

Primary Presenter: Erin Aldag

Project Title: *Group B Streptococci colonization in pregnant women in rural Guatemala: Prevalence and neonatal outcomes*

Primary Mentor: Leana May, Center for Global Health, Pediatric Emergency Medicine

Secondary Mentor(s): Edwin Asturias

Thematic Area: Global Health

Abstract:

Background

Group B Streptococcus (GBS) colonization in pregnant women is strongly associated with neonatal early onset sepsis. Although GBS intrapartum antibiotic prophylaxis can significantly reduce adverse neonatal outcomes, it is not standard of care in Guatemala. A lack of robust epidemiologic data may limit current practice. Recently, we identified a 17.3% prevalence rate of GBS colonization among pregnant women living in an urban area of Guatemala. However, little is known about GBS colonization in rural areas of Guatemala.

Objective

To identify the prevalence of GBS colonization among pregnant women in rural Guatemala and to assess infection-related neonatal outcomes.

Design/Methods

This is a prospective cohort study conducted through a community health program in the rural southwest Trifinio region of Guatemala from May 2018 to August 2019. Consented women  $\geq 28$  weeks gestation had a single rectal-vaginal swab collected by trained nurses, which was then plated on a chromagar culture and incubated for 48 hours. Bacterial growth suspected as GBS was tested with latex agglutination. Positive chromagar and latex agglutination results were considered confirmed GBS colonization. Per ethical considerations, CDC intrapartum treatment recommendations for GBS were provided to women with suspected or confirmed GBS to provide to their clinicians at delivery. Neonatal outcomes including illnesses, hospitalizations, and medications were elicited by parent report during 3 in-home visits by trained nurses during the first 30 days of life and medical record review.

Results

153/154 (99.4%) women enrolled and had rectal-vaginal samples collected. 63 (41.2%) women had suspected GBS bacterial growth on chromagar. Of these, 10 were positive on latex agglutination giving an overall GBS colonization rate of 6.5% (95%CI: 3.2-11.7%). 145 infants were enrolled. 7 (4.8%) infants had infection related hospitalizations or death requiring antibiotics within 30 days of birth, of whom 1 had a mother with suspected but not confirmed GBS.

Conclusion(s)

GBS colonization among pregnant women in rural Guatemala may be lower than rates identified in urban Guatemala. Infants experienced high infection-related morbidity during the first 30-days of life, but this was not associated with maternal GBS colonization. This lack of association may be due to

provision of treatment recommendations for GBS colonization, inadequate detection of GBS, or non-GBS related infections. Findings may inform prioritization of GBS prophylaxis programs in Guatemala.

Primary Presenter: Nicholas Arlas

Project Title: *The Youth Community Health Awareness Partnership: Community-based participatory research initiative to assess the scope of alcohol use within the community of refugees from Burma in the greater Denver area*

Primary Mentor: Janet Meredith, Family Medicine

Secondary Mentor(s): Dr. Bethany Kwan

Thematic Area: Global Health

Abstract:

#### BACKGROUND

For more than fifty years, minorities in Burma have faced severe persecution and violence that has forced them to flee their homeland. In the past ten years there has been an influx in the number of refugees resettled in Denver. Refugees often struggle to navigate the complexities of the American health care system and adapt to life in a foreign culture. The development of novel programs and partnerships to assist refugees in their pursuit of health and integration is essential to build stronger, cohesive communities.

#### METHODS

Beginning in 2014, a multi-phase community based participatory research (CBPR) project was developed in collaboration with the refugee community from Burma residing in the greater Denver area. The first phase of the project involved establishing a partnership with the community. A group of motivated teenagers and young adults from this community collaborated to form our Youth Advisory Board (YAB). We met regularly with the YAB to discuss and prioritize health issues. They identified alcohol use and misuse as the paramount health concern within their community. Formative information was elicited from community leaders, local refugee organizations, healthcare providers, and informal surveys to guide future research tools. With this identified issue, the project moved into phase two of data collection. Phase two involved conducting formal one-on-one, semi-structured, audio-recorded interviews with community members. Participants were recruited voluntarily at health information nights held by the student researchers at their local apartment complex. The interviews were conducted by one medical student researcher with one translator present and were transcribed afterward. Phase three, the current phase of the project, includes data analysis and presenting our findings to the community. The interview data was analyzed using Immersion Crystallization methodology. This data will be leveraged to create, implement, and evaluate a culturally competent intervention to effectively address risky alcohol use in this affected community.

