

**Public Health Research@Maryland Day 2013
Poster Abstracts**

This document is a compilation of all research abstracts presented at Public Health Research@Maryland Day 2013. The abstracts are grouped by the categories below, and alphabetically by name of presenter within each category. Department/Center and Affiliation are specific to the presenter.

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PUBLIC HEALTH RESEARCH@MARYLAND DAY 2013 POSTER ABSTRACTS

HEALTH DISPARITIES

National Survey Results on Investigator Strategies Used to Retain Minorities in Research

Presenter: James Butler III

Co-authors: 1) James Butler III - UMCP, 2) Sandra C. Quinn - UMCP, 3) Craig S. Fryer - UMCP, 4) Mary A. Garza - UMCP, 5) Kevin H. Kim - Univ. of Pittsburgh, 6) Christopher M. Ryan - Univ. of Pittsburgh, 7) Stephen B. Thomas - UMCP

Department/Center: Behavioral and Community Health/ Maryland Center for Health Equity

Affiliation: University of Maryland, College Park

Funding Source: This study was supported by Award Number RC2MD004766 (Sandra C. Quinn and Stephen B. Thomas, PIs) from the National Institute on Minority Health and Health Disparities and the Office of the Director, National Institutes of Health.

Abstract:

Little attention has been given to the optimal strategies for retaining racial and ethnic minorities within studies and during the follow-up period. High attrition limits the interpretation of results and reduces the ability to translate the findings into successful interventions. Until now, there has not been a national study that specifically examined the retention of minorities from the researcher's perspective. We conducted an online survey of researchers (principal investigators, research staff) and examined their use of seven commonly used retention strategies derived from the literature. The number and type of retention strategies used, how these strategies differ by researcher type, and other characteristics (e.g., researcher training and funding) were explored. A total of 279 respondents with a primary or secondary role as a researcher participated in the survey, 130 PIs/co-Is and 149 research staff. Our analysis of the retention strategies revealed three clusters: limited retention strategy researchers utilized the smallest number (n=1) of retention strategies; moderate retention strategy researchers utilized an average number (n=4) of retention strategies; and comprehensive retention strategy researchers utilized the largest number (n=6) of retention strategies. Comprehensive researchers were more likely than the moderate and limited researchers to work with a community advisory board, build strong relationships with the minority community, modify study materials for minority populations, hire minority staff, and allow staff to work flexible hours. Our findings suggest that by utilizing several effective strategies researchers can increase the retention of minority populations in research, an essential group whom the research ultimately aims to affect.

Epidemiology, Policy, Racial/Ethnic Minority Health Disparities

Presenter: Olivia Carter-Pokras

Co-authors: 1) Olivia Carter-Pokras - UMCP, 2) Tabatha Offutt-Powell - UNC, 3) Jay Kaufman - McGill Univ., 4) Wayne Giles - CDC, 5) Vickie Mays - UCLA

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: NIH/NIMHD

Abstract:

Epidemiologists have long contributed to policy efforts to address health disparities. Epidemiologic evidence impacts policy to address emerging public health problems yet few epidemiologists are formally trained in the domains to support policy development. This presentation describes efforts by the American College of Epidemiology's Policy Committee to review the translation of epidemiologic evidence into policy by developing case studies. We queried epidemiologists engaged in disparities research in the U.S., Canada, and New Zealand, and drew upon the literature. Three examples illustrating how epidemiologists have addressed health disparities through a "social determinants of health" lens were: 1) epidemiology's role in definition/measurement, 2) study of housing and asthma, 3) study of food policy strategies to reduce health disparities. Epidemiologic research has done much to define and quantify health inequalities; it is less successful at producing evidence that would identify targets for health equity intervention. Epidemiologists have a role to play in measurement, basic surveillance, etiologic research, intervention and evaluation research. Training and funding sources place greatest emphasis on surveillance and etiologic research. Lessons learned suggest that process, content and outcomes are needed to help move policy forward. Epidemiologists contribute to content and outcomes activities, but policy and process issues are not well incorporated into their training. Controversy remains over the role of epidemiologists as policy change advocates. The complexity of health disparities requires better training for epidemiologists to effectively work in multidisciplinary teams.

The Healthy Futures Program

Presenter: Menucha Frischling

Co-authors: 1) Menucha Frischling - UMCP, 2) Hoda Sana - UMCP, 3) Elliot Segal - UMD, 4) Jie Chen - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: Healthy Futures Program

Abstract:

The Department of Health Services Administration at the University of Maryland, School of Public Health at College Park established The Healthy Futures Program (HFP). The primary mission of HFP is to reduce the incidence and prevalence of childhood obesity in Prince George's County, particularly among young, low-income children particularly improve childhood obesity rates for low-income children birth to five. The program addresses inadequate maternal and child-care, and the high rate of infant mortality, seeks to increase timely receipt of prenatal and postpartum healthcare and social services through partnerships and collaborations with public and private entities. A key approach is to enroll families in the Healthy Futures Families (HFF) program to provide them with resource and referral services. The program has an electronic data care monitoring system, which is used as a portal into a patient centric electronic medical record. In collaboration with UMB a research study to examine whether low birth weight infants obtaining appropriate nutrition, care management, and related education can alter Barker Hypothesis results is being developed. Identify the Problem: High obesity; infant mortality, sub-optimal birth weight rates leading to chronic conditions and poor health outcomes. Research Design: Jie Chen has designed a preliminary research protocol that focuses on low birth rates. Positive results from these activities will substantially improve community health in Prince George's County Maryland. In addition, Sarah Pomerantz will be promoting family physical activity through a proposed study in Prince George's Head Start Program. The study would engage parents in the creation of a physical activity campaign and evaluate its impact on family activity levels. Results: We will be compiling data, monitoring changes and compiling our findings.

Racial Concordance and Recruitment of Minority Populations into Research

Presenter: Craig S. Fryer

Co-authors: 1) Craig S. Fryer - UMCP, 2) Susan R. Passmore - UMCP, 3) Raymond Maietta - Research Talk, Inc., 4) James Butler III - UMCP, 5) Natasha A. Brown - UMCP, 6) Mary A. Garza - UMCP, 7) Erica Casper - UMCP, 8) Stephen B. Thomas - UMCP, 9) Sandra C. Quinn - UMCP

Department/Center: Behavioral and Community Health/Center for Health Equity

Affiliation: University of Maryland, College Park

Funding Source: NIH/ NIMHD - National Institute on Minority Health and Health Disparities and the Office of the Director, National Institutes of Health

Abstract:

The well documented underrepresentation of racial and ethnic minority populations in research demands action. Racial and ethnic diversity in research is an essential strategy in the campaign to eliminate health disparities to achieve health equity. However, the ever-growing field of health disparities research lacks scientific consensus about how best to respectfully engage minority populations into research. We conducted semi-structured, telephone interviews with investigators (N=31) experienced in the effective recruitment of minority populations. We describe critical factors in building trusting, respectful, research relationships with minority communities. We used a novel data analysis technique, Co-Analysis, with Research Talk, Inc. The method promotes shared decision-making between two entities examining one dataset. Thus, six core modules (Data Inventory, Written Reflection, Reflective Diagrams, Categorization, Bridging, and Data Presentation) were employed in this multidimensional qualitative analysis plan. Respondents stated that their racial and ethnic background was important, but not a completely sufficient factor for successfully recruiting minorities into research. Utilizing episode profiles, this presentation highlights the challenges and valuable approaches in the recruitment of minority populations, including: 1) the role race and ethnicity play in the recruitment process; 2) the role of historical mistrust in building relationships with minorities; and 3) the training and capacity of research teams to effectively recruit minority participants. Lessons learned will be incorporated into a comprehensive curriculum designed to train investigators on best practices for the respectful and ethical engagement of minorities in the research enterprise.

Toward a Deeper Understanding of African American and Latino Participation in Research

Presenter: Mary A. Garza

Co-authors: 1) Mary A. Garza - UMCP, 2) Sandra C. Quinn - UMCP, 3) Kevin H. Kim - Univ. of Pittsburgh, 4) Erica Casper - UMCP, 5) James Butler - UMCP, 6) Craig S. Fryer - UMCP, 7) Natasha A. Brown - UMCP, 8) Stephen B. Thomas - UMCP

Department/Center: Behavioral and Community Health/Center for Health Equity

Affiliation: University of Maryland, College Park

Funding Source: National Institutes of Health

Abstract:

Racial and ethnic minority populations account for about 33% of the US population; however, less than 10% of them participate in biomedical clinical trials. This study examines the barriers and facilitators associated with participation of African Americans and Latinos in public health research and clinical trials. We conducted the "Building Trust" random household telephone survey of 2,455 African American (N=1191) and Latino (N=1264) adults. The survey included valid and reliable instruments designed to assess knowledge of research, informed consent procedures, human subjects' protections, previous participation in research, religiousness, and trust. Latinos were 1.7 times more likely to participate in a medical research study compared to African Americans. Multiple regression analysis demonstrated that 29% of the variability in willingness to participate in future research was explained by 1) previous participation, 2) motivation to participate, 3) researcher honesty and 4) interactions with doctors. Both African Americans and Latinos were willing to participate; however, few were ever asked. This study represents the largest samples exclusive to African Americans and Latinos on this topic. The findings suggest that African Americans and Latinos have no automatic predisposition to decline participation in research studies, including invasive and/or potentially controversial research involving DNA. Information from the survey supports community engagement and informs the development of culturally-tailored interventions for ethical recruitment of minorities into public health research and clinical trials.

Building Bridges in Baltimore: Addressing Health Disparities of Urban American Indians through a CBPR Approach

Presenter: Shannon Jette

Co-authors: 1) Shannon Jette - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: Jointly funded by a UMCP Qualitative Methods Research Interest Group (QRIG) seed grant and a Research and Scholarship Award (RASA)

Abstract:

American Indian/Alaska Natives (AI/AN) have a life expectancy that is 5.2 years less than the overall U.S. population, dying at higher rates from preventable causes such as diabetes, suicide, and alcoholism. Given these disparities, greater knowledge about the lives and health practices this population is crucial. However, the understandable hesitancy of AI/AN tribes to work with non-Native researchers, due to years of marginalization and manipulation, makes this research difficult. Thus, there is a strong imperative for prospective researchers to fully engage in community-based participatory research (CBPR) to foster relationships with tribal populations and work in collaboration to improve health. While literature documenting the successful use of CBPR with indigenous communities is growing, less is known about its use in urban settings; which is a crucial oversight as 70% of self-identified AI/ANs reside off of tribal lands. This presentation highlights the experiences of researchers applying tribal participatory research methods to a study with an urban AI community, and provides important lessons learned from this process. These strategies were used to address research questions exploring urban female youths' constructions of health and physical activity, and their perceptions of the health of AI/ANs. Through a reflection of the process, the researchers identified the following lessons learned for conducting meaningful CBPR with this population: being invited to do research is different from asking permission to conduct research; the logistics of conducting research with an urban minority community may be complicated and flexibility is key; tribal affiliation does not guarantee community buy-in; and creating a data sharing agreement may take longer than expected and timeline should be considered. The findings presented in this poster presentation provide insight and recommendations for researchers interested in working with urban AIs, and further existing research aimed at improving relationships between researchers and AI/ANs to improve health and wellbeing.

Paradise Lost: A Survey of Homeless Continuum of Care Service Providers in "Resort" vs. "Non-resort" Communities Throughout the U.S.

Presenter: Marian Moser Jones

Co-authors: 1) Marian Moser Jones - UMCP, 2) David Curtis - UMCP, 3) Ronneal Mathews - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

I conducted a survey on homeless Continuum of Care provision in U.S. "resort communities" and non-resort communities. The 33-question online survey explored whether a distinct identity and set of concerns could be identified among self-identified CoC providers in "resort", "destination," or "retirement" communities in comparison to CoC providers as a whole. The survey followed a 2012 listening session held by the U.S. Interagency Council on Homelessness in which self-identified CoC providers in "resort communities" discussed their specific concerns. Survey participants were recruited via email from the U.S. Department of Housing and Urban Development's national list of CoC providers and through contacts obtained at the USICH listening session. Analyses of 150 responses, 46.2% of which came from self-identified providers in resort communities, point to several distinct challenges encountered by these providers. The majority indicated that homelessness in their community was affected by seasonally high housing rental rates, the seasonal and temporary nature of local employment, large numbers of homeless/unstably housed people who had moved from elsewhere, and higher housing prices than in non-resort areas. Additionally, a marginally greater proportion of CoC providers in resort areas than non-resort areas reported that efforts to "clear the streets" of people appearing to be homeless or to make panhandling/begging illegal had occurred in their communities in the past decade (Z-score =2.39). However, about the same proportion of respondents from non-resort vs. resort areas listed a lack of affordable housing as their greatest unmet need, indicating that long-term housing presents an across-the-board challenge for CoC providers. Further analyses will examine whether additional issues can be identified among providers in "resort" areas.

HEALTHCARE, ACCESS, INSURANCE

Analysis of Insurance Status of a Rural Nurse Managed Mobile Safety Net Clinic Patient Panel

Presenter: Susan Antol

Co-authors: 1) Susan Antol - UMB

Department/Center: Nursing

Affiliation: University of Maryland, Baltimore

Funding Source: CareFirst BlueCross BlueShield

Abstract:

Statement of Research Purpose: Primary care access constitutes one social determinant of health that accounts for the inequality in distribution of health disparities among rural populations. Goals of the Governor's Wellmobile Upper Eastern Shore Primary Care and Service Linkages project are to

provide nurse managed primary care to underserved patients and to achieve fiscal sustainability. While the projected targets the uninsured, one sustainability strategy is to expand services to insured but unaffiliated patients. The research question was "What proportion of the unduplicated patient census are insured or pending insurance determination?" Methods: Data from July 2012 through February 2013 were analyzed to determine current patient census and relative proportions of insured (Medicare, commercial insurance) and uninsured (application pending, ineligible for public programs, and status unknown). Age was analyzed to determine proportion of uninsured within 3 years of Medicare eligibility. Findings: Out of 139 patients reviewed, 18% were insured (9.35% Medicare, high deductible commercial plans and 8.6% Medicaid), 43% were uninsured, 13.5% had Medicaid applications pending, and 25% were Medicaid ineligible. Four patients in birth year 1948, two in birth year 1949 and one in birth year 1950 will be Medicare eligible beginning in 2013 and the two subsequent years. Implications for Public Health: The Affordable Care Act (ACA) will increase the number of insured through Medicaid expansion and subsidies to purchase insurance from health exchanges effective October 2013. Concern that the surge of additional insured will overload the already under resourced primary care infrastructure can be ameliorated by harnessing the resources of the current primary care safety net providers who enjoy existing relationships with patients that can be used to further improve health status. Safety net providers should identify clients eligible for new programs and provide enrollment and eligibility determination. Transitioning to a reimbursement model will enhance fiscal sustainability.

Determinants of Hospital Costs Associated with Childbirth

Presenter: Rada Dagher

Co-authors: 1) Rada Dagher - UMCP, 2) Kyoungrae Jung - Penn. State Univ., 3) Kristen Kjerulff - Penn. State Univ.

Department/Center: Health Services Administration

Affiliation: University of Maryland, College Park

Funding Source: The Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health

Abstract:

Research Purpose: We investigated the factors associated with hospital delivery costs. With the passage of health care reform, it is important to learn about the factors that increase childbirth-associated hospital costs. **Methods:** 3,006 pregnant women, 18 to 36 years old, and expecting their first child in 2009 to early 2011, were interviewed in Pennsylvania in their third trimester and at one month postpartum. Ordinary Least Squares analysis was performed with the natural log of total hospital charges as the dependent variable. Data on total hospital charges came from inpatient discharge data. **Results:** The women averaged 27 years old, 86% were white, 57% had a college degree, and 29% had a cesarean delivery. The highest average hospital charges were specialty and room and board charges followed by ancillary, drug, equipment, and miscellaneous charges, respectively. In multivariate analyses, variables associated with increased hospital charges were: being non-white, obese, older, delivering by cesarean section, experiencing delivery complications, and having baby complications. Women who gave birth by cesarean section incurred 72.5% higher hospital charges than those who delivered vaginally and women who experienced delivery complications incurred 14% higher hospital charges than those who had no complications. **Public Health Implications:** With health care reform, states will be trying to save on their hospital costs as their Medicaid programs expand and they will have to cover more maternity services such as birth center fees. Learning about the factors that increase hospital charges related to childbirth may help states with their efforts to decrease hospital costs.

Clarifying Definitions and Measures of Clinical Reasoning in Health Professions

Presenter: Lily Fountain

Co-authors: 1) Lily Fountain - UMB

Department/Center: Family and Community Health

Affiliation: University of Maryland, Baltimore

Funding Source: N/A

Abstract:

This research examined the terms and instruments used to measure clinical thinking in healthcare provider education. Critical thinking and its analog clinical reasoning have been noted to be of particular in the health professions (Institute of Medicine; 2010; Norman, 2005). The lack of explicit, clear definitions of terms has been cited as a methodological issue by researchers in educational psychology (Alexander et al., 2011) and education in the health professions (Victor-Chmil, 2013). This systematic review was conducted to answer the following question: How well are definitions and measures of critical thinking and clinical reasoning specified in the health education literature? The terms clinical reasoning, problem solving, critical thinking, and case-based reasoning were used to search the PsycInfo database. The resulting pool of 45 articles was the data source for this systematic review. Results regarding definitions indicated that a very large minority of studies, 42%, did not explicitly state the definition used in the study. Seventy percent reported the presence of equivalency of definitions between at least two of the terms. Instruments used included the California Critical Thinking Skills Test, the Health Sciences Reasoning Test, and the Script Concordance Test; researcher constructed instruments were used for 40% of the studies. Less than half the studies had full alignment between definition and operationalization. Reliability was obtained for both the current and a previous sample in 16% of studies; validity was obtained for both in 9% of studies. This review found that studies of clinical thinking demonstrated definitional conflation. The low level of experimental research on the topic of clinical thinking may be related to the lack of explicit definitions. More transparency in term definition could lead to increased interdisciplinary/interprofessional communication, and better performance evaluation. Public health would ultimately be improved by this increased coordination.

Do Competing Health Insurance Regulators Provide Pro-Patient Effects?

Presenter: Manouchehr Mokhtari

Co-authors: 1) Manouchehr Mokhtari - UMCP, 2) Edmond D. Shenassad - UMCP, 3) Doha Abdelhamid - American Univ., 4) Mamak Ashtari - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

This paper shows that competition among health insurance regulators has strong pro-patient effects, if inter-regulatory competition is allowed. The pro-patient effects of the competition among health insurance regulators do not depend on the need for the patients to form or exercise their political influence, such as, forming cooperatives or voting. When inter-jurisdictional transactions are allowed, endogenous policy making ensures that the health care regulators pursue public interests at no costs to patients.

Innovative Payment Mechanisms in Maryland Hospitals: An Empirical Analysis of Readmissions under Total Patient Revenue

Presenter: Chad Perman

Co-authors: Karoline Mortensen - UMCP, 2) Chad Perman - UMCP

Department/Center: School of Public Policy (with Health Services Administration)

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Background: The state of Maryland implemented innovative global budgeting of outpatient and inpatient services in eight rural hospitals under the Total Patient Revenue (TPR) system in July, 2010. Methods: This paper uses data on Maryland discharges from the 2009-2011 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID). Individual inpatient discharges from eight treatment hospitals and five control hospitals comprise the sample (n=423,101). Difference-in-differences probit and linear probability models with hospital fixed effects are estimated to determine the effect of the global budgeting system on hospital readmissions. The analysis controls for patient demographics and characteristics, as well as hospital quality ratings. Results: Difference-in-differences estimates show that after implementation of TPR in the treatment hospitals, the predicted probability of readmissions increased by .01 ($p \leq .01$). Hospital quality ratings are associated with a statistically significant decline in readmissions (coefficient = -.0224, $p \leq .01$). Conclusions: Early evidence from the TPR program shows that readmissions increased slightly after implementation. Hospital quality did not appear to be negatively affected. Implications: As the health care system innovates, it is important to evaluate the success of these innovations. One of the goals of TPR was to lower readmission rates, however these rates did not show consistent downward trends after implementation. Our results suggest that payment innovations that provide financial incentives to lower spending while maintaining quality of care may not have immediate effects on commonly used measures of hospital quality, particularly for rural hospitals that may lack coordinated care delivery infrastructure.

HEALTH LITERACY, HEALTH COMMUNICATION, HEALTH EDUCATION

Testing Texting among Rural, Low-Income Mothers in Maryland

Presenter: Bonnie Braun

Co-authors: 1) Mili Duggal - UMCP, 2) Bonnie Braun - UMCP, 3) Elisabeth Maring - UMCP, 4) Linda Aldooray - UMCP, 5) Ronald Yaros - UMCP, 6) Virginia Brown - UME, 7) Crystal Terhune - UME

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: This research was supported by the Rural Health and Safety Education Competitive Program of the USDA Cooperative State

Abstract:

"mHealth" - use of mobile and wireless devices to improve health outcomes, healthcare services, and health research, is growing exponentially every day and texting is one of its most widely adopted technological feature. According to Pew Internet and American Life Project, 87% of American adults own a cell phone and 80% use it to send and receive texts. However, little is known about the prevalence of cell phone use among rural, low-income populations. A pilot study was conducted in Maryland with 13 rural, low-income mothers with a child less than 12 years and who possess a cell phone to ask about their perceptions of using texting to receive health information. Tailored health messages were sent to the participants on 4 topics: dental health, food security, physical activity, and health insurance, which were followed by phone interviews. The research study also measured recall of information, behavioral intent and outcome. A second pilot sample with 50 rural, low-income Maryland mothers will be conducted in mid-March. The poster will present results from the first pilot study. Implications of using texting to reduce the burden on health care among rural, low-income mothers will be discussed. Implications for health educators and health professionals working with rural, low-income mothers and developing health care prevention information will also be presented.

