Pesticide contamination of produce and medicinal plants in Suriname: An emerging environmental health threat

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Background: Pesticides are used widely in Suriname, an upper middle-income country, in large and small-scale agriculture and family gardens. The levels of imported pesticides in 2013 include 73,144.77 kg of insecticides, 447390.80 kg of fungicides and 277,234.00 kg of herbicides. While import is regulated, no policies exist regarding distribution and sale. National monitoring of pesticide residues in produce is absent; however, data from the Netherlands (2011-2013) on imported produce from Suriname show that approximately 20% of samples confirmed pesticide residues above the European Union Maximum Residue Limits. The Caribbean Consortium for Research in Environmental and Occupational Health is designed to address high-priority environmental and occupational health risks in Suriname. Among the consortium's key studies is examining the public health implications of agricultural pesticides use.

Methods: The study is being conducted in three phases. Phases 1 and 2 entail the environmental characterization; pesticide residue analysis of mostly consumed crops and medicinal plants cultivated or harvested in Suriname in the 2 main seasons. Phase 1 consists of a preliminary characterization; analysis of the biota collected in the rainy season from the largest fresh market of Suriname, district Paramaribo. In Phase 2 the environmental characterization is expanded with spatial sampling in the dry season and with an additional pesticide test panel. Sampling is conducted at the largest fresh market of district Paramaribo as well as district Wanica; the 2 most densely populated districts. Additionally, the most popular produce item Tannia is sampled at 3 other fresh markets in district Paramaribo. Phase 3 focuses on human health assessment including a comprehensive dietary assessment to conduct a risk factor analysis and biomarker testing to ascertain organ system function impact.

Findings: In Phase 1, 32 insecticides (e.g. lambdacyhalotrin) and 12 fungicides (e.g. carbendazim) were tested on 7 crops (tannia, cabbage, long beans, peppers, rice, sweet potatoes, and banana) and 1 medicinal plant (Phyllanthus amarus). Tannia had levels of Endosulfan that exceeds the MRLs of the EU. Endosulfan is an insecticide that is prohibited in Suriname and is being phased out globally. Phase 1 results are only based on collection of crops from 1 fresh market in only 1 season. Also, the Surinamese population consumes not solely locally cultivated crops. However, this study is the first to characterize pesticide contaminated produce and to conduct the future human health assessment.

Interpretation: The results indicate that pesticide residue levels may pose a threat to human health. Produce samples are currently being analyzed using an expanded pesticide panel including other organophosphates, herbicides and fungicides. The findings will be available and will be presented at the upcoming conference.

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Establishing an environmental and occupational health hub for research and training in Eastern Africa: Lessons learned and next steps

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Program/Project Purpose: The burden of disease due to environmental and occupational health hazards and from the consequences of global climate change are of growing concern in Eastern Africa. To tackle these challenges, Addis Ababa University in Ethiopia and the University of Southern California, along with regional partners from Kenya, Rwanda and Uganda, conducted planning activities towards establishing a regional hub for training and research with focus on indoor/outdoor air pollution, occupational health, and climate change.

Structure/Method/Design: Country-specific situational analysis and needs assessments (SANA) on all three themes and policy frameworks have now been conducted to assess the current status and to identify the most critical evidence and capacity gaps. In this presentation, we outline the steps followed in building a strong partnership within the region and with US partners, by focusing on progress made so far and future plans towards achieving a sustainable regional hub.

Outcomes & Evaluation: The SANAs have indicated that, while many policies and regulatory provisions are already in place, environmental tracking is lacking as are implementation of the policies/strategies and enforcement of regulatory measures. Lack of adequate local scientific evidence to inform policy and insufficient skilled personnel to implement any relevant policies are arguably the most critical gaps identified in the SANA. Future success in developing and implementing environmental health policies will depend on addressing the cross-cutting gaps in the different sectors. Most key stakeholders lack adequate trained professionals. Research activities on the health impacts of air pollution exposure, on occupational health and safety, and on climate change are quite limited at present. Consequently, evidence-based decision-making and monitoring and evaluation are hampered. The SANA findings highlight the complexity of the challenges in East Africa and by their multi-sectoral nature. Current lack of mechanisms for coordination and integration reduces the engagement of stakeholders mandated by the respective governments. The need to build training and research capacity, develop clear implementation guidelines, and create effective intersectoral coordination mechanisms are some of the most important findings from the SANAs. Moreover, due to the commonality of the most pressing environmental health issues in the region, there is a compelling support for having a regional hub.

