

## PLANETARY HEALTH/GLOBAL ENVIRONMENTAL HEALTH/ONE HEALTH

### Project “Environment Ni Mimi” By Kenya Association of Physicians and medical workers for social responsibility (Apms) – Moi University chapter

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**Background:** The Kenya Association of Physicians and medical workers for social responsibility is an affiliate of the broader International Physicians for the Prevention of Nuclear War (IPPNW). The Association is Non – governmental and its main objectives are to improve the quality of human life through the provision of good health based on the understanding that its members’ responsibility as medical workers goes beyond treating patients in hospitals and include tackling the primary causes of human suffering. The association has its members in different medical schools spread across Kenya. Each year, the members in the respective schools are tasked with the responsibility of coming up with a project which will promote social responsibility among the communities around them. The students are well trained in a workshop to equip them with the right skills which will enable them to do this.

Students of the medical school at Moi University realized that there was a lot of littering taking place around the school and hospital environs. As a result, they came up with project “Environment ni Mimi”, which when translated means ‘the environment is my responsibility’. The project entailed ensuring the environment is better taken care of. It portrays; the responsibility of the environment begins with an individual and then becomes a collective responsibility.

**Method:** The main objectives of the project were to create more awareness on the environment, to curb the excessive dumping of litter around the school and hospital environment and to promote social responsibility among the health workers and students. Students organized an anti-litter campaign and designed posters and T-shirts which were advertised all around school. In addition, there was a major clean-up day organized which saw the picking up of litter and placing of dust bins in strategic places within the school compound.

**Outcome and Evaluation:** The school environs is more litter free. The dust bins are well used and there has been awareness created on the importance of a litter free environment.

**Abstract #:** 2.001\_PLA

### The Caribbean Consortium for Research in Environmental and Occupational Health (CCREOH): A transdisciplinary roadmap in addressing regional EOH threats

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**Program Purpose:** CCREOH aims: characterize key EOH risks associated with gold mining–related mercury contamination, pesticide use in agriculture, and indigenous nutraceutical contamination

to inform a gap- and opportunities assessment of relevant environmental policies; create a sustainable public health and EOH network to serve as the trans-disciplinary research and training hub for CCREOH; develop a trans-disciplinary research roadmap to guide the consortium’s EOH research leveraging all consortium partner assets; and develop a capacity building portfolio including a regional EOH training program to successfully implement the priority areas articulated in the CCREOH research roadmap.

**Structure/Method/Design:** CCREOH’s investigator team is indicative of its trans-disciplinary research portfolio, bringing together an array of scientists from biology to epidemiology, toxicology and medicine (University of Suriname, Tulane University). Partner countries include Trinidad and Tobago, Guyana, and northern Brazil. Environmental assessments were conducted to identify health threats associated with priority hazardous substances. Occupational assessments were implemented to identify EOH workforce gaps. An inventory of environmental policies was established to ascertain country and regional EOH protection strategies. A preliminary evaluation of medicinal plants and nutraceuticals identified key plants of focus for further toxico-pharmacologic testing.

**Outcomes & Evaluation:** Hg and pesticides were identified as key contaminants of concern, posing potential adverse health effects to pregnant women and their offspring. From an occupational perspective, critical technical cadre is missing, especially laboratory technicians. No environmental policy exists in Suriname. While Hg is banned, it is actively being used in goldmining; likewise, while pesticide import is regulated, distribution, handling, sale, and disposal in agriculture is not. The CCREOH team has developed a roadmap to address each of these EOH threats. CARPHA is a regional network to engage other countries with similar EOH threats and to disseminate findings.

**Going Forward:** CCREOH was awarded a GEOHealth hub (1U01TW010087-01; 1U2RTW010104-01 NIH/FIC) to assess the impact of environmental exposures on 1000 maternal-child dyads recruited during pregnancy and followed prospectively through four years of age in Suriname (U01-Suriname) complemented by a robust research training portfolio (U2R-Tulane)

**Source of Funding:** NIH/FIC R24TW009570; R24TW009561.

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### Utilizing a One Health approach for identifying risk factors associated with an epidemic of chronic kidney disease of unknown etiology (CKDu) in the North Central region of Sri Lanka

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**Background:** An epidemic of chronic kidney disease of unknown etiology (CKDu) has been occurring in Sri Lanka over the past

decade, primarily among rice farming communities. The national healthcare system is struggling to address the medical needs of the growing number of affected individuals who need to be treated with dialysis and renal transplants.

**Hypothesis:** Occupational pesticide use and alcohol consumption are risk factors associated with CKDu in farming communities in Sri Lanka.

