

and the level of cognitive function at a school in Guayaquil, Ecuador. Demographic data was also collected from 175 students between the ages of 5 to 11 years old. Exclusions were those children with a known mental disability. Each student had their hemoglobin levels measured using the STAT-Site Hgb Meter. Cognitive function was measured by the Raven Colored Progressive Matrices (CPM) exam. The CPM exam measures nonverbal intelligence and was selected because it is language independent.

**Outcomes & Evaluation:** The correlation between the level of anemia and the level of cognitive function was .001 showing no correlation. A T-test from the CPM score also showed no significant difference. Of significance (Beta=0.16,  $t=2.5$ ,  $p=0.01$ ) was the correlation between cognitive function and monthly household income.

**Going Forward:** Although the original hypothesis of anemia negatively affecting cognitive function was disproved, it is worthwhile to further investigate the relation between household income and cognitive function. Time spent with parent and child doing homework, the opinion of parents and others in the household on the value of education, and the level of education of the parents are a few of the items that could be considered. Higher incomes resulting in improved nutrition could also contribute to higher hemoglobin levels and higher CPM scores. All of these variables should be studied to show the correlation between household income and cognitive function in children.

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### Assessing childhood malnutrition in Haiti: Is the United Nations Millennium Goal #4 being met?

J.J. Cherry<sup>1</sup>, E.L. Tresselt<sup>2</sup>, D.M. Vanderpool<sup>1</sup>, E.R. Crain<sup>3</sup>, C.T. Russell<sup>4</sup>, L. Ray<sup>5</sup>, R.L. Bush<sup>1</sup>; <sup>1</sup>Texas A & M Health Science Center College of Medicine, Bryan, TX/US, <sup>2</sup>Texas A & M Health Science Center College of Medicine, Bryan, TX/US, <sup>3</sup>University of Texas-Houston School of Medicine, Houston, TX/US, <sup>4</sup>Samford University, Birmingham, AL/US, <sup>5</sup>Texas A&M Health Science Center College of Medicine, Bryan, TX/US

**Background:** Context: The United Nations (UN) Millennium Developmental Goal #4 is to reduce childhood mortality. Malnutrition in Haitian children has been a major public health problem. Why the study was done, in one or two sentences: The study was done to quantify the progress of the UN Developmental Goal #4 in Haiti. Aim: The major aim was to examine the nutritional status and characteristics of children that increase risk for malnutrition.

**Methods:** Study Design: The study was conducted in a medical clinic that serves four communities in the rural Thomazeau region of Haiti. Identifying information was not recorded; participants were not allocated to groups. Participants: Participants consisted of 103 children under the age of five presented in the clinic over seven days. Interventions: Not applicable. d. Analysis: i. Participant numbers were limited by the time period. Primary outcomes were significant variables of these specific populations at higher risk of malnutrition. Both univariate and multivariate analyses were performed. ii. Verbal consent was obtained from guardians. The study was approved by the Texas A&M IRB.

**Findings:** Provide number of participants assigned and analyzed in each group: Participants were not assigned to groups. Describe outcomes, data, and statistical tests if appropriate. Average age was 2.1 years (SD=1.4), 52% were females, and 63% were first-born

children in families that averaged 2.3 children. Moderate malnutrition (as measured by height-for-age Z-score) was found in 10.9% of children with an additional 5.9% having a severe status. Using a parsimonious multivariable regression model to compare family structure factors to anthropomorphic variables, multiparity was significantly associated with Z-score ( $p < 0.05$ ), suggesting that higher values may be more protective. Distance from the clinic negatively affected nutritional status. Any important adverse events/side-effects: None.

**Interpretation:** General interpretation of the results and their significance: Malnutrition is prevalent in this region. Children of new mothers may be at higher risk as new mothers may be less skilled at securing nutrition for children or have fewer resources. Distance from medical care may obstruct treatment for parasites and other common illnesses. We plan to educate community health workers to focus attention and resources toward at-risk populations to decrease malnutrition and hopefully child mortality to achieve the UN Millennium Goal #4. Outline limitations and strengths of the study: The study was only conducted in one rural region of Haiti and may not be representative of the entire country. This study completed its aim.

