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1. A Point-of-Care Assay for Rapid Detection of Proteases

Authors
Sandeep Adem, Sonal Jain, Drew Hall, Anthony O'Donoghue

Abstract
Background: We are developing a rapid point-of-care test for detection of proteases. Proteases are enzymes that cleave proteins and play an important role in many physiological processes. However, their unregulated activity can trigger onset of many diseases like cancer, respiratory diseases, and other infections. Some proteases are highly specific and only cleave substrates with a specific peptide sequence which allow them to be used as biomarkers for detection of specific diseases.

Methods: We have demonstrated proof-of-concept optical test that starts with immobilizing a cleavable peptide on the surface of a 96-well plate. This peptide contains a specific cleavable sequence for papain, a commercially available protease that is related to several disease-associated proteases. Fluorescent tags were attached to the peptide through streptavidin-biotin chemistry. The total florescence directly correlates with the amount of peptide immobilized to the surface. Addition of papain was predicted to cleave the peptide and cause a time-dependent reduction in the fluorescent signal. A non-cleavable PEG-linker sequence that was used as a control.

Results: The data showed an 85% RFU reduction was achieved within 30 min when 2.9 ug of substrate was incubated with 3.3 ug of papain validating the proposed sensing scheme.

Conclusions: We have demonstrated a novel method to detect papain activity. Knowing this concept, we can further expand this test by modifying the peptide sequence so that it can be cleaved by a protease that is directly associated with a disease. We are working on translating this research to magnetic detection to truly make it point-of-care.

Primary topic area: Health Technology | Secondary topic area: Medical Diagnostics
2. Extreme precipitation events and water quality in California: Implications for human health in a varying and changing climate

Authors
Rosana Aguilera, Tarik Benmarhnia, Alexander Gershunov

Abstract
Background: Most pathogens and pollutants collect on the land surface or in infrastructure between strong rainfall episodes and are then delivered via storm runoff to areas of human exposure, such as coastal recreational waters. In California, precipitation events are projected to become more extreme, and at the same time decrease in frequency as storm tracks move poleward due to polar-amplified global warming. Precipitation extremes in California are dominated by atmospheric rivers, which carry more moisture in a warmer climate. Thus, the physical driver of extreme precipitation events is expected to grow stronger with climate change, and pollutant accumulation and runoff-generated exposure to those pollutants are expected to increase, particularly after prolonged dry spells. In southern California, microbiological contamination of coastal water via storm runoff exposes human populations to elevated concentrations of microorganisms in bathing/surfing waters at beaches, which could cause gastrointestinal and ear infections, and lead to exposure to pathogens causing life-threatening conditions, e.g. hepatitis A.

Methods: We use historical daily precipitation and fecal pollution indicators such as total and fecal coliform levels in coastal waters, in combination with a recently published atmospheric river catalog, to explore associations between extreme precipitation events and coastal water quality in California.

Results: By quantitatively assessing the influence of precipitation regime changes on human health via exposure to recreational coastal waters, we aim to reduce vulnerability to extreme weather and delineate measures, such as an early warning system, that improve the response and resilience of human populations to a varying and changing climate.

Conclusions: N/A

Primary topic area: Environmental Health | Secondary topic area: Health Policy
3. A Multidisciplinary Review of the Current Clinical, Technology and Policy Environment for Telepsychiatry in the Middle East

Authors
Ayman Albdah, Tim Mackey

Abstract

Background: The Middle East has experiencing an alarming increase in mental health burden due to shortages of mental health providers, conflict and war, stigmatization, migration, and lack of access in rural settings. New technology, including the field of "telepsychiatry", has the potential to improve delivery of mental health services. However, little is known about the scope, characteristics, policy, and adoption of telepsychiatry in the Middle East.

Methods: We conducted a multidisciplinary review of peer-review and grey literature related to telepsychiatry in WHO Eastern Mediterranean (EMRO) countries. This included querying scholarly databases PubMed, Google Scholar, JSTOR, conducting Google searches in both English and Arabic, and reviewing data in the WHO Atlas of eHealth Country Profiles and on Ministry of Health websites.

Results: Our literature review uncovered 8 articles detailing telepsychiatry programs in Somaliland, Afghanistan, Pakistan, Iraq, Syria, and Yemen. Technologies included Skype, mobile/android applications, store-forward applications, Internet-based therapy/interventions, and virtual environments. Types of disorders treated included post-traumatic stress disorder, depression, and psychosis. Of the 23 EMRO countries, only 14(60%) responded to the WHO survey and only three of these respondents (Afghanistan, Bahrain and Pakistan) reported having a national telepsychiatry program, with only Afghanistan listing it as established.

Conclusions: There appear to be few telepsychiatry programs or policies in the Middle East, and reviewed studies show a wide range of intervention types and technology utilized. Better data, investment, infrastructure, and technical assistance is needed to advance telepsychiatry in the Middle East to fully realize its potential to address global mental health burden in that region.

Primary topic area: Mental Health | Secondary topic area: Global Health
4. Distracted Driving Related to Electronic Devices among Small Vehicle Passenger Transportation Providers

Authors
Anagelu Ali, Linda Hill

Abstract

Background: Mobile electronic devices (EDs), particularly smartphones, are among the primary sources of distracted driving-related crashes worldwide. Heavy reliance on EDs for work related activities might lead to amplified usage opportunity associated with distracted driving (DD). The purpose of this study was to identify and characterize prevalence of ED-related DD behavior among small vehicle passenger transportation providers.

Methods: A 31-question survey was developed targeting participants from four types of transportation services (app-based, taxi, chartered, and shuttle services). The survey was completed in person or online (majority) from October 2016 to January 2017.

Results: Majority of the participants (N=217) were: male (80%), app-based drivers (60%), and had less than 2 years of experience in the industry (61%). 75% of participants responded they felt obligated to use ED while driving and 90% believed their earning will be affected if this behavior was restricted. Percentage for ED tasks considered safe to engage in while driving ranged from 10% (texting by hand) to 84% (following navigation device). Only 21% of participants said they have a company policy regarding DD behaviors related to ED use. Chi square analysis demonstrated that responses were significantly dependent on service type (P < .05). However, responses associated to DD behavior were prevalent among all service types although app-based service providers might be at higher risk due to their relatively heavier reliance on smartphone.

Conclusions: Rates of DD were high across transportation drivers. Interventions to reduce DD risk among this demographic group are needed.

Primary topic area: Injury and Violence Prevention | Secondary topic area: Occupational Health
5. Distraction Overload – Risk Reduction for First Responders

Authors
Sukainah Alramdhan, Sarah Andrade, Jill Rybar, Jana Jahns, Linda Hill

Abstract

**Background:** Distracted driving is a critical concern in transportation. The least addressed aspect of this problem is distraction among first responders. Modern emergency vehicles have become increasingly complex and personal devices such as smartphones often find their way into the vehicle cockpit, resulting in more distraction. These distractions put officers and the public at risk.

**Methods:** The one-hour course was taught by law enforcement officers utilizing PowerPoint, videos and case examples. Interaction was encouraged through participatory exercises and completion of a pledge card. The curriculum addressed the following topics: behaviors that reduce the focus on driving; crash risks from distraction and fatigue; officer exemption vs. potential civil liability; practical strategies to reduce distracted driving behaviors.

**Results:** Between March – September 2017, 224 'Distraction Overload' classes were delivered to 4,451 officers. Based on pre- and post-testing, 77% of participants were “satisfied or very satisfied” with the class; 74% “agreed or strongly agreed” they were ‘more aware of the risks’ associated with cell phone use while driving. 63% “agreed or strongly agreed” that as a result of the class they intend to change their behavior regarding cellphone use while driving on the job.

**Conclusions:** The curriculum resulted in substantial increases in awareness of risks and motivation to change behavior among participants. Participant feedback was positive and courses were well received. Officer attention to safety will enhance public trust and reduce potential liability.

**Primary topic area:** Injury and Violence Prevention
6. Effect of Motivational Interviewing on Smoking Consequences in Psychiatric Inpatient Smokers with Depression

Authors
Alexandra Angebrandt, Matthew D. Stone, Isabelle Velloze, John P. Pierce, David R. Strong

Abstract
Background: Levels of cigarette use are elevated in individuals with major depressive disorder (MDD), yet these individuals have been largely underrepresented in cessation and treatment research. Consequently, it is unclear how well widely recommended counseling treatments impact key cognitive appraisals of the consequences of quitting smoking to motivate cessation among individuals with MDD. We sought to examine the impact of smoking cessation counseling on MDD patients’ perceptions of the appeal and negative consequences of continued smoking and motivation to quit. We aim to explore the moderating effect that gender may have on these relationships.

Methods: Adult non-treatment seeking daily smokers (n=80) clinically diagnosed with MDD and receiving inpatient psychiatric treatment at a university-affiliated hospital were randomized to receive Motivational Interviews (MI) or self-guided smoking cessation Resource Information (RI) during the course of their hospitalization.

