Randomised trials of BCG to low-birth-weight children in Guinea-Bissau (Christine Benn)

The age of BCG vaccination and the decline in neonatal mortality: Evidence from Navrongo (Paul Welaga)
• Vaccine against tuberculosis (TB), given at birth

• Many countries delay vaccination in low birth weight children

• Only 50% vaccinated within 4 weeks age in Sub Saharan Africa

• Timing not considered very important since TB takes years to develop
Randomised trials in Guinea-Bissau
Low-birth-weight infants (<2,500 g)
Timeline of the three randomised trials of early BCG to low-birth-weight infants in Guinea-Bissau

Trial I: Biering-Sørensen et al, Ped Inf Dis J 2012
Trial II: Aaby et al, J Inf Dis 2011
Trial III: Biering-Sørensen et al, Submitted
Combined mortality analysis of Trials I, II, and III

Combined analysis: In the neonatal period:

After 3 days:
In the first year of life:

BCG early: 72% (-34-83%) mortality reduction
BCG early: 45% (11-66%) reduction

Preliminary data presented

Biering-Sørensen et al, Submitted
Navrongo HDSS: 1996-2012
Neonatal mortality rates and median BCG vaccination age

Welaga et al, manuscript
**Methods**

- We used routine vaccination data of children in the HDSS born from 1996 to 2012.

- Calculated yearly neonatal mortality rates per 1000 live births.

- We also calculated median BCG vaccination age by birth year.

- We carried out a sub-group analysis of children delivered at home and visited in the first 28 days of life to assess neonatal mortality by BCG status.
Median BCG vaccination age and neonatal mortality rates for Home and Health facility deliveries

Welaga et al, manuscript
## Neonatal mortality rates (NMR) and relative mortality for children aged 0-28 days at time of interview by BCG vaccination status

<table>
<thead>
<tr>
<th>BCG status</th>
<th>Number (%)</th>
<th>Neonatal mortality rate</th>
<th>Relative mortality (Adjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG-unvaccinated</td>
<td>4049 (82.5)</td>
<td>147</td>
<td>ref</td>
</tr>
<tr>
<td>BCG-vaccinated</td>
<td>861 (17.5)</td>
<td>81</td>
<td>0.53 (0.12-2.35)</td>
</tr>
</tbody>
</table>

Welaga et al, manuscript
• Though an observational study, the data point to an association.

• Strong emphasis on lowering BCG vaccination age could contribute to reducing neonatal mortality rates.
Conclusion

• Results of RCTs in Guinea-Bissau and observational studies in Ghana support that BCG has important non-specific beneficial effects on neonatal mortality.

• Sub Saharan Africa:

Deaths before 4 weeks of age per year

- 50% BCG UNvaccinated before 4 weeks
- 50% BCG vaccinated before 4 weeks

If BCG can reduce mortality before 4 weeks by 38%, we could save >200,000 lives/year by making sure everybody receives BCG at birth.
Thank you for your attention