TITLE:

IS BEMPU BRACELET USEFUL FOR DETECTION OF HYPOTHERMIA IN NEONATES?

Presenter: Dr V Seta

INTRODUCTION

- More than **6,000 Neonatal Deaths/**year in PNG.
- Of these, **LBW** contributes to **60-80%** of deaths. Most of these babies often suffer from Hypothermia.
- **Preventing hypothermia** can save up to **42%** of neonatal deaths.
- Preventing hypothermia is recognized as an **Essential** part of care for all new-borns.

- Easy to use
- Battery operated
- 4wks durability
- Easy to strap on & remove.
- Blue = Normothermic
- Orange/ Alarm= Hypothermic
- Temp at which light turns orange is unknown.

BACKGROUND

- No published literature on other Bempu studies.

- Thermo-spot study
  - Liquid crystal thermometer in the form of a sticky disc

  - This study compared temperatures from the skin Thermo-Spot and a reading from the axillar using a digital thermometer.

  - The results showed that Thermo-Spot performed well when used by non-medical volunteers to detect hypothermia in the homes of an urban slum community.

AIMS & OBJECTIVES

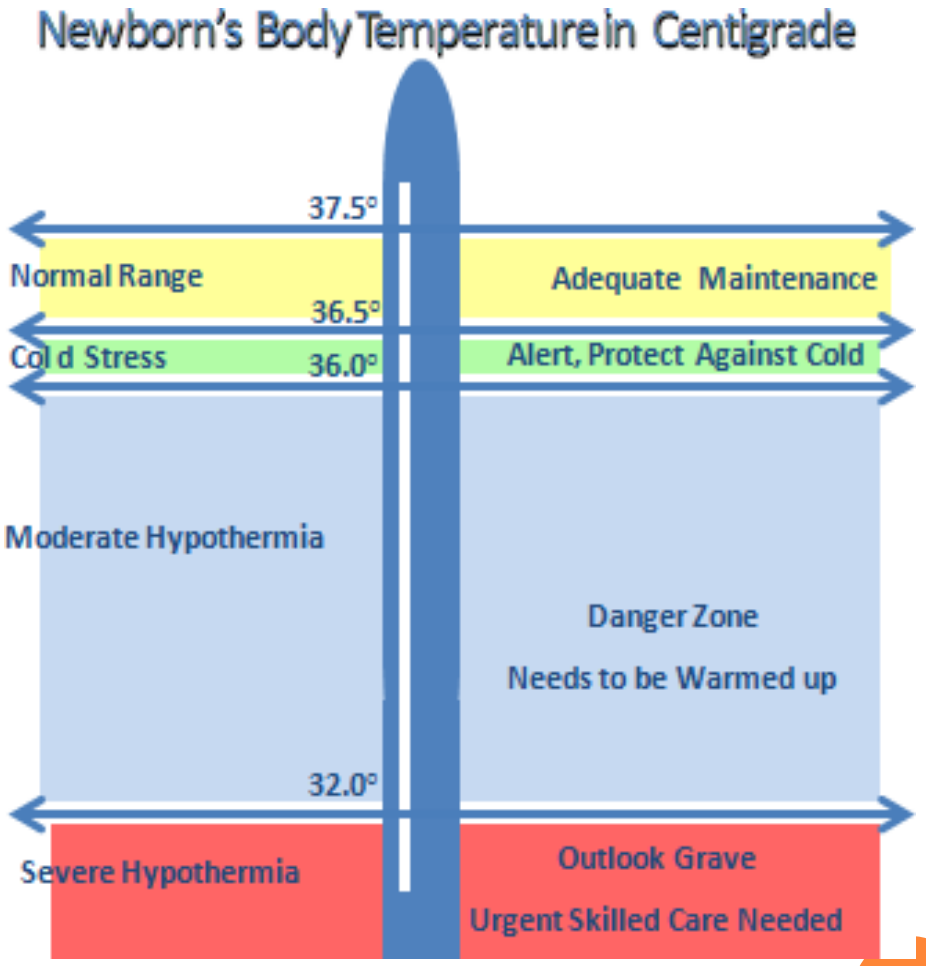
- To assess
  1) **Sensitivity and Specificity** of Hypothermia Alert Device for identification of hypothermia in newborn babies.