Results: Smokers who received MI (37.5%) were 3.2 (95% CI=1.07-9.41, p<.04) times more likely than smokers receiving RI (15%) to attend the outpatient cessation treatment. MI led to greater change in appraisals of the positive and negative consequences of continuing to smoke. Smokers in MI reported decreased ratings of subjective positive effects of cigarettes (b=-0.40±0.20, 95% CI=-0.79 - -0.02, p<.05) and increased ratings of negative consequences from continued smoking (b= 0.24±0.17, 95% CI=-0.10-10.58, p<.05). Small decreases in ratings of negative reinforcing effects emerged, but did not differ by condition (b=-0.14±0.15, 95%CI=-0.10-0.58).

Conclusions: We expect females to report greater baseline appraisals of negative smoking consequences but experience greater reductions in those appraisals following MI.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Mental Health
Is Blood Pressure Status Associated with Having Healthcare Coverage?

Authors
Monica Angeles, Asmaa Deiranieh, Becky Martinez

Abstract

Background: Almost half of Americans are identified as having hypertension (≥130/80 mmHg). Hypertension increases the risk of heart disease and stroke when untreated. Individuals without healthcare coverage are less likely to see a physician annually and have their blood pressure under control. Low income individuals and ethnic minorities tend to be less likely to have health care insurance. We examined the relationship between blood pressure status and healthcare coverage among a low income community.

Methods: Men and women attending a PTA meeting at the Preuss School completed a bilingual questionnaire on demographic factors and health insurance status. Blood pressure was measured using an Omron Blood Pressure Monitor. Correlation analysis was conducted.

Results: Participants were 61 men and women with an average age of 42 years. Individuals without healthcare insurance consisted of 14% Black/African American, 50% Asian, 60% Latino, and 66% White. Individuals with blood pressure ≥130/80 mmHg consisted of 42% Black/African American, 50% Asian, 34% Latino, and 66% White. The prevalence of blood pressure ≥130/80 mmHg was 40% among those without healthcare insurance compared to 35% with healthcare insurance. No statistically significant relationship was found between health insurance coverage and blood pressure status.

Conclusions: Many low income individuals and ethnic minorities with hypertension may be at heightened risk for further health problems given the lack of healthcare insurance coverage.

Primary topic area: Chronic Disease | Secondary topic area: Health Services
HIV Counselor’s Perspectives on Administering an Alcohol and IPV Screening and Brief Intervention in Ugandan Fishing Villages

Authors
Eric Arnold, Godfrey Kigozi, Erika Bonnevie, Robert Kairania, John Baptist Ssemanda, Julian Kobusingye, Jennifer Wagman

Abstract
Background: Evidence suggests a bidirectional association between alcohol use, intimate partner violence (IPV,) and HIV infection. In high income settings, clinic-based screening and brief interventions (SBI) have been successful in addressing alcohol use and violence. It is unknown, however, how feasibly this type of SBI can be delivered by fishing area HIV counselors with extremely heavy workloads. This qualitative study aimed to assess how the counselors perceived the acceptability of this SBI in two Rakai fishing communities.

Methods: We first conducted 5 individual counselor interviews on the benefits and challenges of administering the SBI, followed by collection of observational data during 7 counseling sessions. Interview and observation findings informed a focus group discussion with 4 HIV counselors, focused on their perspectives of the acceptability and logistics of conducting the SBI. The group discussion was transcribed then analyzed in Excel using a basic coding matrix.

Results: Counselors overwhelmingly felt the SBI was acceptable and appropriate for this setting. They found that the SBI was educational and clients appreciated the opportunity to discuss alcohol use and experiences of violence. Some of the challenges they encountered included complicated partnering patterns, inconsistent or hard to measure drinking patterns, no services in Rakai for dependent drinkers, and limited counseling time.

Conclusions: Despite potential challenges of implementing a clinic-based SBI, HIV counselors felt it could feasibly be integrated into their work and it warrants large scale assessment in Rakai fishing villages.

Primary topic area: Global Health | Secondary topic area: Dissemination and Implementation
9. Hispanic Women With Coronary Heart Disease Have Lower Cardiac Rehabilitation Referral and Participation Rates Than Non-Hispanic Women

Authors
Nainjot Baines, Santiago Nuno, Yu-Xuan Dang, Michelle Hsu, Kyle Udd, Lue Lao, Luis Castellanos

Abstract
Background: Cardiac rehabilitation (CR) is a multifaceted intervention shown to improve morbidity and mortality in patients with coronary heart disease (CHD). Despite its proven benefits, it is underutilized in women.

Methods: A prospective observational study was conducted to evaluate CR referral and participation rates among patients with CHD. Patients self-identified ethnicity and filled out a questionnaire at the time of discharge, with follow-up phone calls at 6 and 12 weeks.

Results: The cohort consisted of 130 patients; 91 men and 39 women, 13 of which were Hispanic and 26 were Non-Hispanic. CR referral rates were higher among non-Hispanic women compared to Hispanic women (36.6% vs. 7.7%, p=0.06). No significant difference identified in CR participation rates between Hispanic and Non-Hispanic women at 6 weeks (7.1% vs. 17.4%, p =0.377). At 12 weeks, only 20.8% of Non-Hispanic women participated in CR (p=0.077). Hispanic women tend to have lower socioeconomic status (SES) compared to non-Hispanic women (76.9% vs. 38.5%, p=0.023). Similar proportions of Hispanic and non-Hispanic women (12.5% vs. 27.3%) reported financial difficulties as the primary reason for not participating in CR. Hispanic women reported lower education levels than Non-Hispanic women (92.3% vs. 15.4%, p<0.001), with 92.3% of Hispanic women reporting Spanish as their primary written and spoken language (p<0.001).

Conclusions: Hispanic women with CHD have lower CR referral and participation rates than Non-Hispanic women. This trend would likely be amplified with a study involving a greater sample. Addressing potential barriers like low SES and education levels, and language barriers may improve CR participation among Hispanic women.

Primary topic area: Cardiac Rehabilitation | Secondary topic area: Health Equity and Disparity
10. **Hearts, Minds and Human Rights: Police attitudes towards people who use drugs as a structural determinant of enforcement practices that drive HIV risk in Tijuana, Mexico**

**Authors**
Pieter Baker, Javier Cepeda, Jaime Arredondo, Irina Artamonova, Maria Luisa Mittal, Steffanie Strathdee, Leo Beletsky

**Abstract**

**Background:** In Tijuana, people who inject drugs (PWID) interact frequently with police. Policing practices such as confiscation, arrest for syringe possession and physical altercations persist as structural determinants of HIV risk among PWID. Little is known about how officer attitudes toward PWID influence policing practices. This analysis evaluates the role of officer internalized human rights norms related to PWID on self-reported enforcement behaviors.

**Methods:** Between February 2015 and May 2016, Tijuana police officers (n=1,771) self-administered surveys on occupational safety, legal knowledge, attitudes toward PWID and policing behaviors that impact PWID health. Univariate associations between officers’ attitudes and policing practices related to HIV were measured using logistic regression.

**Results:** Officers were mostly male (85.9%) with median age 38 years (IQR:32-44) and median 11 years working as police (IQR:8-18). One in four (24.6%) held views antithetical to basic human rights norms, as measured by agreement with the statement: “Drug users do not deserve to be treated as people.” Officers reporting this attitude were more likely to confiscate syringes (OR: 1.32, 95%CI: 1.06, 1.64), arrest for syringe possession (OR: 1.42, 95%CI: 1.14, 1.78) and had physical altercations with PWID (OR: 1.44, 95%CI: 1.11, 1.86).

**Conclusions:** To be recognized as a person is a universally recognized human right. Police attitudes inconsistent with human rights are associated with harmful policing practices, but such practices are modifiable. Contributing to the growing evidence of the nexus between health and human rights of vulnerable groups, these findings support police interventions as means to mitigate structural HIV risk among PWID.

**Primary topic area:** Infectious Disease | **Secondary topic area:** Tobacco, Alcohol, and Other Drugs
11. Does increased physical activity explain cardiovascular benefits in a weight loss trial?

Authors
Alma Behar, Loki Natarajan, Chase Reuter, Dorothy Sears, Cheryl Rock, Jacqueline Kerr

Abstract
Background: Cardiovascular disease (CVD) remains the leading cause of death in the United States, especially in women. Excessive weight plays an important role in the development and progression of CVD. Physical activity (PA) may play an important role in CVD prevention by reducing CVD risks associated with overweight and obesity.

Methods: This study aimed to assess the impact of PA in the relationship between BMI and cardiovascular outcomes (i.e. insulin sensitivity and triglyceride levels) among 245 non-diabetic overweight and obese women taking part in a randomized controlled weight loss trial. Three intervention conditions with different dietary requirements encouraged weight loss. All conditions promoted PA. PA was measured by 7-day accelerometry at baseline, 6 and 12 months. We employed mediation analysis, with BMI (kg/m2) entered as the predictor variable, PA (number of minutes per week above the 1952 cut point) entered as the mediator, and cardiovascular outcomes, insulin (µIU/mL) and triglycerides (mg/dL), entered as dependent variables.

