“Helt blong ol mama, Helt blong ol komuniti”

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TWO-MONTH INTERNATIONAL INTERNSHIP
PORT VILA, EFATE ISLAND, VANUATU

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STUDENT VOICES FROM THE FIELD SEMINAR
Background: Stress and Child Development

- Stress hormones can cross the placenta and affect the developing fetus
- Research in the United States, Canada, and Europe shows that high levels of stress during pregnancy are associated with adverse outcomes at birth
  - Low birth weight
  - Preterm birth
- Later, these children exhibit:
  - Slight delays in language, cognitive, and motor development
  - Higher risk of obesity and diabetes

Stress triggers the release of hormones such as cortisol which, at high levels, can cross the placenta and affect fetal development.
The Call for More Research

- Most studies on prenatal stress are within industrialized nations
- Relationships may differ in low- or middle- income countries (LMICs)
  - We might expect worse outcomes
    - Undernutrition and food insecurity
    - Infectious disease
    - Double burden of disease – chronic and infectious
  - We might expect better outcomes
    - Strong social networks
    - Community support

Essential to the field of public health to identify relationships in LMICs
- Understand health burdens with research
- Form interventions to minimize identified health burdens
- Work with local community to prevent ailments and promote good health
The Islands of Vanuatu: Ideal Research Location

- Island archipelago in the South Pacific
  - 83 islands/68 inhabited
- Excellent Location
  1. Well-established research network
  2. Health patterns are consistent with expectations of real and identifiable effect of prenatal psychosocial stress
  3. Greater application/generalizability of results
  4. Existing data – we can research long-term outcomes
- Early phases of health transition
- Gradient of economic development and differences in health burdens across islands of Vanuatu

Fig. 1. Map of Vanuatu
Natural Disaster in Vanuatu: Cyclone Pam, 2015

- Natural Disaster Model – Research opportunity
- March 15, 2015
- Category 5 Cyclone
- 75,000 people left in need of emergency shelter
- 96% food crops destroyed
  - Food shortage, agriculture-based society
- Limited solid housing infrastructure
  - Advantages vs. disadvantages
- Clean water
- Bridges destroyed – transport difficult
- Communication disabled
The Study

- **Objective:** To identify the relationships between prenatal psychosocial stress, nutrition, and infant development
- **Two components:**
  - 1) Stress and dietary change following Cyclone Pam
     - “Acute stress sample”, 2015
  - 2) Stress and diet among the general population one year after Cyclone Pam
     - “Chronic stress sample”, 2016
Data Collection: Psychosocial Health Survey

- Bislama adaptation of the Impact of Events Scale – Revised: to assess Post Traumatic Stress Disorder
- Bislama adaptation of the Center for Epidemiological Studies Depression Scale: assess depression
- Bislama adaptation of the Perceived Stress Scale: to assess stress and anxiety
- 24-hour dietary recall
- Food frequency questionnaire
- Respiratory and Cooking Analysis
  - Where do you cook (inside/outside), on stone or fire, is your kitchen good?
Data Collection: Hair Sample for Cortisol Analysis

- Subsample of positively identified pregnant women
- Invite to participate in hair cortisol sampling
  - Donation of hair: less than ½ cm diameter amount of hair separated with two elastic bands at tends, cut from base of the scalp located in the back region of the head.
  - Hair sample placed in individual plastic bag along with completed consent form. Plastic bag labeled with personal identification number given by researcher, date, and psychosocial health survey number.
  - Samples stored in safe and confidential area while in Vanuatu, then carried to the Université du Québec à Montréal (UQAM) to be analyzed for cortisol concentration using modified Salivary Cortisol ELISA kit.
- Will provide validation of psychosocial health surveys used
Additional Data Collection: Birth Records

- Collected birth records from 2007-2016
- Took pictures of each page of birth records recorded by hand in a hard-cover book that is kept each year in the maternity ward
- Include information on
  - Number of children, mother’s age, island of origin of mother, hemoglobin, mothers’ STI status, type of birth, sex of child, weight at birth, APGAR score, blood loss of mother, gestational BP, highest antenatal BP, health ailments (mother/child)
- Will be used in analysis and comparisons
Results

- **About 1,000 - Survey results**
  - Expected 450
  - Expanded survey audience
    - Prenatal clinic (original), maternal health, triage, dental clinic, physiotherapy, ENT department

- **About 50 - Hair samples**
  - Expected 80
  - Difficulty due to cultural restrictions
    - Worked with clinic leaders to have private (blood draw) room in prenatal clinic building
    - If necessary in future years – will be more successful
Results: Distress During Cyclone

- Distress levels were high
  - 70.6% of women had very elevated distress levels (high enough to suppress immune function)

- Distress levels were higher among women from villages with greater damage due to the cyclone (orange line)
Results: Dietary Diversity During Cyclone

During the cyclone:
- Limited dietary diversity was a major predictor of distress
- Dietary diversity was low even in villages with little damage due to the cyclone (green bars)

- Patterns were similar among both pregnant and non-pregnant women
Results: Distress Preliminary Analyses

- For women who were pregnant during the cyclone:
  - Distress is *not* associated with smaller birthweight

- This is different than results observed in Canada, U.S., and Europe
Results: Depression Preliminary Analyses

- Depression levels are lower among pregnant women compared to women who are not pregnant.
- Results are similar to those observed in Canada, U.S., and Europe.
Results: Depression Preliminary Analyses

- Greater depression levels *might* be associated with larger birthweight.
- This is interesting and unexpected!
- We have seen this same pattern among women in the U.S. with *strong social support networks*.
Challenges Faced

- **Bislama native language**
  - Translation of surveys, asking to complete survey, understanding the results provided by women
  - Learn Bislama! Had mamas teach me Bislama, made sure to talk to women each day at clinic for practice, picked up pamphlets and health education at the hospital for “homework”

- **Culture boundaries**
  - “Black magic” and “voodoo” are common beliefs of Vanuatu, therefore providing individuals with personal effects (i.e. hair samples) was against some individual belief systems
  - Thoroughly explain that all samples were confidential and would be completely destroyed after analysis. Have local health workers support me and explain in local terms.

- Bislama = limited scientific vocabulary
  - no word in the Bislama language for cortisol, difficult to explain stress and stress chemicals, health education of sample population was limited.
Future Years

- Every year from June-August, we will return to Vanuatu to assess child development
  - Questionnaires: household food security, chronic stress
  - Anthropometric measurements (height, weight, skinfolds)
  - Ages and Stages questionnaire (basic questions on cognitive, motor, linguistic, and behavioral development)

- Each year, we will present a report of all results to the Ministry of Health and to Vila Central Hospital

- Right: Skinfold measures of adiposity.
- We have collected anthropometric data among adults and children in Vanuatu since 2007
How is this useful?

- **Study participants**
  - Give women information about their children’s growth and development
  - Tell women if their children might need to see a local health professional

- **Local Health Professionals**
  - Consult with local health professionals to refer families who might be suffering from high levels of food insecurity, maternal depression, or adverse child development outcomes
  - Share our translated questionnaires with health practitioners

- **Ministry of Health**
  - Share our databases with the Ministry of Health
  - Our study might demonstrate the need for more psychosocial health resources in Vanuatu
Thank you!

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- Kelsey Dancause, Research Advisor
- Community members and health workers of Vanuatu!


