Touch detection of neonatal hypothermia in Nepal
M Ellis, D Manandhar, L Hunt, S Barnett, K Azad

RESULTS
A total of 250 well infants were examined with local ethical clearance and maternal consent. Ambient temperatures were low (overall mean (SD) 17.0 (2.0) °C). Forty five infants (18%) remained normothermic during both assessments, 126 (50%) showed evidence of cold stress, and 78 (32%) were hypothermic. Five (2%) were actually hypothermic.

Validity
To assess the validity of touch for the detection of cold stress and hypothermia, we compared the findings of each observer using palpation with contemporaneous mercury thermometer readings. Table 1 shows sensitivity and specificity estimates for each observer. The sensitivity of palpation using the two site approach to detect hypothermia as distinct from cold stress was 11–42% depending on the observer. The specificity of palpation to detect hypothermia was 93–100%.

DISCUSSION
Two site palpation does not reliably detect cold stress or mild hypothermia because of low interobserver reliability. Palpation is a specific but insensitive method for detecting mild hypothermia. Sensitivity improves with decreasing temperature.

Temperature monitoring by touch underestimates the degree of hypothermia in newborn infants. In a few cases, the process of unwrapping contributes to the fall in temperature. It does, however, achieve improved levels of predictive power when infant core temperatures fall below 35°C. Combining the high sensitivity of peripheral palpation with the specificity of central palpation in selected cases may be the pragmatic solution.

Recommendations
In Bangladesh, where 94% of all births occur at home and 78% are delivered by traditional birth attendants, we recommend peripheral palpation for the detection of hypothermia in the first instance. If the infant’s peripheries feel cool, we suggest that the traditional birth attendant should unwrap the infant and palpate the abdomen. If this is
also cold, then the infant requires further assessment and enhanced thermal care. This advice is in line with recently drafted guidelines extending the Integrated Management of Childhood Illness to the first week of life in Nepal.

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Competing interests: none declared

Since the data reported here were collected under her supervision, Sister Purna Shrestha has died. This paper is dedicated to her memory.

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**REFERENCES**


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<th>2 site palpation (3 categories)</th>
<th>1 site palpation (2 categories)</th>
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<tr>
<td>Observer 1</td>
<td>Sensitivity: 35%</td>
<td>Specificity: 94%</td>
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<tr>
<td></td>
<td>Specificty: 93%</td>
<td>Specificty: 36%</td>
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<tr>
<td>Observer 2</td>
<td>Sensitivity: 42%</td>
<td>Specificity: 88%</td>
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<td>Specificty: 95%</td>
<td>Specificty: 40%</td>
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<td>Observer 3</td>
<td>Sensitivity: 11%</td>
<td>Specificity: 82%</td>
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<td></td>
<td>Specificty: 100%</td>
<td>Specificty: 74%</td>
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<td>Observer 4</td>
<td>Sensitivity: 25%</td>
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