Health Literacy and Parental Feeding Practices

Presenter: Stephanie Grutzmacher

Co-authors: 1) Stephanie Grutzmacher - UMCP, 2) Katherine Speirs - Univ. of Illinois

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: Maryland SNAP-Ed

Abstract:

Background: Parental health literacy may have implications for child well-being. Parents with limited health literacy have less health knowledge, are less likely to have health insurance for their children, and are more likely to have trouble understanding medication labels (DeWalt & Hink, 2009; Yin et al, 2009). To further understand how parent's health literacy is related to child well-being, this paper explores the relationship between parental health literacy and feeding practices. Parental feeding practices; or the behaviors and decisions parents make concerning what, when, and how to feed their children; have implications for children's eating behaviors and health. Using food to reward good behavior (Musher-Eizenman et al., 2009) and pressuring children to eat (Brann & Skinner, 2005) are associated with increased BMI. Using food for emotion regulation has been linked with increased snacking (Sleddens et al., 2010). Providing a healthy food environment and modeling healthy eating habits are associated with children consuming moderate amounts of healthy foods (Galloway et al., 2005; Savage, Fisher, Birch, 2007). Methods: The present study used data from the Maryland Health and Nutrition Literacy Study, a cross sectional study of the nutrition knowledge and behaviors of low-income adults. A convenience sample was recruited from 11 Department of Social Services waiting rooms. Data were collected using a face-to-face survey. Health literacy was assessed using the Newest Vital Sign, a six item measure of literacy and numeracy (Weiss et al., 2005). Parental feeding practices were measured using the Comprehensive Feeding Practices Questionnaire (CFPQ) which has 12 subscales each representing a different feeding practice (Musher-Eizenman & Holub, 2007). Analysis and Results: To examine the relationship between health literacy and the 12 CFPQ subscales, 12 linear regression models were fit. Covariates included: parent's age, gender, income, education, race/ethnicity, number of children, and child's age. The majority of the sample (n=99) was female (87%), African American (60%), earned less than \$19,999 per year (60%), and had at least a high school education (59%). The average age was 37. Forty three percent of the sample had adequate health literacy, 41% had possible limited health literacy, and 16% had a high likelihood of limited health literacy. Results from the linear regressions show that health literacy was significantly related to providing a healthy food environment ($\beta = .711$, $R^2 = .203$, $p = .004$) and, at the trend level, food for emotion regulation ($\beta = -0.328$, $R^2 = .073$, $p = .061$). Implications: Our findings suggest that parents with lower health literacy are less likely provide a healthy food environment and more likely to use food to regulate their child's emotions. It is possible that parents with lower levels of health literacy are unable to access or use information about healthy feeding practices. They may not understand the importance of having healthy foods available in the home or the negative consequences of using food to regulate emotions. The findings from this exploratory study suggest a need for further exploration of the relationship between health literacy and parental feeding practices, most importantly with larger samples.

Maryland Adult Knowledge of Fluoride and Use of Tap Water

Presenter: Alice Horowitz

Co-authors: 1) Alice M. Horowitz - UMCP, 2) Dushanka V. Kleinman - UMCP, 3) Min Qi Wang - UMCP

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: DentaQuest Foundation

Abstract:

Background: The best way to prevent dental caries is the appropriate use of fluorides. For decades community water fluoridation has been the corner stone of caries prevention. Yet little overt education has taken place about this preventive measure. Objectives: To investigate differences among Maryland adults regarding whether they know if their tap water is fluoridated, whether they filter it, whether they and their children drink tap water and if they know the purpose of fluoride. Methods: Nine questions were included in a random digit dial telephone survey administered to 803 Maryland adults 18 years of age and older who had a child in the house six and younger. Land and cell phones were used. The data analysis included percentages, cross tabulations, and chi-square tests. Results: The response rate was 26%. Nearly all respondents (98%) had heard of fluoride but only 58% knew its purpose. Adults with high school education were significantly less likely to know if their tap water is fluoridated ($p < 0.001$) and were significantly less likely to drink tap water or give it to their child ($p < 0.001$) than those with higher education. Further, children who were on Medicaid, those most in need for caries prevention, were significantly less likely than those with private insurance to drink tap water. Conclusion: A major educational intervention is needed to educate the public about the benefits and appropriate use of fluoride in our water supplies.

Impact of Informational Support on Hepatitis B Screening Among Chinese, Korean and Vietnamese Adults

Presenter: Xiaoxiao Lu

Co-authors: 1) Xiaoxiao Lu - UMCP, 2) Hee-Soon Juon - JHU, 3) Sunmin Lee - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Objective: The objective of this study is to examine the impact of informational support on hepatitis B virus (HBV) screening status among Chinese, Korean and Vietnamese Adults. Methods: Data of 872 Chinese, Korean and Vietnamese recruited for a liver cancer prevention program in Maryland during 2009 to 2010 were used. Informational support was measured by the four questions including physician recommendation, family member recommendation, friend recommendation, and self ask doctor for HBV screening. Outcome was self-reported HBV screening status. Multiple logistic regressions were used to estimate the association between informational support and HBV screening status. Results: 47% of the respondents reported previous HBV screening. Only 19.8% recalled a physician recommendation for HBV screening. After adjusting for age, gender, ethnicity, education, self reported health status, health insurance and regular physician, people who reported a previous physician recommendation had 8 times odds of HBV screening than those who did not (OR = 8.2, 95% CI= 5.2, 12.7); those reported family member recommendation had 6 times odds of HBV screening than those who did not (OR = 6.0, 95% CI= 4.0, 9.0); and people who recalled a friend recommendation had 4 times odds of HBV screening than those who did not (OR = 4.1, 95% CI= 2.5, 6.5). Participants who had one and more than one type of recommendation had 4.9 and 10.4 times odds of HBV screening respectively (OR = 4.9, 95% CI= 3.1, 7.8; OR = 10.4, 95% CI= 6.4, 19.9) compared to those without any type of recommendation. People who asked doctor for a HBV screening was strongly associated with screening status (OR = 11.1, 95% CI= 6.8, 18.2). The association was stronger among well educated participants than less educated participants. Conclusions: Recommendations from doctor, family members and friends were strongly associated with HBV screening status. Clearly, information support from physician and social networks should be encouraged for HBV screening among Asian Americans.

Project SHARE: Empowering Student Community Health Advocates

Presenter: Anna Tatro

Co-authors: 1) Anna Tatro - UMB, 2) M.J. Tooe - UMB, 3) Alexa Mayo - UMB

Department/Center: Health Sciences and Human Services Library

Affiliation: University of Maryland, Baltimore

Funding Source: This funding was awarded to us to create a curriculum, not for research purposes. The project is supported by Award G08LM011079 through the National Library Of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Library Of Medicine or the National Institutes of Health

Abstract:

Objective: This paper describes the implementation of SHARE (Student Health Advocates Redefining Empowerment), a three-year, \$205,000 project funded by an NLM Information Resource Grant to Reduce Health Disparities. Through a partnership between University of Maryland's Health Sciences and Human Services Library and Vivien T. Thomas Medical Arts Academy, a nearby high school, selected students develop skills to advocate for better health at the personal, family and community level. Methods: The aims of Project SHARE are to empower high school students as community health advocates, promote improved health, reduce health disparities in Baltimore neighborhoods and develop a replicable student health advocacy program that can be used by community-academic partnerships nationwide. This presentation reports on building successful partnerships with school administrators; student recruitment; program staffing and evaluation; and the development of a health promotion curriculum aligned with national standards such as Healthy People 2020, National Health Education Standards, and National Partnership for Action to End Health Disparities. In the project's first phase, students build capacity/skills by participating in training sessions on topics such as health literacy, cultural competency, and navigating the health care system. In its second phase, students learn through experience as they plan and lead health promotion events in communities throughout Baltimore. Results and Conclusions: This paper will report on the successful implementation of the first year of the project and the efficacy of the curriculum, informed by a web-based pre-and post-test that was administered to the students.

FAMILY HEALTH, CHILD HEALTH, ADOLESCENT HEALTH**The Influence of Media on Perceptions of Healthy and Unhealthy Teen Dating Relationships**

Presenter: Donna Howard

Co-authors: 1) Katrina J. Debnam - JHU, 2) Donna E. Howard - UMCP, 3) Nancy Aiken - CHANA, 4) Sharon O'Brien - Catholics for Family Peace

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: NICHD and UMCP School of Public Health

Abstract:

Statement of Research Purpose: Available evidence suggests that between 9%-35% of teens have been embarrassed, harassed, or threatened through electronic media, i.e. internet chat rooms, social networking sites, and text messaging. This study explores the influence of media on teens' dating dynamics. Methods: Semi-structured in-depth interviews were conducted with 47 girls aged 15 to 18 years across 5 high schools in the mid Atlantic region. Interviews were conducted in a private room at each school, digitally recorded, transcribed verbatim by trained research staff and entered into ATLAS.ti for coding and analysis. Each girl received a \$20 incentive. The sample was 47% Caucasian, 40% African American, 9% mixed race, and 4% Hispanic. Girls' narratives addressed the plethora of unhealthy relationships that are portrayed on network and reality television; healthy relationships depicted on television and in movies were often described as unattainable "fairytales." Unhealthy relationships dynamics depicted in television and movies also were seen by girls to provide warning signs for what to watch out for in their own relationships. Cellular phones and social

networking internet sites afforded girls the opportunity to get to know a potential partner 'virtually', before committing to a face to face encounter. The term "Facebook stalking" was applied not to harmful dating behavior but rather as a protective strategy by which girls could gauge compatibility by viewing prospective dating partner's Facebook page and learning about their positive and negative qualities, hobbies and friends. Implications: Prohibiting adolescent access to, and use of, media is not the answer nor is sole reliance on blocking or filtering software. The challenge is to understand how to enhance the benefits offered by media while mitigating its dangers, particularly in relation to teen dating relationships. Studies which explore the lived experiences of teen girls can facilitate positive youth development initiatives.

Transracially Adopted Adolescent Development: The Influence of Different Adolescent-Parent Perspectives of the Family

Presenter: Katie Hrapczynski

Co-authors: 1) Katie Hrapczynski - UMCP, 2) Leigh Leslie - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

One aspect of the family environment researchers have focused on when seeking to understand adolescent development is the extent to which adolescents' views of their family differ from their parents'. Transracial adoption is a microcosm within the adoption world providing a unique and compelling familial context to explore this relationship because not only do the age and role of family members differ, but so does the biology and race of family members. In addition, navigation of the developmental task of balancing autonomy from and connection to their family may be particularly challenging for transracially adopted adolescents. Although typical for adolescents to feel misunderstood by their parents when establishing a self separate from the family, the experience of feeling misunderstood may be heightened for transracial adoptees. They may feel that their racial majority parents never fully understand them because they are of a different race, thereby lacking a shared experience of being a racial minority in the U.S. or a shared cultural background. Although there are no known studies that have explored perceptual discrepancies between white parents and their transracially adopted children, retrospective accounts of transracially adopted young adults expose a disconnect between the actions of their racial majority parents and their needs as racial minority children. The study aims to describe the perceptions transracially adopted adolescents and their parents maintain regarding family cohesion and conflict, examine the extent to which their perceptions differ, and examine the influence of discrepancy in adolescent-parent perceptions on adolescents' outcomes, including self-esteem, internalizing behaviors, and externalizing behaviors. The study utilizes data collected as part of a larger research study on transracial adoptive families. Adopted racial minority youth and one of each youth's white parents were recruited nationally and completed an online survey. Practical, empirical and theoretical implications relevant to promoting transracially adopted adolescent development and public health will be elaborated upon.

Association of Migration and Climate Changes on Health and Food Access of HIV/AIDS Impacted Orphan/Vulnerable Children (OVC) and Their Families in Ethiopia

Presenter: Mariano Kanamori

Co-authors: 1) Mariano Kanamori - UMCP, 2) Tigist Abate - International Training and Education Center for Health Ethiopia, 3) Nolawi Eshetu - Salesian Missions, 4) Olivia Carter-Pokras - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: USAID

Abstract:

Introduction: Ethiopia's current challenges include the health and migration of millions of HIV/AIDS impacted orphan/vulnerable children (OVC). Many OVCs' families migrate. This study aims to understand associations between climate changes and migration on OVC families' health and food access. Methods: In November 2011, 8 focus groups (n=149) were conducted in Amharic, Trigregna and English with professionals working with OVC, community leaders from high prevalent OVC communities and OVC's caregivers in 6 Ethiopian towns: Addis Ababa, Adigrat, Adwa, DebreZeit, Mekelle and Zeway. Semi-structured, open-ended questions collected data on societal changes, climate change and internal migration. A research panel developed coding schemes and analyzed the data using ATLAS.ti: Qualitative Software. Results: Factors influencing migration include: proliferation of flower farms, expensive rent, governmental resettlement plans, seasonal jobs (e.g., cobblestone), shortage of farming land, unseasonable Fall rains, higher temperatures, and unemployment. Participants reported getting sick by drinking water from polluted lakes, being exposed to flower farm pesticides, and interacting with immigrants. Adigrat people perform better at work because the famine has decreased. Recent Ethiopian emigration involves illegal travel to Sudan and Arab countries. In urban Zeway, people struggling to access food don't want to use their urban land to grow vegetables, corn prices double every 2-3 months, and deforestation areas are increasing as people sell charcoal to survive. Recommendations: OVC programs should recognize the impact of migration and climate change on OVC families' health and nutrition. Migration is a phenomenon resulting from climate change, urbanization, rapid population growth, environmental degradation, and agricultural land availability.

Overweight among Orphan and Vulnerable Child Caregivers in 3 Southern African Countries: An Emerging Public Health Concern

Presenter: Mariano Kanamori

Co-authors: 1) Mariano Kanamori - UMCP, 2) Olivia Carter-Pokras - UMCP

Department/Center: Epidemiology and Biostatistics
Affiliation: University of Maryland, College Park
Funding Source: N/A

Abstract:

Objective: This cross-sectional study investigated the association between African orphan and vulnerable children (OVC) caregiving, women's overweight status, and sociodemographic characteristics. Methods: Demographic Health Survey data collected during 2006-2007 from 20-49 year old women in Namibia (n=6,638), Swaziland (n=2,875), and Zambia (n=4,497) were analyzed using weighted marginal means and logistic regressions. Results: OVC caregivers' overweight prevalence ranged from 26.98% (Namibia) to 61.3% (Swaziland). Namibian OVC primary caregivers were less likely to be overweight than non-OVC caregivers (OR=0.59, 95% CI=0.37-0.93) and non-caregivers not living with OVC (OR=0.39, 95% CI=0.23-0.64). Swazi and Zambian OVC caregivers were more likely to be overweight than non-caregivers living with OVC (Swaziland: OR=1.56, 95% CI=1.04-2.34; Zambia: OR=2.62, 95% CI=1.80-3.79) or not living with OVC (Swaziland: OR=1.92, 95% CI=1.46-2.54; Zambia: OR=1.94, 95% CI=1.44-2.60). In Namibia, women's age was an effect modifier. Conclusions: Although programs for OVC families generally focus on undernourishment, overweight also exists among OVC caregivers. African public health systems/OVC programs may face an overweight epidemic alongside existing ones (e.g., HIV/AIDS, tuberculosis, malaria). Future studies/interventions to curb overweight should consider OVC caregiving status and address country-level differences.

Federal Nutrition Assistance at Farmers' Markets: Evaluating Self-Efficacy and the Home Nutrition Environment

Presenter: Kelci Schexnayder

Co-authors: 1) Carolina Aguiar - UMCP, 2) Valerie Caplan - UMCP, 3) Emily Chang - UMCP, 4) Sophia Chang - UMCP, 5) Jennifer Kuo - UMCP, 6) Moses Lahey - UMCP, 7) Rutvij Pandya - UMCP, 8) Kate Richard - UMCP, 9) Kelci Schexnayder - UMCP, 10) Monique Thornton - UMCP, 11) Rachel White - UMCP

Department/Center: Behavioral and Community Health
Affiliation: University of Maryland, College Park
Funding Source: N/A

Abstract:

SNAP and WIC help alleviate food insecurity among low-income families; however, some still struggle with fruit and vegetable accessibility. Farmers' markets present the opportunity to purchase fresher foods than other food retailers; therefore, we chose this environment to conduct our research. A survey of 70 WIC/SNAP shoppers at three D.C. metropolitan area farmers' markets assessed the correlation between parental self-efficacy and the home nutrition environment (composed of family health behavior, perceived barriers, and fruit and vegetable offerings in the home) and found a significant relationship. Interviews were used to evaluate market accessibility, SNAP/WIC benefit redemption, and the feasibility of accepting these benefits. Both market participants and coordinators mentioned the greater variety and superior quality of farmers' market produce but also suggested several improvements. Findings suggest that SNAP incentive programs may increase fruit and vegetable purchases. Programs targeting consumer self-efficacy may also produce positive outcomes.

PHYSICAL ACTIVITY, EXERCISE PHYSIOLOGY, MOVEMENT

Physical Activity and Brain Function in Older Adults at Genetic Risk for Alzheimer's Disease

Presenter: Alfonso Alfini

Co-authors: 1) J.C. Smith - UMCP, 2) T.J. Smith - UMCP, 3) A. Alfini - UMCP, 4) S. Durgerian - Medical College of Wisconsin, 5) J.L. Woodard - Wayne State Univ., 6) K.A. Nielson - Marquette Univ., 7) A.M. Butts - Marquette Univ., 8) N.C. Hantke - Marquette Univ. 9) M. Seidenberg - Rosalind Franklin Univ. of Medicine and Science, 10) M.A. Lancaster - Rosalind Franklin Univ. of Medicine and Science, 11) M. Matthews - Marquette Univ., 12) M. Sugarman - Wayne State Univ., 13) S.M. Rao - Cleveland Clinic Schey Center for Cognitive Neuroimaging

Department/Center: Kinesiology
Affiliation: University of Maryland, College Park
Funding Source: This work was supported by grants from the National Institutes of Health and the Advancing Healthier Wisconsin foundation.

Abstract:

The current study aimed to examine longitudinal changes in cognitive function and hippocampal volume in APOE-ε4 carriers who reported being physically active (High PA) compared to physically inactive (Low PA). Thirty-two healthy cognitively intact older adults ages 65 to 85 years participated in the study. Two equal groups (N = 32): (1) Low PA (1 ε2/ε4; 15 ε3/ε4) Age 74.2 ± 5.2 yr.; Education 15.8 ± 3.0 yr.; retest interval 563 ± 26 days (2) High PA (2 ε4/ε4; 14 ε3/ε4) Age 70.8 ± 4.4 yr.; Education 15.5 ± 3.2 yr.; retest interval 552 ± 18 days. The frequency and intensity of leisure time physical activity was measured using the Stanford Brief Activity Survey (SBAS): two or fewer days/week low intensity physical activity = physically inactive (Low PA). Three or more days/week moderate/vigorous intensity = physically active (High PA) Neuropsychological Testing involved the Rey Auditory Verbal Learning Test (RAVLT), Mattis Dementia Rating Scale 2 (DRS-2) Cognitive Status. After 18 months, 13 of 16 Low PA compared to 5 of 16 High PA were classified as cognitively declining by at least 1 SD decrease in neurocognitive performance (Group difference, p = .011, Fisher's exact test). See Table 1. No statistically significant group differences on demographic variables (age, education, or gender) Among healthy individuals at risk for Alzheimer's disease by possession of an APOE-ε4 allele, being physically active was associated with cognitive stability over an 18 month interval. In contrast, APOE-ε4 allele carriers who were less physically active were more likely to show cognitive decline on measures of episodic memory performance. This is

consistent with our recent report (Woodard et al., in press, Current Alzheimer Research) that APOE-e4 allele carriers who reported lower levels of physical activity at baseline were more likely to show cognitive decline.

Characterization of Protein Glycosylation in Skeletal Muscle of Type 2 Diabetics After Aerobic Exercise Training

Presenter: Dapeng Chen

Co-authors: 1) Dapeng Chen - UMCP, 2) Yan Wang - UMCP, 3) Steve J. Prior - UMB, 4) Alice S. Ryan - UMB, 5) Heidi K. Ortmeier - UMB, 6) Jacob Blumenthal - UMB, 7) Jeffrey Beans - UMB, 8) Eva R. Chin - UMCP, 9) Andrew P. Goldberg - UMB

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: UMB/UMCP RESEARCH Seed Program

Abstract:

Post-translational modification of proteins play a key role in signal transduction. We hypothesized that skeletal muscle protein glycosylation is a mechanism for explaining impaired glucose metabolism in Type 2 Diabetes Mellitus (T2DM). The aim of this study was: i) to develop a method for large-scale analysis of N-linked protein glycosylation in skeletal muscle; and ii) to determine whether aerobic exercise training (AEX) that improved glycemic control in subjects with T2DM would alter muscle protein glycosylation patterns. Older, sedentary T2DM subjects (75±7 yrs; HbA1c 7.1±0.5%) completed 12 mos. of AEX and skeletal muscle biopsy samples were obtained at baseline and 12 mos. training. Muscle biopsy samples were enriched for glycoproteins using lectin affinity columns and then analyzed by tandem mass spectrometry. 87 N-linked glycoproteins were identified in skeletal muscle. By comparing spectral counts at baseline and after AEX, a decrease in number of glycosylation sites or reduced glycoprotein levels were observed. Five proteins had reduced glycan count, including isoform H17 of myeloperoxidase which was down-regulated after AEX. This was associated with significant reduction in HbA1c of 0.8±0.1%. Our data support the notion that improved glycemic control is associated with alterations of skeletal muscle protein glycosylation patterns.

No Fats, No Femmes: The Bear Community as a Site of Socio-Cultural Resistance and Re-Articulation of the Body

Presenter: Shaun Edmonds

Co-authors: 1) Shaun Edmonds - UMCP, 2) Susan Zieff - SFSU, 3) Gilbert Herdt - SFSU

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

In the United States, larger individuals are the target of an increasingly fervent moral panic on “obesity” (Gard & Wright, 2005). Obesity is a socially constructed idea that is loaded with moral judgments around personal efficacy, cognitive and physical ability, and social value (Murray, 2008). Healthiest and medical discourses categorize “obese” bodies as non-normative others, while structural inequalities in health care, consumptive access, and employment stigmatize larger individuals. In the United States, weight stigma and discrimination continues to be a socially acceptable form of bias (R. M. Puhl & Heuer, 2010). As an acknowledged part of the gay male community (Wright, 1997a), the “Bear” subculture provides a site of bio-political resistance to the pervasive body ideals (and associated fat stigma) embedded within, and perpetuated by, the mainstream gay community. In contrast to often critical and stigmatizing mainstream gay spaces, Bear spaces empower and valorize the larger hirsute male. Utilizing in-depth interviews, and participant observation, this study explores the ways in which Bears come to understand health, physical activity, and the politics and praxis of their own embodied selves. Preliminary observations have identified Bears reclaiming sexual agency, deploying specific expressions of masculinity to define community membership, and rejecting the hegemonic “Twink” image that dominates the larger gay community. However, the celebration and sexualization of size is not without its contradictions; participants internalized fat phobia and self-blame related to their size. The implications for public health are readily apparent – fat phobia and fat shaming behaviors lead to lowered trust in the health care system. Additionally, systemic factors such as lack of appropriate clothing and training facilities, as well as media misinformation, act as a strong barrier to physical activity participation. Finally, common public health interventions fail to acknowledge the diversity of sexual and social dimensions associated with food and body size.

Intelligent Cooperative Human-Prosthetics Control for Reaching Movements

Presenter: Rodolphe Gentili

Co-authors: 1) Rodolphe J. Gentili - UMCP, 2) Hyuk Oh - UMCP, 3) Isabelle M. Shuggi - UMCP, 4) Ronald N. Goodman - VA MERCE, 5) Jeremy C. Rietschel - VA MERCE, 6) Bradley D. Hatfield - UMCP, 7) James A. Reggia - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

In most human-robotic interaction, the user completely controls the robot performance which is considered as a passive tool without any adaptation capabilities. However, it is highly desirable to develop synergetic human-robot interface where both the user and the robot adaptively collaborate in order to improve the user performance while reducing the ergonomic burden and cognitive workload. Specifically, when considering the field of rehabilitation, the robot can take the form of a prosthetic device (arm, hand). Therefore, here we examined an adaptive collaborative human-

prosthetics interaction scheme during reaching performance. Namely, through a computer interface, by means of limited head movements, healthy users controlled a simulated prosthetic arm displayed on a computer screen in order to perform reaching movements to visual targets. In addition, by employing the user data that were recorded online, an adaptive bio-mimetic control system was able to learn progressively a robust and flexible inverse kinematics computation. The findings revealed that when this adaptive neurocontroller was enabled, it was progressively able to assist the user in controlling the prosthetic limb through a collaborative shared control. This resulted in performance improvements while reducing the user's cognitive workload. The long term goal of this work is to contribute to the development of next generation of intelligent human-robotic interfaces for rehabilitation.