- Secondary Objectives:
  1) To see if the band is durable through out the 4 weeks.

CLASSIFICATION OF HYPOTHERMIA

According to WHO :

- Normal Temp : 36.5 to 37.5
- Mild Hypothermia : 36.0 to 36.4
- Moderate : 35.9 to 32.0
- Severe : < 32.0



METHODOLOGY

- Target Population: Stable LBW/PT
- Setting: SCN & PNW, PMGH
- Sample Size: 300 neonate; 100+ at-least for this presentation.
- Convenient sampling done
- Informed consent from parents/ guardians.
- Bracelet worn on neonates wrist

METHODOLOGY

- 6th Hourly temp monitoring done.
- Alarms outside of routine monitoring times also noted.
- Temp corrective actions included:
  1) KMC
  2) Swaddling
  3) Heat source
  4) Cool sponging
  5) Uncover

RESULTS: OVERVIEW OF STUDY

TOTAL RECRUITED:

109

MET CRITERIA:

97

→

ANALYSED:

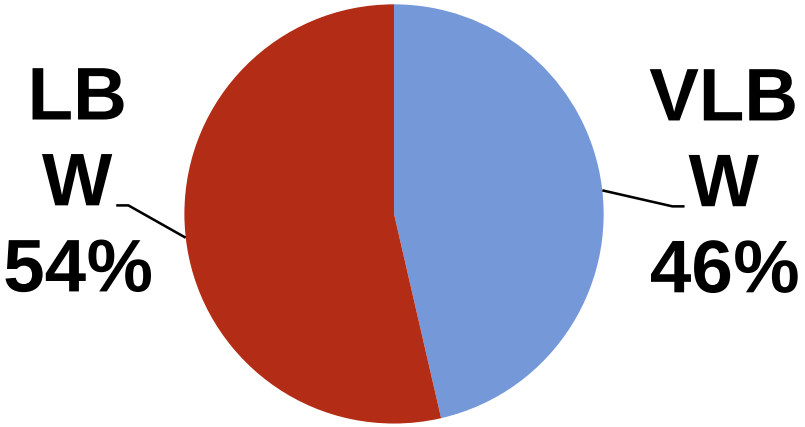
97

EXCLUDED:

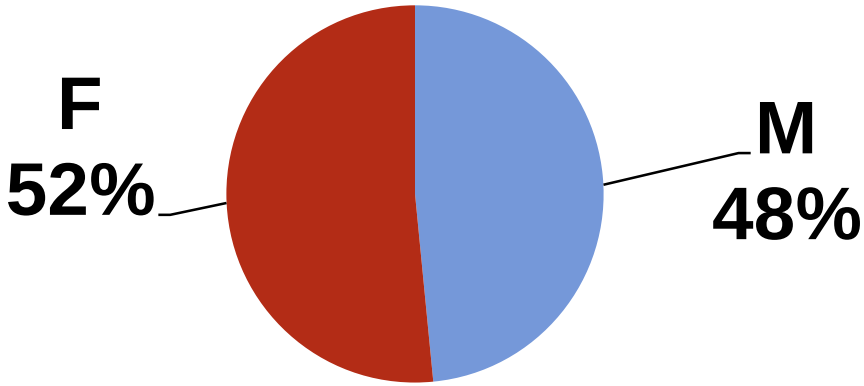
12

Reasons for exclusion:
temperature readings recorded < 4

Weight Ranges



Sex Distribution



Education Level of mothers

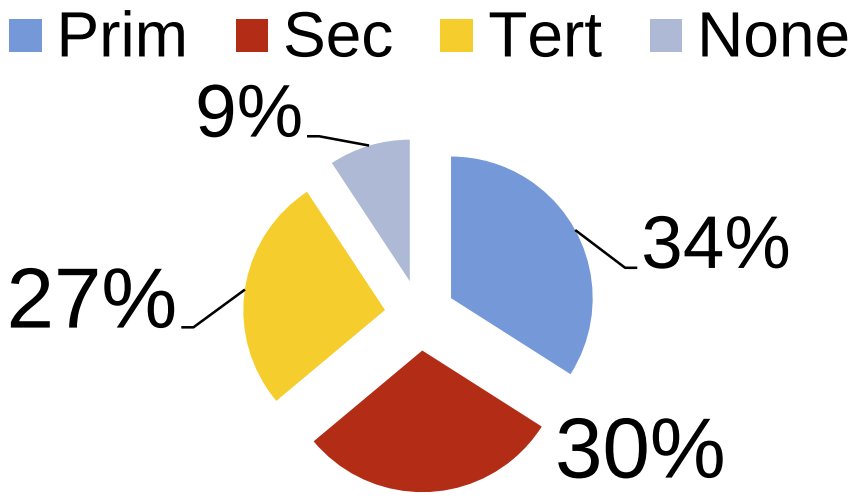
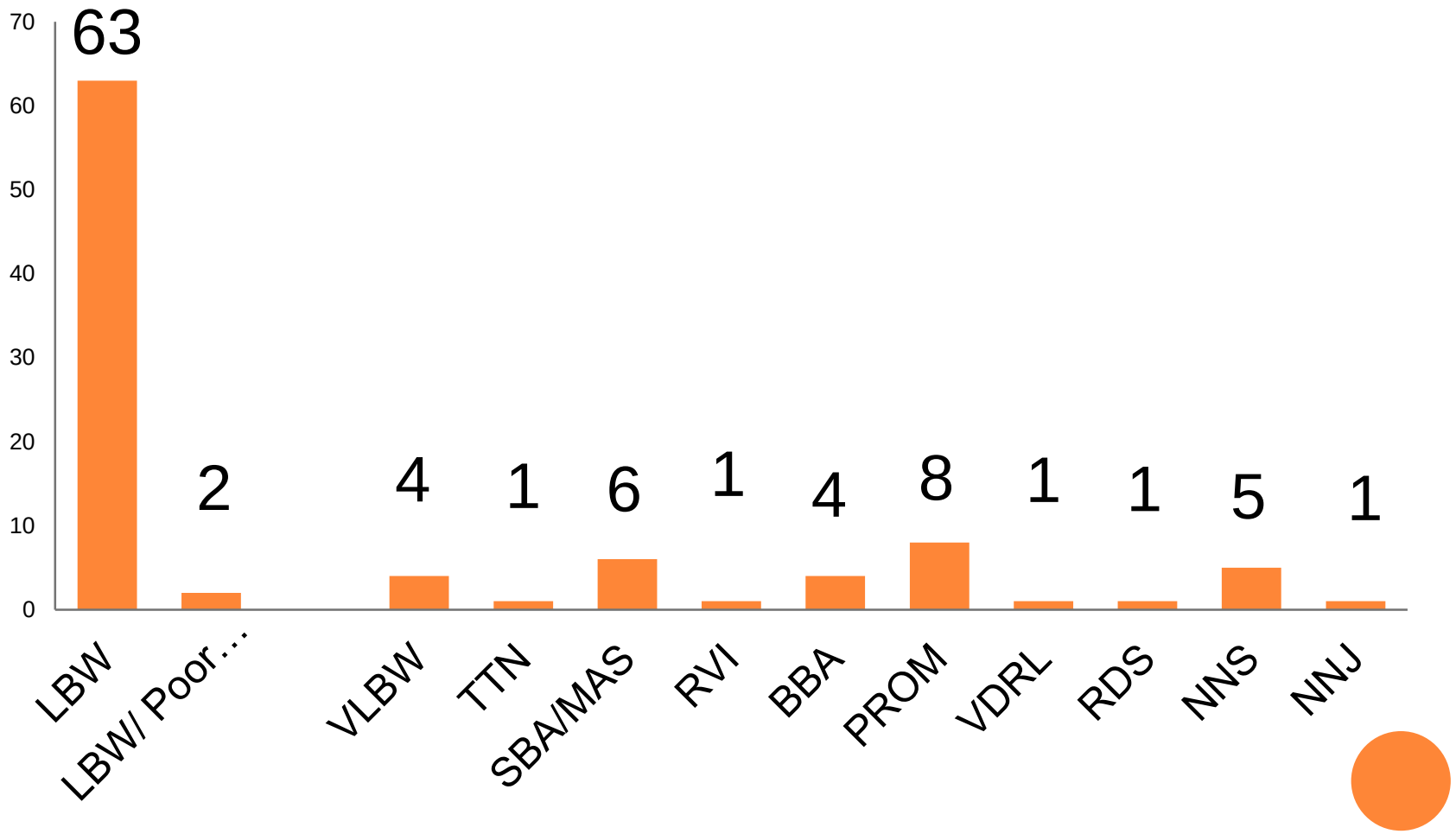