Results: Mixed-effects analyses showed that PA levels increased over the course of the study, but that differences in PA did not differ across the three study conditions. Mediation analyses revealed that PA mediated the relationship between BMI and triglycerides and that PA also mediated the relationship between BMI and insulin.

Conclusions: The findings show that a combined dietary and PA intervention can help improve CVD health. These findings provide support for cardiovascular health promotion programs that facilitate or encourage increased moderate to vigorous PA in overweight and obese women.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Chronic Disease

**Authors**
Tarik Benmarhnia, Georgia Kayser, Sara McElroy

**Abstract**

**Background:** Diarrheal disease is one of the primary causes of child mortality in low to middle-income countries, such as Ethiopia. Access to safe water and sanitation and hygiene (WaSH) has been recognized as a significant way to mitigate diarrhea disease and thus reduce child mortality. In addition, there are important inequalities in child mortality associated with socioeconomic factors such as maternal education and wealth.

**Methods:** This study aims to elucidate these socioeconomic inequalities in child mortality by quantifying the relative contribution of individual maternal and household characteristics and WaSH indicators. A regression-based decomposition of a concentration index of child mortality for both maternal education and household wealth was used to explain these inequalities. First, a concentration index was calculated using a cumulative distribution of the Ethiopia Demographic Health Survey (DHS 2011) sample ranked by the years of maternal education. Second, a decomposition of this index, which measured the extent to which WaSH and other individual and household characteristics contribute to both educational and economic inequalities in child mortality was conducted.

**Results:** Child mortality is concentrated among less educated mothers and within the bottom 40% of the distribution of wealth within Ethiopia. Almost 22% of maternal education inequalities in child mortality can be attributed to unimproved sources of drinking water and sanitation. Furthermore, maternal education predicts a greater proportion of access to water and sanitation-associated child mortality than household wealth status.

**Conclusions:** Interventions should be focused around education and improving access to safe drinking water and sanitation to increase child survival in Ethiopia.

**Primary topic area:** Maternal and Child Health | **Secondary topic area:** Health Equity and Disparity
13. Hearing Impairment and Cognitive Decline in Older Adults: The Rancho Bernardo Study

Authors

Abstract
Background: Hearing impairment is an emerging risk factor for cognitive impairment. We examined the association between hearing and cognitive function over a 24-year follow-up in community-dwelling older adults.

Methods: Participants were members of the Rancho Bernardo Study of Healthy Aging who attended a 1992-1996 research visit, were not wearing hearing aids, and had hearing and cognition assessed. Participants returned for up to 5 additional cognitive assessments, median follow-up 7 years. Linear mixed models were used to assess associations between hearing and cognition over time.

Results: Of 1164 participants, 388 (33.3%) had normal hearing (pure-tone average [PTA] threshold <25 dB), 580 (49.8%) had mild impairment (PTA 25-40 dB), and 196 (16.83%) had moderate or greater impairment (PTA>40 dB). Hearing impairment was associated with poorer cognitive performance and steeper decline on tests of global (Mini Mental State Exam, MMSE, p=0.002) and executive (Trails B, p=0.001) function. Associations were unchanged after adjustment for social engagement but were modified by education. Among participants with mild hearing impairment, only those with lower education experienced steeper decline on the MMSE than normal hearing adults. Additionally, associations were unchanged when testing survival bias using joint modeling.

Conclusions: Hearing impairment is associated with faster cognitive decline with age. Higher education may help protect against negative cognitive effects of mild, but not more severe, hearing loss. We found no evidence that reduction in social engagement contributed to greater cognitive decline among individuals with hearing loss. Screening for hearing loss may be important for identifying individuals at risk for cognitive decline.

Primary topic area: Chronic Disease | Secondary topic area: Biostatistics and Bioinformatics
14. Marijuana use by breastfeeding mothers: the concentration of cannabinoids in human milk samples

Authors
Kerri Bertrand, Nathan Hanan, Gordon Honerkamp-Smith, Brookie Best, Christina Chambers

Abstract
Background: Marijuana is the most commonly used recreational drug among breastfeeding women. With legalization of marijuana for recreational use in six U.S. states and for medicinal use in 30 U.S. states, there is a need for information on the risk of exposure to the infant via human milk. The objective of this study was to determine if cannabinoids are measurable in human milk following maternal marijuana use and to investigate the relationship between cannabinoid concentrations, the maternal reported dose, and time post-marijuana use in breastfeeding women.

Methods: Between 2014-2017, 50 breastfeeding women from the U.S. who reported marijuana use at any time since giving birth provided breastmilk samples to Mommy's Milk for a total of 54 samples. Concentrations of Δ9-THC, 11-OH-THC, CBD, and CBN were measured using LC-MS.

Results: Δ9-THC was detectable in 34 (63%) of the 54 samples; among these, median concentration of Δ9-THC was 9.47 ng/mL (range 1.01, 323.00). Five samples had levels of 11-OH-THC or CBD above limits of quantification (1 ng/mL). CBN was not detected in any samples. Number of hours since last use and number of daily uses were significant predictors of log Δ9-THC concentrations (-0.03, 95% CI -0.037, -0.002, p=0.032; 0.51 95% CI 0.03, 0.99, p=0.039).

Conclusions: This is the first report to assess Δ9-THC, 11-OH-THC, CBD, and CBN levels simultaneously in human milk. Results indicate that Δ9-THC can be detected up to six days after maternal marijuana use, while infant exposure to CBD and CBN are likely negligible.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Maternal and Child Health
A comparison of the anxiety, depression, and stress mood scores in breastfeeding women who use marijuana compared to those who do not use marijuana in Mommy’s Milk

Authors
Samantha Boccia, Shyla Butala

Abstract
Background: Women are twice as likely as men to be diagnosed with anxiety and/or depression. The use of marijuana to treat anxiety and/or depression has become increasingly popular among breastfeeding women.

Methods: Breastfeeding mothers ages 18 and older were enrolled into Mommy’s Milk between 2014 and 2017. Participants expressed a milk sample and completed an interview about their health and their child’s health, breastfeeding habits, and current exposures to medications and substances within the past 14 days. Participants completed the Edinburgh Postnatal Depression Scale (EPDS), Perceived Stress Scale-10 (PSS), and State-Trait Anxiety Inventory Y-1 Y-2 (STAI) shortly after milk collection via email. The 28 women who used marijuana and completed the mood questionnaires were matched to controls by maternal age and child age for a total of 56 controls.

Results: There was a significant difference in the mean EPDS score between marijuana and non-marijuana breastfeeding women (p=0.05). The marijuana users had a higher EPDS score than non-marijuana users. There was no difference in the mean STAI and PSS-10 scores between marijuana and non-marijuana.

Conclusions: The screening results indicate that marijuana users may be at higher risk for postnatal depression than non-marijuana users.

Primary topic area: Effects of Marijuana usage on anxiety and/or depression in breastfeeding mothers
Secondary topic area: The concentration of Marijuana transferred into breast milk, and the correlation with anxiety and/or depression
16. Is There a Safe, Inexpensive Alternative to Sterile Ultrasound Gel in Resource-Limited Settings?

Authors
Heather Boynton, Ilan Kolkowitz, Colleen Campbell

Abstract
Background: In hospitals and clinics around the world there is limited access to sterile ultrasound gel. At the same time, many of these settings are adopting ultrasound as a low-cost, versatile mode of imaging. This study looks at infection rates between sterile ultrasound gel and an inexpensive alternative.

Methods: This study used 3 types of ultrasound gel (sterile, non-sterile and non-sterile mixed with isopropyl alcohol). Skin and ultrasound probes were cleaned with alcohol wipes. Probes were dipped in gel then held on skin for 5 seconds. Skin was swabbed and plated. Culture plates were incubated for 5 days at 37°C. A right-tailed chi-squared test was used to analyze the difference between groups.

Results: Eight of 80 plates from the non-sterile group, 19 of 96 plates from the mixture group and 19 of 96 plates from the sterile group had bacterial growth. Zero of 6 of the non-sterile and mixture control plates had growth; 1 of 4 of the sterile control plates had growth. Overall significance of difference in growth had a p-value of 0.07.

Conclusions: Our study shows no significant difference in bacterial contamination between ultrasound gels of any type. This is encouraging for resource-limited settings where there is limited access to sterile gel. The study was designed to replicate procedural conditions. By swabbing the skin after the probe was placed on it, we add skin and probe as potential contaminants. Our study suggests clean technique is more effective in reducing infection than type of ultrasound gel used.