#### RESULTS

Initial results from the nineteen meetings with the YAB, fourteen meetings with local organizations, nineteen formative community surveys, and three key informant interviews pointed to the vulnerability of the refugee population, the scarcity of culturally appropriate resources for alcohol abuse, and the urgency of addressing problematic alcohol use. The analysis of the ten audio-recorded surveys showed the emergence of several themes related to the use of alcohol within this community. Themes identified through qualitative analysis include negative consequences of alcohol use, specifically negative impacts

on familial relationships, employment, and financial resources, and a perceived personal responsibility for managing one 's own alcohol consumption.

## CONCLUSIONS

This project corroborates current literature regarding the scope and breadth of hazardous alcohol use within the community of refugees from Burma. Our data has expanded our understanding of the values of community members including the influence of religion and family on behaviors, and the negative impact on employment as the most impactful negative consequence. These findings need to be shared with the community to move forward in mapping the most effective and appropriate interventions.

Primary Presenter: Adam Avant

Project Title: *Lack of Prenatal Vitamins and Anti-malarial Medications during Pregnancy is Associated with Maternal Complications in Rural Uganda*

Primary Mentor: Madiha Abdel-Maksoud, Global Health

Thematic Area: Global Health

Abstract:

Background

Maternal morbidity and mortality remains a major issue in Uganda. This study looks at Mpigi Health Center IV (MHCIV), a community based referral center serving a large catchment area.

Objectives

To use a survey to study socioeconomic and psychosocial factors and their correlation with maternal outcomes in rural Uganda at MHCIV.

Methods

A survey was developed and administered a survey to 147 women who delivered at the health center from June 12 to July 12 2017. It was administered in-person via interpreters when needed, and included 33 questions (maternal sociodemographic factors, prenatal conditions and care, mode of delivery and maternal complications). The outcome variable, maternal complications, was a composite variable including: miscarriage, fetal death, pre-eclampsia, prolonged labor, uterine rupture, post-partum hemorrhage and puerperal sepsis. Descriptive statistics were used to summarize the data, and multivariable logistic regression was used to examine the independent associations between the above-mentioned factors and maternal complications.

Findings

The average age of participants was 26.4 years. 60.5% of participants reported taking iron, 62% reported taking folic acid, and 56.5% reported taking sulfadoxine-pyramethamine for malarial infection or prevention of infection during pregnancy. Analysis revealed that pregnant women who did not take these three medicines were 5.472 times more likely to have maternal complications than those who took them.

Conclusions

In this study, the absence of prenatal medications during pregnancy was associated with increased risk of maternal complications. These medicines are prescribed by the prenatal clinic at MHCIV, and the intake of these could be an indicator of compliance with prenatal care in general. Therefore, increasing awareness about the importance of prenatal care, including the intake of supplements and antimalarials, in addition to ensuring the availability of these compounds is critical to reduce the burden of maternal complications in Mpigi and other high malaria burden regions.

Primary Presenter: Ryan Hirata

Project Title: *A Cross-Sectional Study of Knowledge, Attitudes, and Practices Surrounding Exclusive-Breastfeeding at Dhulikhel Hospital, Nepal*

Primary Mentor: Jennifer Bellows, EM

Thematic Area: Global Health

Abstract:

Background

Rates of malnutrition and stunting in Nepal are among the highest in the world. Exclusive breastfeeding, defined as giving an infant only breast milk without any food or liquid supplementation, is known to be protective against stunting and is recommended by the World Health Organization (WHO) until an infant is six months of age. Few studies have addressed the lack of exclusive breastfeeding (EBF) as a contributing factor to malnutrition and stunting in Nepal. The objective of this research study was to determine knowledge, attitude and intentions to exclusively breastfeed of pregnant women receiving care at the Antenatal Clinic at Dhulikhel Hospital in the Kavre District of Nepal.