Chronic Psoas Major Tendinopathy in a Female Runner: A Case Report

Presenter: Karen Gordes

Co-authors: 1) Karen L. Gordes - UMB, 2) Jason Liu - UMB

Department/Center: Physical Therapy and Rehabilitation Science

Affiliation: University of Maryland, Baltimore

Funding Source: N/A

Abstract:

Background and Purpose: Tendinopathy refers to chronic tendon pain secondary to overuse and is the most common type of tendon pain seen by family physicians. Historically, treatment for tendinopathy has emphasized decreasing inflammation via activity restriction. However, for many patients symptoms continue to persist long after the offending activity is stopped and anti-inflammatory treatment is provided. Current evidence has shown patients with tendinopathy have degeneration of the tendon, disorganization of collagen fibers, increased cellularity, and hypovascularity with only minimal inflammation. Therefore, the ideal treatment protocol for tendinopathy is unknown. The purpose of this case report was to investigate the efficacy of an integrated treatment approach for improving lower extremity function in an active adult with persistent hip pain and to expand upon existing evidence on the use of functional exams as outcome measures. **Methods and Results:** A 28 year old female diagnosed with a left hip strain with pain persisting after discontinuing physical activity was seen for 10 treatment sessions. Treatment included modalities, an exercise program (core stability training, functional movement, eccentric strengthening) and manual therapy (sacroiliac (SI) and hip joint manipulation, myofascial release, Graston technique). Outcome measures included the verbal rating scale (VRS), ROM measurements, manual muscle testing, the lower extremity function scale (LEFS), and functional tests measuring core/trunk stability, muscle imbalance, and mechanics with functional movements. At the conclusion of treatment, the patient reported pain decreased from 3-8/10 to 0-1/10 and her LEFS score increased from 64 to 73. The patient's core muscle strength improved, her functional movements of the LE were symmetrical and the patient was able to transition from sit to stand, as well as walk and run with little to no symptoms. **Discussion:** An integrated treatment program of myofascial release, Graston technique, core stability/eccentric exercises, and SI/hip joint manipulations can be effective in treating psoas major tendinopathy. Limitations of this case report include the inability to determine the individual effects of each intervention, a lack of existing evidence on the functional tests incorporated in the examination, including interpretation of the test results and the short data collection period limiting analysis of long term outcome effects.

Effects of Exercise Ancestry on Multiple Generations of Mature C57BL/6 Mouse Offspring

Presenter: Lisa Guth

Co-authors: 1) Lisa M. Guth - UMCP, 2) Andrew C. Venezia - UMCP, 3) Michael P. Marini - UMCP, 4) Estefan P. Beltran - UMCP, 5) Espen E. Spangenburg - UMCP, 6) Stephen M. Roth - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: This work was supported by NIH grants HD062868 and AG000268.

Abstract:

The objective was to examine if exercise (EX) ancestry vs. sedentary (SED) ancestry alters body/tissue mass, glucose metabolism, or muscle mRNA in two generations of mature mouse offspring. C57BL/6 mice (F0) were exposed to EX (wheel running, N=20) or a SED condition (no wheel, N=20) for 12 weeks before breeding. EX males bred with EX females and SED males bred with SED females to obtain F1 pups. F0 EX animals had wheel access through weaning. F1 pups bred with like-ancestry F1 offspring to obtain the F2 pups. F1 and F2 offspring were sacrificed at 28 wk without EX exposure. Body and tissue masses were recorded, intraperitoneal glucose tolerance was measured, and mRNA expression of several metabolic genes was examined in muscle. In F1 males, liver and soleus mass were lower in EX ($p < 0.05$). F2 EX males also had lower liver and soleus masses ($p < 0.05$). In females, no differences in tissue mass were observed. However, F1 EX females had higher baseline glucose ($p < 0.05$) while F2 SED females had better glucose tolerance ($p < 0.05$). No differences in glucose or glucose tolerance were observed in male offspring. Pgc1a mRNA expression was higher in F1 EX males and Cox1 mRNA expression was higher in F2 SED males. There were no other differences in mRNA expression. These findings suggest limited, generation- and sex-specific effects of EX ancestry on tissue mass, glucose metabolism, and muscle mRNA in two generations of mature C57BL/6 offspring. This work was supported by NIH grants HD062868 and AG000268.

Active Lifestyle, Activity Perception, and Health

Presenter: Sandra Hofferth

Co-authors: 1) Sandra Hofferth - UMCP, 2) Sarah Flood - Univ. of Minnesota, 3) Deborah Carr - Rutgers Univ., 4) Yoonjoo Lee - UMCP

Department/Center: Family Science/ Maryland Population Research Center
Affiliation: University of Maryland, College Park
Funding Source: National Institute of Child Health and Human Development

Abstract:

This paper examines the association between active behaviors and physical health, measured with the widely-used self-rated health indicator (excellent, very good, good, fair, or poor). Travel and volunteering plus social activities are part of an “active life style” and sedentary activities are not. We examine the association of both time spent in active versus sedentary activities and individual perceptions (happy, sad, tired, stressed, or in pain) during these activities with self-reported health, net of health at an earlier time point. Data were drawn from the 2010 wave of the American Time Use Survey (ATUS), which collected momentary assessments of three randomly selected activities from men and women between 18 and 64, and the socioeconomic supplement to the March Current Population Survey (CPS), both nationally representative surveys conducted by the U.S. Census Bureau. Multiple ordinal logistic regression was used to examine the association between activity, perception of the activity and health, adjusting for potentially confounding factors. Preliminary results suggest that it is not total time but positive individual perception of the activity that is associated with better health. This is the first study to examine the link between individual assessment of specific types of activities and overall health. This has important implications for programs aimed at changing individual behavior and activity level.

Effects of Emotional Exposure on State Anxiety After Acute Exercise

Presenter: Danielle Kauffman

Co-authors: 1) D. Kauffman - UMCP, 2) T. Keenan - UMCP, 3) B. Leitner - UMCP, 4) S. Prakash - UMCP, 5) S. Saheb - UMCP, 6) R. Toledo - UMCP, 7) J.C. Smith - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Purpose: Despite the well-known anxiolytic effect of acute exercise, it is unknown if anxiety reductions after acute exercise conditions survive in the face of a subsequently experienced arousing emotional exposure. The purpose of this study was to compare the effects of moderate-intensity cycle ergometer exercise to a seated rest control condition on state anxiety symptoms after exposure to a variety of highly arousing pleasant and unpleasant stimuli. **Methods:** Thirty-seven healthy and normally physically active young adults completed two conditions on separate days: 1) 30 min of seated rest and 2) 30 min of moderate-intensity cycle ergometer exercise (RPE =13; “somewhat hard”). After each condition, participants viewed 90 arousing pleasant, unpleasant, and neutral pictures from the International Affective Picture System for 30 min. State anxiety was measured before and 15 min after each condition, and again after exposure to the affective pictures. **Results:** State anxiety significantly decreased from baseline to after the exercise and seated rest conditions ($P = 0.003$). After the emotional picture-viewing period, state anxiety significantly increased to baseline values after the seated rest condition ($P = 0.001$) but remained reduced after the exercise condition. **Conclusion:** These findings suggest that the anxiolytic effects of acute exercise may be resistant to the potentially detrimental effects on mood after exposure to arousing emotional stimuli.

A Comparative Kinematics Analysis in Human and Humanoid Fingers for Neurobotic System Validation

Presenter: Alissa Kregling

Co-authors: 1) Alissa V. Kregling - UMCP, 2) Isabelle M. Shuggi - UMCP, 3) Samuel E. Sondheim - UMCP, 4) Jacob Fine - UMCP, 5) Brandon Cleary - UMCP, 6) Peter Perrella - UMCP, 7) Calvin Lu - UMCP, 8) Rachel Brown - UMCP, 9) Hyuk Oh - UMCP, 10) James A. Reggia - UMCP, 11) Rodolphe J. Gentili - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

A previous study proposed an adaptive cortical model that was able to learn the inverse kinematics for an actual anthropomorphic humanoid finger having its two last joints coupled and controlled by pneumatic muscles. Specifically, after learning, this cortical architecture was able to accurately control the humanoid index finger in order to perform single 3D center-out reaching movements as well as more complex motions such as reversal reaching movements and typing (Gentili et al. 2012, IEEE EMBC Proc.). Although the kinematics produced appeared to be comparable to those of humans, there is a need to further quantify such kinematic production by examining more accurately the kinematic similarities between the humanoid and the human finger in order to validate this bio-mimetic cortical model. Therefore, this study aims to compare those kinematics produced by the robot and its human counterpart while performing the same tasks. The three tasks considered were: i) performing center-out reaching movements; ii) drawing a diamond shape and iii) performing accurate multiple reversal reaching movements. As previously employed for the humanoid robot, human participant performed each task while a motion capture system recorded the linear kinematics of the index fingertip by means of infrared emitting sensors attached to the finger. In addition, a data glove recorded the angular kinematics produced at the joints. Preliminaries result revealed that kinematics velocity profiles were comparable between the humanoid and human finger movements. More accurate analyses are currently underway in order to quantify with a higher accuracy the kinematics discrepancy between the robotic finger and its human counterpart. This work contributes to develop bio-mimetic control systems for dexterous anthropomorphic multi-fingered robotic hands/neuroprostheses.

Effects of Training Status on Circulating Angiogenic Cell Paracrine Activity in Young Men and Women

Presenter: Rian Landers-Ramos

Co-authors: 1) Rian Q. Landers-Ramos - UMCP, 2) Nathan T. Jenkins - Univ. of Missouri, 3) Espen E. Spangenburg - UMCP, 4) James M. Hagberg - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: Support: NIH AGT3200068 and UMD KNES Graduate Research Initiative Fund

Abstract:

Purpose: To determine if a relationship exists between physical fitness and the ability of CD34+ or CD34-/CD31+ circulating angiogenic cells (CAC) to influence angiogenic function through paracrine activity. Methods: Peripheral blood was drawn from healthy inactive (n = 7), active (n = 10) and endurance-trained (n = 7) men and women aged 25-39. Mononuclear cells were isolated by density centrifugation and CD34+ and CD34-/CD31+ fractions were purified by immuno-magnetic selection. Conditioned media (CM) from cultured CACs was retrieved and used for a HUVEC-based angiogenesis tube formation assay. Tube length and complexity were imaged and quantified. Results: CM from CD34+ CACs of endurance-trained subjects resulted in 21% greater tube length (P<0.05) and 48% greater complexity (P<0.05) than inactive subjects, and 22% greater complexity than active subjects (P<0.05). CD34+ CM from active subjects produced greater length and complexity than inactive subjects (P<0.05, 18% and 33%, respectively). Tube length was 22% greater and complexity was 42% greater (P<0.05 each) with CD34-/CD31+ CAC CM of endurance-trained subjects compared to inactive individuals. Conclusions: These preliminary data provide promising support for a chronic exercise-induced increase in paracrine-mediated angiogenic function of CD34+ and CD34-/CD31+ CACs.

Evaluation of Calcium Clearance between Different Mouse Models for Duchenne Muscular Dystrophy

Presenter: Davi Mázala

Co-authors: 1) Davi Mázala - UMCP, 2) Spencer Bonar - UMCP, 3) Eva R. Chin - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: This research was funded by the University of Maryland's Department of Kinesiology Graduate Student Research Initiative Fund (GRIP).

Abstract:

Duchenne muscular dystrophy is a progressive and devastating neuromuscular disease. Some of the mechanisms thought to contribute to disease severity include elevations in intracellular calcium (Ca²⁺), increased activation of calpains, and increased mitochondrial Ca²⁺ overload. Purpose: to evaluate differences in intracellular Ca²⁺ clearance between three dystrophic mouse models. Methods: control (CON; C57BL/10ScSn; n=3), mdx (n=5), mdx/Utr+/- (n=6), and mdx/Utr-/- (n=4) mice were used in the present study. Single muscle fibres from the flexor digitorum brevis were obtained by collagenase digestion and loaded with Fura-2 AM. Fibres were electrically stimulated at 50 and 100Hz and the time for Fura-2 ratio to return 75% back to resting ratio was used as an index of Ca²⁺ clearance (T75). Results: There were no differences between CON and dystrophic genotypes in T75 at 50 and 100Hz. However, there was a main effect for all dystrophic fibres (mdx, mdx/Utr+/- and mdx/Utr-/- combined) vs. CON with an increase in T75 at both frequencies (50Hz: 0.10 ± 0.01s vs. 0.08 ± 0.01s; 100Hz: 0.12 ± 0.01s vs. 0.09 ± 0.01s for dystrophic vs. CON, respectively; p<0.05). Conclusion: Our results suggest that Ca²⁺ clearance is prolonged in dystrophic muscle compared to control but is similar between different dystrophic mouse models. These data suggest that differences in Ca²⁺ clearance mechanisms may not be responsible for differences in disease severity between dystrophic models.

Effect of an Educational Module on African-American Churchgoers' Knowledge of the Role of Physical Therapists and Personal Trainers as Health Promotion Professionals

Presenter: E. Anne Reicherter

Co-authors: 1) Teoma L. Taylor, 2) E. Anne Reicherter - UMB, 3) Trish Muse - UMB, 4) Senora Simpson - Howard Univ., 5) Spiridon Karavatas - Howard Univ.

Department/Center: Physical Therapy and Rehabilitation Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Background: African Americans have higher rates and greater morbidity and mortality from many diseases, including cancer, diabetes, cardiovascular disease, hypertension, and stroke. Because the church has traditionally been the cornerstone of African American culture, it is an ideal setting in which to offer health promotion activities for African Americans. With a scope of practice including intervention, prevention, and promotion of health, wellness, and fitness, physical therapists (PTs) can provide these services to African Americans. However, as more people are seeking the expertise of personal trainers, it is vital that African Americans are educated about the roles that personal trainers and PTs play in health promotion. Purpose: The purpose of this research was to ascertain knowledge levels of African-American churchgoers' regarding the role of physical therapists (PTs) and personal trainers as health promotion professionals, before and after an educational module. Participants: 53 African-American adults at two

predominantly Black churches in two states (DC and CA). Methods: After church services, participants completed a pre-test that included their level of exercise stage-of-change and knowledge of the role of PTs and personal trainers in health promotion. A 30-minute educational module on these topics was then presented. In order to perform an impact evaluation of the presentation, participants completed a post-test. Data from the pre- and post- tests were analyzed both qualitatively and quantitatively. Qualitative response data were coded into categories. Quantitative analyses included descriptive statistics and Wilcoxon rank sum test. Results: Positive effects of the educational module were evident in several test items. When asked if personal trainers treat movement disorders or evaluate and treat individuals, there was a 64% and 59% decrease in response rate (respectively), from pre-test to post-test. Also at post-test, 92% of the participants believed that personal trainers help and motivate clients to achieve personal fitness goals. Qualitative results demonstrated that major categories for reasons why participants visit a personal trainer include: to get in shape, to exercise, and to lose weight. When asked if PTs prevent disability, there was a 40% increase in response rate from pre-test to post-test. Response rate was at least 80% on both pre- and post-test when asked if PTs increase strength after injury. Qualitative results demonstrated that major reasons for participants visiting PT included: pain relief and recovery from injury. Regarding the role of spirituality in illness management, a majority of respondents mentioned that prayer and faith played a prominent role. While only 45% of respondents stated that their church offered health promotional activities, 89% reported they would attend such activities, if offered. Though there were no significant differences in participants' exercise stage of change pre- and post-test ($Z = -0.085$, $p = .932$), they exhibited a wide variety of readiness levels as exhibited the table. Conclusions: According to results of this study, the educational module had a positive effect on African-American churchgoers' awareness of the roles of PTs and personal trainers. It also suggests that the church would be a beneficial place to provide health promotion to the African-American community by both PTs and personal trainers, as churchgoers would attend these events if offered. As the healthcare establishment continues to gain an understanding of the health needs of various ethnic groups, health professionals can decrease health disparities affecting African Americans by providing health promotion activities in settings that are supportive of these efforts.

Effects of an Exercise Intervention on Semantic Memory fMRI Activation in Mild Cognitive Impairment

Presenter: Theresa Smith

Co-authors: 1) J.C. Smith - UMCP, 2) Kristy A. Nielson - Marquette Univ., 3) Piero Antuono - Medical College of Wisconsin, 4) Jeri-Annette Lyons - Univ. of Wisconsin-Milwaukee, 5) Matthew D. Verber - UMCP, 6) Alissa M. Butts - Marquette Univ., 7) Nathan C. Hantke - Marquette Univ.

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: This project was supported by a grant from the Graduate School Research Growth Initiative at the University of Wisconsin-Milwaukee and by grant UL1RR031973 from the Clinical and Translational Science Award (CTSA) program of the National Center for Research Resources, National Institutes of Health.

Abstract:

Despite the known neurotrophic and cognitive benefits of exercise in healthy older adults, little is known about the effects of exercise training on brain function in those with early signs of Alzheimer's disease (AD). While exercise has been shown to improve cognitive function in mild cognitive impairment (MCI) patients, it is unknown if exercise training alters functional brain activation during memory retrieval in MCI patients. We compared the effects of a 12-week walking exercise intervention on semantic memory fMRI activation in MCI patients and healthy controls. Seventeen MCI/early AD patients (7 M, 10 F; mean (SD) age 78.7 (7.5 y), education 15.5 (3.0 y)) and 17 healthy controls (3 M, 14 F; mean (SD) age 76.5 (7.2 y), education 16.5 (2.0 y)) participated in a 12-week exercise intervention consisting of supervised treadmill walking (30 min/day, 4 days/wk) at a moderate intensity (60-70% HRR). Before and after the intervention participants completed a famous name discrimination task during fMRI and a neuropsychological battery. Voxel-wise and functional region of interest (fROI) analyses were conducted (famous minus unfamiliar area under the curve) with whole-brain error correction $p < .05$. The groups did not differ in sex, age, education, or depression. Twenty-six fROIs were identified. A Group x Time repeated measures ANOVA showed a significant main effect of Time in 11 regions ($ps = .048$ to $.0001$), reflecting a decrease in activation after the intervention in both groups. The groups differed in 4 regions (patients > controls in 3 fROIs), and significant Group x Time interactions occurred in 4 regions. These findings suggest exercise training may improve neural efficiency during semantic memory retrieval in MCI patients. Longitudinal clinical trials are required to determine whether walking exercise is effective in MCI to improve or maintain memory performance and reduce or delay conversion to AD.

Muscle-Specific Inactivation of Comparative Gene Identification-58 (CGI-58) Causes Severe Cardiac Steatosis and Systolic Dysfunction in Mice

Presenter: Liqing Yu

Co-authors: 1) Ping Xie - Wake Forest Univ., 2) Feng Guo - Wake Forest Univ., 3) Yinyan Ma - UMCP, 4) Xianlin Han - Sanford-Burnham Medical Research Institute, 5) Miao Wang - Sanford-Burnham Medical Research Institute, 6) Leanne Groban - Wake Forest Univ., 7) Bingzhong Xue - Georgia State Univ., 8) Hang Shi - Georgia State Univ., 9) Liqing Yu - UMCP

Department/Center: Animal and Avian Sciences

Affiliation: University of Maryland, College Park

Funding Source: NIDDK/NIH and Intramural funds

Abstract:

CGI-58 is a lipid droplet-associated protein implicated in intracellular triglyceride (TG) hydrolysis. Here we show that muscle-specific CGI-58 knockout (MusKO) mice accumulate TG and cholesterol in the heart and soleus muscle, but display a significant reduction in hepatic TG and cholesterol contents, and plasma concentrations of cholesterol, ketone, and glucose. The intracardiomyocellular lipid deposition results in severe ventricular

fibrosis and systolic dysfunction. The cardiac steatosis is attributable, at least in part, to reduced tissue TG hydrolase activity and PPAR- α /PGC-1-dependent mitochondrial fatty acid oxidation. Lipid accumulation is not seen in glycolytic quadriceps muscles. Despite lipid accumulation in myocardial and soleus muscles, MusKO mice are more glucose tolerant and insulin sensitive, which is associated with augmented glucose uptake and insulin signaling in heart and soleus muscles. Our data demonstrate that CGI-58 plays a key role in preventing lipid deposition in oxidative muscles and is indispensable for normal heart function.

OBESITY PREVENTION

Nurses' Working Conditions and Obesity

Presenter: Kihye Han

Co-authors: 1) Kihye Han - UMB, 2) Alison M. Trinkoff - UMB

Department/Center: Family and Community Health

Affiliation: University of Maryland, Baltimore

Funding Source: The original data collection for the Nurses Work life and Health Study was supported by National Institute for Occupational Safety and Health R01 OH07554 (Dr Trinkoff, PI). This study was a part of doctoral dissertation research project and has no additional funding sources. The Institutional Review Board of the University of Maryland, Baltimore, reviewed and approved this study.

Abstract:

Introduction: The effect of job stress (JS) on obesity can vary with work schedule (WS) characteristics because WS influence workers' lives in many ways, including sleep, diet, physical and social activities, and family life. However, there are knowledge gaps about differences in factors which are associated with nurse obesity by WS status. This study aimed to examine the relationship between JS/WS and nurse obesity, and compare associations of JS and obesity between nurses with favorable WS and those with unfavorable WS. **Methods:** This study was a secondary data analysis of 1724 female nurses. Obesity was measured using body mass index estimates. Binomial logistic regression models for overweight/obesity (OW/OB) incorporated independent components of JS/WS. To examine associations between JS and OW/OB by WS status, regression models were stratified by WS status (favorable/unfavorable). All models included demographic, health and family related covariates. **Results:** In the overall nurse sample, longer work hours (OR=1.22, 95% CI=1.08-1.39) and jobs with less physical exertion (OR=0.83, 95% CI=0.73-0.95) and more limited movement (OR=1.14, 95% CI=1.02-1.28) were significantly associated with OW/OB. When comparing associations between JS and nurse obesity by WS status, among nurses with favorable WS, OW/OB nurses reported significantly less supervisory support (OR=0.83, 95% CI=0.68-1.00). On the other hand, among those with unfavorable WS, no job stress components were significantly related to OW/OB. Only healthy behaviors (exercise, sleep) were significantly associated with decreased odds of OW/OB (OR=0.79, 95% CI=0.66-0.95). **Conclusions:** Organizational supports to limit adverse WS are needed. In particular, for nurses with unfavorable WS, educational interventions about sleep hygiene and other lifestyle modifications for adaptation to their WS may help improve health. For nurses with favorable WS, organizational supports for alleviating nurses' home/family responsibilities and stress are also needed. Future worker's health research should include WS characteristics.

