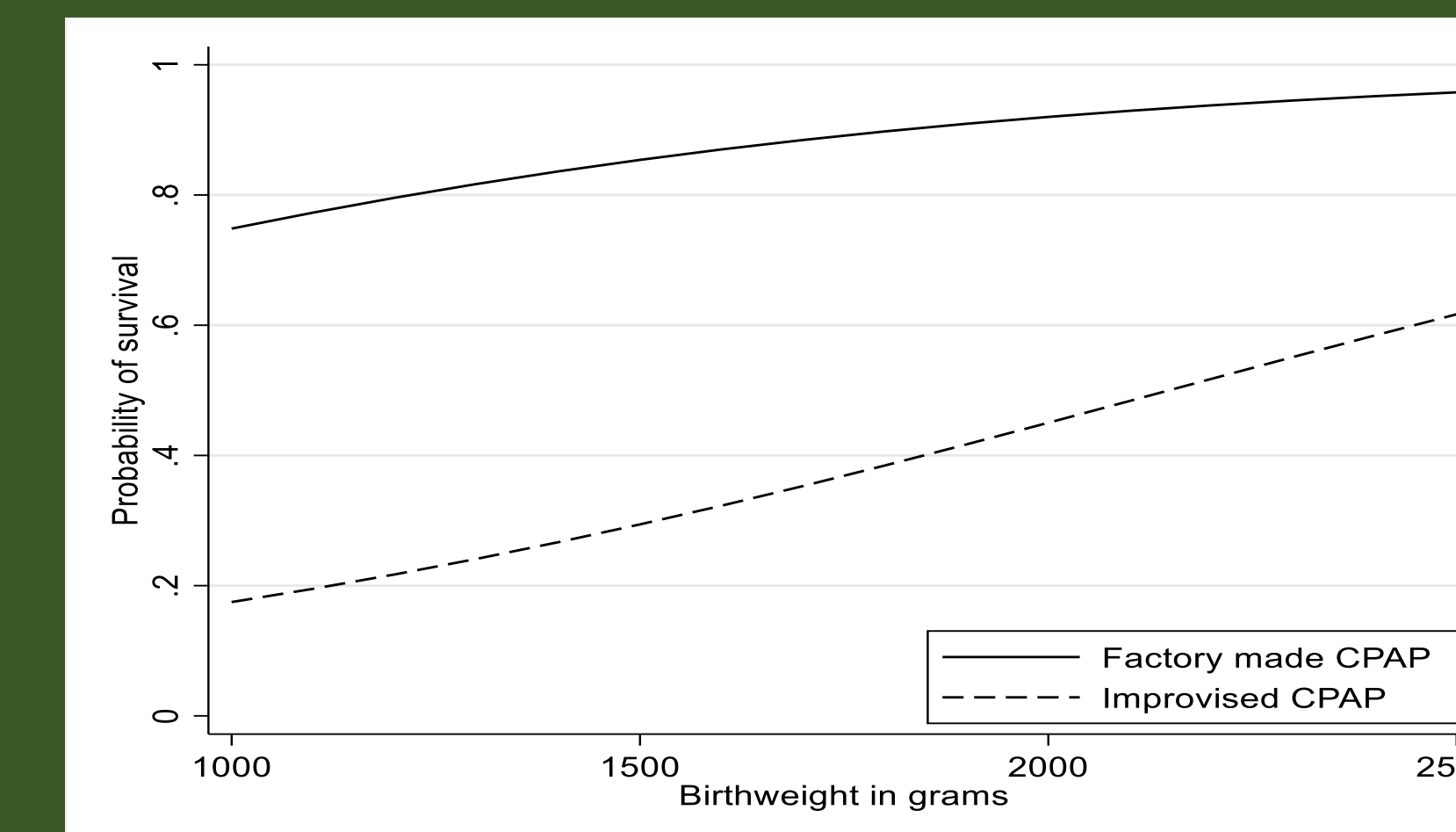


Neonatal Outcomes

- Data from 136 neonates was used (56 improvised CPAPS).
- Factory-made CPAP increased survival by 18.45 ($p=0.001$) using regression analysis.



Birthweight had an impact on survival, as expected. However the factory made CPAP machines made more difference than birthweight in survival.



Conclusion & Recommendations

- The combination of knowledge and skills training of nurses on the neonatal intensive care unit and the availability of factory-made CPAP machines can significantly improve the chance of survival of neonates in a teaching hospital in Rwanda.
- We recommend that: All neonatal units have adequate factory-made CPAP machines to cater for the number of neonatal admissions with respiratory distress.
- All nurses working in neonatal units are provided training in use of CPAP machines.

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