Methods

A cross-sectional survey was conducted among 302 pregnant women that attended the antenatal clinic at Dhulikhel Hospital in Nepal from June to August 2015. The quantitative questionnaire was created from a survey used to evaluate barriers to EBF in Zimbabwe, with additional questions based on the Behavioral Theory Model. Data set is categorical and was statistically analyzed using Fisher's Exact Test.

Results

Knowledge of exclusive breastfeeding recommendations, belief of ability to produce sufficient breast milk, and perception of the necessity for infant supplementation influenced mothers' decision to discontinue exclusive breastfeeding. Most women reported healthcare workers as influential in their decision to breastfeed, whereas local community and familial attitudes had little influence on mothers' decisions.

Conclusion

Lack of knowledge of the definition of exclusive breastfeeding is prevalent among pregnant women receiving care at Dhulikhel Hospital. The belief that infants require supplemental food or formula appears to have a particularly influential impact on cessation of exclusive breastfeeding within the first six months of an infant's life. Interventions driven by health-care workers have the potential to influence the intentions regarding exclusive breastfeeding in pregnant women in Nepal.

Primary Presenter: Vishnupriya Krishnan

Project Title: *A Cross-Sectional Study of Knowledge, Attitudes, and Practices Surrounding Exclusive-Breastfeeding at Dhulikhel Hospital, Nepal*

Primary Mentor: Jennifer Whitfield, Emergency Medicine

Thematic Area: Global Health

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Primary Presenter: Andrew Lamp

Project Title: *A single-site pilot implementation of a novel trauma training program for prehospital providers in a resource-limited setting*

Primary Mentor: Nee-Kofi Mould-Millman, Emergency Medicine

Thematic Area: Global Health

Abstract:

**Background**

Prehospital (ambulance) care can reduce morbidity and mortality from trauma. Yet, there is a dearth of effective evidence-based interventions and implementation strategies. Emergency Medical Services Traumatic Shock Care (EMS-TruShoC) is a novel bundle of five core evidence-based trauma care interventions. High-Efficiency EMS Training (HEET) is an innovative training and sensitization program conducted during clinical shifts in ambulances. We assess the feasibility of implementing EMS-TruShoC using the HEET strategy, and feasibility of assessing implementation and clinical outcomes. Findings will inform a main trial.

**Methods**

We conducted a single-site, prospective cohort, multi-methods pilot implementation study in Western Cape EMS system of South Africa. Of the 120 providers at the study site, 12 were trainers and the remaining were eligible learners. Feasibility of implementation was guided by the RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) framework. Feasibility of assessing clinical outcomes was assessed using shock indices and clinical quality of care scores, collected via abstraction of patients' prehospital trauma charts. Thresholds for progression to a main trial were developed a priori.

**Results**

The average of all implementation indices was 83% (standard deviation = 10.3). Reach of the HEET program was high, with 84% learners completing at least 75% of training modules. Comparing the proportion of learners attaining perfect scores in post- versus pre-implementation assessments, there was an 8-fold (52% vs. 6%) improvement in knowledge, 3-fold (39% vs. 12%) improvement in skills, and 2-fold (42% vs. 21%) increase in self-efficacy. Clinical outcomes data were successfully calculated and there were clinically significant improvements in shock indices and quality of prehospital trauma care in the post- versus pre-implementation phases. Adoption of HEET was good, evidenced by 83% of facilitator participation in trainings, and 100% of surveyed stakeholders indicating good programmatic fit for their organization. Stakeholders responded that HEET was a sustainable educational solution that aligned well with their organization. Implementation fidelity was very high; 90% of the HEET intervention and 77% of the implementation strategy were delivered as originally planned. Participants provided very positive feedback, and explained that on-the-job timing enhanced their participation. Maintenance was not relevant to assess in this pilot study.

**Conclusions**

We successfully implemented the EMS-TruShoC educational intervention using the HEET training strategy in a single-site pilot study conducted in a low-resource international setting. All clinical



outcomes were successfully calculated. Overall, this pilot study suggests high feasibility of our future, planned experimental trial.