The Advantages/Disadvantages to Using Cultured Single Muscle Fibers as an In Vitro Model to Mechanistically Research Skeletal Muscle

Presenter: Kathryn C. Jackson

Co-authors: 1) Kathryn C. Jackson - UMCP, 2) Lindsay M. Wohlers - UMCP, 3) Christopher W. Ward - UMB, 4) Espen E. Spangenburg - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: National Institutes of Health (AR059913) and Pilot and Feasibility grant from Baltimore Diabetes Research Training Center (DRTC-P60DK079637) (EES)

Abstract:

Muscle cell cultures have served as an important experimental approach for many seminal discoveries in skeletal muscle. Currently, immortalized skeletal muscle rodent cells (C2C12 and L6) are the prevailing culture models. Here we demonstrate broad applications for enzymatic isolation and culturing of adult single skeletal muscle fibers (SMF). Using data from our labs, we show that cultured SMF can be used for a variety of physiological and metabolic measures. Mechanical properties can be made using systems to induce passive stretch (force transducer/length controller) or mechanical perturbation (Atomic Force Microscopy). Ionic flux (e.g. calcium transients) can be assessed using real-time imaging techniques. Further, mitochondrial function can be determined using sensitive assays designed to assess oxygen consumption. Also, it is possible to assess glucose uptake of the SMF. Using fluorescence microscopy and specific dyes one can image lipid droplets, mitochondria, and myonuclei in SMF. Lastly, cultured SMF are amenable to gain-of or loss-of function approaches through adenovirus infection or plasmid electroporation. The SMF model is not without disadvantages. Not all muscle groups are amenable to enzymatic isolation of SMF limiting which muscles can be used. In conclusion, cultured single SMF are an important model to consider for studying skeletal muscle since they represent muscle in the adult state from a function and phenotype perspective.

Examination of Select Demographic, Behavioral and Psychosocial Factors Associated with Bias in Self-Reported Height, Weight, and BMI among Adolescent Girls

Presenter: Brit I. Saksvig

Co-authors: 1) JoAnn Kuo - UMCP, 2) Deborah Rohm Young - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: National Heart, Lung and Blood Institute: R01HL094572

Abstract:

Background: The accuracy of self-reported height and weight among adolescents is subject to bias. Purpose: To examine factors associated with over and under-reporting of self-reported height and weight among adolescent girls. Methods: Height and weight of 589 healthy 11th grade girls, mean age of 16.7±0.4 years were self-reported and measured by trained technicians. Participants were classified as overweight or obese using CDC criteria. Demographic variables examined included ethnicity and receiving free or reduced priced lunch. Behavioral factors included physical activity, smoking, and trying to lose weight. Psychosocial factors included depression and perceived body size. Multiple regression models were used to determine factors associated with over- or under-reporting of height, weight, and body mass index (BMI, kg/m²) and least squares means (LSM). Results: Participants under-estimated their weight (mean -1.5±4.3 kg) and over-estimated their height (mean 0.35±2.5 cm). Hispanic girls over-reported their height compared to White and African American girls (LSM = 0.92 vs. -0.14 and -0.18 cm, respectively; p-values <0.02). Compared to those trying to gain weight, girls trying to lose weight under-reported their weight (LSM = -1.8 vs. 1.0 kg; p<0.01) and BMI (LSM = -0.70 vs. 0.27 kg/m²; p<0.02). Girls reporting they were very overweight under-reported their BMI compared to girls reporting they were slightly overweight (LSM = -1.2 and -0.03 kg/m²; p<0.04). Conclusions: Girls' perceptions of their body size and weight loss behaviors are associated with under-reporting of BMI and weight. Socioeconomic status, physical activity, smoking, and depressive symptoms are not associated with under- or over-reporting.

The Growing Built Environment of the State of Maryland and its Impact on Obesity Related Issues

Presenter: Lisa Silverman

Co-authors: 1) Lisa Silverman - UMCP, 2) Jessica Montresor-Lopez - UMCP, 3) Tatiana Loboda - UMCP

Department/Center: Civil Engineering and Mathematics

Affiliation: University of Maryland, College Park

Funding Source: UMD BSOS seed grant study

Abstract:

Obesity is a growing health concern within the U.S. and is related with many serious diseases. Previous studies have shown that the built environment of a community can be associated with obesity due to the lack of physical activity outlets. In the last 50 years, Maryland has seen an increase in land development, as well as a change in the percentage of obesity from about 10% to 25-29%. This study is part of a UMD BSOS seed grant study (PI: Tatiana Loboda, Geographical Sciences and Co-PI: Robin Puett, MIAEH) with the overall goal of examining the feasibility of using satellite data to analyze land use change over time and its relationship with changes in physical activity and obesity over time in MD, as well as whether population demographics (e.g. race, socioeconomic status) impact this relationship. This study provides a foundation for that study by examining whether physical activity is related with population demographics in 2000. Results from linear regression models examining the relationship between physical inactivity and median household income for the total MD population showed a parameter estimate of -0.000189 with a p-value of 0.0058. Results from linear regression models examining the relationship between physical inactivity and median household income for the total Hispanic or Latino MD population showed a parameter estimate of -0.000159 with a p-value of 0.0233.

Estrogens Regulate Endocrine Influences of Adipose Tissue on Skeletal Muscle

Presenter: Espen E. Spangenburg

Co-authors: 1) Espen E. Spangenburg - UMCP, 2) Lindsay M. Wohlers - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: Baltimore Diabetes Research Training Center (DRTC-P60DK079637)

Abstract:

Reductions in estrogen function lead to adiposity and peripheral insulin resistance. Significant metabolic changes have been found in adipocytes and skeletal muscle with disruptions in the estrogen-signaling axis function; however it is unclear if inter-cellular communication exists between these tissues. The purpose of this study was to examine the impact of isolated adipocytes co-cultured with single adult skeletal muscle fibers (SMF) collected from control female (SHAM) and ovariectomized female (OVX) mice. In addition, a second purpose was to compare differential effects of primary adipocytes from omental and inguinal adipose depots on SMF from these same groups. OVX SMF displayed greater lipid content, impaired insulin signaling, and lower insulin-induced glucose uptake compared to SHAM SMF without co-culture. In the SHAM group, regardless of the adipose depot of origin, co-culture induced greater intracellular lipid content compared to control SHAM SMF. The increased lipid in the SMF was associated with impaired insulin-induced glucose uptake when adipocytes were of omental, but not inguinal origin. Co-culture of OVX SMF with omental or inguinal adipocytes resulted in higher lipid content, but no further reduction in insulin-induced glucose uptake compared to control OVX SMF. The data indicate that in the OVX condition there is a threshold for lipid accumulation in skeletal muscle beyond which there is no further impairment in insulin responsiveness. These results also demonstrate depot-specific effects of adipocyte exposure on skeletal muscle glucose uptake and further implicate a role for increased intracellular lipid storage in the pathogenesis of insulin resistance when estrogen levels are reduced.

Ovariectomy Increases Hepatic Mitochondrial ROS Production in Mice

Presenter: Ana P. Valencia

Co-authors: 1) Ana P. Valencia - UMCP, 2) Matthew E. Morris - Univ. of Missouri, 3) John P. Thyfault - Univ. of Missouri, 4) Espen E. Spangenburg - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: Baltimore DRTC (NIH-P60DK079637)

Abstract:

We have previously shown that loss of ovarian function leads to the disruption of lipid metabolism regulators in hepatic tissue, thus increasing the susceptibility for developing hepatic steatosis. Purpose: To determine if the loss of ovarian function in female mice results in increased triacylglycerol (TAG) storage, impaired hepatic mitochondrial function, and whether any of these changes resulted from altered sirtuin (SIRT) function. Methods: Female C57BL/6 mice were divided into two groups SHAM or bilateral ovariectomy (OVX). Mitochondrial function was assessed by measuring oxygen consumption, reactive oxygen species (ROS) production, and mitochondrial protein content from isolated hepatic mitochondria. In addition, mitochondrial acetylation status and sirtuin 1/3 (SIRT) protein content were assessed. Results: Compared to SHAM mice, hepatic mitochondria from OVX mice exhibited no differences in oxygen consumption in either state 3 or 4 conditions, but did exhibit increased ROS production. In addition, no differences in mitochondrial protein content, acetylation status or total SIRT 1/3 content were detected between groups. OVX mice exhibited a non-significant increase in hepatic TAG storage compared to SHAM mice. Conclusion: The data suggest that ovariectomy contributes to impaired hepatic mitochondrial function by increasing ROS production, which is not a result of altered SIRT function.

BEHAVIORAL HEALTH, MENTAL HEALTH, SUBSTANCE ABUSE

The Interactive Role of Distress Tolerance and Trait Aggression in Problematic Alcohol Use among College Students

Presenter: Bina Ali

Co-authors: 1) Jonathan Ryan - UMCP, 2) Kenneth Beck - UMCP, 3) Stacey Daughters - UMCP

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Trait aggression, a component of negative emotionality consisting of anger and hostility, has been linked to alcohol-related problems among college students. However, the individual conditions underlying this association are unknown. Empirical evidence and theory suggest the importance of distress tolerance, defined as an individual's ability to withstand negative affective states, in the relationship between trait aggression and alcohol use. Therefore, the purpose of the current study was to examine whether distress tolerance moderates the relationship between trait aggression and problematic alcohol use. Participants were 646 undergraduate students in a large university. The dependent variable, problematic alcohol use, was measured using the Alcohol Use Disorders Identification Test (AUDIT) total score. The main independent variable, trait aggression, was assessed on the negative emotionality scale of the Multidimensional Personality Questionnaire (MPQ-NE), and the moderator, distress tolerance, was determined using the Distress Tolerance Scale (DTS). Hierarchical linear regression analyses indicated a significant interaction between trait aggression and distress tolerance in predicting problematic alcohol use, adjusting for demographic variables, regular substance use, depressive symptoms, and anxiety symptoms. Specifically, a significant positive relationship between trait aggression and problematic alcohol use was present among those with low, but not high, distress tolerance. Results provide evidence that college students with high levels of trait aggression are more likely to engage in problematic alcohol use if they also evidence an inability to tolerate negative affective states. Study implications are discussed, including the development of prevention and intervention programs that target distress tolerance skills.

Choline: A Public Health Approach to Prevent Fetal Alcohol Syndrome

Presenter: Cynthia Bearer

Co-authors: 1) Ningfeng Tang - UMB, 2) Min He - UMB, 3) Penny Bamford - UMB, 4) Cynthia Bearer - UMB

Department/Center: Pediatrics

Affiliation: University of Maryland, Baltimore

Funding Source: NIH AA016398

Abstract:

Background: Fetal alcohol spectrum disorder is the leading known cause of mental retardation. 1% of all liveborns are affected. Eliminating maternal drinking has not been successful. Postnatal interventions to reduce impact of prenatal alcohol exposure show some promise. One target of ethanol neurotoxicity is L1 cell adhesion molecule (L1). L1 is critical for development of the brain. Ethanol inhibits L1's signaling cascade and L1 mediated neurite outgrowth, and increases L1 present in lipid rafts. Objective: To determine if prenatal choline supplementation provides neuroprotection from alcohol developmental neurotoxicity. Hypothesis: Our hypothesis is that choline supplementation of common foodstuffs will provide neuroprotection from alcohol developmental neurotoxicity. Methods: In vitro: Cerebellar granule neurons (CGN) from postnatal day 6 rat pups are pretreated with 0 -

80 μ M choline overnight followed by 25 mM ethanol for 1 h. L1 signaling is measured by western blot or immunoprecipitation. Lipid rafts are isolated and L1 distribution determined. L1 mediated neurite outgrowth is measured. In vivo: Pregnant and lactating dams are kept on a choline deficient diet. Rat pups are treated with 18.8 mg/kg/d choline or saline from postnatal day 4 to 6. On postnatal day 6, they are orogastrically entubated and given either ethanol in intralipid or an isocaloric maltose-dextrin solution for a total dose of 6 g/kg/d. The distribution of L1 in lipid rafts is determined. Results: Choline protected L1 signal transduction and L1 mediated neurite outgrowth. Choline also partially prevents the redistribution of L1 to lipid rafts. In choline treated rat pups, the redistribution of L1 in lipid rafts is partially prevented. Conclusions: Choline supplementation may prevent the developmental neurotoxicity of ethanol. Other nutritional interventions aimed at restoring lipid raft function should be explored. The impact of choline supplementation on the ethanol induced changes in rat pup behavior needs to be studied.

Activating Patients with Depression: Evidence from a Nationally Representative Data Set

Presenter: Robin Bloodworth

Co-authors: 1) Jie Chen - UMCP, 2) Karoline Mortensen - UMCP, 3) Robin Bloodworth - UMCP

Department/Center: Health Services Administration

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Using data from the Health Tracking Household Survey 2007 and Area Resource File 2008, we explore variation in patient activation among patients with depression. Our results show that depressed patients receiving routine care at physician offices have significantly higher patient activation levels than those accessing routine care in the emergency department or hospital outpatient clinics. In addition, we find significant geographic variation in activation level. Results show that the availability of community mental health centers, lower proportion of foreign-born individuals and higher income in the local community are associated with higher patient activation. This study shows evidence that depressed patients can benefit from Affordable Care Act by gaining access to mental health care, and having a sustained patient-physician relationship. Results also suggest that disseminating medical knowledge at different sites of care and in the local community among depressed patients can be directions for future studies examining effective patient activation interventions.

Association between Racial Discrimination and Psychological Distress among Asian Immigrants: An Examination of Within-Group Differences in the Effects of Age at Immigration and Length of Residence by Ethnic Subgroups

Presenter: Hyeun Chung

Co-authors: 1) Hyeun Chung - UMCP, 2) Mia Smith Bynum - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

The purpose of this study was to examine within-group differences in the effects of age at immigration and length of residence on the associations between racial discrimination and psychological distress among Asian immigrants. Using data from the National Latino and Asian American Study (NLAAS), this study focused on foreign-born Asian immigrants (n = 1,628). The sample was divided into four subethnicities: Vietnamese (n = 497), Filipinos (n = 345), Chinese (n = 472), and Other Asians (n = 314). We conducted regression analysis for the full model and then four sets of hierarchical regression analyses to investigate the interaction effects by group. The results for the full model suggest that lower education, shorter length of residence, and racial discrimination were associated with greater psychological distress. In addition, within-group differences were found in moderating effects of age at immigration and length of residence. For the Chinese sample, there was a significant interaction effect between age at immigration and racial discrimination. That indicates that the effect of racial discrimination on psychological distress was stronger when they came to the US at younger ages. For other Asians, the interaction effect between length of residence and racial discrimination was significant. The result suggests that the effect of racial discrimination on psychological distress was stronger for immigrants who had stayed shorter lengths of time. Our finding that racial discrimination has a negative effect on psychological distress for all subgroups suggest that Asian immigrants still struggle with racial discrimination and the experience is detrimental to their mental health. Intervention programs should focus on providing education about how to deal with immigration-related stressors including racial discrimination. Moreover, subethnic differences in moderating effects of age at immigration and length of residence highlight the importance of examining how unique immigration experiences impact Asian immigrants from different countries of origin.

The Perceived Racial Discrimination, Acculturative Stress, and Psychological Distress among Asian Immigrants: Moderating Effects of Support and Social Strain from a Partner

Presenter: Hyeun Chung

Co-authors: 1) Hyeun Chung - UMCP, 2) Norm Epstein - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

This study examined the roles of partner support and strain as moderators of the associations between Asian immigrants' experiences of (a) acculturative stress and (b) perceived racial discrimination and their levels of psychological distress. Using data from the National Latino and Asian American Study (NLAAS), the present study focused on foreign-born Asian immigrants (n = 1,012) who were married or cohabiting. Two hierarchical multiple regression analyses were conducted to assess the main effects of acculturative stress and perceived discrimination on immigrants' psychological distress, as well as the moderating effects of either social support or social strain from a partner. Acculturative stress and perceived racial discrimination were associated with greater psychological distress. Although social support from a partner had a significant negative association with psychological distress, it did not moderate the negative associations that acculturative stress and perceived discrimination had with psychological distress. However, social strain from a partner had a significant positive relation with psychological distress and there was a significant interaction effect in which the association between perceived racial discrimination and psychological distress was stronger when social strain from a partner was higher. Our findings suggest that even Asian immigrants who came to the U.S. a long time ago need help with adaptation, because the negative effects of acculturative stress and racial discrimination may persist. Intervention programs should include immigrants who have been living in the U.S. for a long time and should provide education about how to deal with ethnicity-related life stressors. Moreover, the finding that strain from a partner exacerbated the association between perceived discrimination and psychological distress points to the importance of couple relationships in immigrants' mental health. Thus, programs designed to assist immigrants should attend to the quality of couple relationships, including interventions to reduce partner strain and teach problem-solving skills.

Consequences of Problem Drinking over the Life Course among an Urban African American Community Cohort

Presenter: Kerry Green

Co-authors: 1) Kerry M. Green - UMCP, 2) Elaine E. Doherty - JHU, 3) Kate Fothergill - JHU, 4) Margaret E. Ensminger - JHU

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Problem drinking is a significant public health issue among African Americans. Although African Americans have a lower lifetime risk of developing alcohol use disorders compared to Whites, once developed, disorders follow a more chronic pattern. Therefore, consequences of problem drinking may be greater among African Americans. This poster uses data from the Woodlawn Study, a longitudinal community cohort study of urban African Americans followed for 35 years (N=1242), to identify consequences of problem drinking over the life course. Specifically, we examine patterns of drinking across adolescence (age 16) and young adulthood (age 32) and relate them to potential consequences in midlife (age 42). Specifically, we focus on SES-related problems (poor education, low-level employment, welfare participation), failure to achieve successful adult social roles (marriage, parenting, workforce participation), HIV-related risk behaviors, and premature mortality. These multivariate regression analyses control for childhood risk factors (e.g., low socioeconomic status, school problems) that may explain consequences in order to better isolate the impact of alcohol from those of shared risk factors. We also examine gender differences in the relationship between alcohol and consequences since previous work has found more deleterious effects of alcohol use disorders for women compared to men. Results show significant negative consequences of problem drinking in a variety of domains. As there is much to be learned about mitigating negative effects of problem drinking for African Americans, this research can contribute to the development of culturally relevant intervention programs that meet needs at different stages in the life course more effectively.

Association between Psychological Distress and Unintentional Non-occupational Injuries among U.S. Adults

Presenter: Christina Greene

Co-authors: 1) Jana McAninch - UMB, 2) Christina Greene - UMB, 3) Gordon Smith - UMB

Department/Center: Epidemiology and Human Genetics

Affiliation: University of Maryland, Baltimore

Funding Source: Meyerhoff Fellows Program, Graduate Program in Life Sciences

Abstract:

Background: Previous studies have demonstrated that individuals with mental illness have an elevated risk of intentional injuries, but the association between poor mental health and unintentional injuries is not well understood. Methods: We used the 2010 National Health Interview Survey to assess the association between psychological distress and the 3-month prevalence of unintentional non-occupational injury in adults. Psychological distress was measured by the Kessler Psychological Distress Scale, a validated scale that identifies community-dwelling persons with serious mental illness. Multivariable logistic regression was used to estimate adjusted odds ratios (AOR) and 95% confidence intervals. Results: Of the 27,157 participants, 2.5% (weighted %) reported a medically-attended unintentional injury in the past three months. Those with moderate and severe levels of psychological distress had 1.5 [1.2-1.9] and 2.1 [1.5-3.0] times higher odds of injury, respectively, as compared to those with low distress levels, after adjusting for age, sex, race, marital status, education level, alcohol use, physical functional limitation, presence of chronic disease, employment status, and health insurance status. Severe psychological distress was significantly associated with falls [AOR 2.3 (1.5-3.7)] and overuse/strain injuries [AOR 3.4 (1.4-8.1)] but not transportation-related injuries [AOR 1.7 (0.7-4.2)]. Conclusion: Among community-dwelling U.S. adults, psychological distress is significantly associated with unintentional non-occupational injury, and the magnitude of association increases with severity of distress. The association between psychological distress and injury may be particularly strong for fall and overuse/strain injuries. Screening for psychological

distress to identify and intervene in high-risk groups should be considered as part of prevention strategies for both intentional and unintentional injuries.

The Attitudes and Behaviors of Young Adults Regarding Provision of Alcohol to Underage Youth

Presenter: Olga Moshkovich

Co-authors: 1) Amelia M. Arria - UMCP, 2) Olga Moshkovich - UMCP, 3) Kimberly M. Caldeira - UMCP, 4) Kathryn B. Vincent - UMCP, 5) Brittany A. Bugbee - UMCP, 6) Kevin E. O'Grady - UMCP

Department/Center: Center on Young Adult Health and Development, Department of Family Science

Affiliation: University of Maryland, College Park

Funding Source: NIDA Grants P50-DA027841 and R01DA14845

Abstract:

Purpose: It is well known that a significant proportion of underage drinkers obtain alcohol from family, friends, and/or other acquaintances. Little data is available regarding the extent to which recently-turned 21-year-olds are approached to provide alcohol for their younger peers and how often they do so. This study aimed to understand the attitudes and behaviors of young adults related to providing alcohol to underage drinkers. Method: Participants were 756 individuals (mean age 23.1) originally enrolled as first-year college students in an ongoing prospective study who had been approached by someone under the age of 21 to provide alcohol at least once since the participants turned 21. Data were gathered on the total number of times they provided alcohol, and how provision related to the age of the recipient (18- to 20-years old or under 18 years) and their relationship to the recipient. Providers and non-providers were compared on demographic factors, drinking frequency, age at first drink, fraternity/sorority involvement, and perceptions of legal and health risks of provision. Results: The majority of young adults in the sample (84.5%) reported providing alcohol to someone under the age of 21, with fewer providing to someone under 18 (20.6%) than between the ages of 18 and 20 (82.7%). Young adults most commonly provided alcohol to friends, followed by family members, and less frequently to acquaintances or strangers. Males were more likely than females to provide alcohol, both for minors under 18 and for 18- to 20-year-olds. Past-month drinking frequency, younger age at first drink, and less perception of health and legal risks were also significantly associated with provision. Conclusions: These findings highlight that recently turned 21-year-olds represent a prevention target for strategies to reduce underage drinking. More research is needed to understand the motivations of young adults who provide alcohol to underage drinkers.

EEG Source Localization and Connectivity Estimation in Cognitive Motor Performance under Mental Stress Condition

Presenter: Hyuk Oh

Co-authors: 1) Hyuk Oh - UMCP, 2) Rodolphe J. Gentili - UMCP, 3) Michelle E. Costanzo - Uniformed Services Univ. of the Health Sciences, 4) Ronald N. Goodman - VA MERCE, UMB, 5) Li-Chuan Lo - UMCP, 6) Jeremy C. Rietschel - VA MERCE, 7) Mark Saffer - UMCP, 8) Bradley D. Hatfield - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Social-evaluation increases corticocortical connections and activation levels beyond those necessary for the motoric demands of the nonstressful tasks, and such excessive increases result in greater dysfluency of motor behavior. Although these findings have established critical links between motor performance under competitive pressure and excessively elevated neural activity, cortical network dynamics between distinct components in the nervous system during cognitive motor performance under varying conditions of mental stress still remain unclear. In this study, electroencephalographic (EEG) recording, shooting score, and motor performance measurements were obtained while participants performed a pistol shooting task under both performance-alone and competitive conditions. The multiple electric potentials that were recorded from the scalp were localized into a three-dimensional distribution of the generating neuronal sources by applying a low resolution brain electromagnetic tomography algorithm (LORETA). Then, network analysis approaches, based on graph theory measures between LORETA voxels, were employed in order to examine patterns of brain connectivity. The present results are consistent with those obtained in our previous study and suggest elevated statistical dependencies and causal interactions between motor and non-motor areas during the competitive condition. Such analysis provides a complementary approach to more traditional EEG derived metrics allowing for examination of informative brain dynamics during cognitive motor performance under varying conditions of mental stress.