Primary topic area: Global Health | Secondary topic area: Health Technology
17. Physician perceptions of harm related to cigarettes, e-cigarettes, and marijuana

Authors
Katherine Braden, Yue-Lin Zhuang, Rina Edi, Sharon Cummins, Shu-Hong Zhu

Abstract
Background: While the adverse health effects of cigarettes are well-established, the risk of using e-cigarettes and marijuana is less understood. Moreover, controversies exist around the benefits of e-cigarettes (e.g., in helping smokers quit) and the extent of marijuana’s medicinal effects. As important arbiters of health information, it is key to understand physicians’ harm perceptions related to e-cigarettes and marijuana.

Methods: An online survey by the UC San Diego, conducted with a national sample of physicians (N=2,014) practicing in family medicine, internal medicine, pediatrics, and psychiatry, measured harm perceptions of cigarettes, e-cigarettes, and marijuana on a 5-point Likert Scale: (1) totally safe to (5) extremely harmful.

Results: Most physicians considered smoking cigarettes as extremely harmful (72.4%). In comparison, less than one third considered smoking marijuana (30.1%), vaping marijuana (27.3%), or vaping e-cigarettes (26.1%) as extremely harmful. Physicians’ perception of risk from second-hand exposure follows the same order, 59.1%, 28.6%, 21.7% and 19.2%, for cigarette smoke, marijuana smoke, marijuana vapor, and e-cigarette vapor, respectively. Pediatricians tended to rate e-cigarettes and marijuana as extremely harmful more than other medical specialties. Significantly higher proportions of physicians are very confident that CBD (18.1%) and THC (12.3%) in marijuana have strong therapeutic effects, while few considered nicotine to have clear medicinal effects (2.8%).

Conclusions: Physicians considered the use of marijuana and e-cigarettes to carry similar levels of health risk. Both are considered to have significantly lower risk than smoking cigarettes. These harm perceptions should be weighed against the potential utility of e-cigarettes and marijuana. Medical education implications will be discussed.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Services
A cross-sectional and longitudinal analysis of changes with age in cardiorespiratory fitness among male firefighters in San Diego, California, 2005 – 2015

Authors
Natalie Cameron, Jian Shen, Katie Rusk, Richard Parker, Jeanne Nichols

Abstract
Background: Firefighters require high levels of fitness to meet the demands of a strenuous occupation. However, cross-sectional studies report mean cardiorespiratory fitness (CRF) values below the 12 MET National Fire Protection Association (NFPA) recommendation in firefighters 40+ years old. We aimed to determine the rate and pattern of change in CRF with increasing age in male firefighters over 11 years using cross-sectional and longitudinal analyses.

Methods: Male firefighters (n = 1169) underwent annual evaluations from 2005-2015 in San Diego, CA. Differences in CRF among 10-year age groups, and patterns of change over 11-year follow-up were investigated using ANOVA and mixed modeling, respectively.

Results: ANOVA revealed significant differences among CRF by age group (p < 0.05); the largest difference of 1.39 METs occurred between the 30-39 and 40-49 age groups. After adjusting for body fatness, CRF change across age groups decreased from 1.19 to 0.57 METs. Mixed modeling showed a non-linear pattern of change in CRF over 11-years, which differed across baseline age groups, with the youngest age group demonstrating the greatest decrease in CRF over time. In both analyses, average CRF exceeded 12 METs except for firefighters 50+ years with over 40% of firefighters in this group not meeting the guideline.

Conclusions: Both analyses support a negative association between age and CRF, especially among younger firefighters, which may be attenuated by maintaining healthy body fatness. Fire departments should recognize the health and safety risks of declining CRF, and institutionalize programs to promote and sustain fitness among all firefighters.

Primary topic area: Occupational Health | Secondary topic area: Diet, Physical Activity, and Obesity

Authors
Laura Campbell, Jessica Montoya, Pariya Fazeli, Maria Marquine, Dilip Jeste, David Moore, Raeanne Moore

Abstract
*Background:* Engagement in physical activity (PA) is related to better cognitive functioning in people living with HIV (PLWH) and HIV-uninfected (HIV-) adults; however, less is known about the effects of nutrition on cognitive functioning. We examined associations of PA and nutrition with successful cognitive aging (SCA) among PLWH and HIV- adults.

**Methods:** 106 PLWH and 92 HIV- adults, aged 36-65 (M=51.2; SD=7.9), 76.8% male, 62.1% non-Hispanic white, were administered the International Physical Activity Questionnaire (minutes/week x intensity) and the By-Meal Screener to assess average fruit and vegetable (FV) consumption (servings/day). A continuous SCA composite was calculated based on performance on a comprehensive neuropsychological battery, self-report of instrumental activities of daily living, and depressive symptoms. Covariates examined included diabetes, hypertension, hyperlipidemia, lifetime smoking, and lifetime methamphetamine use disorder.

**Results:** In separate multivariable models predicting SCA, lower PA (p=0.006) and HIV+ status (p<0.001) (model 1), and lower FV (p=0.060) and HIV+ status (p<0.001) (model 2) were associated with worse SCA. After controlling for relevant covariates HIV- status (p<0.001) and greater PA (p=0.036) were independently associated with better SCA; however, FV was not significantly related to SCA (p=0.464). No interactions were observed.

**Conclusions:** Greater PA, but not FV, was related to SCA after adjusting for covariates. The By-Meal Screener may not be a sensitive measure of overall nutrition, and FV consumption may be related to developing other medical conditions (e.g., diabetes) which may relate to SCA. Interventional and longitudinal studies that utilize objective measures should further investigate the relationships among PA, nutrition, and SCA.

**Primary topic area:** Diet, Physical Activity, and Obesity | **Secondary topic area:** Chronic Disease
Perceptions of cigarette brand packaging: A qualitative study of how different graphic images affect smokers

Authors
Ashley Chae, Justine Wang, Tiffany Cai, Samantha Hurst, Jesica Oratowski, David R. Strong, John P. Pierce

Abstract
Background: Recent studies suggest the effectiveness of plain cigarette packaging in reducing the attractiveness of packaging, eliminating misconceptions that some cigarettes are less harmful, and increasing the awareness of health warnings. This qualitative pilot is part of an overall research study examining smokers’ acute and persistent adaptations to different graphic labels and marketing materials on US cigarette packaging.

Methods: Qualitative interviews were conducted using the Think Aloud method as participants performed a centralized task of examining five different graphic varieties of cigarettes packaging, including three graphic varieties currently used in Australia. These images were reprinted with permission from the Commonwealth of Australia. All participants (ages 21-50) are current smokers with no intention of quitting (n=43).

Results: Early qualitative coding analysis reveals the following trends. #1 Australian pack of a premature infant evokes a sense of “sadness” and majority remark on how “fragile,” “wrinkly and brown” the baby looks. #2 Australian pack with a gangrene foot produces the strongest, negative response, including “disturbing,” “horrifying,” and “disgust for the “nasty colors” of the image. #3 Australian pack of a throat stoma triggers distressing reactions such as “kind of freaking out” and self-concern “this could happen to me.” #4 Plain pack (no brand / no anti-smoking marketing) arouses comments for the dislike of pack color and some men associate the dark green with “military smokes.” #5 American brand, elicits positive remarks, often described as “comforting,” most participants state that it “makes me happy to see it.”

Conclusions: Analysis of transcripts is ongoing.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Policy
21. Couple Communication and Family Planning Use Among Married Adolescent Girls in Dosso, Niger

Authors
Sneha Challa, Jay Silverman

Abstract
Background: This analysis aims to assess associations between spousal communication about fertility and sexual and reproductive health (SRH) outcomes including lifetime family planning (FP) use, overt use (with husband’s knowledge) and covert use (without husband’s knowledge) among married adolescent girls and their husbands in Niger.

Methods: This analysis uses cross-sectional data from the Reaching Married Adolescents Evaluation Study. Baseline data were collected in 2016 from 1,137 married adolescent girls (ages 13-19) and their husbands in the Dosso region of Niger. Using women’s data, logistic regression assessed unadjusted associations of spousal communication with actual FP use, overt use, and covert use as well as associations adjusting for age, age at marriage, number of children, number of wives, and wealth (food insecurity).

Results: Approximately 35% of women in this sample reported ever communicating with their husbands about number of children, spacing of births, or FP use. Spousal communication was significantly associated with lifetime FP use (OR: 5.98, 95% CI: 4.27, 8.37) and overt FP use (OR: 13.78, 95% CI: 8.38, 22.64) but not covert use (OR: 1.26, 95% CI: 0.76, 2.09). After controlling for covariates, spousal communication was still associated with lifetime FP use (AOR: 4.47, 95% CI: 3.11, 6.42) and overt use (AOR: 10.58, 95% CI: 6.24, 17.93).

Conclusions: Among married adolescent girls in Niger, communication with their husbands is a significant predictor of family planning use. Future research should focus on further characterizing the nuances of couple communication in Niger and understanding conflict related to reproductive health in this context.