Primary Presenter: Matthew Lippi

Project Title: *Resolution of Ring Tourniquet with a High-speed Dental Drill in a Remote Pacific Island Clinic.*

Primary Mentor: Leana May, Pediatric Emergency Medicine

Thematic Area: Clinical Science

Abstract:

Ring tourniquet syndrome is a strangulation injury, usually at the proximal finger or toe, caused by a rigid circular metal object. The resulting ischemia can lead to necrosis, permanent nerve and/or tissue damage, and amputation of the digit. There are numerous non-cutting methods for removing the ring; however, edema, fractures, or arthritis near the site can occasionally make these techniques difficult or impossible. While ring cutters, manual or electric, are the first choice for resolving ring tourniquet caused by metal jewelry, these tools are not readily available everywhere. Resolution of ring tourniquet with high-speed rotary tools has been previously described as a tertiary method. Here we describe the use of a high-speed dental tool as a primary ring cutting method for the resolution of ring tourniquet in a patient with significant edema in a low-resource setting.

Primary Presenter: Meghan Nedic

Project Title: *Determinants of childhood mortality and malnutrition rates in tribal populations of India: A Literature Review*

Primary Mentor: Madiha Abdel-Maksoud, Global Health

Thematic Area: Global Health

Abstract:

Rates of childhood malnutrition and mortality among tribal populations in India are disproportionately high compared to the country as a whole. Despite the availability of government healthcare facilities and incentives, a 2018 report from the Tribal Health Expert Committee in India asserts that the “scheduled tribe infant mortality rate in India was highest in the world among the indigenous populations, next only to the Federally Administered Area in Pakistan.” This literature review explores what the major determinants of childhood mortality and malnutrition are and what programs the government has implemented to address this issue.

Primary Presenter: Laurel Officer

Project Title: *The Youth Community Health Awareness Partnership: Community-based participatory research initiative to assess the scope of alcohol use within the community of refugees from Burma in the greater Denver area*

Primary Mentor: Janet Meredith, CU Dept of Family Medicine

Secondary Mentor(s): Jamaluddin Moloo

Thematic Area: Global Health

Abstract:

#### BACKGROUND

For more than fifty years, minorities in Burma have faced severe persecution and violence that has forced them to flee their homeland. In the past ten years there has been an influx in the number of refugees resettled in Denver. Refugees often struggle to navigate the complexities of the American health care system and adapt to life in a foreign culture. The development of novel programs and partnerships to assist refugees in their pursuit of health and integration is essential to build stronger, cohesive communities.

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on familial relationships, employment, and financial resources, and a perceived personal responsibility for managing one 's own alcohol consumption.

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Primary Presenter: Alexander Vasconcellos

Project Title: *Use of a Simple Survey to Elicit Predictors of Maternal Complications in Rural Uganda*

Primary Mentor: Madiha Abdel-Maksoud, Epidemiology

Thematic Area: Global Health

Abstract:

Background

Maternal morbidity and mortality remains a major issue in Uganda. This study looks at Mpigi Health Center IV (MHCIV), a community based referral center serving a large catchment area.

Objectives

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Findings

The average age of participants was 26.4 years. 60.5% of participants reported taking iron, 62% reported taking folic acid, and 56.5% reported taking sulfadoxine-pyramethamine for malarial infection or prevention of infection during pregnancy. Analysis revealed that pregnant women who did not take these three medicines were 5.472 times more likely to have maternal complications than those who took them.

Conclusions

In this study, the absence of prenatal medications during pregnancy was associated with increased risk of maternal complications. These medicines are prescribed by the prenatal clinic at MHCIV, and the intake of these could be an indicator of compliance with prenatal care in general. Therefore, increasing awareness about the importance of prenatal care, including the intake of supplements and antimalarials, in addition to ensuring the availability of these compounds is critical to reduce the burden of maternal complications in Mpigi and other high malaria burden regions.

Primary Presenter: Andrew Vines

Project Title: *Lack of Prenatal Vitamins and Anti-malarial Medications during Pregnancy is Associated with Maternal Complications in Rural Uganda*

Primary Mentor: Madiha Abdel-Maksoud, Colorado School of Public Health – Epidemiology Global Health Track CUSOM

Thematic Area: Global Health

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Primary Presenter: Erin Wylie

Project Title: *Demographics and predictors of mortality in children undergoing resuscitation at Khayelitsha Hospital, Western Cape, South Africa*

Primary Mentor: David Richards, Emergency Medicine

Thematic Area: Global Health

Abstract:

Background

The clinical outcomes of paediatric patients requiring resuscitation depend on physicians with specialised knowledge, equipment and resources owing to their unique anatomy, physiology and pathology. Khayelitsha Hospital (KH) is a government hospital located near Cape Town, South Africa, that sees ~44 000 casualty unit patients per year and regularly functions at more than 130% of the bed occupancy. Many of these patients are children requiring resuscitation.

