Improving neonatal outcomes in regional hospitals in Ghana using an integrated approach to systems change

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Non-profit 501 (c)(3) organization to promote safe childbirth worldwide through medical education partnerships

Founded in 2001
Kybele’s Educational Model

- On-site Education
- Cost Efficient
- International Trainers
- Multidisciplinary Teams
- Leadership Involvement / Development
- Monitoring / Evaluation

Kybele – fertility goddess 7,000 BC
Context

Regional Referral Hospitals

- Mortality rates are much higher than national average\textsuperscript{1,2}
- They have high work volumes
- Many high risk cases are referred late
- They depend on resources: equipment, medication and blood
- Staff numbers are inadequate
- Lack organization and problem solving skills

\textsuperscript{1}Acta Obstet Gynecol Scand 2012;91:87-92; \textsuperscript{2}Perinatol 2012;36:79-83
Context
Regional Referral Hospitals

- MMR in Ghana decreased from 470 to 380 maternal deaths/100,000 live births between 2005 and 2013 (MGD target 185)

- In tertiary hospitals MMR is higher than the national average:
  - Korle Bu Teaching Hospital – MMR 840 (2012) Internal source
Aim: 2007 to Present

Aim: 50% Reduction of Maternal & Newborn Mortality in Tertiary Hospitals.

Dr. George Yankee, Ghana Health Minister with Dr. Medge Owen, WFUSM
Two Systems Strengthening Approaches

Picking the low hanging fruit (2007-2011)

Building a stronger foundation (2013-2015)
Theory of Change: 2007 to 2011

Partnership
Srofenyoh, Int J Gynecol Obstet 2012;116:17-21

<table>
<thead>
<tr>
<th>Identify systematic challenges</th>
<th>Strengthen leadership</th>
<th>Motivate &amp; empower staff</th>
<th>Improve knowledge &amp; skills</th>
<th>Initiate triage &amp; patient flow processes</th>
<th>Maximize physical workspace</th>
<th>Improve resources &amp; logistics</th>
<th>Improve service quality &amp; clinical standards</th>
<th>Improve communication within &amp; between departments</th>
<th>Facilitate communication &amp; feedback with referral centers</th>
<th>Monitor implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Map</td>
<td>Personnel-Based Bundles</td>
<td>Systems-Management Bundles</td>
<td>Quality &amp; Communication Bundles</td>
<td>Process Map</td>
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Advocacy at all levels
Frequent monitoring visits

OUTPUTS

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<tr>
<th>Appropriate &amp; timely referrals</th>
<th>Improved patient surveillance</th>
<th>Clinical protocol &amp; guideline use</th>
<th>Timely intervention &amp; reduction of delay</th>
<th>Improved responsiveness towards patients</th>
</tr>
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</table>

SECONDARY OUTCOMES

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<tr>
<th>Improve patient satisfaction</th>
<th>Improve institutional reputation</th>
<th>Produce local trainers &amp; experts</th>
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</table>

PRIMARY OUTCOME

Reduce maternal & newborn morbidity & mortality

- Reduce maternal and neonatal mortality and stillbirths
- Close clinical, operational and leadership gaps

Learn from Improvement Projects

Ward Level Projects

Cross-departmental Projects

Coach and Facilitate

Build Locally Appropriate Capacity

- Clinical Capacity
- QI Capacity
- Leadership Capacity

Select Change Agents

- Clinical Champions
- Quality Improvement Leaders
INTEGRATED MODEL (2013-2015)

Clinical Excellence

Operational Excellence

Leadership Excellence

Integrated Health Systems Strengthening Approach
QI Projects (2013-2015)

- Obstetric Theater Delay
- Obstetric Triage
- NICU Hand Hygiene
- NICU 5S

Of 926 admissions, median waiting time to be seen 40 min; max. 1 day, 2.5 hours
Median Decision to Delivery time
Emergency CS = 4 hrs, Elective CS = 3 days
Leadership Activities (2013-2015)

• Emotional Intelligence Workshop
• Leadership Styles Training
• Accountability Workshop
• Clinical Champions Leadership Training
• Leadership Ambassador Training
• Compassionate Care Workshop
• Individual Coaching Sessions
Clinical Training (2013-2015)

• Obstetric Triage
• Neonatal Resuscitation
• Labor and Delivery
• NICU CPAP Training
Post intervention data shows that “Diaper Change” (lowest adherence at baseline) had highest % increase.

Post intervention data shows that Night Shift (lowest hand hygiene adherence at baseline) had highest % increase.
Process Results: Obstetric Theater Delay

All Senior House Officers were trained to perform cesarean sections when Specialists are attending another case or are otherwise unavailable.

Percentage of mothers waiting an unacceptable length of time for CS: Before intervention: 9%  After intervention: 2%

Both the theater staff and mothers benefit from this increase in available surgeons.
Process Results: Obstetric Triage

Median Wait Time from Arrival to Assessment

Waiting time for assessment reduced from 40 minutes to 5 minutes and sustained
Process Results: NICU 5S

BEFORE

AFTER
Case Fatality Rates 2007-2015

- **Hemorrhage**
- **Pre-eclampsia**
## Neonatal Outcomes 2012-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Stillbirth Rate</th>
<th>Neonatal Death Rate</th>
<th>Institutional Perinatal Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>12.0</td>
<td>31.1</td>
<td>43.1</td>
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<tr>
<td>2013</td>
<td>10.2</td>
<td>23.8</td>
<td>33.9</td>
</tr>
<tr>
<td>2014</td>
<td>9.9</td>
<td>17.1</td>
<td>27.0</td>
</tr>
<tr>
<td>2015</td>
<td>9.4</td>
<td>23.6</td>
<td>33.0</td>
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<tr>
<td>2016</td>
<td>8.3</td>
<td>25.1</td>
<td>33.3</td>
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Estimated 392 newborn lives were saved
Lessons Learned

- Health Systems Strengthening is fundamental to progress
- Change can be slow
- There can be setbacks
- There may be different avenues to success
Maternal Mortality Rate – Greater Accra Regional Hospital 2007-2014

Deliveries and MMR - Ridge Hospital: 2007 to 2014

Photo Source: Kyebele Worldwide
Neonatal Outcomes 2012-2016

Stillbirth and Neonatal Death Rate - Greater Accra Regional Hospital 2012-2016

Per 1000 Live Births

Year


Stillbirth Rate
Neonatal Death Rate
### Newborn Statistics
Ridge Regional Hospital

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<tbody>
<tr>
<td>Neonatal Death Rate</td>
<td>38.0</td>
<td>31.1</td>
<td>23.8</td>
<td>17.1</td>
<td>23.6</td>
<td>25.1</td>
</tr>
<tr>
<td>% NICU Deaths</td>
<td>38%</td>
<td>29%</td>
<td>19%</td>
<td>13%</td>
<td>15%</td>
<td>16%</td>
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Neonatal Death Rate = deaths/live births x 1000
% NICU Deaths = deaths/admissions x 100