Primary topic area: Reproductive Health | Secondary topic area: Global Health
Factors Associated with Fair/Poor Self-Rated Oral Health Among Underserved Seniors

Authors
Alexis Chavez Escobedo, Padideh Asgari, Karen Becerra, Tracy Finlayson

Abstract
Background: This study examined factors associated with fair/poor self-rated oral health (FPOH) status among underserved seniors to understand their dental needs.

Methods: This cross-sectional study included lower-income, older adults (>60yrs) attending a wellness center. Survey data were collected between 08/11/15-09/11/15 (n=257). Self-rated oral health was the main outcome, dichotomized as fair/poor vs. better (excellent, very good or good). Descriptive and logistic regression models were analyzed to assess associations between self-reported periodontal status, dental symptoms (pain, problems or functional difficulties), socio-demographics, health behaviors (smoking, brushing, flossing, dental visits) and FPOH status.

Results: Seniors’ average age was 70±7 years, most (62%) were males and most (60%) reported FPOH status. Final regression model showed seniors who reported a tooth that did not look right were more likely to report FPOH (AOR= 2.79, 95%CI=1.34-5.81,p<0.05) compared to their counterparts. Seniors who met brushing guidelines were less likely to report FPOH (AOR=0.36,CI= 0.17-0.76,p<0.05) than those who did not brush twice/daily. Seniors who experienced difficulty with chewing, tasting, or swallowing were 3.97 times more likely to report FPOH (CI=1.97-8.01,p<0.05) than those who did not. Seniors who reported having gum disease were 2.84 more likely to report (AOR= 2.84, CI=1.22-6.60) FPOH status than those without it.

Conclusions: Seniors experienced a range of symptoms that affect perceived oral health status. Two periodontal status indicators positively correlated with FPOH status. Those with reported gum disease and more problems had worse ratings. Seniors’ FPOH status is associated with greater perceived dental needs, and this can inform treatment planning. Regular toothbrushing was negatively associated with FPOH status.

Primary topic area: Oral Health | Secondary topic area: Geriatrics
23. Smoking status can be inferred from methylation levels of peripheral blood lymphocytes

Authors
Ruifeng Chen, Karen Messer, Carol Franz, Brinda Rana, William Kremen

Abstract
Background: Biomarkers which can assess lifetime exposure to cigarette smoke may be useful risk markers for smoking-related disease. We investigate whether DNA methylation status in peripheral blood lymphocytes can distinguish smokers from non-smokers.

Methods: We used 256 subjects aged 50 to 65 years from The Vietnam Era Twin Study of Aging with available methylation data from the Infinium Methylation EPIC BeadChip. Smokers were defined as those who had smoked more than 100 lifetime cigarettes and had smoked after age 35 years. Methylation levels at ~850,000 CpG sites were obtained using standard processing pipelines, as measured by the log2 intensity ratio of the methylated versus unmethylated probe (the M-value). We used logistic regression to investigate the relation of smoking status with methylation M-values, controlling for demographics. Additional models investigated the ability to predict lifetime exposure as measured by total reported pack-years smoked.

Results: We found 560 differentially methylated sites, 6 of which replicated in the literature, and 26 of which were significantly associated with total pack-years smoked. There were strong correlation patterns among the M-values for these 6 sites. Each site alone was predictive of smoking status (p-values < 10e-7). Using a multivariate model to predict smoking status for a subset of 178 randomly chosen subjects, 4 sites were selected by AIC; the cross-validated AUC was 0.96. The R-squared was 0.68 for predicting total pack-years smoked from the 26 associated methylation sites.

Conclusions: Methylation status using 6 validated CpG sites is highly predictive of smoking status. Future work will focus on validation.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Biostatistics and Bioinformatics
24. **Use of E-cigarettes by Pregnant Smokers**

**Authors**
Sharon Cummins, Shiu-Shing (Victor) Wong, Shu-Hong Zhu

**Abstract**
**Background:** Pregnancy is considered a contraindication for use of FDA approved quitting aids; therefore, few pregnant smokers use them. Many smokers use e-cigarettes to help them quit smoking. This study examined whether pregnant smokers use e-cigarettes and, if such use impacts their ability to quit smoking.

**Methods:** Cross sectional representative telephone survey. A subsample (N=66013) of the 2016 Behavioral Risk Factor Surveillance System (BRFSS, N=486,303) that included women age 18-44 who provided information about pregnancy status (pregnant N=2,497, not pregnant N=63,516). Measures: (1) Pregnant or not pregnant: Answered yes or no to the question “To your knowledge, are you now pregnant?” (2) Ever use: Ever use of cigarettes included only those who had smoked 100 cigarettes in their life (3) Current use: use within the last 30 days (4) Former smoker: Had ever used cigarettes, but not a current smoker.

**Results:** Pregnant women were no less likely than non-pregnant women to have ever smoked (25.2% vs. 27.7%) or ever use e-cigarettes (24.1% vs. 26.1%). However, they were significantly less likely to be current smokers (7.1% vs. 15.5%) or vapers (1.9% vs. 4.8%). Furthermore, among smokers who had successfully quit, pregnant women were significantly more likely to have tried e-cigarettes than non-pregnant women. These results, combined with the fact that pregnant women are less likely to use FDA approved quitting aids, suggests that e-cigarettes played a positive role in quitting smoking.

**Conclusions:** The use of e-cigarettes does not appear to negatively impact smoking cessation during pregnancy.

**Primary topic area:** Tobacco, Alcohol, and Other Drugs | **Secondary topic area:** Maternal and Child Health
Associations Between Education, Physical and Emotional Health, and Social Support in San Diego

Authors
Kaylene De Vries, Elizabeth Duxbury, Christina Mnatzagainian, Karen Pellegrin, Eduardo Fricovsky

Abstract
Background: The social determinants of health are the circumstances people live, work and age which are shaped by unequal distribution of money and power. These circumstances are the culprits of health inequities. The goal of this study is to better understand social determinants of health in San Diego by determining if education level predicts physical and emotional health and to explore the relationship between social support and health status.

Methods: Surveys were administered over 6 months online and in person. Online surveys were distributed through social media and the UC-San Diego email listserv. Surveys were distributed in-person at local Departments of Motor Vehicles, supermarkets, pharmacies, and at UC San Diego Student-Run Free clinics. Data were analyzed with two-way ANOVA using STATA14.

Results: Based on the 138 completed surveys, education level did not predict self-reported fitness; however, higher education did predict a decreased BMI (p<0.05). Additionally, education level did not predict self-reported emotional problems. However, exploratory analyses indicated that self-reported social support did predict emotional health (p<0.01).

Conclusions: Higher education predicted decreased BMI but not fitness or emotional health within this San Diego sample; additional research is needed to better understand potential mediating variables and results from other regions. However, perceptions of social support did predict emotional health, suggesting that positive interpersonal connections may play an important role in health outcomes. Future research is needed to further explore these social determinants of health in San Diego County and to determine if these results are representative of all communities.

Primary topic area: Health Equity and Disparity | Secondary topic area: Diet, Physical Activity, and Obesity
26. Undergraduate student-led health screenings for low income families at the Preuss School UCSD

Authors
Asmaa Deiranieh, Alison Wong, Bianca Navarro, Becky Marquez

Abstract

**Background:** The Bachelor of Science in Public Health Program has collaborated with the Preuss School to provide health screenings to the low-income families they serve. This year to address past challenges of limited health professional volunteers and bilingual services, students learned how to plan, implement, and evaluate health screening services via a Directed Group Study for the Preuss School.

**Methods:** Ten bilingual (Spanish, Somali, Arabic, and Cantonese) students received training in conducting health interviews, measuring blood pressure and body mass index (BMI), and behavioral counseling through written protocol, role-play exercises, and feedback activities. Students provided health screenings at two PTA meetings. Students reviewed with participants an individualized health report containing their measurements along with public health recommendations. Participants provided feedback via an anonymous exit questionnaire.

**Results:** A total of 107 participants were screened. The majority of participants were women (76%) and Latino (80%). The average age was 43 ± 7 years. More than half did not have health insurance (57%) and 49% had not seen a physician in the last year. Less than half (43%) engaged in moderate-to-vigorous physical activity. Most met the dietary guidelines for fruit (81%) and vegetable (53%) consumption. Almost half (46%) had blood pressure classified as hypertension and most (80%) had a BMI classified as overweight or obese. Participant feedback was very positive with 97% rating our service as helpful.

**Conclusions:** Student-led health services may be a feasible and effective means of providing health education to communities with limited resources.

**Primary topic area:** Descriptive Program Analysis | **Secondary topic area:** Health Services
Assessing Hepatitis B Vaccination Status and Barriers to Vaccination among Asian Americans in San Diego County

Authors
Kaishan Ding, Kayla Giang, Binh Tran

Abstract
Background: Hepatitis B (HBV) is a viral infection that disproportionately affects Asian and Pacific Islanders in the United States. This study aims to assess the HBV vaccination status of Asian populations in San Diego and to determine whether the patient’s perceived knowledge, awareness, socio-economic status, and access to healthcare affect their vaccination status.