The Longitudinal Causal Directionality between Body Image Distress and Self-Esteem among Korean Adolescents: The Moderating Effect of Relationships with Parents

Presenter: Woochul Park

Co-authors: 1) Woochul Park - UMCP, 2) Norman B. Epstein - UMCP

Department/Center: Family Science

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

This study examined the longitudinal relationship between self-esteem and body image distress, as well as the moderating effect of relationships with parents, among adolescents in Korea, using nationally representative prospective panel data. Regarding causal direction, the findings supported bidirectionality for girls, but for boys the association was unidirectional, in that their self-esteem predicted body image distress, but not vice versa. A gender difference also emerged in the moderating effect of quality of relationships with parents. For girls, relationships with parents moderated the effect of body distress on self-esteem, such that when relationships with parents were better, the effect of greater body image distress on subsequent lower self-esteem was stronger than when relationships with parents were less positive. For boys, relationships with parents moderated the influence of self-esteem on body image distress, such that self-esteem reduced body image distress more when boys had better relationships with parents. The present findings have important practical implications for educational or therapeutic programs for adolescents, namely taking client gender into account and including parent-child relationship components in the treatment/education package. These findings may help professionals develop more sensitive interventions to improve adolescents' well-being. Also, this study provides additional support for the link between body image distress and self-esteem through its longitudinal design and use of a nationally representative Asian sample.

Hepatitis C Knowledge and Risk Behaviors in Persons with Serious Mental Illness and Substance Dependence

Presenter: Elana Schwartz

Co-authors: 1) Elana Schwartz - UMB, 2) Melanie Bennett - UMB, 3) Alan Bellack - UMB

Department/Center: Division of Services Research, Department of Psychiatry, School of Medicine

Affiliation: University of Maryland, Baltimore

Funding Source: This work was supported by NIH grant R01 DA012265 from the National Institute of Drug Abuse and the VA Capital Network Mental Illness Research, Education, and Clinical Center (MIRECC; R. Goldberg, Ph.D. Director)

Abstract:

There are known behaviors that increase the risk of contracting Hepatitis C (Hep C), but it is unclear how prevalent these behaviors are among a critical high risk group: persons with dual serious mental illness (SMI) and substance dependence (SD). A better understanding of what information persons with SMI have about Hep C, as well as the rates of high risk behaviors and how rates differ by Hep C status (positive or negative) and gender in this group of substance abusers is critical to the development of effective prevention programming. In the present study we examined knowledge about Hep C in a sample of 136 adults with co-occurring SMI and SD who were participating in a substance abuse intervention trial. Participants were asked about their experiences getting tested for Hep C and receiving follow up care, as well as their knowledge regarding Hep C and the behaviors that put one at high risk for contracting it. Comparisons were made between the subsample of participants who were Hep C positive (n=33) and the total sample, as well as between males and females. Overall, most participants had good basic knowledge about Hep C and its health impacts, and generally knew the drug related behaviors that put someone at risk for contracting the illness. However, many participants reported engaging in these high risk behaviors, which were especially common among those who tested positive for Hep C. Most of those who tested positive reported being provided little in the way of education or treatment for Hep C following testing. Gender comparisons showed that males showed greater rates of injection drug use and female reported higher rates of trading sex for shelter. Implications of these findings for treatment and prevention efforts with persons with SMI and SD are discussed.

Anxiety's Effect on Performance in an Attention Task

Presenter: Claire C. Stevens

Co-authors: 1) Claire C. Stevens - UMCP, 2) Bartlett A.H. Russell - UMCP, 3) Bradley D. Hatfield - UMCP

Department/Center: Kinesiology

Affiliation: University of Maryland, College Park

Funding Source: Graduate Research Initiative Project (GRIP) department of Kinesiology, UMD-College Park

Abstract:

Stress and anxiety are common features of the modern workplace. It has been estimated that anxiety and anxiety-related disorders account for almost a third of total expenditures for mental illness in the U.S. and most of that cost is attributed to lost workplace productivity. Yet how anxiety affects performance in different contexts remains unclear. This study examined the effects of stress on performance in high- and low-stress situations. We measured the performance of college-age adults (N= 50) on a simple sustained attention task under "threat" (risk of mild, unpredictable shock) and "safe" (no risk of shock) conditions. Because some individuals are more sensitive to stress and anxiety than others, we also compared the performance of those with high and low Trait Anxiety.

Imaging for White Matter Alterations in Chronic Cocaine Dependents

Presenter: Wang Zhan

Co-authors: 1) Wang Zhan - UMCP, 2) Hong Gu - NIH, 3) Yihong Yang - NIH

Department/Center: Maryland Neuroimaging Center

Affiliation: University of Maryland, College Park

Funding Source: NIH

Abstract:

Neuronal dysfunctions associated with cocaine additions have been widely reported inside and outside the dopaminergic reward system, yet the structural basis for the abnormal circuitry responses is largely unknown. A diffusion tensor imaging (DTI) study was performed using larger group sizes and more comprehensive subject characterizations to investigate the white matter (WM) alteration patterns in chronic cocaine users. We found that the direction of the FA alteration and its correlations with a cocaine dependence index vary across multiple regions inside and outside the dopaminergic system, which would elaborate more neuronal mechanisms of the cocaine dependence. The critical role of mesolimbic reward system in cocaine dependence has been well established, however, the structural basis for the dopamine circuitry responses is largely unknown. By using larger group sizes and more comprehensively characterized subjects, the present study would provide more specific and reliable observations to how the cerebral WM structures would respond to the chronic cocaine addictions. Our data suggest that the CU-related WM integrity alterations do occur in both directions in a regionally selective pattern, and that the across-subject correlations in CU between FA and cocaine dependence index CD*UY are generally consistent with the group comparison results, especially for regions with increased FA in CU. Thus we further hypothesize that the increased FA in those regions might reflect a neuronal plasticity mechanism toward compensating the impaired functions in the circuitry. The next step of the study will be performed to test this hypothesis by incorporating DTI, fMRI and resting-state fMRI network analysis.

INFECTIOUS DISEASES

Mechanism of HIV Reverse Transcriptase Inhibition by Zn²⁺

Presenter: Vasudevan Achuthan

Co-authors: 1) Vasudevan Achuthan - UMCP, 2) Katherine Fenstermacher - UMCP, 3) Jeffrey DeStefano - UMCP

Department/Center: Molecular & Cellular Biology

Affiliation: University of Maryland, College Park

Funding Source: NIH RO1 GM051140

Abstract:

HIV reverse transcriptase (RT), like other polymerases, requires a divalent cation, Mg²⁺, as a co-factor to carry out efficient catalysis. The catalysis step of HIV reverse transcriptase (RT) is an attractive target for antiretroviral drug therapy of HIV-1. Alternative divalent cations, such as Ca²⁺, Mn²⁺, and Zn²⁺, can inhibit Mg²⁺-dependent RT catalysis. Zn²⁺ especially is a potent inhibitor of RT catalysis, possibly by displacing one or more Mg²⁺ ions bound to the enzyme. However, as we have recently shown, Zn²⁺ still facilitates the polymerase and RNase H activities of RT. In the presence of Zn²⁺, RT binds the primer-template complex much more stably than with Mg²⁺ (half life of 220 ± 60 min and 1.7 ± 1.0 min respectively). The RT nucleotide (nt) incorporation rate is greatly reduced in the presence of Zn²⁺, with a maximum of 0.1 nt/sec compared to 3.5 nt/sec with Mg²⁺. Despite this, the processivity of RT (average number of nucleotides added in a single binding event) is only modestly affected, as RT-Zn²⁺ remains bound to primer-template complexes for several hours and continues nucleotide incorporation. This implies that RT inhibition by Zn²⁺ is due to formation of a stable complex with slow incorporation kinetics and not direct inhibition of nucleotide incorporation. This slow kinetics of RT in Zn²⁺ could possibly alter its fidelity, and our preliminary data suggests that the fidelity of RT increases with Zn²⁺. Analysis using alpha complementation assays indicated 2-4 fold greater fidelity with Zn²⁺. Preliminary data from mismatch extension assays and running start assays also indicates the same. Investigation of the mechanism of inhibition of HIV by Zn²⁺ and other divalent cations could prove to be important in designing future RT inhibitors and anti-viral therapies. Although other cations should be investigated, Zn²⁺ is particularly interesting because it has relatively low toxicity and has been investigated as a component of topical ointments to inhibit viral infection including retroviruses. Additionally, Zn²⁺ could possibly be used to increase the fidelity of in vitro assays using commercially available RTs.

Optimizing In Vitro Reverse Transcription Reactions to More Closely Mimic the Cellular Environment

Presenter: Katherine J. Fenstermacher

Co-authors: 1) Katherine J. Fenstermacher - UMCP, 2) Jeffrey J. DeStefano - UMCP

Department/Center: Cell Biology and Molecular Genetics

Affiliation: University of Maryland, College Park

Funding Source: NIH/NIAID General Medicine

Abstract:

One difficulty with in vitro reverse transcriptase reactions is that the enzyme has reduced fidelity and extension efficiency when compared to RT in virion reverse transcription complexes in vivo. We have demonstrated that using an alternative cation (Zn²⁺, a known potent inhibitor, instead of Mg²⁺, the physiologically relevant cation) in extension reactions results in a remarkably different RT phenotype. The rate of nucleotide incorporation is greatly reduced: Mg²⁺ reactions incorporate a maximum of 3.5 nt/sec, while Zn²⁺ reactions are significantly slower (0.1 nt/sec) and evidence suggests that Zn²⁺ is able to displace Mg²⁺ from co-factor binding sites on the RT, even when 5-fold less abundant. Surprisingly, this dramatic reduction in incorporation rate only results in a modestly reduced processivity (average # nt incorporated in a single binding event); the half-life of a RT-Mg²⁺-primer-template complex is 1.7 ± 1 min, while a Zn²⁺ complex has a half-life of 220 ± 60 min (a 130-fold increase in stability). This implies that the inhibition of reverse transcription by Zn²⁺ is due to the formation of catalytically competent and highly stable RT-primer-template complexes with profoundly slowed progression. We believe that these gross phenotypic changes hold a clue to the more subtle differences between RT extensions in vitro and in the cell, which may also shed light on a potential avenue for RT inhibition in future anti-retroviral therapeutic developments.

Drug Delivery by Novel Cucurbit[n]uril-Type Molecular Containers

Presenter: Gaya Hettiarachchi

Co-authors: 1) Gaya Hettiarachchi - UMCP, 2) Da Ma - UNC, 3) Duc Nguyen - UMB, 4) Lyle Isaacs - UMCP, 5) Volker Briken - UMCP

Department/Center: Cell Biology and Molecular Genetics

Affiliation: University of Maryland, College Park

Funding Source: State of Maryland (Nano-Biotechnology Initiative 2009 and the Maryland Technology Development Corporation, TEDCO) to V. Briken and L. Isaacs. Dr. Issac's lab is also funded by NSF grant CHE-0615049. D. Nguyen was supported by an undergraduate fellowship from the HHMI.

Abstract:

Background: Many drug delivery systems are based on the ability of certain macrocyclic compounds – such as cyclodextrins – to act as molecular containers for pharmaceutical agents in water. Cucurbit[n]urils (CB[n]) are a class of molecular containers that bind to a variety of cationic and neutral species with high affinity ($K_a > 10^4$ M⁻¹) and therefore show great promise as a drug delivery system. Initial in vitro toxicity analysis demonstrated good biocompatibility of five different CB[n]-type compounds. We hypothesized that these nanocontainers can be used to increase solubility of hydrophobic small chemical compound drugs. Methodology: In this study we investigated the toxicology and bioactivity of one novel cucurbit[n]uril CB[n]-type container (named Motor1). The container induced no toxicity at concentrations of up to 10 mM in human cell lines originating from kidney, liver or blood tissue using assays for metabolic activity and cytotoxicity. Furthermore, the Motor1 container was tolerated in mice without any toxicity after intravenous dosing of up to 1.5g/kg bodyweight. Interestingly, Motor1 was able to bind the cancer drug paclitaxel/taxol and increase its solubility in water by a factor of 2000. Furthermore, Motor1 bound to three additional drugs and increased their aqueous solubility by 700fold (Melfalan), 400fold (Cinnarizine) and 1200fold (Clopidogrel). Finally, bioactivity assays showed that the increase in solubility by paclitaxel via Motor1 led to a more efficient killing of the cervical cancer cell line HeLa. Conclusion: Our study reveals very low toxicity of a novel member of the cucurbit[n]uril family of nanocontainers. It demonstrates the increase in solubility of four commercially available drugs by the containers by factors ranging from 400-2700fold. Importantly, the increase in solubility of paclitaxel/taxol led to increased killing of cancer cells in vitro. These results provide initial proof-of-concept towards the use of CB[n] molecular containers as an advanced drug delivery system for the treatment of cancer.

Quantitative Polymerase Chain Reaction for Detection of Shigella Improves Ascertainment of Shigella Burden in Children with Moderate to Severe Diarrhea in Low Income Countries

Presenter: Brianna Lindsay

Co-authors: 1) Brianna Lindsay - UMB, 2) Ben Ochieng - KEMRI/CDC, 3) Usman Ikumapayi - Medical Research Council, Basse, the Gambia, 4) Toure Aliou - Centre pour le Development des Vaccins du Mali, Bamako, Mali, 5) Dilruba Ahmed - International Center for Diarrheal Disease Research, Mirzapur, Bangladesh, 6) Shan Li - UMB, 7) Sandra Panchalingam - UVA, 8) Myron M. Levine - UMB, 9) Karen Kotloff - UMB, 10) David A. Rasko - UMB, 11) Carolyn R. Morris - UMB, 12) Jane Juma - KEMRI/CDC, 13) Barry S. Fields - KEMRI/CDC, 14) Michel Dione - Medical Research Council, Basse, The Gambia, 15) Dramane Malle - Centre pour le Development des Vaccins du Mali, Bamako, Mali, 16) Stephen M. Becker - UVA, 17) Eric R. Houpt - UVA, 18) James P. Nataro - UVA, 19) Halvor Sommerfelt - University of Bergen, 20) Mihai Pop - UMCP, 21) Joe Oundo - KEMRI/CDC, 22) Martin Antonio - Medical Research Council, Basse, The Gambia, 23) Anowar Hossain - International Center for Diarrheal Disease Research, Mirzapur, Bangladesh, 24) Boubou Tamboura - Centre pour le Development des Vaccins du Mali, Bamako, Mali, 25) O. Colin Stine - UMB

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: Bill and Melinda Gates Foundation

Abstract:

Estimates of Shigella prevalence are limited by suboptimal sensitivity of current methods. We used a quantitative (Q)PCR assay to detect Shigella in stools of 3,533 children aged less than 59 -months from The Gambia, Mali, Kenya and Bangladesh, with or without moderate to severe diarrhea (MSD). We compared the results of conventional culture to those of QPCR for the Shigella ipaH gene. Using MSD as the reference standard, we determined the optimal cut point to be 2.9×10^4 ipaH gene copies per 100 ng of stool DNA for Set 1 (N=877). One-hundred and fifty-eight (18%) samples specimens yielded greater than 2.9×10^4 ipaH gene copies. Ninety (10%) specimens were positive by traditional culture for Shigella. Individuals with a value of $>2.9 \times 10^4$ have 5.6 times higher odds of having diarrhea compared to those with values $<2.9 \times 10^4$ (95%CI 3.7-8.5; $p < 0.0001$). Nearly identical results were found using an independent set of samples. QPCR detected 155 additional MSD cases with high copy numbers of ipaH, a 90% increase from the 172 cases detected by culture within both samples. Among a subset (N=2,874) comprising MSD cases, and age-, gender- and location-matched controls, the fraction of MSD cases attributable to Shigella infection increased from 9.6% (N=129) for culture to 17.6% (N=262) for QPCR employing our cut-point. We suggest that QPCR with a cut-point of approximately 1.4×10^4 become the new reference standard for the detection and diagnosis of Shigellosis in children in low-income countries. Acceptance of a new standard would substantially increase the fraction of MSD attributable to Shigella.

AI-2 Analogs and Antibiotics: A Synergistic Approach to Reduce E. coli Biofilms in a Microfluidic Setting

Presenter: Mariana Meyer

Co-authors: 1a) Mariana Meyer - UMCP, 1b) Varnika Roy - UMCP, 2) Jacqueline Smith - UMCP

Department/Center: MEMS Sensors and Actuators Laboratory

Affiliation: University of Maryland, College Park

Funding Source: Robert W. Deutsch Foundation, National Science Foundation Emerging Frontiers in Research and Innovation (NSF-EFRI)

Abstract:

Bacteria form complex aggregates of cells encased in thick polymeric matrices called biofilms. Biofilms are a protective cover for bacteria to evade antibacterial agents and are a significant contributor to the growing concern of antibiotic resistance. Quorum sensing (QS), the process of cell-cell autoinducer mediated signaling in bacteria facilitates biofilm formation. One such autoinducer-2 (AI-2) is known as the 'universal signaling molecule' due to its ubiquitous presence in over 70 species of bacteria. QS inhibitors that prevent biofilm formation and thus make bacteria more susceptible to antibiotics will help answer the call for new alternative antimicrobial therapies. We synthesized a panel of synthetic C1-alkyl AI-2 analogs and used them to inhibit QS responses in various bacteria. In this study we demonstrate the ability of Isobutyl-DPD, one such AI-2 analog, to significantly decrease growth of *E. coli* biofilms in an in vitro microfluidic flow cell. We also show that a synergistic approach where Isobutyl-DPD is used in combination with the antibiotic gentamicin is the most effective in causing near-complete clearance of pre-existing *E. coli* biofilms. Clearance of pre-existing biofilms is of high medical relevance as biofilms are seen in 80% of human infections. Due to prevalence of AI-2 pathogenicity, AI-2 analogs used in a combination with antibiotics have the potential of being broad spectrum biofilm inhibitors. These analogs can be added to the toolbox of developing next generation antimicrobials.

CANCER PREVENTION AND CONTROL

The Effect of Cultural Views on Colorectal Cancer Screening Behavior among Asian Americans in the Washington, D.C. Metropolitan Area

Presenter: Mary Jung

Co-authors: 1) Mary Jung - UMCP, 2) Hee-Soon Juon - JHU, 3) Xin He - UMCP, 4) Sunmin Lee - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: National Cancer Institute (R25CA129042)

Abstract:

Objective: To evaluate the influence of Asian cultural views of health and cancer on colorectal cancer screening behavior among Asian Americans in the Washington, D.C. metropolitan area. **Methods:** A cross-sectional examination was conducted of 858 Chinese, Korean, and Vietnamese adults. Asian cultural views were measured using a 16-item cultural views scale, which consisted of fatalism, self-care, herb use, and Western medicine use subscales. The Asian cultural views scores were examined as continuous and categorical variables. To assess the outcome, participants self-reported colorectal cancer screening behaviors. Logistic regression was used to investigate the relationship between Asian cultural views and colorectal cancer screening. **Results:** When examining Asian cultural views as a continuous variable, the association between herb use and colorectal screening remained significant while becoming marginally significant for self-care after adjusting for age. With a 10-point increase in the herb use and self-care subscales, there was a 12% (OR=0.88; 95% CI:0.82-0.97) and 7% (OR=0.93; 95% CI:0.87-1.00) decreased likelihood, respectively, for an individual to have received screening. When cultural views were categorized into tertiles (Asian, Neutral, and Western), herb use and self-care were both significantly associated with the outcome and showed a gradient effect after adjusting for age. For example examining herb use, there was a 78% decreased odds of receiving colorectal cancer screening among those with more Asian cultural views than those with more Western cultural views (OR=0.22; 95% CI:0.06-0.77), whereas there was a 32% decreased odds for individuals with Neutral cultural views than those with more Western cultural views (OR=0.68; 95% CI:0.47-0.99). After adjusting for age, the association between most of the Asian cultural views scores and colorectal cancer screening became marginally significant or insignificant. **Conclusions:** Findings from this study suggest that culturally appropriate interventions that address specific cultural views of cancer can potentially increase colorectal cancer screening among Asian Americans.

Making an M-PACT: A Faith-Based CPBR Intervention to Increase African American Men's Informed Decision Making

Presenter: Daisy Le

Co-authors: 1) Daisy Le - UMCP, 2) Darlene R. Saunders - UMCP, 3) Cheryl L. Holt - UMCP, 4) Bettye Muwakkil - Access to Wholistic and Productive Living Institute Inc., 5) Ralph Williams - Access to Wholistic and Productive Living Institute Inc., 6) Jimmie Slade - Community Health Ministry of Prince George's County, 7) Min Qi Wang - UMCP, 8) Tony L. Whitehead - UMCP, 9) Nancy L. Atkinson - National Cancer Institute, 10) Emily Schulz - A.T. Still Univ., 11) Michael Naslund - JHU

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: American Cancer Society, Grant No. 119421-RSGT-10-113-01-CPPB

Abstract:

African American men are 60% more likely to develop prostate cancer and are twice more likely to die from this disease than European-American men. At the same time, more than half of African Americans (53%) reported attending religious services at least once a week in a recent study conducted by Pew Forum on Religion & Public Life (2010). The objective of the Men's Prostate Awareness Church Training (M-PACT) project is to develop and evaluate a spiritually-based 4-part workshop series focused on informed decision-making for prostate cancer screening among African American men. Following a community-based participatory research (CBPR) approach, the M-PACT project actively worked with members from the community to develop program activities and educational materials for the intervention. The project frames health messages with spiritual themes, involves female health partners, and incorporates health information technology. Forty community health advisors from 20 participating Prince

George's County churches are being trained with these messages and materials, and will implement the 4-part men's health series for participants from their congregations. Findings from the formative and pilot phases of this randomized controlled trial and lessons for designing culturally relevant interventions for African American men will be discussed.

Project HEAL: Development of an Online Training to Promote Cancer Early Detection in African American Churches

Presenter: Sherie Lou Z. Santos

Co-authors: 1) Sherie Lou Z. Santos - UMCP, 2) Cheryl L. Holt - UMCP, 3) Erin K. Tagai - UMCP, 4) Min Qi Wang - UMCP, 5) Janice Bowie - JHU, 6) Muhiuddin Haider - UMCP, 7) Mary Ann Scheirer - Scheirer Consulting, 8) Jimmie Slade - Community Ministry of Prince George's County, 9) Tony Whitehead - UMCP

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: This research is funded by the National Cancer Institute (#1 R01 CA147313).