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### Intimate partner violence and condom versus other modern contraception use among married women in rural India

A. Dasgupta<sup>1</sup>, N. Saggurti<sup>2</sup>, B. Donta<sup>3</sup>, M. Battala<sup>4</sup>, M. Ghule<sup>3</sup>, S. Nair<sup>5</sup>, J. Ritter<sup>1</sup>, J. Silverman<sup>1</sup>, A. Raj<sup>1</sup>; <sup>1</sup>University of California, San Diego, San Diego, CA/US, <sup>2</sup>Population Council, New Delhi, IN, <sup>3</sup>National Institute for Research in Reproductive Health, Mumbai, IN, <sup>4</sup>Population Council, Mumbai, IN, <sup>5</sup>National Institute for Medical Statistics, Mumbai, IN

**Background:** Data from India document that spousal intimate partner violence (IPV) is associated with both unintended pregnancy and spacing contraceptive use. Analysis of IPV by type of contraception is lacking. Condom use may be less likely than other spacing contraception in the context of IPV, as it is under male control. This study aims to assess associations of physical and sexual IPV with condom and other contraception use among married women in rural India. We hypothesize that women reporting physical and sexual IPV victimization are significantly less likely to report condom use but not other contraception use, relative to women reporting no such victimization.

**Methods:** Study participants were from the randomized control trial evaluation of CHARM, a male-centered family planning intervention for young married couples in rural Maharashtra, India. Baseline data from women (age 18-30, residing with husbands) were used for analyses; data were restricted to those who were not pregnant at interview ( $n=867$ ). Surveys assessed socio-demographics, husband's physical and sexual IPV perpetration, and an item on primary form of contraception used by women in the past 3 months (subsequently categorized as none, condom, other modern spacing contraception). Multinomial logistic regression analyses assessed associations between past 6 month physical and sexual IPV and contraceptive use, adjusting for age, education, length of marriage, caste, parity, and husband's alcohol use. All participants provided written informed consent; all study procedures were approved by Institutional Review Boards at UCSD, and ICMR.

**Findings:** Participants were aged 18-30 (SD: 2.5), and 17% reported no formal education. 12% and 4% of women reported past 6 month physical

and sexual IPV, respectively. The majority (72%) reported not using any modern spacing method of contraceptive in the past 3 months; 14% reported condom use and other modern spacing contraception, respectively. Physical IPV was significantly associated with condom use (AOR: 1.89, 95% CI: 1.04, 3.28) but not other contraception use. Sexual violence was associated with other modern contraceptive use (AOR: 2.78, 95% CI: 1.11, 7.00), but not condom use.

**Interpretation:** Women contending with sexual violence were more likely to engage in other modern contraceptive use but not condom use. This finding may indicate that women contending with sexual violence may depend on forms of contraception more within their control. To our knowledge, this study is the first of its kind to examine such associations between IPV and contraception use by type of method. These findings are limited due to the cross-sectional nature of the data, and are not generalizable to the larger population of women in India. Further research is needed to explain the association between recent physical IPV and condom use, a finding inconsistent with prior research.

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### Increase in metabolic diseases following the Fukushima triple disaster: A retrospective study of Kawauchi Village with long-term follow-up

D. Ebner<sup>1</sup>, K. Harada<sup>2</sup>, A. Koizumi<sup>2</sup>; <sup>1</sup>Brown University, Providence, RI/US, <sup>2</sup>Kyoto University, Kyoto, JP