Methods: A cross-sectional study was conducted. Consenting participants were asked two survey questions – (1) whether they were vaccinated and (2) if HBV can be prevented by vaccination. Blood samples were collected to corroborate findings from participants’ self-reports with HBV immunoassays.

Results: Among the 224 participants, more than half (51%) did not know their vaccination history. A majority of participants (61.3%) incorrectly reported being vaccinated. Of the 32 individuals who answered the knowledge assessment question – whether HBV was preventable by vaccine, 66% did not know the answer. Access to care has a significant effect on vaccination status (P=0.02). However, there was no significant association between participants’ vaccination status and socio-economic status (P=0.26).

Conclusions: The patient knowledge gap about vaccination status is a potential barrier to preventing HBV infection. The relatively large fraction of unvaccinated individuals with access to healthcare points to the need for expanding awareness of the availability and importance of HBV vaccination in San Diego.

Primary topic area: Infectious Disease | Secondary topic area: Health Equity and Disparity
28. Association of unintended pregnancy with infant deaths among women in Nigeria DHS 2013

Authors
Anvita Dixit, Lotus McDougal, Amruta Trivedi, Sarah Averbach, Margaret Bolaji, Anita Raj

Abstract
Background: One in five infant deaths globally occurs in Nigeria, approximating to one million infant deaths each year. Research suggests that unintended pregnancy may be associated with increased risk for infant mortality, such results are inconclusive and not examined for Nigeria. Given that one in twelve women in Nigeria report unintended pregnancy, the issue warrants further study. This study examines association between pregnancy intention at last birth and infant death, among a nationally representative sample of women.

Methods: This study used the population based cross-sectional Nigeria Demographic Health Survey 2013. The study was restricted to women currently married or cohabiting, who gave birth to a living child in five years prior to the survey (n=17,872). Simple and adjusted logistic regression assessed the hypothesized association between pregnancy intention and infant death.

Results: Four percent of last births resulted in an infant death for this representative sample of mothers in Nigeria, and 8.1 percent of these births were unintended (6.0% wanted later and 2.1% unwanted). Crude analyses document a significant association between wanting no more children and infant death (OR=1.68, p=.03). Adjusted analyses resulted in slightly attenuated findings and a more marginal significance for this association (AOR=1.60, p=.06).

Conclusions: Having an unwanted pregnancy is associated with increased risk for infant death in the country. Given low prevalence of contraceptive use and in particular limiting contraceptive use in Nigeria, even among married women, improvements in modern and limiting contraceptive access and use may further prevent unintended pregnancy and simultaneously reduce infant mortality rates.

Primary topic area: Global Health | Secondary topic area: Maternal and Child Health
U Fitbit Charge HR VO2 Max Validation Study

Authors
Katherine Dizaye, David Wing, Michael Higgins, Jeanne Nichols, Linda Hill, Job Godino

Abstract

Background: Cardiorespiratory fitness (CRF), broadly defined as the body’s ability to transport and utilize oxygen, is a well-established prognostic marker of health. However, it is not routinely measured in clinical practice due to time and cost constraints. Wearable activity trackers may enable free-living measurement of CRF. One such device is the Fitbit Charge 2. The primary objective of this study was to determine the validity of the Fitbit Charge 2’s measure of CRF compared to a gold standard laboratory measure.

Methods: 0 healthy adults (55% female, 45% male) aged 18-45 years completed a treadmill-based VO2 max test measured via indirect calorimetry and were asked to wear a Fitbit Charge 2 continuously for one week, during which they were asked to complete at least 3 outdoor runs (the manufacturer recommended amount to measure CRF). Laboratory and free-living CRF measures at varying epochs were compared using Bland Altman procedures.

Results: There was a strong correlation between 15 second epoch laboratory and Fitbit-based measures (r= 0.724, P<0.001). Overall the mean bias for the sample was 1.64 (95% CI -10.17, 13.45). Split by sex mean difference for males was -0.33 (CI -13.81, 13.15) and females was 3.26 (CI -6.03, 12.55).

Conclusions: These data suggest that there is potential for low-cost, non-invasive, wrist-worn wearable devices to be useful in assessing CRF. However, there appear to be differences in accuracy between males and females which warrants further analysis.

Primary topic area: Health Technology | Secondary topic area: Diet, Physical Activity, and Obesity
30. Fireworks Legislation And The Incidence Of Severe Fireworks-related Injuries in Washington State

Authors
Sherise Epstein, Rahel Hintza, Todd Lyons, Kari Keys

Abstract

Background: The use of fireworks in Washington State is associated with over 200 reported injuries per year. Fireworks-related injuries can be severe and disabling. Legislation represents one potential way to mitigate dangers. The primary objective of this study was to determine the association between county-level fireworks legislation and the cumulative incidence of severe fireworks-related injuries.

Methods: We conducted a cross-sectional study of patients with fireworks-related injuries admitted to Washington’s only level 1 trauma center from 2005-2015. Data sources included an institutional fireworks injury database, US Census data, and municipal coding provided by the State Fire Marshal. We compared the incidence of injury among counties exposed to varying levels of consumer fireworks legislation (banned, restricted, no restrictions) via a clustered Poisson multivariable regression model adjusted for demographic and socioeconomic confounders.

Results: There were 267 severe fireworks-related injuries over 390 county-years of exposure to legislation. The overall crude cumulative incidence of severe fireworks-related injuries was 3.97/100,000 people; this incidence varied by county and legislative exposure level. There were significant differences in the size of the elderly and Asian and Pacific Islander populations among exposure groups. Adjusting for these differences, the incidence rate of severe fireworks-related injury was 2/100,000 residents of counties with a ban on consumer fireworks. This rate was 2.41 (95% CI 1.49-4.17; p=0.0007) times higher among residents of counties with consumer fireworks restrictions and 2.59 (95% CI 1.50-4.68; p=0.0009) times higher among residents of counties with no restrictions.

Conclusions: Consumer fireworks regulation is associated with a lower incidence of severe fireworks-related injuries in Washington.

Primary topic area: Injury and Violence Prevention | Secondary topic area: Health Policy
31. Strategies for Implementing a Sustainable Peer-Led Program in Senior Centers

Authors
Danielle “Nina” Escueta, Michelle Takemoto, Khalisa Bolling, Brittany Lewars, Katie Crist, Jacqueline Kerr

Abstract
Background: Less than 3% of older adults meet physical activity (PA) guidelines. The Peer Empowerment Program for PA (PEP4PA) is a peer-led, multi-level PA program in senior centers that hopes to address this.

Methods: PEP4PA is a pragmatic trial and models the Plan-Do-Study-Act framework. Prior to program launch, Peer Health Coaches (PHCs) from the community and a center staff member complete a training course to lead the program. There is an immediate transition of intervention delivery from UCSD research staff to these community members. The efficiency of implementation during intervention is assessed based on results from both an online tablet and measurements administered every 6-months.

Results: Based on results from the tablet, attendance drops off at around 6-months going from approximately 75% to 60% before stabilizing. Also, variability in participants meeting step goals is high across sites, ranging from 65% to 85%. This could be due to a number of factors such as PHC turnover or burnout.

Conclusions: Providing accurate feedback in real time is a key element for program success. The first site that was re-randomized to no support continued to be monitored for program progress and has been sustained. The sites value ongoing dialogue and evaluations as essential components and hope to continue with this program after the study’s end.

Primary topic area: Dissemination and Implementation | Secondary topic area: Diet, Physical Activity, and Obesity
32. Depression is associated with levels of sexual risk-taking among gay, bisexual, and other men who have sex with men in Houston, Texas in 2014: a cross-sectional study

Authors
Christina Espinosa da Silva, Zheyu Liu, Alan Nyitray, Paige Padgett Wermuth, Jose Miguel Yamal

Abstract
Background: Men who have sex with men (MSM) are disproportionately impacted by HIV in the US and have increased risk of mental health problems compared to men in the general population. MSM in Texas are at higher risk because Texas has higher HIV diagnosis and mental illness rates compared to national rates.

Methods: 511 MSM were surveyed in Houston in 2014 as part of the NHBS system. Depressive symptoms were assessed via the 10-item CES-D scale and categorized as no symptoms, moderate, or severe symptoms. Sexual risk-taking was based on self-reported sexual behavior in the past year and defined as risk-level with sexual partners: no sexual partners, low-risk sexual partners (condom-protected/unprotected oral intercourse or condom-protected anal intercourse), and high-risk sexual partners (condom-unprotected anal intercourse). Multinomial logistic regression was used to model sexual risk-level as a function of depression adjusting for demographics, alcohol use, non-injection drug use, and outness.

Results: On average participants were 35 years old, 39% were non-Hispanic Black, 37% were heavy drinkers,15% and 10% had moderate or severe depressive symptoms, and 32% had high-risk sexual partners. Compared to having low-risk sexual partners, the odds of having high-risk sexual partners were 2.5 times higher among MSM with moderate depression (95% CI: 1.5-4.2) and 3.7 times higher among MSM with severe depression (95% CI: 2.0-7.1) than the odds among MSM with no depression.