Figure 3: Reasons for admission to PNW/SCN



HYPOTHERMIA

TOTAL TEMP = 1491

Hypothermic?	YES	NO	TOTAL
ORANGE	171	1	172
BLUE	425	893	1318
TOTAL	596	894	1491

MOD- SEV HYPOTHERMIA

Hypothermic?	YES
ORANGE	102
BLUE	22
TOTAL	124

TOTAL TEMPS = 124

RESULTS

- Total # of Recorded temps: **1491**

Generally, for Hypothermia we had a:

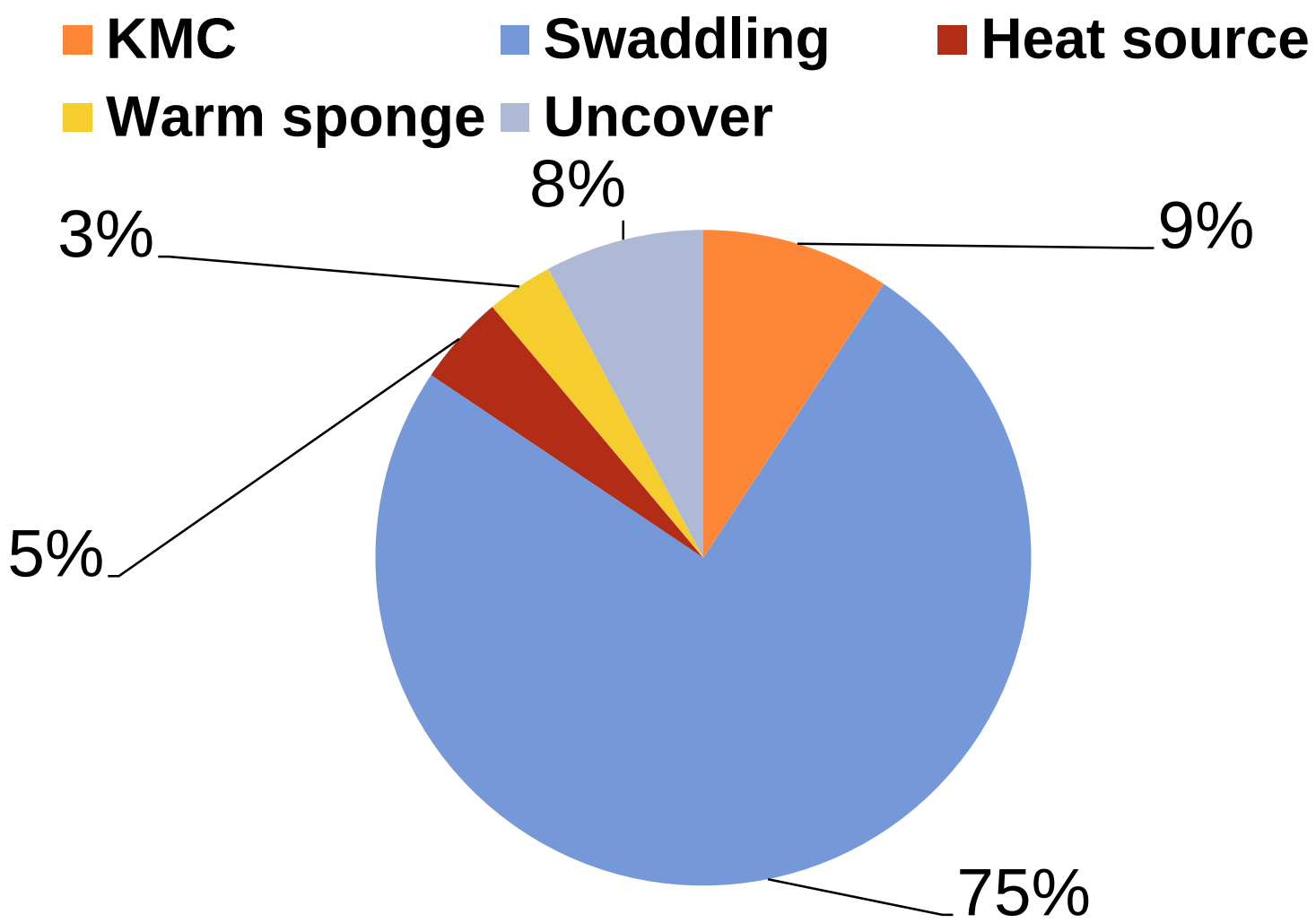
- **Specificity of 99%**.
- **Sensitivity of 29%**
- PPV: 99%
- NPV: 68%

