Intervening to Improve Birth Weight and Infant Respiratory Health in Rural Ghana: GRAPHS
Measuring health outcomes

- **birth weight** assessment within 24 hours of delivery using Tanita scales (+ ultrasound gestational age assessments)

- **Pneumonia**: Active case finding (weekly FW assessment of baby); all cases referred to study physician at Kintampo District Hospital. Primary outcome: physician-assessed severe pneumonia
Biomarkers

Urine
- Maternal prenatal urine sample collected each day of exposure monitoring
- Urinary PAH may provide dosimeter of biomass exposure and efficacy of stove intervention (samples will be analyzed by CDC)

Placenta
- After birth, placental samples stored in formalin
  - Allows analysis of placental malaria, growth restriction during pregnancy
  - Mediator for neurodevelopmental effects?
## GACC funding: MassTag PCR

### Table 1: Respiratory Disease Panel

<table>
<thead>
<tr>
<th>RNA agents</th>
<th>DNA agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza A</td>
<td>Adenovirus</td>
</tr>
<tr>
<td>Influenza B</td>
<td><em>Chlamydia pneumoniae</em></td>
</tr>
<tr>
<td>RSVA</td>
<td><em>Legionella pneumophila</em></td>
</tr>
<tr>
<td>RSVB</td>
<td><em>Mycoplasma pneumoniae</em></td>
</tr>
<tr>
<td>HPIV1</td>
<td><em>Neisseria meningitidis</em></td>
</tr>
<tr>
<td>HPIV2</td>
<td><em>Haemophilus influenzae</em></td>
</tr>
<tr>
<td>HPIV3</td>
<td><em>Streptococcus pneumoniae</em></td>
</tr>
<tr>
<td>HPIV4</td>
<td><em>Mycobacteria tuberculosis</em></td>
</tr>
<tr>
<td>MPV</td>
<td><em>Moraxella catarrhalis</em></td>
</tr>
<tr>
<td>Coronavirus OC43</td>
<td></td>
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<tr>
<td>Coronavirus 229E</td>
<td></td>
</tr>
<tr>
<td>Enterovirus/rhinovirus</td>
<td><em>Bordetella pertussis</em></td>
</tr>
</tbody>
</table>
Challenges in Assessing LBW

- Missed deliveries (Out of study area deliveries)
- Willing to stay in the study area for the period of study (Move outs)
- Anthropometric measurements (Breakdown of the measuring scales & frequent calibration)
- Missed preterm & stillbirths (some caregivers conceal these births) especially at the community
Challenges in Assessing Pneumonia cases

- Weekly home visits (Respondent fatigue)
- Reluctance of some caregivers to send referred sick children to hospital for assessment
- Some caregiver preference for other hospitals other than KMH where all suspected cases are seen by a trained clinician
- Distance to the hospital is far for some participants
- Expensive to treat children with pneumonia especially as inpatients
- Lack of basic needs for effective case management if we should depend on routine health care:
  - Evidence-based training
  - Facilitated referral system
  - Antibiotics
  - Oxygen
- Requires a lot of logistical supply:
  - Transportation & Feeding
  - X-ray measurements
  - Reading and interpretation of X-ray images
Other outcomes – pilot data

- Infant lung function (+ cord blood)
- Ambulatory & home blood pressure
- Neurodevelopmental outcomes (Bayley Scale)
- LFTs in adult women
Challenges in Neurodevelopment Assessment

- Training on the use of the Assessment tools
- Translations of the tools to different languages may result in distorting the original meaning (study area comprise of multi-ethnic groups)
- Personal attributes of children (Shy and unwilling to respond to assessment questions from the assessor)
- Logistical support (transportation costs, i.e. conveying study participants to a central location for the assessment, feeding of both child and caregiver)