Objectives

We sought to describe characteristics of children under the age of 12 who required resuscitation upon presentation to KH, determine predictors of mortality, and compare paediatric volume to specialist physician presence in the unit.

Methods

A retrospective chart review was performed on patients younger than 12 years who were treated in the resuscitation area of KH during the six-month period from 1 November 2014 to 30 April 2015.

Results

A total 317 patients were enrolled in the study with a median age of 14 months. The top 5 diagnoses were: pneumonia (n=58/317); neonatal sepsis (n=40/317); seizures (n=37/317); polytrauma (n=32/317); and acute gastroenteritis complicated by septic shock (n=28/317). Overall mortality was 7% (n=21/317) and mortality in children less than 1 month of age was 12% (n=5/42). Premature birth was associated with a mortality odds ratio of 8.44 (p=0.002). More than two-thirds (73%; n=231/317) of paediatric resuscitations occurred when specialist physicians were not physically present in the unit.

Conclusion

The study findings indicate that children under one month of age with a history of prematurity are at high risk and may benefit most from paediatric-specific expertise and rapid transfer to a higher level of care.



Primary Presenter: Amy Young

Project Title: *Improved maternal iodine status during first trimester gestation with preconception nutrition supplementation: The Women First Maternal Preconception Nutrition Trial*

Primary Mentor: Nancy Krebs, Pediatrics, Section of Nutrition

Thematic Area: Global Health

Abstract:

**Background**

Iodine deficiency remains common globally, with ~25% of low and middle-income country households without iodized salt. With its critical role in embryogenesis, iodine supplementation prior to conception may be especially important in fetal development. This study compared the effect of preconception nutrition supplementation of 250 µg/day (vs no supplementation) on maternal iodine status at 12 week gestation and birth outcomes in 3 low resource settings in the Women First Preconception Nutrition Trial.

**Methods**

Women in Guatemala, India and Pakistan (n~100/arm/site) were randomized to receive multi-micronutrient fortified lipid-based nutrient supplements until delivery, starting ~3 months prior to conception (Arm 1), or starting at ~12 week gestation (Arm 2) after sample collections. Urinary iodine (µg)/creatinine (g) ratios (I/Cr) were determined at 12 wks. The cutoff for deficiency was I/Cr<150. Birth outcomes included length-for-age Z-scores (LAZ), weight-for-age Z-scores (WAZ), head circumference-for-age Z-scores (HCAZ) and BMI-for-age Z scores (BMIAZ), as well as age adjusted Z scores <-2, including stunting and wasting (LAZ<-2 and BMIAZ<-2, respectively) according to maternal urinary I/Cr status.

**Results**

At 12 wks, the adjusted mean I/Cr for Arm 1 vs Arm 2 was significantly higher for all sites (Adjusted mean: 220, 95% CI: 205,191, vs Adjusted mean: 163, 95% CI: 152,176, p<0.0001), Guatemala (Adjusted mean: 224, 95% CI: 197, 254 vs Adjusted mean: 161, 95% CI: 142,183, p=0.0003) and India (Adjusted mean: 228, 95% CI: 200, 260, vs Adjusted mean: 155, 95% CI: 135,177, p<0.0001) but not for Pakistan (Adjusted mean: 164, 95% CI: 148,182, vs Adjusted mean 176, 95% CI: 159,195, p=0.32). Prevalence of deficiency was lower in Arm 1 vs Arm 2 in Guatemala (30% vs 44%, p=0.06) and India (24% vs 47%, p<0.0004); >40% were deficient for both arms in Pakistan. For combined sites and arms, there was no significant relationship between continuous age adjusted Z scores or dichotomous age adjusted Z scores <-2 and I/Cr groups.

**Conclusion**

The preconception intervention resulted in improved maternal iodine status during the first trimester in 2 of the 3 sites. The prevalence of iodine deficiency at 12 wk in all sites suggests opportunities for enhanced implementation of iodine fortification programs.