For moderate to severe hypothermia, we had a:

- **Sensitivity of 82%**.

RESULTS

Figure 2:
Actions Taken to correct temperature



RESULTS

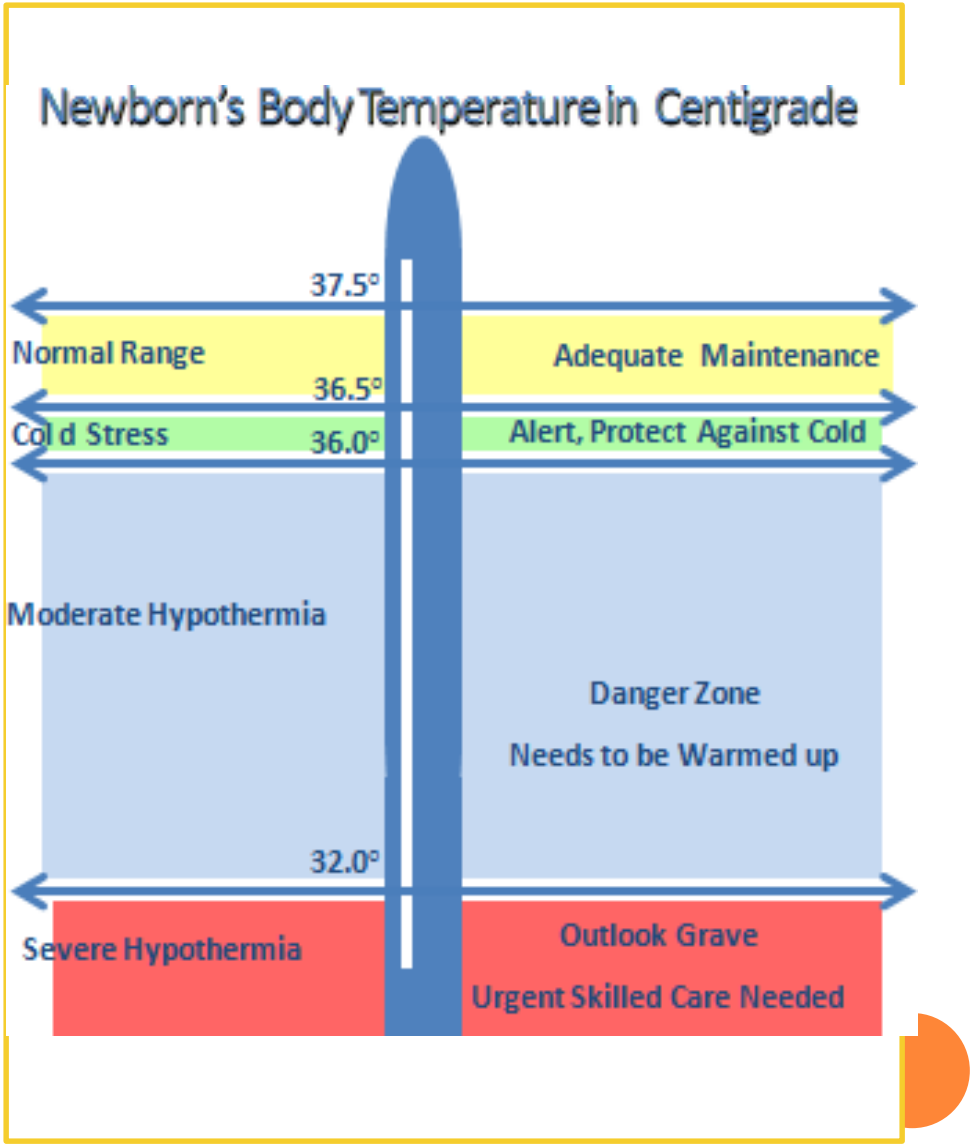
- F/up on DC for 4 wks to monitor durability of band

