Updates from the Field: Conducting Maternal and Child Health Programs in Guatemala

Gretchen Domek, MD, MPhil
Gretchen Heinrichs, MD, DTMH

Global Health Lecture Series
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Objectives

• Appreciate that Universities are an ideal platform to foster collaboration for global health initiatives
  – Example: CU’s community health program in Guatemala

• Understand the value of data for continuous quality improvement and targeting of interventions to specific communities

• Understand the characteristics of early childhood health and development interventions that have the greatest impact and how these have been incorporated into CU’s community health program in Guatemala
Public-Private Partnership
Trifinio region in the south-west
Rapid Needs Assessment

• Conducted by professionals from the University of Colorado and Guatemalan community health workers in September – October 2011
• Included 287 families from 9 different communities in the southwest Trifinio of Guatemala
• Key Findings
  – High rates of pregnancy complications
  – High rates of childhood morbidity and mortality
  – High rates of food insecurity
  – High rates of maternal depression
  – High rates of illiteracy and unemployment
So what do we do about this??
University of Colorado Team Effort

**Center for Global Health**
Edwin Asturias
Steve Berman
Maureen Cunningham
Gretchen Domek
Gretchen Heinrichs
Susan Niermeyer

**School of Public Health**
Sheana Bull

**Residents and Students**

**Children’s Hospital Colorado**

**CU College of Architecture**
Phil Gallegos

**CU Anthropology Department**
John Brett
Jean Scandlyn

**CU School of Dental Medicine**
Elizabeth Shick

**CU Nurse-Midwifery Program**
Amy Nacht
1,000 Days

• WHO partnership recognizing “the window of opportunity” to improve nutrition for mothers and children in the 1,000 days between a woman's pregnancy and her child's 2nd birthday
• Promotes targeted action during a period “when better nutrition can have a life-changing impact on a child’s future and help break the cycle of poverty”
Creciendo Sanos: Maternal-Child Health Interventions

1. Madres Sanas
   - Birth registry started in November 2012

2. Niños Sanos
   - Started enrolling children in September 2013

3. Maternal and Child Health Clinic
   - Grand opening in March 2014
   - Birth Center to be opened soon!
Creciendo Sanos: Maternal-Child Health Interventions

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Madres Sanas

• Pregnancy Registry
• Prenatal Care delivery in communities
• Traditional and Skilled Birth Attendant Training program
• Birth Center due to open January 2016
Using the data: Evaluation and improvement of programs

- Pregnancy Registry
  - Factors associated with skilled birth attendance
  - Neonatal referral
- Prenatal Care delivery in communities
  - Group care, QI completion of 4 visits, and incentivizing nurses
- Traditional and Skilled Birth Attendant Training program
  - Improvement in skills based trainings using knowledge assessments and OSCEs
Pregnancy registry: Understanding factors associated with facility birth

- Retrospective secondary analysis of 292 women from prospectively created QI database
- Rate of facility birth in the cohort was 66%.
- Rate of CS in the cohort was 31%.
- **Maternal factors associated** with facility birth were:
  - Self or spouse employment at the local banana plantation (P<0.001)
  - Planned facility delivery (P < 0.003)
  - Higher rate of maternal complications
- **Factors NOT associated:**
  - Distance from the hospital
  - Maternal education
  - Parity
  - Completion of four prenatal visits
- No maternal mortalities
- No difference in rate of neonatal death or subsequent neonatal referral whether delivery occurred in a facility or at home.
What does this mean for the project?

- Birth Center audience for recruitment
- Understanding self triage of patients (low vs. high risk)
- Powerful economic factors contributing to ability to access skilled birth attendance
- CS rate in our cohort is high suggests reason people may stay at home
Neonatal referral practices

- Between October 25, 2013 and March 27, 2015, of the 336 live-births
- Twelve neonates (3.5%) were referred
- Most common causes for referral:
  - difficulty breathing (33%),
  - fever (25%),
  - scleral icterus/jaundice (16.5%),
  - difficulty feeding (16.5%),
  - one referral for unspecified cause
- Of all twelve referrals, four (33%) were noted to have more than one primary reason for referral
- Most cases of referral occurred in neonates delivered by a doctor or a combination of a doctor and nurse (58%)
- 33% of referrals were for neonates delivered by a comadrona
### Neonatal Deaths:

<table>
<thead>
<tr>
<th>Cause</th>
<th>Mode of delivery</th>
<th>Known pregnancy complications</th>
<th>Delivery Attendant</th>
<th>Delivery Location</th>
<th>Attended to Neonate at Delivery</th>
<th>Referred Neonate</th>
<th># Visits Prenatal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous Abortion &lt;20 weeks</td>
<td>Vaginal</td>
<td>Unspecified</td>
<td>Doctor</td>
<td>Public Hospital</td>
<td>Nurse</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Termination for reasons medical</td>
<td>Vaginal</td>
<td>Sepsis</td>
<td>Doctor</td>
<td>Private Hospital</td>
<td>Unspecified</td>
<td>Unspecified</td>
<td>2</td>
</tr>
<tr>
<td>Malformation of the head, limp limbs at birth</td>
<td>Vaginal</td>
<td>Unspecified</td>
<td>Comadrona</td>
<td>Home of mother</td>
<td>Comadrona</td>
<td>No</td>
<td>&gt;4</td>
</tr>
<tr>
<td>Work of labor, premature labor</td>
<td>Cesarean</td>
<td>Suffering of fetus, prolonged labor or meconium</td>
<td>Doctor/Nurse</td>
<td>Unspecified</td>
<td>Doctor, Nurse</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Unspecified</td>
<td>Cesarean</td>
<td>Hemorrhage, breech</td>
<td>Doctor</td>
<td>Private Hospital</td>
<td>Doctor</td>
<td>No</td>
<td>&gt;4</td>
</tr>
<tr>
<td>Unspecified</td>
<td>Cesarean</td>
<td>Unspecified</td>
<td>Doctor</td>
<td>Private Hospital</td>
<td>Doctor</td>
<td>Yes</td>
<td>3</td>
</tr>
</tbody>
</table>
Prenatal care in the communities
TBA and SBA training programs:
Simulation in action: Shoulder Dystocia
Metric results: Training Efficacy

Shoulder Dystocia

Postpartum Hemorrhage

SD OSCE Score

PPH OSCE Score

SD Question Score

PPH Question Score

<.001

0.005

<.001

<.001

PRE
POST

PRE
POST

PRE
POST

PRE
POST

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Trainings have been modified and extended to SBAs
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Dimensions of Child Well-Being

1) **Health** (survival, infections)
2) **Nutrition** (growth)
3) **Development** (sensory-motor, cognitive, and socio-emotional)

- Global research has demonstrated the importance of interventions that combine these three areas into an integrated model of care
  
Early Childhood Interventions

• Characteristics of interventions that research shows have the greatest impact (*Engle et al. 2007*)
  – Integrate health, nutrition, and development
  – Occur during the earliest periods of life
  – Provide both direct services to children (child focused) and support/education for parents (caregiver/parent focused)
  – Utilize several types of interventions (education, micronutrient supplementation, demonstration of stimulation activities)
  – Include more than one delivery method (home visits, group counseling, childcare centers, mass media)
Pilot Study: July 2012

• Study included 75 children ages 12 – 48 months
  – Demographic survey
  – Developmental screening with Ages and Stages Questionnaire (ASQ)
    ▪ 30-item questionnaire completed by parent at specific ages
    ▪ 5 developmental categories:
      • Communication
      • Gross Motor
      • Fine Motor
      • Problem Solving
      • Personal Social
Pilot Study: July 2012

• Demographic survey results:
  – 37% of mothers could not read or write
  – 32% of mothers had not received any formal education
  – Many mothers did not stimulate their children through behaviors such as reading and story-telling
    • 53% of mothers reported reading books to their children (16% read books > 3 times per week)
    • 65% reported telling their children stories (15% tell stories > 3 times per week)
Percentage of children at the Trifinio communities with cumulative delays in any of the 5 ASQ categories
Effect of specific risk factors on the frequency of having 2 or more ASQ delays

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother's literacy</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Mother's primary education</td>
<td>27</td>
<td>63</td>
</tr>
<tr>
<td>3 or fewer pregnancies</td>
<td>30</td>
<td>54</td>
</tr>
<tr>
<td>Plays with toys</td>
<td>32</td>
<td>78</td>
</tr>
<tr>
<td>Reads books</td>
<td>28</td>
<td>49</td>
</tr>
</tbody>
</table>
Pilot Study: July 2012

