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Background: Even with improvement in current chemotherapy regimens, acute leukemia remains an alarming problem and the second leading cause of death in children. Flow cytometry plays a vital role in the diagnosis and detection of this disease. At Texas Children's Cancer and Hematology Centers (TXCH), a multiparametric flow cytometry approach using six color panel and 33 basic antibodies is used for the diagnosis and follow-up of pediatric leukemias.

Objective: We investigated if the six-color 33 antibody panel may be reduced to a four color 18 antibody panel without compromising diagnostic potential of pediatric leukemias. Such a reduced panel may be cost effective and better for leukemia/lymphoma diagnosis in developing countries.

Design: Retrospective analysis of thirty cases was independently performed by three clinicians. The immunophenotypic expression of the 18 antibodies selected for the reduced panel was employed for diagnosis. The cases used for this study consisted of 11 patients previously diagnosed with pediatric B cell-acute lymphocytic leukemia (B-ALL), nine with T cell-ALL, and ten with acute myeloid leukemias (AML) using the 33 antibody panel.

Results: The diagnosis of both B- and T-ALL cases by using the 18 antibody panel matched with the previous diagnosis. While 50% of the myeloid cases were diagnosed as AML using the 18 antibody panel by all three clinicians, the remaining 50% cases were grouped mostly as T-ALL.

Conclusion: This study shows that pediatric B- and T-ALL can be diagnosed with the limited 18 antibody panel. However, immunophenotypic aberrancies of pediatric AML pose a challenge with the limited panel. Inclusion of intracytoplasmic staining should improve AML diagnosis.

Abstract #: 1.010_PLA

Public Health and malaria in Benin's lake areas: why does intermittent preventive treatment (IPTp) stagger?

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Background: Malaria is the leading cause for medical consultations (43% among the general population; 48% among children under five years), hospitalization (27% among general population; 48% among children under five years) in Benin (INSAE 2013: 170). Benin is a malaria endemic region. A lakeside area in Southern Benin where houses are built on water is a high malaria transmission area, where pregnant women are at particular risk. Malaria is associated with maternal anemia and low birth weight, high risk factors for perinatal death, morbidity and mortality. According to the World Bank, 37% of Benin's population lives below the poverty line with a per capita

annual income of only \$750; households spend approximately one quarter of their annual income on the prevention and treatment of malaria (World Bank 2014). The WHO preventive strategy comprises monthly administration of IPTp during antenatal consultations from the second trimester of pregnancy up to delivery (WHO 2014). While Benin's Demographic and Health Survey indicates antenatal clinic attendance is 87%, only 27% of pregnant women had at least one dose of IPTp (INSAE, 2013: 125). Although the Benin government makes IPTp free, women incur a user fee for antenatal consultation which is the only means to access IPTp. Decision-makers in Benin assume user fees promote efficiency and do not affect women's antenatal consultation attendance, believing populations understand the risk associated with pregnancy and make antenatal consultation a priority. The objective of our research was to determine the accuracy of these assumptions and their effect on public health care.

Methods: A unique set of key informant interviews with government decision-makers, pregnant women and in-depth direct observations in hospitals in Benin's lake region were conducted from June to August 2015.

Findings: The assumptions concerning user fees are misplaced and shed light on the distortions between public health policies and their representations of pregnancy and malaria in pregnancy. The findings also clarify the unintended effects of user fee policies on the uptake of IPTp in Benin's lake areas.

Interpretation: Interviews were transcribed and analyzed through content analysis.

Funding: York Incentive Grant, Faculty of Health (York University).

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Clean cookstoves and pneumonia prevention: A mathematical model to investigate the relationship between coverage and efficacy

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Background: Pneumonias remain one of most significant causes of mortality and morbidity in young children worldwide. In recent years, the prospects for preventing pneumonias have markedly improved, partly owing to a renewed focus from the global health community to encourage cleaner burning stoves and fuels. Several lines of evidence, considered in concert, suggests that the efficacy of these interventions may well be determined not only by household-level use but also community-level coverage. Thus far, relatively few efforts have sought to characterize such an association. This project develops a mathematical model to analyze the theorized relationship between coverage and efficacy for liquid petroleum gas (LPG) as a cooking fuel and the prevention of pneumonias in young children.

