Abstract

Introduction: The overall goal of the New York State Department of Health's Maternal and Infant Health Initiative (MIH) is to improve maternal and infant health outcomes for high-need, low-income women and their families while reducing persistent racial, ethnic, and economic disparities in those outcomes. The initiative will fund Maternal and Infant Community Health Collaboratives (MICHC) throughout New York State. It is necessary to evaluate the level and effectiveness of collaboration taking place.

Methods: A literature search was conducted to find key aspects of successful collaboratives and measures used to evaluate collaboration. The search uncovered a Program to Analyze, Record, and Track Networks to Enhance Relationships (PARTNER). PARTNER was then adapted to evaluate the MICHCs. A test run was conducted with staff in the Perinatal Health Unit. Based on their suggestions, the tool was revised.

Results: PARTNER tool was selected because it has been successfully used by public health collaboratives to evaluate the level of collaboration, visualize the relationships in collaboratives, and changes over time. The revised tool takes into account aspects of the MIH initiative, links collaboration to systems building, and health outcomes.

Conclusion: It is anticipated that the tool will be administered yearly and used to help inform MICHC efforts. The tool will be a way to monitor changes in the collaborative, manage resources more effectively, and identify ways to improve collaboration to better address maternal and infant health issues.

☐ I have reviewed the guidelines and wish to enroll in the Delta Omega Honorary Society abstract competition.
Objective: Skin cancer is the most common cancer in the United States, affecting 2 million annually, more than all other cancers combined. 90% of skin cancer is associated with ultraviolet exposure. Melanoma risk doubles with one blistering sunburn. This study explores solar radiation as a factor, previously treated as invariant, and finds the 11 year solar cycle to be a significant long term component to cancer. This benefits forecasting and prevention strategies.

Methods: Time series data includes Sunspot Number (SN), Total Solar Irradiation (TSI), and Surveillance Epidemiology End Results (SEER) skin cancer data ranging from 1973 to 2009 from a geographically representative sample of locations throughout the US. Kolmogorov-Zurbenko filters separate time scales by removing short term components and destructive noise to isolate long term signals. Peak lag correlations between variables guide regression analysis.

Results: Lag correlations between skin cancer cases and TSI reach 0.42 at ground level and 0.61 at satellite level. Correlation with SN is 0.53 lagged 347 months. Correlation squared indicates 18% of long term variation in skin cancer cases is explained by ground TSI variation, 37% by satellite TSI, and 28% by SN at the optimal 347 month lag.

Conclusions: A solar cycle effect is strongly present in the variation of skin cancer cases. TSI records are only recently established. These more accurate measurements are supportive but poorly suited compared to SN for forecasting. Additional research into the relationships between the solar cycle, skin cancer and other diseases is merited.

Student Role: Data collection, analyses, conclusion.
Urine TCPy as a biomarker of occupational exposure to chlorpyrifos

Title of Project

Author(s)

Christine Pittman, MPH Candidate; Barbara McGarrigle; James Olson, PhD

Abstract

Introduction: The organophosphate pesticide, chlorpyrifos, is widely used throughout the world. The aims of this study are to determine chlorpyrifos exposures and the impact of genotype in Egyptian agricultural workers that apply chlorpyrifos to cotton fields. Cytochrome P-450 CYP2C19 detoxifies chlorpyrifos to 3,5,6-trichloro-2-pyridinol (TCPy), while CYP2B6 metabolizes chlorpyrifos to the toxic oxon form, which inhibits cholinesterases. Urinary-TCPy was used as a biomarker of occupational exposure for three job-categories (Applicators, Engineers, Technicians) and a reference group. Variations in CYP2C19 and CYP2B6 genotypes were also analyzed to determine their influence on mean urinary-TCPy levels. Methods: Saliva samples were collected from 313 workers and genotyped for CYP2B6 and CYP2C19 variants. The workers also provided spot urine samples daily during the 2009 and 2010. These samples were analyzed for urinary-TCPy levels and CYP2B6 and CYP2C19 genotype. Urine-TCPy and genotype analyses were conducted using Kruskal-Wallis and log-transformed ANOVA for individual spray-periods. Results: Applicators had significantly higher urinary-TCPy levels than other workers across all spray-periods (p-value<0.0001). Technicians and Engineers had similar mean TCPy levels throughout the study-period that were greater than the reference group. CYP2B6 and CYP2C19 genotypes did not influence TCPy levels after controlling for job-type. (p-value=0.0639). Conclusion: Applicators experience a greater exposure to chlorpyrifos due to increased dermal contact caused by the lack of Personal Protection Equipment. Variations in CYP2B6 and CYP2C19 genotype did not correlated with urine-TCPy levels, however, this analysis was limited by the range of real world exposures and limited sample size.

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Design of a genotyping assay for identifying and monitoring HIV-2 drug resistance

Title of Project

Author(s)

Michael Carroll; Renee Hallack; Katie Steider; Linda Styer, PhD; Monica Parker, PhD

Abstract

Introduction: Human immunodeficiency virus type 2 (HIV-2) is a causative agent of acquired immunodeficiency syndrome (AIDS) but is distinct from the more prevalent HIV-1. HIV-1 and HIV-2 can rapidly acquire mutations which confer drug resistance (DR). HIV-2 can be treated with some HIV-1 antiretrovirals, but is intrinsically resistant to others. Genotyping assays for HIV-1 are used to identify DR mutations and guide treatment. No clinically approved genotyping assays exist for HIV-2, making treatment difficult.

Objectives: Our overall objective is to develop and validate an HIV-2 DR genotyping assay for clinical use. The goal of this project was to develop a set of pol region amplification and sequencing primers and to collect and organize DR mutation information by genomic region with appropriate evidence.

Methods: HIV-2 information was gathered from literature and public databases. Amplification and sequencing primers were aligned for compatibility with reference sequences from HIV-2 group A and B using sequence analysis software and tools available from the Los Alamos HIV databases (http://www.hiv.lanl.gov).

Results: Primers were developed that successfully amplified and sequenced the pol region of HIV-2 group A viruses. An annotated pol region gene map was created using HIV-2 group A and B reference sequences, which will allow for sequence analysis at positions known to confer DR and for comparison with closely related viruses.

Conclusion: We have made significant progress in developing the HIV-2 DR genotyping assay. Our future goals are to optimize the assay, validate it for clinical use and create an HIV-2 rules based DR interpretation tool.

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Abstract

Objectives/Research Questions: Establish a data source to measure and track strength and comprehensiveness of Physical Activity and Nutrition policy in School Local Wellness Policies (LWPs).

Methods: LWPs from public school districts maintained by New York State Education Department served as the data source (n = 653). Training materials were developed to allow reliable coding using a standard tool, WellSAT. Coders were required to achieve a kappa score of >.60. Policies were sorted into random groups of 30 for coding.

Results: Three independent raters achieved acceptable levels of reliability. Data from 30 LWPs indicated physical activity policies had lower comprehensiveness, 36 versus 53 (mean), and strength scores, 14 versus 19 (mean), than other policy categories. In all policy categories strength scores were consistently lower than comprehensiveness scores, suggesting LWPs were comprehensive but lacked strong, specific, language. Only 23% of LWPs included a nutrition policy that achieved Institute of Medicine standards.

Conclusions: A reliable method to assess LWPs was established. Gaps in nutrition and physical activity policies were evident. The resulting data source will support LWP adoption and implementation.

Student Role: Finalize data set, data analyses, training tools, policy coding.

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