• Intervention: presentation with portable flip charts
  – 12-24 months: language development and vocabulary
  – 24-48 months: encouraging good behavior (praise) and ignoring bad behavior

• Videos done pre- and post-intervention of mother-child interaction with picture book
Pre-Intervention
Post-Intervention
Pilot Study: July 2013

• Intervention:
  – Flipchart instructional talks with mothers covering age-related topics
    • 0-6 months: post-partum depression, child health, development, hygiene, nutrition
    • 6-12 months: child health, development, hygiene, injury prevention, nutrition

• Learning assessments:
  – Pre: before the flipchart talk
  – Post-1: immediately after the flipchart talk
  – Post-2: 1-2 weeks after the flipchart talk
Pilot Study: July 2013

- **0-6 month flipchart**
  - 38 mothers completed learning assessments
Pilot Study: July 2013

- **6-12 month flipchart**
  - 38 mothers completed learning assessments

![Learning Assessment Chart]

- Pre
- Post-1
- Post-2

Percent Correct

Learning Assessment
Niños Sanos

- **Neonatal Home Visits (3)**
  - Home visits at birth, 2 weeks, and 1 month
- **Group Health Visits (4)**
  - Groups visits in the community at 6, 12, 24, and 36 months
- **Care Groups (35)**
  - Interactive group visits monthly from 2 - 36 months
Niños Sanos

• Neonatal Visits (individual home visits)
  (1) Birth visit (~3 days of life)
    ➢ CHW assessment of danger signs, growth monitoring, EPDS screen
  (2) 2-week visit
    ➢ CHW assessment of danger signs, growth monitoring, EPDS screen
  (3) 1-month visit
    ➢ Flipchart with anticipatory guidance, growth monitoring, EPDS screen
Neonatal Visits

Causes of neonatal deaths

Deaths among children under five

- Deaths in older infants and children: 63%
- Diarrhoeal diseases: 3%
- Neonatal deaths: 37%
- Neonatal infections: 25%
- Birth asphyxia and birth trauma: 23%
- Prematurity and low birth weight: 31%
- Other: 9%
- Congenital abnormalities: 7%
- Neonatal tetanus: 3%

Neonatal Visits

**Daily risk of death during the first month of life**

Niños Sanos

• Group Health Visits
  (4) 6 month visit
    - Flipchart with anticipatory guidance, growth monitoring and promotion, developmental screening, immunization verification
  (5) 12 month visit
    - Flipchart with anticipatory guidance, growth monitoring and promotion, developmental screening, immunization verification, hematocrit
  (6) 24 month visit
    - Flipchart with anticipatory guidance, growth monitoring and promotion, developmental screening, immunization verification
  (7) 36 month visit
    - Flipchart with anticipatory guidance, growth monitoring and promotion, developmental screening, immunization verification
Niños Sanos
Niños Sanos

- Monthly mother-child care groups from 2 - 36 months of age
  - Activities
    - *Language Power (Bonnie Camp)*, gross motor stimulation, nutrition, other developmental topics
    - *Learning Games (BB3, Abecedarian curriculum)*
  - Health topic reinforcement (5-10 minutes)
    - *Diarrhea/ORt, cough/fever/PNA, hand washing, crying baby, clean water, injury prevention, complementary feeding*
  - Growth monitoring and promotion (weight, height/length, head circumference, and mid-upper arm circumference)
Niños Sanos Update

• Currently over 700 children enrolled
  – 150 new participants since June 2015!
  – Over 300 children have had a nurse visit in the first month of life
    ▪ Over 150 have had a nurse visit in the first week

• Expanding Telehealth program
  – Developing weekly telehealth (Vidyo) trainings on lactation and other child health topics
  – Conducted a 1-week Care Group training via telehealth (September 2015)
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Niños Sanos
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  – Darren Eblovi (MS IV)
  – Brittney MacDonald (MS I)
  – Cassy Cooper (MS I)
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  – Gretchen Domek, MD, MPhil
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  – Bonnie Camp, MD, PhD

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Conclusion

• Universities are an ideal platform to foster collaboration for global health initiatives

• University of Colorado is embarking on a collaborative effort to develop a clinic and a community health program for women and children in rural Guatemala

• Use of quality improvement data allows projects to undergo continuous evaluation and program improvement directed toward specific community needs

• Integrated models of care that incorporate health, nutrition, and development have the best outcomes for promoting early childhood health and development in resource-limited settings
Questions??