**Background:** The March 2011 earthquake, tsunami, and nuclear accident in northeastern Japan caused unprecedented destruction and worry of contamination, with the Fukushima Daiichi nuclear accident 20 km exclusion zone requiring the evacuation of over 200,000 people alone. Residents of Kawauchi Village in Fukushima Prefecture escaped significant damage from the earthquake and tsunami, but were forced to evacuate due to threat of nuclear contamination to government-erected shelters and temporary housing in Koriyama City. In April 2012 residents were allowed to return, and by April 2014 approximately 50% of villagers had returned. We aim to retrospectively examine the members of the village for changes to their health status secondary to the evacuation, focusing primarily on metabolic disease. **Methods:** Residents of Japan undergo comprehensive health screenings yearly under the National Health Insurance system. We were granted access to the records from 2008 to 2013. Data for 777, 797, 779, 431, and 477 residents were available in 2008, 2009, 2010, 2012, and 2013, respectively; 2011 was not collected due to the disaster. In 2012, 233 residents remained evacuated, while 99 remained evacuated in 2013. Data were analyzed by ANOVA using Statistica, with  $p < 0.05$  considered significant.

**Findings:** Population changes between 2008 and 2010 were compared to 2010 vs. 2012. Significant increases in change rate were seen in weight, BMI, blood glucose, HDL, LDL, AST, ALT,  $\gamma$ -GT, and uric acid. Significant decrease was seen for systolic blood pressure. Evacuees in 2012 had significantly increased systolic and diastolic blood pressure, triglyceride count, and blood creatinine, and significantly decreased eGFR and HDL, compared to village returnees. In 2013, there was significantly increased LDL and significantly decreased ALT in evacuees, but other differences had normalized compared to the returnee population.

**Interpretation:** Significant differences in metabolic health status were seen between the pre-disaster and post-disaster timeframes and between evacuees and returnees. By 2013 the majority of evacuee

differences appear to have normalized, suggesting population adjustment to the evacuation city. This represents the first time recovery from an earthquake and tsunami has been complicated by nuclear accident, and ongoing longitudinal study is needed to inform response to future disasters.

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### Water quality and quantity in the Trifinio: A pilot study

I.F. Eisenhauer<sup>1</sup>, E. Carlton<sup>2</sup>; <sup>1</sup>University of Colorado School of Medicine, Denver, CO/US, <sup>2</sup>University of Colorado School of Public Health, Denver, CO/US

**Program/Project Purpose:** Fecal contamination of water has been proven to indicate diarrheal illness, which itself is a contributor to child malnutrition and developmental delay. This study attempted to quantify contamination of drinking water as part of a long term goal of improving access to safe water and sanitation in the Trifinio Region of Guatemala. This effort was completed in conjunction with the Center for Human Development, a public-private partnership with a clinic in the region, ensuring sustainability of the project.

**Structure/Method/Design:** Water samples from randomly selected homes in Colonia Los Dias (21/267) and Los Encuentros (40/621), were tested for *Escherichia coli*, sanitation hazards, and other determinants of contamination using WHO Rapid Assessment for Drinking Water Quality (RADWQ) standards. Current and possible future methods were also piloted including P&G Purifier of Water (n=5), chlorine bleach (n=2), and ONIL filtration systems (n=2).

**Outcomes & Evaluation:** GIS ArcMap software was utilized to display maps and bacterial distribution, and median contamination levels were found to be 90 E-Coli/100mL and 160 E-Coli/100mL in Los Encuentros and Colonia Los Dias, respectively. Water retrieval method was implicated in contamination (Mean 247 vs 871 for pumped vs. hand-drawn, respectively), as was distance from main roads. Pilot data indicated that methods such as ONIL filtration were not effective against bacterial contamination, but that the P&G "Purifier of water" was more effective in this respect, though our method was above the minimum level of detection.

**Going Forward:** Local leadership were engaged and presented the initial results of this work, to build local capacity and knowledge around the issue of water quality. Understanding of current contamination levels and contributors to contamination should guide the development of permanent sustainable drinking water delivery, with clear recognition of social, financial, and political constraints. Future efforts will include studying the effects of sanitation and clean water interventions on diarrheal illness to understand determinants of health, and to understand local resistance to large-scale water quality projects.

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### Understanding resource deserts and geospatial needs: Working with refugee women's groups

C.J. Frost, S. Benson, L. Gren, R. Jaggi; University of Utah, Salt Lake City, UT/US

**Program/Project Purpose:** Refugee women often arrive in the United States with significant and unique health care needs.