Abstract:

African Americans suffer a disproportionate burden from breast, prostate, and colorectal cancer. Faith-based approaches have been increasing in the effort to raise awareness and early detection for these cancers in African American communities. However, significant gaps exist between research and sustainable practice. Utilizing novel health communication efforts in today's fast-changing technological environment, the potential to close the gap between research discovery and program delivery promises a significant impact on the elimination of disparities in cancer early detection. The objective of the Health through Early Awareness and Learning (HEAL) Project is to identify an optimal implementation strategy in the context of behavioral translational research. HEAL utilizes a set of evidence-based interventions (EBI) that aim to increase early detection of breast, prostate, and colorectal cancer among African Americans. Informed by an advisory panel of community leaders and a multidisciplinary project team, the three EBIs were interwoven into a single branded package with two delivery methods for training Community Health Advisors (CHAs): 1) a traditional live training session and 2) utilization of technological resources. An online delivery system mirrors each aspect of the live training to provide CHAs a training curriculum consisting of: informed consent, memorandum of understanding, 13 content-specific presentation videos, and CHA certification after passing a knowledge exam. Once certified, all CHAs will lead a 3-part cancer education workshop series in his/her church. Pilot test findings from the CHA training and church-based workshops are discussed here. The overall Project HEAL intervention will be evaluated using the RE-AIM framework to determine factors for successful implementation and sustainability.

Men's Prostate Cancer Awareness Church Training (M-PACT) Project: Process Evaluation & Technology Integration

Presenter: Darlene R. Saunders

Co-authors: 1) Darlene R. Saunders - UMCP, 2) Cheryl L. Holt - UMCP, 3) Daisy Le - UMCP, 4) Nancy Atkinson - Westat, 5) Tony L. Whitehead - UMCP, 6) Jimmie Slade - Community Ministry of Prince George's County, 7) Betty Muwwakkil - ACCESS To Wholistic & Productive Living, 8) Ralph Williams - ACCESS to Wholistic & Productive Lining, 9) Emily Schulz - A.T. Still Univ., 10) Michael Naslund - UMB

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: American Cancer Society

Abstract:

African American men are more likely to develop prostate cancer and are twice as likely to die from this disease than are White men. Due to limited evidence of the impact of screening on mortality, educational interventions focus on informed decision making (IDM), where men assess their personal risk, and become aware of the pros and cons of screening. The M-PACT Project aimed to develop and evaluate a spiritually-based educational intervention to increase IDM for prostate cancer screening. Community health advisors were trained and certified by the M-PACT research team in 20 churches to deliver a 4-part workshop series to African American men in church settings. M-PACT uses a community based participatory research approach that led to the inclusion of a health information technology (HIT) component in which participants receive a series of text messages that serve as 1) reminders about upcoming workshops; 2) post-workshop content reinforcement; 3) spiritual uplifting health content; and 4) between-workshop retention strategies. The text message strategy is being tested for feasibility and acceptability with this population which has generally been overlooked by HIT approaches due to the digital divide. The second major component identified by the CBPR process was the inclusion of women Health Partners. A randomized design was employed where half of the churches were assigned to receive the Health Partner condition and the other half were assigned to male-only workshops. Impact on the primary outcome of IDM will be assessed. The M-PACT intervention components, including the use of text messaging and role of women as health partners will be described. Baseline data, text message feasibility/acceptability, from pilot of health partner condition showed positive effects and will be presented.

Up-to-date Long-term Survival of Older Adult Patients with Lung Cancer: Period Analysis

Presenter: Ying Tang

Co-authors: 1) Ying Tang - UMB, 2) Gordon Smith - UMB

Department/Center: Kinesiology

Affiliation: University of Maryland, Baltimore

Funding Source: N/A

Abstract:

Objective: To estimate up-to-date long-term survival proportion and relative survival ratio (RSR) of older adults with lung cancer. Methods: SEER cancer registry data were used to identify older adults with newly diagnosed lung cancer between 1973 and 2008. Selection criteria: (1) age \geq 65 at cancer diagnosis; (2) first primary lung cancer, microscopically confirmed; (3) active follow-up after diagnosis; (4) non-missing race and sex information. Patient's vital status (dead or alive) and follow-up time between diagnosis and death, loss to follow-up, or the censoring date of December 31, 2008, were recorded. Period analysis was employed to calculate observed long-term survival proportion. Expected number of deaths from all causes was obtained by applying population mortality rates to the cancer population, which is used for calculation of expected survival proportion. Finally, RSR was calculated as the ratio of the observed to the expected survival proportions. Results: 5-year RSRs during 2000-2008 by age groups are: 22.2% in 40-44 year-old, 20.4% in 45-54, 20.0% in 55-64, 17.7% in 65-74, and 14.0% in 75+. During 2000-2008, among older patients aged 65 or over, 5-year RSRs were 18.7% and 13.6% among females and males, 16.3%, 11.5%, and 17.2% among whites, blacks, and other races, respectively. Five-year RSR of older patients was 50.2%, 22.2%, 3.2%, and 9.1% for localized, regional, distant, and un-staged lung cancers. Conclusion: Long-term survival of older patients with lung cancer has improved over the years between 1973 and 2008. However, RSRs decrease with increasing age, with older patients having lower RSR compared to younger lung cancer patients. Among older patients, females had higher RSR than males; Whites had higher RSR than Blacks; Localized lung cancer had the highest RSR, followed by regional, un-staged lung cancer, with the lowest survival among distant lung cancer.

ENVIRONMENTAL HEALTH, ENVIRONMENTAL JUSTICE

Review: Aflatoxin Interventions in West Africa: The Critical Role of Extended Breastfeeding

Presenter: Stephanie Carey

Co-authors: 1) Barbara Z. Pasturel - UMCP, 2) Stephanie Carey - UMCP, 3) Christopher Caler - UMCP, 4) Paul C. Turner - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Fungal toxins also known as mycotoxins are contaminants of cereal crops that occur throughout the world. Aflatoxins are one of the most important families of mycotoxins in tropical regions; in fact approximately 4.5 billion persons live in at risk regions. Chronic high levels of exposure are especially important in poor rural subsistence farming populations reliant on dietary staples including maize and groundnuts. Aflatoxins were classified as Class 1 liver carcinogens by IARC responsible for about 20-100 thousand cancers annually. Stunting and immune suppression have additionally been associated with chronic aflatoxin exposure, perhaps affecting tens of millions of children. Aflatoxin-albumin exposure biomarkers were used to monitor the changes in aflatoxin exposure in several distinct studies from West Africa that are reviewed here. The overwhelming message is that breast feeding provides a period of relative protection, but four distinct transitions occurred: (a) Aflatoxin-albumin adducts were significantly higher in infants where weaning foods were introduced (partially weaned). (b) Aflatoxin-albumin adducts were significantly higher in infants who were fully weaned compared to those who were partially weaned; (c) In a longitudinal survey aflatoxin-albumin adduct level at any time point was significantly higher in those infants that had been fully weaned earlier; (d) Whilst the timing of weaning varies, once fully weaned aflatoxin-albumin adducts remain high. In all of these studies aflatoxin-albumin was significantly associated with stunting or reduced growth velocity. Reducing aflatoxin contamination of dietary staples will be valuable, but it appears no individual approach will reduce exposure to safe levels. Given that early life exposures are critical in the etiology of aflatoxin driven disease and that some at risk populations initiate weaning foods at a very early age (8-12 weeks), educational programs to support extended duration of breast-feeding may be valuable to additionally protect against aflatoxin exposure.

Characterization of Pathogenic *Vibrio parahaemolyticus* from the Chesapeake Bay, Maryland

Presenter: Arlene Chen

Co-authors: 1) Arlene Chen - MPRI-UMD, 2) Nur Hasan - MPRI-UMD, 3) Bradd Haley - MPRI-UMD, 4) Elisa Taviani - MPRI-UMD, 5) Seon Young Choi - MPRI-UMD, 6) Steve Hiner - MDE, 7) Rusty McKay - MDE, 8) David White - MDNR, 9) Mitch Tarnowski - MDNR, 10) Kathy Brohawn - MDE, 11) Crystal Johnson - LSU, 12) Jay Grimes - USM, 13) Anwar Huq - MPRI-UMD, 14) Rita Colwell - MPRI-UMD

Department/Center: Cell Biology and Molecular Genetics /Maryland Pathogen Research Institute (MPRI)

Affiliation: University of Maryland, College Park

Funding Source: This research was supported by NSF grant EF-0813066 as part of the joint NSF-NIH Ecology of Infectious Diseases program. Partial support was also received from NIH grant #2RO1A1039129.

Abstract:

Vibrio parahaemolyticus is the leading cause of bacterial gastroenteritis associated with seafood consumption in the United States. The two major virulence factors, thermostable direct hemolysin (tdh) and thermostable direct hemolysin-related hemolysin (trh), are commonly employed to describe its pathogenicity. Here we sought to investigate the virulence and genetic diversity of *V. parahaemolyticus* isolated from the Chesapeake Bay. Water, oyster and sediment samples were collected from two study sites in the Chesapeake Bay of Maryland, Chester River and Tangier Sound. Presumptive identification of *V. parahaemolyticus* by culture was confirmed by species-specific PCR. Next, multiplex and group specific PCRs were

used for genotyping, followed by serotyping using the *V. parahaemolyticus* antiserum test kit. Pulsed-field gel electrophoresis (PFGE) of SfiI-digested DNA was performed using Pulse-Net protocol followed by multiple-locus variable nucleotide tandem repeat (MLVA) analysis. The study includes samples that were gathered from June 2009, until December 2010. Of more than 1,100 presumptive isolates, 591 *V. parahaemolyticus* were confirmed using a multiplex PCR targeting the *toxR* gene. Among them, a total of 10 strains contained both the virulence encoding genes *tdh* and *trh*, whereas six contained only *trh* gene. All 16 strains were negative for pandemic marker genes, *GS* or *ORF8* by PCR, but displayed β hemolysis on blood agar. *V. parahaemolyticus* investigated in this study contained a multitude of serogroups including 13 "O" and 71 "K" serogroups whereas the predominate serotype was detected to be O1:KUT and O3:KUT. Dendrogram constructed with PFGE images demonstrated high diversity among the sixteen strains, an observation also / evident by multiple-locus VNTR analysis (MLVA) displaying high variability among the 10 VNTR loci. This study suggests that the characteristics of pathogenic *V. parahaemolyticus* were highly variable and the percentage of pathogenic to non-pathogenic *V. parahaemolyticus* was low. However, it is important to note that pathogenic forms of *V. parahaemolyticus* are present in the Chesapeake Bay and an active monitoring is recommended to prevent disease occurrence from consumption of seafood deviated from the bay.

Mobilome Analysis of *Yersinia pestis* using Comparative Genomics

Presenter: Seon Young Choi

Co-authors: 1) Seon Young Choi - UMCP, 2) Nur A. Hasan - UMCP, 3) Jongsik Chun - SNU, 4) Thomas A. Cebula - JHU, 5) Anwar Huq - UMCP, 6) Rita R. Colwell - UMCP, JHU

Department/Center: Maryland Pathogen Research Institute

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Yersinia pestis, a Gram-negative bacterium, is the causative agent of plague, responsible for three recorded human pandemics in history. Historically, *Y. pestis* strains have been subdivided into classical biovars (bv.) *Orientalis*, *Medievalis* and *Antiqua*. Currently, two groups of atypical *Y. pestis*, *Pestoides* and *Microtus* are classified as new biovars. All of the 24 available *Y. pestis* genomes were included in phylogenetic analysis and genomic island (GI) identification. *Y. pestis* exhibits both low genetic diversity and evolutionary rate, evidenced by very shallow branch lengths in its core genome phylogeny. All eight bv. *Orientalis* strains formed a monophyletic clade, while bv. *Antiqua* strains distributed into three subgroups. Four bv. *Medievalis* and bv. *Antiqua* Nepal516 comprised a single clade. Fourteen GIs were identified in *Y. pestis*, using a definition for GI as comprising five or more contiguous ORFs. The previously identified high pathogenicity island, HPI and regions associated with pathogenicity were detected, but most of the observed GIs were novel. Whereas all bv. *Medievalis* strains and bv. *Antiqua* Nepal516 were GI-01 (14kb) negative, GI-07 (8kb) was present in the bv. *Orientalis* strains. Most of the GIs harbored IS elements and FV-1, isolated in the USA had elements of the type IV secretory pathway. However, its precise genomic location has not yet been determined. This study provides evidence that, despite having extremely low genetic diversity, several genome rearrangements have shaped *Y. pestis*. Furthermore, a starting point for phylogenetic and mobilome dynamics analysis in *Y. pestis* has been provided. We expect that, as additional strains are analyzed, more GIs and genome rearrangements in *Y. pestis* will be discovered.

Influenza Virus Aerosols in Human Exhaled Breath: Particle Size, Culturability, and Effect of Surgical Masks

Presenter: Michael L. Grantham

Co-authors: 1) Donald K. Milton - UMCP, 2) M. Patricia Fabian - Harvard Univ., 3) Benjamin J. Cowling - Univ. of Hong Kong, 4) Michael L. Grantham - UMCP, 5) James J. McDevitt - Harvard Univ.

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: Centers for Disease Control and Prevention cooperative agreements 1U01CI000446 and 1U01IP000497, NIH grant RC1AI086900, and the U.S. Federal Aviation Administration (FAA) Office of Aerospace Medicine through the Air Transportation Center of Excellence for Airliner Cabin Environment Research (Cooperative Agreement 04-C-ACE-HU and 07-C-RITE-HU) via a subcontract from Auburn University (#06-ACER-207814).

Abstract:

Surgical masks are part of the recommended personal protective equipment to decrease transmission of influenza A virus from patient to staff in a health care setting. However, prior to the the work described in this poster, little was known about the ability of influenza patients to produce infectious aerosols, or the effect of surgical masks on shedding of virus-laden aerosols. Exhaled breath particles in two size fractions (<5 micron and > 5 micron) were collected from volunteers with active influenza infection either while wearing a surgical mask or without a mask. The samples were assayed for total and infectious virus. Fine particle fractions contained 8.8 more virus than course fractions, and surgical masks reduced virus shed in the fine fraction nearly 3-fold. Infectious virus was detected in the fine particle fractions of two subjects. These data indicate that persons with influenza shed virus in aerosol fractions, including fine particle fractions, and that while surgical masks do not prevent all virus shedding in the fine particle fraction, they may serve as an important means of source control.

Disparities, Hazards, and Health: A Maryland Assessment of Brownfields

Presenter: Chengsheng Jiang

Co-authors: 1) Rianna Murray - UMCP, 2) Chengsheng Jiang - UMCP, 3) Hongmei Zhang - UMCP, 4) Sacoby Wilson - UMCP, 5) Rebecca Rehr - US EPA

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Background: The purpose of this study was to assess spatial disparities in the distribution of brownfields across Maryland to determine whether certain racial/ethnic or socioeconomic groups are differentially burdened by these sites in their communities and further evaluate possible disparities in health care infrastructure in communities impacted by brownfields. Methods: The FRS 2010 brownfield state file was obtained from the US EPA's ACRES Geospatial Data Download Service. US census tract and block level data (2010) were used to enumerate population and community-level characteristics such as race/ethnicity, poverty and employment status, education, home ownership, home built before 1950, and urban area. Additional measures were used to assess segregation (Diversity Index), deprivation (Townsend index), SES (median household income), and health care infrastructure (Health Professional Shortage Areas (HPSA)). Geographic Information System (GIS) were used to map the distance between brownfields and closest census tracts. Spatial methods (mean distance analysis, buffer analysis, and spatial approximation) were employed and regression analysis was performed to evaluate the relationship between the distribution and number of brownfields and the aforementioned factors. Results: Low income and non-white census tracts were located closer to brownfields. A 10% increase in black or non-white populations in census tracts decreased the distance of the census tracts to brownfields by 0.5 or 0.4 km. In contrast, increasing the white population would increase the distance to a brownfield by 0.4 km. In urban areas, the HSPA census tracts were located closer to a brownfield by 2.81 km when compared to non-HSPA census tracts (p-value = <0.001) while rural areas were located closer to a brownfield by 5.16 km (p-value = 0.054). Conclusion: Disparities exist in the distribution of brownfields in regards to race/ethnicity, SES, segregation, and access to health care infrastructure.

Segregation Indices, Air Toxics, and Cancer Risk: A South Carolina Analysis

Presenter: Chengsheng Jiang

Co-authors: 1) Sacoby Wilson - UMCP, 2) Hongmei Zhang - USC, 3) Kristen Burwell - UMCP, 4) Dayna Campbell - USC, 5) LaShanta Rice - USC, 6) Ashok Samantapudi - USC, 7) Edith Williams - USC, 8) Charles Beverly - USC, 9) Laura Dalemarre - UMCP, 10) Chengsheng Jiang - UMCP, 11) Charles Naney - UMCP, 12) Rianna Murray - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: NIH, grant numbers 1R21ES017950-01 and 3P20MD001770-07S1

Abstract:

Background: The purpose of this study was to assess cancer risk disparities in SC using the USEPA's National Air Toxics Assessment (NATA) data and additional indicators such as sociodemographic characteristics from the 2000 US Census Bureau and Segregation (including Dissimilarity and Isolation Indices), Townsend, and Diversity Index. Methods: NATA risk data for varying risk categories were linked with 2000 census data and analyzed using R. Simple linear regression between indices or sociodemographic variables and cancer risk were used to quantify relationships while controlling for urban-rural effects. Percent high cancer risk tracts (cancer risk > 90th percentile of all tracts) were calculated in each quartile for every index and sociodemographic variable. Relative risk and 95% confidence intervals (CI) were estimated by comparing the first quartile with the latter three quartiles. The level of significance for differences in the percent high cancer risk between the first and latter quartiles was calculated for major, area, on-road, and non-road source cancer risk. Results: The cancer risk for 95% of tracts was 42/million which is lower than the national average (50/million). Cancer risk from on-road sources greatly contributed to all source risk when excluding background sources. There were no significant differences in percent high major source cancer risk within different quartiles of all indices; however, area cancer risk was higher in areas with a higher Isolation Index. When considering the urban-rural effect impacts, all of the coefficients were significant which means that the influence of both indices and sociodemographic status on cancer risk was different in urban and rural areas. The adjusted R-square (0.47) of the Isolation Index and percent urban area was the highest among all indices and sociodemographic variables. Conclusion: On-road sources and Isolation Index may be the best indicators of cancer risk and should be considered when addressing cancer disparities in SC.

A Needs Assessment Survey of a Private Well Water Quality and Well Owner Education Program in Maryland: Initial Analysis and Findings

Presenter: Kate Manchisi

Co-authors: 1) Karen Aspinwall - UME, 2) Elisabeth F. Maring - UMCP, 3) Teresa K McCoy - UME, 4) Amy R. Sapkota - UMCP, 5) Rachel Rosenberg Goldstein - UMCP, 6) Daphne Pee - Mid-Atlantic Water Program

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: Health Smart

Abstract:

Background: Groundwater quality is affected by multiple factors in the natural and built environments, and contaminants may contribute toward adverse health effects. A significant number of Maryland residents utilize private wells for drinking water, so ground water quality is a key factor to public health outcomes. Many of these homes also have septic systems which may impact ground water quality. Private well water testing is an important public health intervention to help address ground water quality issues. However most private well water is not regulated nor routinely tested in Maryland, so little is known about testing performed by private well owners; knowledge regarding well maintenance and testing; and private well water quality. A well water and septic education program, including water sampling, has been developed to help address this need for testing and

education. It is a collaboration of University of Maryland extension professionals, University of Maryland researchers, and other partner to improve health and prevent disease related to compromised well water quality. Methods: One component of this program is the prior knowledge needs assessment survey. This survey was given to program participants to determine the greatest information needs of the participants concerning well maintenance and water quality testing. Survey questions include whether the participants currently use their wells as a drinking water source, how satisfied they are with the quality of their drinking water, whether they have had their well tested, how often they test it, and who they trust to provide them information about their well water. The survey also assesses participants' health literacy levels. Over 60 needs assessment surveys have been completed by participants in Cecil, Kent, and Montgomery counties and compiled into Excel, SPSS, and ArcView. Findings: An initial analysis of the survey data examined the demographic variables and survey items. Future work includes further analysis of survey results and water tests 1) the level of annual testing that is performed by private well owners; 2) the knowledge and literacy among private well owners regarding proper well maintenance, testing and test results; and 3) analysis of the microbiological and chemical quality of drinking water consumed from private wells on local, regional and national scales.

Aflatoxin Exposure and Childhood Growth Faltering: Is There a Threshold Exposure Level

Presenter: Jessica Montresor-Lopez

Co-authors: 1) Jessica Montresor-Lopez - UMCP, 2) Paul C. Turner - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Background: Aflatoxins are toxic fungal metabolites that frequently contaminate dietary staples in tropical regions of the world. Subsistence farmers in some of the poorest world regions are at greatest risk of being exposed. In animals they are carcinogenic and suppress growth, and are proven carcinogens in humans naturally exposed through diet. In young children from Africa growth faltering has recently been associated with dietary aflatoxin intake. **Aims:** It is not clear at this point if there is a threshold point for the observed growth faltering reported, information that would support intervention approaches. This study re-examined one data set from a survey in Benin to see if such a threshold was apparent. **Methods:** We re-analyzed aflatoxin exposure data from a cross-sectional study conducted in Benin and Togo, West Africa in which serum aflatoxin-albumin (AF-alb) was used as a validated exposure biomarker to assess aflatoxins relationship to stunting (HAZ) and being underweight (WAZ). The study used a subset of children who were fully weaned (18-60 months, n=315) from 16 villages in 4 geographic zones. **Results:** In this subset the mean AF-alb was 77pg aflatoxin/mg albumin (range 3 – 1076pg/mg) all were positive. For children with AF-alb <20pg/mg or <50pg/mg no apparent relationship was observed between log AF-alb and either HAZ or WAZ, whilst for children with AF-alb greater than 50pg/mg a highly significant inverse relationship between log AF-alb and both HAZ (p<0.01) and WAZ (p<0.01) was observed, after adjustment for village, sex, geographic region and socio-economic group. **Conclusions:** Approximately 4.5 billion persons are at risk of aflatoxin exposure, and tens of millions (at least) of those are in regions with chronic high levels predicted to be relevant for infant growth retardation. These data are suggestive of a threshold affect for aflatoxin exposure and provide a rough guide as to the levels above which growth faltering may be an issue. Whilst no exposure is desired these data provide important information to support intervention approaches to restrict the adverse health effects of these toxins in high risk regions.