**Aims:** 1) To conduct a case control study investigating risk factors for CKDu using a One Health community survey approach in affected rice farming communities of Sri Lanka; 2) To use results generated from this study to assist CKDu researchers in exploration of multidisciplinary intervention strategies and in generating data-driven policy changes to reduce CKDu incidence.

**Methods:** The case-control study focused on human populations living in the CKDu prevalent North Central region (NCR) of Sri Lanka. A sample population of 110 individuals (55 cases and 55 controls) was selected based on CKDu health screening records from affected communities. Cases were individuals who tested positive for albuminuria and had renal changes consistent with CKD without the presence of diabetes or hypertension. Controls were patients with similar exposures, but negative for albuminuria and CKD. The oral survey tool was translated from English to Sinhalese and administered by Sri Lankan research staff. Multivariable logistic regression was performed to model risk factors associated with CKDu diagnosis.

**Findings:** Community surveys from the 55 CKDu cases and 55 control individuals were analyzed based on exposure factors related to human, animal, and environmental components: 1) cultural practices, 2) family history, 3) animal health, 4) occupational pesticide use, and 5) utilized water sources. Preliminary analysis shows that the CKDu epidemic is most likely multifactorial and involves both cultural and occupational exposures more common in cases than controls.

**Interpretation:** Occupational and cultural risk factors are both important considerations that could be targeted in community interventions to reduce CKDu incidence in Sri Lanka and other affected agricultural communities.

**Funding:** University of California Global Health Institute and UC Davis Blum Center for Developing Economies.

**Abstract #:** 2.003\_PLA

### Impact of an improved biomass stove on birth outcomes in rural Nepal: A cluster-randomized, step-wedge trial

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**Background:** Low birthweight (LBW), preterm birth, and small-for-gestational-age (SGA) are strongly associated with morbidity and mortality in low-resource settings. Data on the impact of

reducing particulate indoor air pollution from biomass stoves on adverse birth outcomes is lacking.

**Methods:** A cluster-randomized, step-wedge, community-based cookstove replacement trial was conducted in rural southern Nepal to estimate the impact on birth outcomes. Eligible households had at least one child < 36 months of age or a married woman 15–30 years of age. Prevalent pregnancies were enrolled at baseline and incident pregnancies were identified by visiting households every five weeks. Gestational age was based on date of last menstrual period ascertained during these visits. Households were surveilled for six months prior to a 12-month stepped-wedge introduction of an improved biomass stove with chimney (Envirofit Corp.), followed by an additional six months of surveillance. 2553 pregnancies were enrolled within 3376 households. As soon after delivery as possible, study workers visited the household to interview the woman and take infant anthropometric measurements. Outcomes were compared across different amounts of time a pregnant woman lived in a household with an improved cookstove. Household PM<sub>2.5</sub> was collected before and after stove installation.

**Findings:** Mean 20-hour PM<sub>2.5</sub> level was reduced from 1386 µg/m<sup>3</sup> to 930 µg/m<sup>3</sup>. Mean birth weight and gestational age was 2627g (SD = 443) and 38.8 weeks (SD = 3.1), respectively, among those delivering prior to improved stove installation. 39% were LBW, 22% preterm, and 55% SGA among pregnancies with no exposure to improved stoves. There was no statistically significant difference or trends in adverse birth outcomes by increasing exposure to improved stoves during pregnancy.

**Interpretation:** PM<sub>2.5</sub> concentrations following installation of the improved stoves were still well above the WHO indoor air standard of 25 µg/m<sup>3</sup>. There was no evidence that installation of improved biomass stoves reduced adverse birth outcomes. This could be due to an inadequate improved stove design, stove stacking, or other sources of indoor air pollution. Trials to examine birth outcomes with better biomass stove designs or clean fuel are needed to establish whether further lowering of indoor air pollution improves birth outcomes.

**Funding:** National Institutes of Health, Thrasher Research Fund.

**Abstract #:** 2.004\_PLA

### Zoonotic enteric pathogens in Kisumu Kenya, a comparison of farmed and Lake Victoria Tilapia: A collaborative interprofessional One Health project

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**Background:** Tilapia are among the main protein source around Lake Victoria, including Kisumu Kenya. Environmental pollutants of Lake Victoria include municipal untreated sewage, runoff, storm-water, and animal waste. We hypothesized that tilapia were contaminated with enteric zoonotic pathogens and we compared lake fish to locally farmed fish. We further wanted to see if certain parts of the fish were more likely to be contaminated.