Conclusions: The findings from our adjusted analysis suggest that targeting mental health in HIV prevention is relevant and could influence HIV transmission rates among MSM in urban areas in Texas.

Primary topic area: Infectious Disease | Secondary topic area: Mental Health
33. **Weight Stigma Reduction among Medical Students through Narrative Medicine**

**Authors**
Rachel Fox, Kelly Park, Anne Vo, Pamela Schaff

**Abstract**

**Background:** Despite scientific evidence refuting many negative stereotypes about the health of fat individuals, stigmatization of fat patients persists, directly contributing to the negative health outcomes often attributed to fatness. Thus, weight stigma reduction methods wherein healthcare providers and fat people participate and benefit equally are long overdue in medical institutions.

**Methods:** In serial workshops at the Keck School of Medicine of USC, mixed groups of medical students and fat individuals participated in a pilot study examining the capacity of collaborative close reading, repeated re-writing of trauma narratives, and long-term paired workshopping to reduce stigma and build dignity-affirming relationships. We posited that narrative methods could help overcome weight bias in medical education, but would not sufficiently address the stigma based in fat corporeality. We therefore welcomed fat participants from an activist community into the room as agents of change, and selected texts that spoke to the dehumanizing effects of fat phobia.

**Results:** Preliminary results from qualitative and quantitative data reveal that all participants were profoundly affected by the workshops. In focus group interviews, both students and community members noted how visceral reactions shape clinical encounters despite bias training. The common ground they found in their creative works inspired mutual compassion and pledges to carry their new knowledge into future clinical encounters; these responses corresponded to quantifiable decreases in fat phobia per the Fat Phobia Scale.

**Conclusions:** Our findings demonstrate that embodied empathy counters embodied stigma, and therefore reinforce the importance of centering the expert perspectives and presence of marginalized people in stigma reduction work.

**Primary topic area:** Health Equity and Disparity | **Secondary topic area:** Stakeholder and Community Engagement
34. Socio-environmental influences on youth total sedentary time: Results from the Hispanic Community Health Study / Study of Latino Youth

Authors
Melawhy Garcia, Sheila Castaneda, Linda Gallo, Jordan Carlson, Maria Lopez Gurrola, Gregory Talavera

Abstract
Background: Sedentary behavior (SED) is associated with higher obesity and cardiometabolic risk in youth, independent of physical activity. Studies showing the association between screen time and SED among Hispanics/Latinos, have primarily focused on Mexican-origin Hispanics. Additional research is needed to examine socio-environmental factors that can influence SED among diverse Hispanics/Latinos. This cross-sectional study examined the home-, neighborhood-, and school- environment to identify factors associated with sedentary time among youth.

Methods: Data from 1,104 youth ages 8-16 years and 728 caregivers from four U.S. cities, who participated in the Study of Latino Youth (2012-2014), were examined. Associations between socio-environmental factors (measured by self-report) and total sedentary time (measured by one-week Actical accelerometry) were examined in linear regression models that included MVPA minutes/day, demographic covariates, and accounted for complex survey design and sampling weights.

Results: Mean sedentary time was 10.1 ± 1.8 hours/day. Home environment factors, such as electronics in the bedroom and parent limit setting, were not associated with total sedentary time. Presence of barriers to physical activity in the neighborhood (e.g., muggings, gangs) was associated with 13.4 more minutes of sedentary time per day. Attending a school that never/rarely compared to sometimes offered after school physical activity opportunities was associated with more sedentary time (B=38.0 minutes/day; 95% CI: 13.5-62.4).

Conclusions: Findings highlight the need for future research to investigate other sources of sedentary behavior in the home. Minimizing barriers by identifying safe places to be active in participant’s neighborhoods may also support youth to spend less time indoors where sedentary time is prevalent.

Primary topic area: Sedentary Behavior | Secondary topic area: Diet, Physical Activity, and Obesity
35. Socio-environmental influences on youth total sedentary time: Results from the Hispanic Community Health Study / Study of Latino Youth

Authors
Melawhy Garcia, Sheila Castaneda, Linda Gallo, Jordan Carlson, Maria Lopez Gurrola, Gregory Talavera

Abstract
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Methods: Data from 1,104 youth ages 8-16 years and 728 caregivers from four U.S. cities, who participated in the Study of Latino Youth (2012-2014), were examined. Associations between socio-environmental factors (measured by self-report) and total sedentary time (measured by one-week Actical accelerometry) were examined in linear regression models that included MVPA minutes/day, demographic covariates, and accounted for complex survey design and sampling weights.

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Conclusions: Findings highlight the need for future research to investigate other sources of sedentary behavior in the home. Minimizing barriers by identifying safe places to be active in participant’s neighborhoods may also support youth to spend less time indoors where sedentary time is prevalent.

Primary topic area: Sedentary Behavior | Secondary topic area: Diet, Physical Activity, and Obesity
Response to a Hepatitis A Outbreak Among the Homeless at a Student-Run Free Clinic Project

Authors
Ethan Gerdts, Natalie Rodriguez, Alicia McGhie, Eduardo Fricovsky, Michelle Johnson, Ellen Beck

Abstract
Background: San Diego County has been experiencing an outbreak of Hepatitis A since its inception in November of 2016. Since then, 577 cases have been reported with some of the poorest outcomes in recent history, with hospitalization and fatality rates far greater than the national average. The UCSD Student-Run Free Clinic Project (SRFCP) was contacted by San Diego County Public Health Services to help administer vaccines to the most vulnerable populations: homeless individuals and those who inject intravenous drugs. In response, the SRFCP implemented a student-led, multidisciplinary effort administering Hepatitis A vaccinations and providing education to help curtail the Hepatitis A outbreak.

Methods: The SRFCP identified the 2 clinic sites that serve meals to many homeless individuals and coordinated vaccination efforts during the meal programs for maximal exposure. Students approached attendees, explaining benefits of vaccination, answering any questions, dispelling myths, and vaccinating interested individuals.

Results: Medical students from the UCSD School of Medicine and pharmacy students from UCSD Skaggs School of Pharmacy were involved in the vaccination and education efforts, with over 130 hours volunteered and 351 vaccinations administered over a 6-month period. The SRFCP accounted for 32% of all vaccines administered across UCSD-affiliated sites, including Hillcrest and Jacobs Medical Center.

Conclusions: UCSD SRFCP provided a unique ability to reach at-risk individuals through a longstanding history of caring for the underserved community in San Diego. Continued follow-up is needed, as the second dose is now due and the outbreak is still considered ongoing.

Primary topic area: Infectious Disease | Secondary topic area: Health Services
37. Who Reads Signs, Anyway? A Comprehensive Inventory of Bicycle and Skateboard Use Signage on the UCSD Campus

Authors
Hunter Green, Madeline Simon, Huey Yih (Elaine) Cheng, Grace Tran, Nancy Binkin

Abstract
Background: UCSD, a large urban university with nearly 60,000 students, faculty, and staff, has several heavily-used sidewalks and pathways where pedestrian traffic intersects with bicycles, skateboard, and motorized cart traffic. To reduce the risk of accidents and ensure a safe campus environment, UCSD has developed policies on the use of these vehicles and posted campus signage, and UCSD police administer fines for infractions. In early 2018, we evaluated the status of signage and frequency of fines.

Methods: We conducted a comprehensive inventory of signage of 9 areas: the six colleges, University Center, the medical school and North Campus. Signs were photographed and classified as weathered, unreadable, and/or having graffiti. Acreage of the nine sites was obtained from UCSD’s campus map. Data on infractions were provided by the campus police.

Results: We found 103 total signs (range: one in Sixth College and north campus to 29 in University Center). Signs per acre ranged from 0.02 in Sixth College and North Campus to 0.69 in University Center. Sixty-eight (66%) signs were weathered, 26 (25%) were unreadable and 30 (29%) had graffiti. Among the six areas with ≥10 signs, between 40% (Marshall College) and 100% (Revelle College) of signs had ≥1 problem. In 2017, 51 citations, 17 written warnings, and 309 verbal warnings were issued for bicycle and skateboard infractions.

Conclusions: Bicycle and skateboard signage are neither equally distributed nor adequately maintained, and fines are rarely issued. Efforts are needed to augment and replace damaged signage and conduct additional enforcement.

Primary topic area: Injury and Violence Prevention | Secondary topic area: Health Policy
38. Cost-Effectiveness of Yoga for Chronic Low Back Pain

Authors
Erik Groessl, Lin Liu, Douglas Chang, Danielle Casteel

Abstract
Background: Yoga interventions can improve function and reduce pain in persons with chronic low back pain (cLBP). Using data from a recent trial of yoga for military veterans with CLBP, we analyzed the incremental cost-effectiveness of yoga versus the study comparator.