Methods: The mathematical model employs a modified mass balance approach to simulate concentrations of airborne fine particulate matter (PM_{2.5}). Indoor and outdoor concentrations are a function of a household's use of either biomass or LPG, as well as the mix of both stove types in the community. LPG coverage is modelled from 0% (the counterfactual) to 100%. Computer

simulations draw on parameter probability distributions based on field data – including emissions rates, cooking durations, ventilation rates, time-activity patterns, and breathing rates – to establish the resulting personal exposure profiles experienced by young children. Applying the integrated exposure-response relationship for PM_{2.5} and pneumonias allows for the calculation of cumulative incidence.

Findings: The approach described here translates into a mathematical model current mechanistic understanding of the household and community level effects of LPG use on young children's exposure to PM_{2.5} and the consequent prevention of pneumonias.

Interpretation: Although less commonly used within the realm of household air pollution, mathematical models can inform the design and interpretation of intervention studies and programs. Moreover, such a modeling approach can serve as a platform for the integration and analysis of scenario-specific information such as other PM_{2.5} sources, stove-fuel combinations, and health outcomes. Future model advances would incorporate geographic information systems or viral transmission dynamics.

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Reducing blood lead levels in children exposed to electronic waste recycling in Montevideo

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Background: The Pantanos River Basin has been identified as a heavily contaminated site in Montevideo, Uruguay. The river basin is home to around 135 informal settlements with a population totaling more than 41,000. The largest contributing source of pollution in this area results from the informal recycling of electronic waste (e-waste). Cases of lead poisoning, especially in children, became evident in the early 2000s. The aim of this study was to reduce blood lead levels in children by performing targeted lead remediations at informal settlements along the Pantanos River Basin.

Methods: This study included two components of intervention. The first involved identification and remediation of informal settlements located at the Pantanos River Basin in Montevideo. Soil monitoring was done in 9 settlements using X-ray fluorescence equipment and 8 settlements were remediated. The second intervention comprised of blood lead level screening for 40 people living in the area. Blood samples were taken before and after the cleanup activities via finger-stick with FDA approved Lead Care II equipment.

Findings: The soil lead levels were as high as 18,900 ppm (recommended level 400 ppm). The cleanup activities resulted in remediated soil levels below 400 ppm. In total, 381 tons of contaminated soil and debris were removed. The average blood lead level (geometric mean) in the population tested was 8.85 µg/dL before intervention and 5.67 µg/dL after the remediation activities.

Interpretation: The clean up activities reduced average blood lead levels by 3.18 µg/dL, suggesting that this type of intervention is an effective tool for reducing blood lead levels in people living in close

proximity to e-waste recycling activities. Remediation of lead contaminated soils should continue to be prioritized in an effort to reduce health effects in population that have been engaged in e-waste recycling.

Funding: This pilot project was funded by the Global Alliance on Health and Pollution (GAHP).

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Motor performance of very preterm and dysmature infants in the multi-ethnic society of Suriname

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Background: Preterm and dysmature infants have an increased risk for developmental delay. In the multi-ethnic society of Suriname 3% of the children are born very preterm (<32 weeks) and/or dysmature (<1500 gram). These infants are referred to a pediatric physical therapist to monitor motor development and in case of motor delay will receive early intervention. The aim of this study is to determine the prevalence of motor delay and contributing risk factors.

Methods: In 2014 a nationwide prospective cohort study was initiated monitoring infants with a gestational age <32 weeks and/or birth weight <1500g using 3 infant motor development tests: the Alberta Infant Motor Scales and the fine and gross motor scales of the Bayley Scale of Infant and Toddler Development version III. Preliminary data were analyzed.

The study is approved by the Commission of Human Subjects Research of Suriname's Ministry of Health.

Findings: Sixty-two infants (32 boys) were referred. Mean gestational age was 30^{6/7} weeks (range 25^{4/7}-37) and mean birth weight 1241 grams (range 640-1990). Fifty-three (85%) were tested at the mean corrected age of 3.5 months (range 2.6-6.7). Thirteen infants (24.5%) scored a delayed motor performance on at least one of the 3 tests during this first assessment. Eighteen infants (29%) had a second assessment at the mean corrected age of 12.4 months (range 11.9 -13.8) of which seven infants (38.8%) scored delayed.

Interpretations: Surinamese infants had an overall high score on both assessments. Earlier studies in the Netherlands showed a 75% delay at age 6 months, and a 78% delay at age 12 months. These testing results should be interpreted with caution because different ethnic background and childrearing practices may influence motor development. Our ongoing validating studies for the Movement Assessment Battery for Children 5 years of age show differences in outcome with the United Kingdom and Dutch reference groups. These observations indicate that developmental tests for infants and children should undergo cross-cultural validation, most certainly in the multi-ethnic Surinamese population.

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