Toxic Release Inventory Facilities in Maryland: An Environmental Justice Assessment

Presenter: Charles Naney

Co-authors: 1) Rebecca Rehr - US EPA, 2) Chengsheng Jiang - UMCP, 3) Kristen Burwell - UMCP, 4) Sacoby Wilson - UMCP, 5) Laura Dalemarre - UMCP, 6) Udochi Ohiri - UMB, 7) Rianna Murray - UMCP, 8) Charles Naney - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Background: Low-income and non-White populations tend to bear a disproportionate burden of environmental hazards, including Toxic Release Inventory (TRI) facilities. Since TRI data may be indicative of exposure to environmental hazards, the purpose of this study was to assess spatial disparities in the distribution of TRI facilities in Maryland (MD). **Methods:** The 2000 US census tract and block level data were used to enumerate population characteristics such as race/ethnicity, poverty and employment status, education, home ownership, home built before 1950, and urban area. Additional variables were analyzed which include the Diversity and Townsend indices as well as capital and median household income. GIS were used to map TRI facilities and develop choropleth maps based on race/ethnicity and SES. Spatial methods (mean distance analysis, buffer analysis, and spatial approximation) were employed and regression analysis was performed to evaluate the relationship between the distribution and number of TRI facilities and the aforementioned variables. **Results:** Low income, low education, and Non-White census tracts were located closer to TRI facilities. Non-White populations living within 5 miles of a TRI facility was 154 times higher than other tracts. Individuals living below poverty and housed within 5 miles of a TRI facility was 71 times higher than those living below poverty in other tracts. The percentage of African-Americans, poverty, and those without a high school diploma were statistically significant using simple linear regression which indicated that the distribution of TRI facilities was influenced by race/ethnicity and SES variables. **Conclusion:** Burden disparities exist in MD in the distribution of TRI facilities across varying levels of demographic composition for race/ethnicity and SES. Based on our findings, we hope to inform local and state health improvement plans and zoning policy in MD as well as provide a template for research in states with similar environmental justice issues.

CFD Characterization of the G-II Aerosol Collector

Presenter: Jovan Pantelic

Co-authors: Jovan Pantelic - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: CDC

Abstract:

G – II aerosol collector was designed to quantify aerosol shedding rate of the Influenza infected people. Aerosols are collected in two stages. The first stage collects aerosol by accelerating them through the slit and impacting them on the plate. The first, impaction plate stage, have efficiency of 50 % for aerosols with diameter of 5 μm (100 % collection efficiency for the aerosols with diameter of 10 μm or greater). After the first collection stage steam is injected into to the air stream containing aerosols that were not deposited. After adding steam, air stream is rapidly cooled creating environment that initially has super saturation ratio above 3 to induce condensation growth. Aerosols that change size through the condensation growth are accelerated through the slit, impacted into the plate from which they slide into the liquid reservoir placed below the plate. Second collection stage collects droplets with diameter greater than 1 μm with efficiency above 90 %. Volunteer sits in the booth with head placed in the cone that sucks the air from the booth with the flow rate of 130 L/min. G – II collects droplets generated by breathing, talking, coughing and sneezing of the infected volunteer. Breathing and talking generated aerosols have low initial velocity (≈ 1 m/s) and initial diameter less than 20 μm . These aerosols dry out very quickly to half of its original diameter and are collected with high efficiency especially in the second collection stage. Aerosols induced by the cough have mean diameter between 10 μm and 20 μm but can have size up to 2000 μm and initial average velocity of 11 m/s. Computational Fluids Dynamics (CFD) simulation shows that cough droplets with initial diameter below 90 μm do not deposit in the cone because drag force induced with the flow rate of 130 L/min is sufficient to prevent gravity to cause deposition of these droplets before they reach the slit at the end of the cone. Droplets larger than 90 μm will be deposited along the surface of the cone and its exact location of the deposition will depend on the initial conditions and position of release. These computational result imply that G – II have ability to collect expiratory generated aerosols up to 90 μm in diameter in two stages with high efficiency. Expiratory generated aerosols with initial diameter between 90 μm and 200 μm will have losses that depend on their initial condition, but aerosol with diameter of 200 μm will be fully deposited on the surface of the cone regardless of initial parameters.

Socioeconomic and Environmental Disparities in the Risk of Campylobacteriosis in Maryland

Presenter: Barbara Zappe Pasturel

Co-authors: 1) Barbara Zappe Pasturel - UMCP, 2) Raul Cruz-Cano - UMCP, 3) Rachel E. Rosenberg Goldstein - UMCP, 4) Amanda Palmer - DHMH, 5) David Blythe - MDHM, 6) Pat Ryan - MDHM, 7) Brenna Hogan - MDHM, 8) Carrienne Jung - MDHM, 9) Sam W. Joseph - UMCP, 10) Min Qi Wang - UMCP, 11) Mei-Ling Ting Lee - UMCP, 12) Robin Puett - UMCP, 13) Amy R. Sapkota - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: Maryland Department of Health and Mental Hygiene

Abstract:

Background & Objectives: Environmental and socioeconomic factors can play an important role in the risk of Campylobacter infections. Here, we evaluate for the first time in the U.S, the combined impact of community-level environmental and socioeconomic factors on the risk of campylobacteriosis. **Methods:** Campylobacter case data (2002-2010, n=3,694) were obtained from the Maryland Foodborne Diseases Active Surveillance Network (FoodNet). Community-level socioeconomic and environmental data were obtained from the 2000 U.S. Census and the 2007 U.S. Census of Agriculture. Data were linked by zip code. Incidence rate ratios were derived by Poisson regressions. A subset of zip code-level characteristics was mapped. **Results:** In zip codes that are 100% rural, incidence rates of campylobacteriosis were nearly 8 times (IRR=7.70; 95%CI=3.51-16.86) that of urban zip codes. In zip codes with broiler chicken operations, incidence rates were 2.28 times that of zip codes without broilers (IRR=2.28, 95%CI=2.21-2.34). Higher rates were also observed for zip codes that were predominantly white and had high median incomes and high owner-occupancy rates. **Conclusions:** Our findings show that the risk of campylobacteriosis could be largely influenced by the community and environment where one lives.

Traditional vs. Commercial Tobacco Use and Lung Cancer Risk in Nepal

Presenter: Greg A. Raspanti

Co-authors: 1) Greg A. Raspanti - UMCP, 2) Amir Sapkota - UMCP, 3) Mia Hashibe - Univ. of Utah, 4) Bhola Siwakota - B.P. Koirala Memorial Cancer Hospital, Nepal, 5) Mei Wei - Univ. of Utah, 6) Binay Kumar Thakur - B.P. Koirala Memorial Cancer Hospital, Nepal, 7) Chin Bahadur Pun - B.P. Koirala Memorial Cancer Hospital, Nepal, 8) Bhakta Man Shrestha - B.P. Koirala Memorial Cancer Hospital, Nepal, 9) Zachary Burningham, 10) Amy Lee Yuan-chin - Univ. of Utah

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: International Agency for Research on Cancer

Abstract:

Recent statistics suggest lung cancer to be the top contributor to cancer deaths in the developing world and tobacco use is the leading risk factor for this disease. Limited information is available on the role of specific local tobacco products that are commonly used in the low income countries. In this study, we compared the role of local tobacco products commonly used in Nepal on lung cancer risk. We recruited a total of 606 lung cancer cases

and 606 controls from the B.P. Koirala Memorial Cancer Hospital in Nepal between 2009 and 2012. All lung cancer cases were either histologically or cytologically confirmed. We computed odds ratios (ORs) and 95% Confidence Intervals (CI) using unconditional logistic regression, adjusting for demographic and socioeconomic variables (age, race, income level, education, and region of the country) as well as household air pollution (HAP) from solid fuels. Overall, the highest risk of lung cancer was observed in the groups that smoked multiple types of tobacco, with the highest risk of those who smoked bidi (local tobacco rolled in a leaf) and cigarettes without filters. Among those who only smoked one type of product, bidi users had the highest risk (OR 5.33; 95% CI 3.1-9.06) followed by cigarettes without filters (OR 5.32; 95% CI 3.5-7.1) and cigarettes with filters (OR 2.8; 95% CI 1.7-4.7). A clear dose-response relationship was observed between increased frequency of smoking and lung cancer risk, for all products considered. These results highlight the important role of local tobacco products on lung cancer risk in the low income countries.

Effects of Maternal Chlorpyrifos Exposure on Guinea Pig Neurodevelopment

Presenter: Roger J. Mullins

Co-authors: 1) Roger J. Mullins - UMB, 2) Su Xu - UMB, 3) Edna F.R. Pereira - UMB, 4) Jacek Mamczarz - UMB, 5) Edson X. Albuquerque - UMB, 6) Rao P. Gullapalli - UMB

Department/Center: Magnetic Resonance Research Center

Affiliation: University of Maryland, Baltimore

Funding Source: This study was partly supported by a grant 5R01ES019282 from the National Institute of Environmental Health

Abstract:

This study examined the neurodevelopmental effects of an organophosphorus compound, chlorpyrifos (CPF), on the offspring of pregnant guinea pigs exposed to it. Pregnant animals were injected with either chlorpyrifos or vehicle on the 50th day of gestation. Offspring were examined at ~70 PND with the Morris Water Maze (MWM) task and Magnetic Resonance Imaging (MRI) methods including T2-weighted anatomical scans, T2* relaxation time maps, Diffusion Tensor Imaging (DTI), Diffusion Kurtosis Imaging (DKI), and 1H Spectroscopy. Offspring with exposed mothers were impaired on the MWM and showed significant decreases in both body weight and brain volume, particularly in the frontal regions of the brain encompassing the striatum. Diffusion measures revealed decreased myelin integrity within the striatum and amygdala, two frontal brain areas linked to acquisition and modulation of learning, respectively. These strong findings serve to clarify the effects of exposure to CPF in the womb, as well as highlight the danger of mother to child transmission of low levels of CPF in the environment.

Socioeconomic and Environmental Disparities in the Risk of Campylobacteriosis in Maryland

Presenter: Amy R. Sapkota

Co-authors: 1) Barbara Zappe Pasturel - UMCP, 2) Raul Cruz-Cano - UMCP, 3) Rachel E. Rosenberg Goldstein - UMCP, 4) Amanda Palmer - DHMH, 5) David Blythe - MDHM, 6) Pat Ryan - MDHM, 7) Brenna Hogan - MDHM, 8) Carrienne Jung - MDHM, 9) Sam W. Joseph - UMCP, 10) Min Qi Wang - UMCP, 11) Mei-Ling Ting Lee - UMCP, 12) Robin Puett - UMCP, 13) Amy R. Sapkota - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: Maryland Department of Health and Mental Hygiene, Centers for Disease Control and Prevention

Abstract:

Background & Objectives: Environmental and socioeconomic factors can play an important role in the risk of Campylobacter infections. Here, we evaluate for the first time in the U.S, the combined impact of community-level environmental and socioeconomic factors on the risk of campylobacteriosis. **Methods:** Campylobacter case data (2002-2010, n=3,694) were obtained from the Maryland Foodborne Diseases Active Surveillance Network (FoodNet). Community-level socioeconomic and environmental data were obtained from the 2000 U.S. Census and the 2007 U.S. Census of Agriculture. Data were linked by zip code. Incidence rate ratios were derived by Poisson regressions. A subset of zip code-level characteristics was mapped. **Results:** In zip codes that are 100% rural, incidence rates of campylobacteriosis were nearly 8 times (IRR=7.70; 95%CI=3.51-16.86) that of urban zip codes. In zip codes with broiler chicken operations, incidence rates were 2.28 times that of zip codes without broilers (IRR=2.28, 95%CI=2.21-2.34). Higher rates were also observed for zip codes that were predominantly white and had high median incomes and high owner-occupancy rates. **Conclusions:** Our findings show that the risk of campylobacteriosis could be largely influenced by the community and environment where one lives.

The Growing Built Environment of the State of Maryland and its Impact on Obesity Related Issues

Presenter: Lisa Silverman

Co-authors: 1) Lisa Silverman - UMCP, 2) Jessica Montresor-Lopez - UMCP, 3) Tatiana Loboda - UMCP

Department/Center: Civil Engineering and Mathematics

Affiliation: University of Maryland, College Park

Funding Source: UMD BSOS seed grant study

Abstract:

Obesity is a growing health concern within the U.S. and is related with many serious diseases. Previous studies have shown that the built environment of a community can be associated with obesity due to the lack of physical activity outlets. In the last 50 years, Maryland has seen an increase in land development as well as a change in the percentage of obesity from about 10% to 25-29%. This study is part of a UMD BSOS seed grant study (PI: Tatiana Loboda, Geographical Sciences and Co-PI: Robin Puett, MIAEH) with the overall goal of examining the feasibility of using satellite data to analyze land use change over time and its relationship with changes in physical activity and obesity over time in MD, as well as whether population demographics (e.g. race, socioeconomic status) impact this relationship. This study provides a foundation for that study by examining whether physical activity is related with population demographics in 2000. Results from linear regression models examining the relationship between physical inactivity and median household income for the total MD population showed a parameter estimate of -0.000189 with a p-value of 0.0058. Results from linear regression models examining the relationship between physical inactivity and median household income for the total Hispanic or Latino MD population showed a parameter estimate of -0.000159 with a p-value of 0.0233.

Characterization of G-II with Influenza Virus

Presenter: Jing Yan

Co-authors: 1) Jovan Pantelic - UMCP, 2) Michael L. Grantham - UMCP, 3) Jing Yan - UMCP, 4) Donald K. Milton - UMCP

Department/Center: Maryland Institute for Applied Environmental Health

Affiliation: University of Maryland, College Park

Funding Source: This study was funded by the Centers for Disease Control and Prevention cooperative agreements 1U01CI000446 and 1U01IP000497, and NIH grant RC1AI086900

Abstract:

The use of a biosampler has been reported to maintain high infectivity of collected aerosolized virus, but due to the low flow rate (12.5 L/min) it is very challenging to collect expiratory generated aerosols. Another issue related to the Biosampler is that it collects aerosols with the diameter up to 10 μm , but some of the expiratory aerosols have larger diameter and have high initial velocity and are released with high flow rate. These difficulties in sampling expiratory released aerosols lead to the design of the aerosol collector (named G-II) that operates with higher flow rate (≥ 130 L/min) and still have ability to maintain virus infectivity. The G-II was compared to a commercially sampler, the SKC Biosampler[®] (SKC Inc, Eighty Four, PA), to evaluate the maintenance of virus infectivity. Influenza aerosols were generated by adding 5×10^5 fluorescent focus units/ml of influenza virus with 25ml of virus buffer containing PBS and 0.1% bovine serum albumin into a Collision nebulizer operated at 15 psi. Samples of the influenza aerosol were collected with either the G-II or biosampler for 15 min and were analyzed for infectivity using fluorescent focus assays and the total influenza virus particles were counted using quantitative PCR. PCR results for A/California virus show that G-II had collection efficiency of 95.9 % compared with Biosampler while for A/PR8 collection efficiency was 96.7 %. Focus assay results indicate that G-II had infectivity of 20 % compared with Biosampler. Results from the experiments show that the G-II achieves high submicron particle collection with high flow rates. Further study is still needed for improving infectivity.

OCCUPATIONAL HEALTH**Chronic Particulate Matter Exposures and Lung Cancer in the Nurses' Health Study Cohort**

Presenter: Jared Fisher

Co-authors: 1) Robin Puett - UMCP, 2) Jaime E. Hart - Harvard Univ., 3) Jeffery D. Yanosky - Penn. State Univ., 4) Donna Spiegelman - Harvard Univ., 5) Francine Laden - Harvard Univ.

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: NIEHS, NIH R01 ES017017, NIEHS NIH R01 ES019168

Abstract:

Background: Occupational air pollution exposures have been consistently associated with an increased risk of lung cancer. However, few studies have been able to examine the association of long term exposures to air pollution in the general population. To date evidence has indicated an elevated risk particularly in non-smokers. **Aims:** To determine if long term ambient exposures to particulate matter (PM) PM_{2.5}, PM₁₀ and PM_{10-2.5} are associated with an increased risk of lung cancer among women in the Nurses' Health Study (NHS), a US-wide prospective cohort study. **Methods:** Lung cancer cases from 1988 through 2010 were identified through biennial questionnaires and confirmed through medical reports. Information on time varying covariates including age, region of US, smoking, alcohol intake, BMI, physical activity, and area level socioeconomic status was available. A spatio-temporal statistical model using monitor, meteorological, road network and other data estimated PM exposures for the three size fractions for each month at each residential address for each participant between 1988 and 2007. Analyses were restricted to women living within metropolitan statistical areas. **Results:** Among 88,033 women, 1,548 cases of lung cancer were identified. Using 10 year cumulative average exposure, the fully adjusted hazard ratio for lung cancer was 1.16 (95%CI: 1.04,1.30) for PM₁₀, 1.27 (95%CI:1.09,1.49) for PM_{10-2.5}, and 1.14 (95%CI: 0.94, 1.40) for PM_{2.5}. Stratified results showed lower risks for current smokers and higher risks among former and never smokers, though the sample size for never smokers was limited (107 cases). Specifically, for never smokers the HRs were 1.20, 1.37,1.15 for PM₁₀, PM_{10-2.5} and PM_{2.5}, respectively. **Conclusions:** Among this cohort of US women, long-term particulate matter exposures were associated with increased lung cancer risk. Although there were a small number of cases, the risk appears to be strongest among never smokers.

Metal Mobilization from Retained Embedded Fragments in a U.S. Veteran: Biomonitoring Correlates with Fragment Content

Presenter: Joanna Gaitens

Co-authors: 1) Joanna Gaitens - VA MERCE, UMB, 2) Katherine Squibb - VA MERCE, UMB, 3) Jose Centeno - Joint Pathology Center, Silver Spring, MD, 4) Marian Condon - VA MERCE, UMB, 5) Melissa McDiarmid - VA MERCE, UMB

Department/Center: General Internal Medicine, Occupational Health Program

Affiliation: University of Maryland, College Park

Funding Source: Department of Veterans Affairs

Abstract:

Recent clinical findings implicate the potential for local and systemic long-term health effects from embedded metal fragments associated with injuries from improvised explosive devices in soldiers serving in military conflicts. In the past, fragments embedded in muscle tissue were thought to be relatively inert; however, evidence has shown that soldiers with embedded depleted uranium fragments have elevated urine U levels 20 years after exposure. To understand the potential health risks associated with embedded fragments from blast injuries, the Department of Veterans Affairs has established a medical surveillance program which integrates fragment composition data, surrounding tissue analyses, and urine biomonitoring results that characterize systemic and local tissue exposure to: Al, As, Cd, Cr, Co, Cu, Fe, Mn, Ni, Pb, U, W and Zn. These metals were chosen based on available fragment composition data and known toxicity of individual metals. We present here results from a Veteran who had 3 fragments removed several years after injury. Using EDXRF, the removed fragments were determined to be an Al-Cu alloy. Chemical analysis of adherent tissue showed levels of Al and Cu consistent with mobilization of these elements from the fragment to the surrounding tissue. Histology showed focal foreign body-type giant cell reaction and chronic inflammatory cell infiltrates, but no evidence of neoplastic changes. Prior to fragment removal, biomonitoring results showed a urine Al level 1.5 fold higher than the reference range, but below levels associated with adverse health effects. Concentrations of all other metals were within established reference ranges. These results provide further evidence that metal fragments in the body are not inert and materials released from fragments can enter systemic circulation over time, thus warranting long-term biomonitoring and medical surveillance of Veterans with embedded fragments. Supported by the Department of Veterans Affairs.

Pulmonary Function in Gulf War I Veterans 20 Years After Exposure to Depleted Uranium Inhalation and Shrapnel Injury

Presenter: Stella E. Hines

Co-authors: 1) Stella E. Hines - VA MERCE, UMB, 2) Patricia Gucer - VA MERCE, UMB, 3) Sue Engelhardt - VA MERCE, UMB, 4) Joanna Gaitens - VA MERCE, UMB, 5) Marc Oliver - VA MERCE, UMB, 6) Katherine Squibb - VA MERCE, UMB, 7) Melissa McDiarmid - VA MERCE, UMB

Department/Center: Occupational Health Program and Division of Pulmonary and Critical Care Medicine

Affiliation: University of Maryland, Baltimore

Funding Source: Department of Veterans Affairs

Abstract:

Rationale: A cohort of Gulf War I (GWI) Veterans who all sustained a unique metal inhalational exposure to depleted uranium (DU) following friendly-fire incidents in 1991 returned for medical surveillance evaluation. Veterans who were closest to blasts have retained shrapnel and persistently high urine uranium levels, and theoretically experienced greater inhalational doses. Because of potential respiratory effects from single massive inhalational exposure to DU and blast particulate, we evaluated a cohort of known DU-exposed GWI Veterans for the presence of pulmonary function test (PFT) abnormalities 20 years post-exposure. We hypothesized that Veterans with higher DU biological indices would have more abnormalities in pulmonary function compared to those with lower indices. **Methods:** 36 members of a cohort of 79 GWI Veterans with known DU exposure were seen in biennial surveillance. All completed a medical history and exposure questionnaire, 24 hour urine collection for uranium concentration and analysis of isotopic signature for DU, and pulmonary function testing. We evaluated mean pulmonary function parameters, assessing for exposure effects three different ways. **Results:** Veterans with high versus low urine uranium (uU) concentrations did not differ significantly demographically. There were no significant differences in any mean PFT parameters between Veterans with high uU levels (>0.1 mcg/g creatinine) compared to low uU level Veterans; Veterans with isotopic signature for DU versus for natural uranium; or Veterans with known shrapnel versus none. Ever-smokers had significantly higher FRC ($p=0.008$) and RV ($p=0.026$) percent predicted compared to never-smokers. **Conclusions:** Veterans with remote inhalational exposure to DU do not appear to have significantly different PFT parameters when analyzed according to current uU indices or retained shrapnel status. As investigations continue into the health of Veterans returning from the Middle East, knowledge about pulmonary function in a cohort with known exposure to DU and blast particulate is of particular interest.

Longitudinal Association of Restless and Inadequate Sleep to Work Related Musculoskeletal Disorders among Registered Nurses

Presenter: Kyungsook Kim

Co-authors: 1) Kyungsook Kim - UMB, 2) Alison M. Trinkoff - UMB, 3) Carla L. Storr - UMB, 4) Kihye Han - UMB

Department/Center: Nursing

Affiliation: University of Maryland, Baltimore

Funding Source: N/A

Abstract:

Research Purpose: Previous studies have shown that reduced sleep increases risk of work-related injury. It is unclear whether restless sleep (RS) and/or inadequate sleep (IS) together impact musculoskeletal disorders (MSD) injury. The purpose was to explore the relation of self-reported RS and

IS to work-related MSD among registered nurses. Methods: This study used secondary survey data from the longitudinal Nurses Work life and Health Study on self-reported RS and IS and work-related MSD. Three wave surveys of 2,273 registered nurses were analyzed. Using binomial regression models, the relationship between wave 1 (baseline) RS and/or IS and risk of incident MSD in waves 2 or 3 (6 and 15 months after baseline respectively) was examined. Other potential risk factors were: age, caring for children, caring for dependents, exercise, smoking, obesity, and work schedules. Findings: RS (compared to no RS) increased the risk of having a MSD of all three body regions by 2.6 times. IS (compared to no IS) was associated with a doubling of MSD risk in all body regions. Compared to nurses without any RS and IS disturbance, nurses with only RS had more than 3.6 times the risk of MSD (back OR=3.57, 95% CI=2.14-6.15; neck OR=3.67, 95% CI=2.06-6.66; shoulder OR=3.62, 95% CI=2.06-6.47). For nurses with only IS the risk was 2.3 (back OR=2.25, 95% CI=1.62-3.15; neck OR=2.67, 95% CI=1.84-3.88; shoulder OR=2.42, 95% CI=1.68-3.49). Nurses with both RS and IS showed an additive interaction on MSD (back OR=4.84, 95% CI=3.48-6.82; neck OR=6.47, 95% CI=4.52-9.37; shoulder OR=5.84, 95% CI=4.10-8.40). However, the additive interaction exists only for neck area after adjustment for confounders (neck OR=5.53, 95% CI=3.69-8.39). Implications for Public Health: Educational intervention for sleep improvement strategies may help prevent nurse MSD. Screening for undiagnosed sleep disorders may be beneficial as well.