- Generally:
  - 100% of the bands lasted the total 4 weeks.
  - Steady increase in weight; length and HC of babies.
  - Increase KMC & ENC at home.
  - High alert for hypothermia & prompt actions.
  - Illiterate mothers were able to recognise hypothermia with use of band.

DISCUSSION

- The sensitivity of the device to pick up hypothermia was generally low:
  - **Sensitivity 29%**

- However the device had a higher sensitivity for temperatures that ranged < 36.0.
  - **Sensitivity 82%**



DISCUSSION

- When comparing our study to other studies, the comparative low sensitivity for Hypothermia could be attributed to:
  - The **setting of the study** (Special Care Nursery vs Post Natal Ward)
  - A range of thermometers were used in the study.
  - **Different nurses/staff** taking at different point of time the temperature readings resulting in human error.
  - **Improper placement of the bracelet** on baby's wrist; this may have an influence on the sensor causing false positives.
  - **Small sample size** (The total sample size is 300 and the study is ongoing)

DISCUSSION

- Specificity: 99%
  - Implying that 99% of the time; the device was able to correctly pick up those neonates who were not hypothermic.
- PPV: 99%
  - 99% Probability that a band with an orange light/beep is truly hypothermic.
- NPV: 68%
  - 68% probability that a band with a blue light is nomothermic.

DISCUSSION

- The band was not soo sensitive in picking up temperatures in the **mild hypothermic range**.

- 95% (403) of the false positive temperatures were mild hypothermic readings.

Hypothermic?	YES
ORANGE	**171**
BLUE	**425**
TOTAL	**596**

- The device alarms when the bodys' core temperature drops <35.6 dc for more than 5 mins.

- If this device was made specifically to detect **Mod-Sev Hypothermia** then it is safe to say that we have just about proved this in our study.

CONCLUSION

The Hypothermia Detecting Band is:

- Easy to use
- Despite having a low sensitivity; it has proven very useful in picking up mod-severe hypothermia which is infact the temperature range at which neonates have more morbidity & mortality.

Qstn: “Is Bempu Bracelet useful in detecting hypothermia in neonates?”

- Although it is still early to make any bold statements; I would like to think that yes- this device is useful in detecting mainly moderate to severe hypothermia.

ACKNOWLEDGMENTS

- Acknowledge my God.
- UNICEF; NDOH & Paediatric Society PNG.
- Professor Trevor Duke
- Dr Sethy
- My Supervisors: Drs Barnabas & Vali
- The Staff of SCN & PNW
- My assistants: Mr Uaiz & Mr Boaz

REFERENCES

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Thank You for Listening

QUESTIONS?