Going Forward: Several interlinked training and research activities have been initiated to produce crucially needed local evidence on the health effects of environmental hazards, and build sustainable human and infrastructural capacity. The objectives of the hub are highly relevant to the development, enforcement and implementation of policies that are in line with the national and regional priorities. We aim to meet these objectives by systemically engaging the major

stakeholders in each country, an approach that has proved to be successful during the ongoing planning grant.
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Assessing the contraceptive needs of female sex workers in Kigali, Rwanda

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Program/Project Purpose: FSWs are a high-risk group for HIV infection, yet few studies have examined the overall contraceptive needs of this group. Projet San Francisco (PSF), a branch of the Rwanda Zambia HIV Research Group, has been following a cohort of Kigali-based, HIV- FSW to track their HIV risk, reproductive health, and behavioral risks since September 2012. Within this cohort, low contraceptive prevalence has been observed. This project was conducted from May 2014-August 2014 to assess Kigali FSWs' knowledge, attitudes, and practices around contraception, as well as to identify any barriers or facilitators of obtaining and utilizing contraception.
Structure/Method/Design: PSF staff used a venue-based recruitment strategy to invite FSW for an eligibility screening for the overall cohort study. At three screening visits, FSW (n=19) were asked to return the next day to participate in a focus group discussion (FGD). Trained moderators facilitated discussion about contraceptive knowledge, attitudes, and practices, with a focus on long-acting, reversible contraceptive (LARC) methods. In addition to FGDs, a survey was designed to understand contraceptive decision-making. HIV+ FSW were recruited from screening visits. Enrolled HIV- FSW were surveyed at study visits. FSW who did not want to conceive within the next three years and who were not using a LARC method (n=40) were surveyed to assess knowledge and beliefs about LARC methods. LARC users (n=44) were surveyed on their satisfaction with the method. The non-LARC survey also served as a counseling intervention; it was based on a psychological model intended to encourage women to consider their contraceptive decision-making process.
Outcomes & Evaluation: FSW who participated in FGDs and surveys reported similar beliefs about LARC methods. Many were hesitant to use the implant because of side effects (spotting, headaches, weight gain). Misconceptions about the IUD were frequently reported, including that it is ineffective and may become dislodged during sex. Several FSW mentioned that they did not feel comfortable disclosing their FSW status to healthcare providers. After completing the Non-LARC user survey, 12.5% of FSW chose to uptake a LARC method that day. An additional 33% would consider using one in the future. LARC users reported that healthcare providers (52%) and friends (36%) influenced their decision to use this method.
Going Forward: In the future, family planning counseling will take into account the specific contraceptive needs of FSW. The decision-making model used in the survey will be adapted for use in counseling. Common misconceptions about the IUD will be specifically addressed. Further research should be done to explore how to best encourage FSW to discuss their profession with healthcare providers.
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Applying a biopsychosocial perspective to address hand washing behaviors among young learners in Limpopo, South Africa

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Background: Despite its perceived simplicity, the promotion of hand washing for disease prevention remains a challenge particularly in resource-limited settings. This paper reports on a quasi-experimental study to measure the independent effect of contextual (resource modifications) and individual-level (education) factors on hand washing behaviors of learners attending two primary schools in Limpopo, South Africa.
Methods: Resource modifications were made at School A and included improvements in hygiene and sanitation facilities that increased access to soap and water. Subsequently, education programs, developed in collaboration with local educators and focused on hand washing for disease prevention, were delivered at both schools. Observations included total counts of hand washing and hand washing paired with toilet facility use.
Findings: At School A, significant increases in hand washing occurred following resource modifications (total counts: T0=359, T1=712; t=3.61, p=0.018). Additional increases in total hand washing behaviors occurred following education (T2=1095, t=3.88; p=0.015). In contrast, at School B, with education alone smaller increases in total hand washing were observed (T0=249; T1=324; t=2.08, p=0.065).
Interpretation: Resource improvements are necessary in order to promote disease prevention behaviors such as hand washing. However, education aids to both promote and sustain these behaviors at the individual level. Results confirm that coordinated interventions that address health promoting behaviors at multiple levels are likely to achieve more substantial change.
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Social disparities: Household income in poverty stricken Ecuador affecting cognitive function in children

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Program/Project Purpose: Iron deficiency anemia (IDA) is one of the largest nutritional disorders in the world. Approximately 25% of the world's population has anemia with 50 % of those cases being IDA, according to the World Health Organization. The reduced oxygen carrying capacity associated with anemia can have many adverse effects. Many anemia studies have been done on infants but few have been done on school-aged children. A charity organization in Ecuador has been identifying anemia prevalence among children within a suburb of Guayaquil. To further identify possible risks resulting from anemia, a study comparing cognitive function with anemia rates was conducted in May 2014.
Structure/Method/Design: A cross-sectional descriptive correlation design was used to study the relationship between the level of anemia