Genotoxic Effects of Depleted Uranium in Exposed Gulf War Veterans With Embedded Fragments

Presenter: Melissa A. McDiarmid

Co-authors: 1) Melissa A. McDiarmid - UMB, DVA, 2) Marc Oliver - UMB, DVA, 3) Richard J. Albertini - Univ. of Vermont, 4) Katherine S. Squibb - UMB, DVA

Department/Center: Department of Medicine, Occupational/Environmental Health Program

Affiliation: University of Maryland, Baltimore

Funding Source: Department of Veterans Affairs

Abstract:

In vitro and in vivo animal studies show evidence that uranium (U) is capable of causing genotoxicity due to its radioactive and chemical characteristics. For this reason, an on-going biennial medical surveillance program established by the Department of Veterans Affairs (VA) for U.S. soldiers exposed to depleted uranium (DU) during the 1991 Gulf War includes biomarkers of genotoxicity. Soldiers were exposed by inhalation, ingestion and wound contamination to particles of DU oxides created when DU munitions impacted tanks with protective DU armor. Some soldiers also have embedded DU fragments in muscle tissue which serve as a constant source of systemic exposure to DU as evidenced by clinically elevated urine U (uU) excretion. Evidence of genotoxicity in peripheral blood collected from 35 members of the DU-exposed cohort was determined by analyzing for HPRT and PIGA mutations and for chromosome aberrations in chromosomes 5, 7, 11 and 13 using fluorescent in-situ hybridization (FISH). Mean chromosome aberrations in individuals with chronically elevated uU concentrations were not significantly different from those with normal uU concentrations when compared using Mann Whitney analysis. Mean mutant frequencies for HPRT and PIGA mutations were also not significantly different between the high vs low uU groups, however Poisson regression analysis indicated a significant ($p < 0.01$) relationship between uU concentration and the frequency of HPRT mutations, when the relationship was controlled for smoking, age and exposure to x-rays. Significant relationships were not observed, however, when uU concentrations and the frequency of PIGA mutations or chromosome aberrations were modeled by regression analysis. Thus, weak genotoxic effects of DU were evident only for one measure of mutant frequency and only in one type of statistical analysis. Mutational spectral analysis is planned to examine whether T cell clonality may be producing the increase in HPRT mutations.

A Comprehensive Safe Lifting Program Influences Caregiver Injury Outcomes and Resident Quality Indicators

Presenter: Marc Oliver

Co-authors: 1) Patricia W. Gucer - UMB, 2) Tanya Restrepo - NCCI, 3) Harry Shuford - NCCI, 4) Marc Oliver - UMB, DVA, 5) Joanna Gaitens - UMB, 6) Frank Schmid - NCCI, 7) D. Habuk, 8) Chun J. Shyong - NCCI, 9) Melissa McDiarmid - UMB

Department/Center: Occupational Health Program

Affiliation: University of Maryland, Baltimore

Funding Source: Commonwealth Fund

Abstract:

Objective: To determine the association between a comprehensive safe lift program, including powered mechanical lifts, in long-term care (LTC) facilities and a) caregiver injury experience and b) resident quality of care indicators. **Methods:** Data on Powered Mechanical Lift availability and safe lifting policies and procedures were obtained from a survey of 271 LTC Directors of Nursing (DONs) in late 2007 and early 2008. We used facility level data of mobility-related resident outcomes from the CMS Minimum Data Set (MDS) Quality Indicators, and workers compensation data provided by the National Council on Compensation Insurance. **Results:** Facilities increased their inventories of lifts over the three years studied (2005 – 2007). As inventories of sit-stand lifts increased, some measures of resident quality indicators improved. Associations were modest, but the more sit-stand lifts facilities had relative to their census the less likely were residents to have pressure ulcers or to be bedfast. In facilities with low availability of sit-stand lifts, 16% of residents had pressure ulcers and 4% were bedfast. In facilities with high availability of sit-stand lifts only 10% had pressure ulcers and 2% were bedfast (probabilities $< .006$). Resident falls were fewer in facilities with better safe lift procedures. Fractures were slightly higher among facilities with more sit-stand lifts. Physical restraints and use of antipsychotic drugs in the absence of psychosis declined between 2005 and 2007. Safe lift policies and procedures were associated with lower workers compensation claims and costs. **Conclusion:** The increasing availability of sit-stand lifts is associated with resident benefits related to mobility and also some mobility-related risks, which can be mitigated by safe lift policies and procedures. Safe lifting policies and procedures are also associated with lower workers compensation claims and costs.

Blood Uranium (U) Isotopic Analysis as a Measure of DU Exposure in U.S. Soldiers.

Presenter: Katherine Squibb

Co-authors: 1) Katherine Squibb - UMB, 2) Todor Todorov - AFIP, 3) Jose Centeno - AFIP, 4) Melissa McDiarmid- UMB

Department/Center: Department of Medicine

Affiliation: University of Maryland, Baltimore

Funding Source: Department of Veterans Affairs

Abstract:

Urine uranium (U) excretion has become the accepted means by which to monitor elevated exposures to U, both in occupational cohorts and environmentally exposed populations. In addition, specific exposure to depleted uranium (DU), as experienced by U.S. soldiers in combat scenarios involving DU munitions, has been made possible by refined methods of analysis that allow the detection of U235/U238 ratios in urine samples with concentrations of U that lie within the normal range of urine U concentrations. Blood concentrations of U are also elevated in DU exposed soldiers, and the recent development of an ICP-MS technique with sufficient sensitivity to measure U235/U238 ratios in blood samples at total U concentrations as low as 50 ppt provides the opportunity to determine whether blood could also be used for detecting DU exposure in U.S. soldiers. Blood U concentrations in Gulf War soldiers exposed to DU by inhalation, ingestion and/or embedded fragments ranged from 0.01 to 0.80 ug/L in 2007. Four of the 33 soldiers tested had blood U concentrations above the average concentration reported for non-occupationally exposed New York City residents (0.14 ug U/kg wet weight) (Fisene, IM and Perry, PM, Hlth Phys 49: 1271, 1985). Isotopic analysis of blood samples from the Gulf War cohort identified 5 soldiers out of 33 with an isotope signature consistent with DU exposure, while analysis of urine samples from these same individuals identified 10 soldiers with DU present in their urines. Thus, urine remains the best matrix for detecting exposure to DU in US soldiers. (Supported by the Department of Veterans Affairs).

SURVEILLANCE, COMMUNITY NEEDS ASSESSMENT, PEDAGOGY

Community Health Needs Assessment for Prince George's Hospital Center and Laurel Regional Hospital

Presenter: Raphael Gaeta

Co-authors: 1) Lori Simon-Rusinowitz - UMCP

Department/Center: Health Services Administration

Affiliation: University of Maryland, College Park

Funding Source: Dimensions Healthcare System

Abstract:

The research team will produce a Community Health Needs Assessment ("CHNA") report for two (2) hospitals: Prince George's County Health Center and Laurel Regional Hospital. The University of Maryland Medical Center CHNA will be utilized as a model for the Dimension hospitals' CHNA reports. The CHNA reports will be comprised of the following components: 1) Community Health Needs Assessment Approach and Methods; 2) Purpose and Scope of the Assessment; 3) Data Collection and Analysis, Hospital Data and Assessment, Community Input Random Household Survey Data (publicly available), Input from Community Leadership, Input from Health Experts, Health Statistics Comparisons to our findings based on County, State and National Health Priorities (publicly available); 4) Selection of top 3-5 Health Priorities for each CHNA; and 5) Documenting and Communicating Results, Assist Dimensions with Development of Implementation Strategies to Address Health Priorities. A presentation of the findings will be made to Dimensions' staff and a final report will be completed for each of the hospitals and presented to the Dimensions' board for approval. Dimensions will make the report available to the public, and put a copy of the report on their website.

Using Study Abroad as Effective Pedagogy for Promoting Competency in Global Public Health

Presenter: Donna Howard

Co-authors: 1) Donna Howard - UMCP

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: None

Abstract:

Purpose: Study Abroad programs provide opportunities for immersion in unfamiliar geographic and sociocultural contexts. For public health students, this experience helps to make apparent and highlight the myriad, often overlooked, ways in which public health affects us on a daily basis. Equally important, study abroad programs foster a greater appreciation for the wisdom, ingenuity and efficiency of low literacy, appropriately tailored community-based programs and technologies. Students also develop self-awareness of assumptions about normalcy, development, and health that are implicit in western/biomedical paradigms. **Methods:** The case study methodology will be used to describe how a winter study abroad program, "East Meets West: Contrasting Public Health Priorities, Pragmatics and Polemics in the U.S. & India" was implemented as an innovative pedagogical practice to promote foundational competency in global public health. Classroom experiences, field activities and excerpts from student reflection essays will be used to illustrate the methodology's application and utility. **Findings:** Students were taught alongside peers in an Indian academic institution. This was combined with hands-on field activities designed to enrich and inform the learning process. Community diagnosis fieldwork,

analysis of public health in the local news media and reflection essays helped to broaden the analytic lens by which student viewed and interpreted challenges and opportunities at the crossroads of public health practice. Implications: Study Abroad programs promote a more textured and critical analysis of the strengths and weaknesses of different public health systems along with sensitivity to the structural, philosophical and environmental determinants that shape and/or impede health promotion efforts.

Evaluating Modes of Influenza Transmission

Presenter: Min Qi Wang

Co-authors: 1) Min Qi Wang - UMCP, 2) Larissa May - GWU, 3) Barbara Albert - UMCP, 4) Jovan Panetlic - UMCP, 5) Jing Yan - UMCP 6) Sheryl Ehrman - UMCP, 7) Michael Grantham - UMCP, 8) Fengjie Liu - UMCP, 9) Aneeqa Choudhury - UMCP, 10) Donald K. Milton - UMCP

Department/Center: Maryland Applied Environmental Health and Epidemiology

Affiliation: University of Maryland, College Park

Funding Source: This study was funded by the Centers for Disease Control and Prevention cooperative agreements 1U01CI000446 and 1U01IP000497, NIH grant RC1AI086900.

Abstract:

Background: As part of validating experimental human infection by nasal inoculation as a model of naturally acquired influenza, we aimed to characterize virus in their exhaled breath of community-acquired cases. We developed an influenza surveillance system to promote visibility and recruitment rates. **Methods:** A web site with the domain name gotflu.org was developed using Microsoft .NET and SQL 2008. Participants provided consent online. Baseline demographic information was recorded, including living situation and location, and weekly symptom questions were sent. Influenza like illness (ILI) was defined as fever plus cough or sore throat. Persons reporting ILI either in response to the weekly questionnaire, or by clicking on a button or calling a phone number on the web site were recruited for clinical screening. Additional cases were referred by the University Health Center. Screened cases with documented fever or a positive rapid test for influenza were enrolled in breath testing. **Results:** 1266 subjects participated in the surveillance study; mean age 27 (range 16 to 77); 68% female; 10% resided in an on campus dorm, 32% in Greek Life housing, and 8% off campus student housing; 49% were not affiliated with the UMCP campus. Most had roommates, 8% lived alone and 8% had children under 18 in their household. Influenza vaccination rates were 48% for the current year and 40% for 2011-2012. The most common reason given for not receiving the vaccine was "I don't think I need it/I never get the flu" (47%). The majority of self-reported ILI occurred in December 2012 (35%), with 23% and 22% of cases in January and February 2013, similar to the DHMH data. We screened 378 cases and enrolled 178 for breath testing. **Conclusions:** A web based syndromic surveillance system was accurate and timely in detecting the start and peak of the influenza season, and could provide the State of Maryland important information about trends in ILI in a large university population and surrounding community not currently in their surveillance network. This information could be used to guide interventions on campus, including vaccination and shows that influenza studies can be efficiently performed on this campus.

New Visual and Geospatial Tools for the Analysis of Hazard and Health Outcome Data on the Maryland Environmental Public Health Tracking Network

Presenter: Min Qi Wang

Co-authors: 1) Min Qi Wang - UMCP, 2) John T. Braggio - DHMH, 3) Jed L. Miller - MDE, 4) Rashid Malik - DHMH, 5) Valerie Agwale - MDE, 6) Clifford S. Mitchell - DHMH

Department/Center: Behavioral and Community Health

Affiliation: University of Maryland, College Park

Funding Source: This project was supported by the cooperative agreement number 5U38EH000944-02 from the Centers for Disease

Abstract:

Background: As more complex environmental and health data become available online, a major challenge becomes providing simple tools to allow a wide variety of users to analyze the data for a variety of needs. The Maryland Environmental Public Health Tracking Network developed a series of tools to dynamically characterize and compare data that take advantage of geospatial analytic freeware. **Objective:** This presentation will explore how these visual and geospatial tools can be used to display and evaluate environmental hazard and health outcome data. **Methods:** We developed a combination of C# and server-based R-statistics to allow users to compute statistics including age-adjusted rates, 95% confidence intervals (CI), and various statistical tests including autocorrelations and general linear models for any user-defined areas. **Results:** Users can now analyze environmental health data with thematic GIS mapping that visually identifies areas with higher disease prevalence; use geospatial tools to select, aggregate, and describe areas using age-adjusted rates and 95% CIs; and compare disease prevalence between geographic areas by using statistics from R modules. By using the buffering tool to select an area with a 10-mile radius from the centroid of the cluster's periphery, adjacent polygons can be selected, and then computed age-adjusted rates and 95% CIs for the two combined areas can be displayed, along with the inclusion of census measures for the two areas. The R statistical procedures (multilevel models, spatial significance using $G_i^*(d)$ statistic, etc.) can then compare the selected areas for a given statistical test. **Conclusions:** These spatial tools enhance available Maryland EPHTN data analysis resources by allowing health officials to quickly and efficiently describe and compare the health characteristics of selected areas. While the analyses may be limited by geographic resolution of the underlying data, these analytical tools represent an important resource for public health.

RESEARCH METHODS

Novel Statistical Frameworks for Brain Connectivity Analysis

Presenter: Shuo Chen

Co-authors: Shuo Chen - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: UMD Tier 1A seed grant

Abstract:

In neuroimaging, brain connectivity generally refers to associations between neural units from distinct brain locations. Specific patterns of brain connectivity may be linked to corresponding actions, emotions, and cognition. Disruptions to these connectivity patterns are often associated with psychiatric and neurological disorders. We propose novel Bayesian hierarchical frameworks for brain imaging data that unifies voxel level and region level brain connectivity analyses, and yields population level inferences. We perform the parameter estimation using Markov Chain Monte Carlo (MCMC) techniques, which can be executed quickly despite the massive number of parameters. We apply our method to a functional magnetic resonance imaging (fMRI) data and simulated data to demonstrate the properties of our method.

Fast Regularized Canonical Correlation Analysis

Presenter: Raul Cruz-Cano

Co-authors: 1) Raul Cruz-Cano - UMCP, 2) Mei-Ling Ting Lee - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: N/A

Abstract:

Canonical correlation analysis is a popular statistical method for the study of the correlations between two sets of variables. Finding the canonical correlations between these datasets requires the inversion of their corresponding sample correlation matrices. When the number of variables is large compared to the number of experimental units it is impossible to calculate the inverse of these matrices directly and therefore it is necessary to add a multiple of the identity matrix to them. This procedure is known as regularization. In this paper we present an alternative method to the existing regularization algorithm. The proposed method is based on the estimates of the correlation matrices which minimize the mean squared error risk function. The solution of this optimization problem can be found analytically and consists of a small set of computationally inexpensive equations. We also present material which shows that the proposed method is more stable and provides more accurate results than the standard regularized canonical correlation method. Finally, the application of our original method to NCI-60 microRNA cancer data proves that it can deliver useful insights in study cases which involve hundreds of variables.

Selection of Fixed and Random Effects in Linear Mixed Effects Models With Applications to TAAG

Presenter: Edward Grant

Co-authors: 1) Edward Grant - UMCP, 2) Tong Tong Wu - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: NSF Grant CCF-0926194

Abstract:

Linear mixed-effect models have become popular in modeling data in a wide variety of fields, particularly in public health. These models are able to account for both the means as well as the covariance structure of clustered or longitudinal data. However, as studies are able to collect an increasing amount of data for large numbers of predictors, a major challenge has been the selection of important variables to create a more interpretable, reduced model. This poster will compare three methods that attempt to select and estimate both important fixed and important random effects from longitudinal data. The models will be compared through analysis of simulated longitudinal data. Additionally, the methods will be applied to a public health study, the Trial of Activity in Adolescent Girls (TAAG), to determine important predictors for Moderate to Vigorous Physical Activity (MVPA). The TAAG study collected data from 8th grade girls at six Maryland schools at two time points. The first time point was in the spring of the girls' 8th grade and for the second, the girls were followed up in 11th grade. The fixed effects contain predictors at the individual, neighborhood, and social level. The random effects contain predictors at the school level, collected at the 8th grade time point. The TAAG data contains 55 predictors for fixed effects and 19 predictors for random effects. The purpose is to select the important predictors for MVPA over time. Results of the simulations indicate that the methods are effective in selecting true fixed and random effects with minimal false selections. The preliminary results of the TAAG study's analysis will also be presented. These methods have important implications for any public health or biomedical study where clustered or longitudinal data is collected for a large number of predictors.

Investigating Disparity of Bone Health by Integrating Bone Mineral Density Data

Presenter: Xin He

Co-authors: 1) Xin He - UMCP, 2) Marc C. Hochberg - UMB, 3) Mei-Ling Ting Lee - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: Center of Excellence in Health IT Research Seed Grant Program

Abstract:

Bone mineral density (BMD) is a widely used surrogate marker for bone strength, but the associated racial disparity in bone health has not been established. We conducted a secondary data analysis to investigate ethnic/racial difference on bone health based on the data from the Study of Osteoporosis of Fractures (SOF). We produced improved individual fracture risk assessment models for the elderly using a newly developed time-to-event methodology called threshold regression. The proposed fracture prediction models have been compared with the FRAX model developed by the World Health Organization (WHO) in terms of the prediction of 10-year probability of bone fracture. An online individual risk assessment tool has been developed for public use.

Clustering Time-Course Gene Expression with Functional Data Analysis

Presenter: Chiaowen Hsiao

Co-authors: 1) Chiaowen Hsiao - UMCP, 2) Tong Tong Wu - UMCP

Department/Center: Epidemiology and Biostatistics

Affiliation: University of Maryland, College Park

Funding Source: This research was supported by the NSF grant CCF-0926181.

Abstract:

Clustering time-course gene expression profiles provides effective organization and visualization of the underlying structure in microarray data. The time series measurements are partial observations of developmental or biological processes. Two expression curves are therefore similar if they measure the same functional relationship over time. The current state-of-the-art clustering technique is model-based clustering approach – expression time profiles are similar if they are generated from the same underlying distribution. Most model-based clustering approaches adopt a linear mixed model (LMM) perspective. Each gene expression time profile is characterized as a linear combination of population average time curve and gene specific deviation from the population time curve. With linear mixed model, clustering faces challenges of missing data, long time series, and order dependency of time-course measurements. The present study proposes functional data analysis (FDA) perspective to model-based clustering. With FDA, each time series of expression is modeled after a smooth curve characterizing features of time dependency. These features are then used to define functionally meaningful similarity metric between expression curves. The metrics can then be used in model-based clustering to uncover groups with biological similarity. In the present study, a series of simulations experiments are performed to compare LMM and FDA in clustering time-course gene expression microarray data. The simulated data sets include both periodic and non-periodic microarray experiments. Preliminary findings demonstrate that FDA approach outperforms LMM approach in model-based clustering. Future research needs to investigate the FDA approach in clustering multi-tissue gene expression experiments as well as the applications to RNA-seq experiments.

Impact of Holidays in Web Module Usage in a Large Online Trial

Presenter: Bu Kyung Park

Co-authors: 1) Bu Kyung Park - UMB, 2) Eun-Shim Nahm - UMB, 3) Shijun Zhu - UMB

Department/Center: Family and Community Health

Affiliation: University of Maryland, Baltimore

Funding Source: NINR

Abstract:

One of major advantages of online health programs is that individuals could participate in an intervention at their convenience. Based on our team's prior experience, holidays seem to be a factor to influence participants' intervention usage. The purpose of this preliminary study was to assess the impact of holidays on usage over the three weeks of the online bone health program in a large scale randomized online trial. A subset of 578 participants (16 teams) who completed using an 8-week online program was included. At least one new module was released on every Monday, and each addressing bone health related issues. Modules scheduled later weeks (e.g., smoking, drinking) were optional, thus, we sampled weeks 1-3. To assess program usage, we calculated percent of participants who visited website per group in each week as we are interested in the impact of holidays. Because each team started the intervention at different time, the holidays falls on the 8-week online program was different for each team. Only following "federal" holidays were counted in the analysis: Birthday of Martin Luther King (MLK), Memorial Day, and Independence Day. Overall, visit rates vary for groups and weeks. On average, 62.5% (range: 100%-50s%) of group members regularly visited the intervention site. 11 Teams had no holiday weeks. The visit rates of during MLK week and Memorial Day week were 66.7%, 63.9%, 65.6%, and 67.6%, respectively. However, the visits during Independence Day week was little lower than other holidays that 56.8%. There was no significant difference of the visits between holiday weeks and non-holiday weeks (62.3% for non-holiday weeks, and 64.1% for holiday week; $t = -.46$, $p = .65$). Findings showed that the impact of holidays on participants' visit to the intervention site was not significant. The limitation of this study is that selected time period did not included summer vacation season and major holidays, such as Thanksgiving Day or New Year's Day, that may need to be considered when interpret the usage patterns. The weight of holidays as well as perceived importance of module contents may also influence the usage. It would be interesting to see replicate this study with the intervention that includes major holidays using larger samples.

ADDITIONAL POSTERS PRESENTED

In Utero Chlorpyrifos Exposure Leads to Augmented CA1 Pyramidal GABAergic Transmission in the Adult Male Guinea Pig

Co-authors: 1) Robert. D. Burke - Univ. of Vicotria, 2) Edson X. Albuquerque - UMB, 3) Edna F. R. Pereira - UMB

Effects of an Acute Exposure to the Organophosphorus Poison VX on the Pharmacokinetics of Galantamine in Guinea Pigs

Co-authors: 1) Hunter R. Coombes - UMB, 2) Julie R. Hunt - Fred Hutchinson Cancer Research Center, 3) Yasco Aracava - UMB, 4) Jyotirmoy Banerjee - S. V. National Institute of Technology, India, 5) Edna F. R. Pereira - UMB, 6) Edson X. Albuquerque - UMB, 7) William P. Fawcett - UMB