Methods: Participants (n=150) were randomized to either 2x weekly yoga sessions for 12 weeks, or to a delayed treatment (DT) control group. Outcomes were measured at 6 weeks, 12 weeks, and 6 months. Clinically meaningful improvement (CMI) = 30% improvement in disability. QALYs were measured with the EQ5D scale. Study intervention costs were tracked and health care costs were estimated using self-report. A 1-year time horizon and organizational perspective were used.

Results: Outcomes were compared using a multivariable random effects model controlling for covariates. At 6-months, 57% of yoga participants had a CMI compared versus 24% of the DT group (p = 0.003). The yoga group had significantly greater increases in EQ5D scores than the DT group (p = 0.047) with 0.041 QALYs gained over 1 year. Total intervention costs were $550/yoga participant and $85/DT participant. The incremental cost-effectiveness ratios (ICERs) were $1,395 per clinically improved patient at 6-months, and $11,341/QALY over one year. Sensitivity analysis estimated that costs for an ongoing yoga intervention could be delivered at about half the cost, or $287/participant, lowering ICERs to $606 per clinical improvement and $4,927/QALY.

Conclusions: The results suggest that yoga, which is typically delivered in a group format, is a relatively low-cost intervention and has a favorable cost-effectiveness ratio.

Primary topic area: Integrative Health | Secondary topic area: Chronic Disease
Computation Developing of RAGE Inhibitors Using Artificial Intelligence

Authors
Shubham Gupta, Valentina L Kouznetsova, Igor F. Tsigelny

Abstract

Background: An important role in Type 2 diabetes pathogenesis is played by advanced glycated end (AGE) products created by glycation, a process similar to the natural glycosylation but not regulated by enzymes. AGE products bind to receptor for AGE products (RAGE), which triggers a variety of pathophysiological conditions. A set of drug candidates are developed to inhibit RAGE. Our goal was to elucidate the set of descriptors related to inhibitors of RAGE and use them as descriptors for a machine-learning system that can be used for drug-candidates selection.

Methods: We trained WEKA, the machine learning program, with 31 known RAGE inhibitors and 131 arbitrary molecules, each with originally 1538 descriptors of chemical properties of these molecules. Then we selected significant descriptors and ran a J48 tree machine-learning algorithm in WEKA to identify what descriptors the machine used to correctly categorize the molecules. We removed those descriptors from the original data sheet, saved them, and repeated this process several times.

Results: eventually, we selected 30 descriptors for machine learning. With this descriptor set, we ran a 66% split validation and achieved 96.30% accuracy of prediction. Then we ran a 10-fold cross-validation and achieved 92.59% accuracy.

Conclusions: We created a good starting point for identifying potential RAGE inhibitors. With further refinement and more data points the trained machine-learning model could identify more potential inhibitors of RAGE that can help in treatment of diabetes, Alzheimer's disease, and other related diseases.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Chronic Disease
40. The Impact of Graphic Images on Attentional Gaze to Smoking-Related Health Communication Messages

Authors
Saksham Gupta, Matthew D. Stone, John P. Pierce, David R. Strong

Abstract
Background: In 2003 the World Health Organization Framework Convention on Tobacco Control represented the first global public health treaty to reduce tobacco-related disease. Recognizing the central role of packaging in communicating product information, pictorial warning labels were recommended to graphically communicate the dangers of tobacco. As part of a randomized trial on the effectiveness of graphic warnings, we manufactured Australian-like cigarette packs (1) as well as packs devoid of all imagery and tobacco company logos. Prior to the start of this trial, we explored how different designs influence the amount of time consumers spend viewing warning labels.

Methods: To assess how marketing materials influence visual attention to smoking related health warnings, US daily smokers naïve to graphic warning labels (n=140) were presented with five cigarette pack designs one-at-a-time in counterbalanced order: 1) a standard US pack, 2) a plain pack with marketing materials removed, and 3-5) three Australian-like packs using approved Australian graphic warning labels. Participants were fitted with eye view camera glasses to capture their visual attention relative to pack movements when handling the products. Behavioral assessment of participant interactions with the packs were coded to quantify the amount of time viewing each warning label region and then gauged across pack conditions.

Results: Exploratory assessment (n=21) revealed that all graphic images significantly increased the time spent viewing the warnings relative to plain and standard packaging.

Conclusions: (1) The Commonwealth of Australia awarded a license to the Regents of the University of California granting permission to use their cigarette package designs.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Policy
Correlates of Medication Adherence in Bipolar Patients: Findings from an Integrated Dataset

Authors
Kristen Hansen, Lisa Eyler, Martha Sajatovic, Xin Tu

Abstract

Background: Treatment adherence is a pervasive challenge in bipolar disorder causing disability and financial cost. As many as 60 percent of patients are at least partially non-adherent to their medication.

Methods: Two datasets from studies of bipolar patients were combined. Measures include everyday functioning, medication load, and medication adherence. After dichotomization of medication adherence, we will examine how adherence relates to the everyday functioning and total medication load. We hypothesize that patients with poorer adherence will show poorer functioning, and that this will be driven by medication burden. We will also examine other measures, like the degree of medical comorbidity and mood, as well as clinical features like age of onset and number of hospitalizations. Logistic regression will be used to explore these relationships. Through which we will demonstrate the efficacy of shared datasets in bipolar research.

Results: Preliminary results show significant association between functioning and medication adherence, but in an unexpected direction (those with better functioning report lower adherence), this suggests the need for other variables in the model. Many potentially confounding variables are significantly related to adherence, including number of psychiatric hospitalizations, age of onset and comorbidity. Additionally, there is a strong site effect.

Conclusions: A model including only Global Assessment of Functioning score and medication load does not predict adherence well. Further analysis is needed to understand predictors of adherence, its relationship to functioning, and explore the role of potential confounders.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Mental Health
Community Approach to Severe Asthma (CASA); Testing the Feasibility of a Community Health Worker Model to Address Child Asthma

Authors
Phyllis Hartigan, Sydney Leibel, Cheri Fidler, Rhonda Sparr-Perkins, Adelita Garcia, Paola Garcia, Wendy Mejia

Abstract
Background: Asthma is of particular concern for children from low income families; these patients have higher severity, poorer control, and higher emergency department (ED) visits and hospitalization rates. Studies have shown that multifaceted interventions incorporating trained community health workers (CHWs) to provide asthma education, in-home assessments and community referrals can be effective to improve quality of life and decrease hospital encounters.

Methods: Community Approach to Severe Asthma (CASA) is an evidence-based program to test the feasibility of creating/implementing a CHW model to improve outcomes for children with asthma. Twenty-five high-risk children (2-18 yo) with > 2 asthma-related ED visits or hospitalizations within 6 months were identified and recruited to participate including up to three Severe Asthma Clinic (SAC) visits and at least one home visit. CHWs were recruited and trained to perform home visits to 1) conduct environmental assessments, 2) reinforce clinician instructions, 3) assess asthma control, 4) set behavioral/environmental change goals and 5) facilitate links with community resources.

Results: Formative research was conducted and a program manual including protocols, scripts, education materials and evaluation tools was created. Existing staff were recruited as part-time CHWs. To date, at least 3 attempts were made to contact all 25 families; 21 were reached and invited to participate; 11 families agreed and scheduled SAC visits. Of those, 8 families completed SAC visit; three did not show. Six home visits were completed.

Conclusions: It is feasible to establish a CHW model with RCHSD asthma patients from underserved areas; however there have been many challenges and lessons learned.

Primary topic area: Health Equity and Disparity | Secondary topic area: Chronic Disease
43. Neighborhood Market Makeovers to Improve Healthy Food Access

Authors
Nehmo Hassa, Catherine Mahoney, Elle Mari, Amina Sheik Mohamed

Abstract

Background: Access to healthy foods can be challenging for people living in low-income communities and communities of color. Limited access to healthy foods, such as fresh produce, is a barrier to healthy eating and can contribute to obesity and other chronic illnesses. To address these challenges, UC San Diego Center for Community Health’s Live Well Community Market Program works with small neighborhood markets to improve and promote access to healthy affordable foods, increase availability of fresh produce, redesign markets, and connect with community stakeholders to build a healthier food environment.

Methods: Two markets, in City Heights in the City of El Cajon, were identified to undergo makeovers with added community gathering spaces. Both markets serve low-income shoppers in ethnically and culturally diverse neighborhoods, and both are identified as important cultural food assets by their communities. The primary goals of the project was to physically transform and beautify the markets in order to increase market patronage and community gathering opportunities, and thereby also highlight local good food availability.

Results: There was strong community involvement during the planning, design, and implementation phases of the makeovers, with over 100 volunteers participating in the final community build events. Residents, community partners, neighboring business owners, youth groups, and program staff worked together to paint, plant greenery, build benches, install shade equipment, and make other improvements to both markets.

Conclusions: Thus far, market owners report increased foot traffic and positive neighborhood reception to the changes that best highlight their healthy food offerings and unique cultural fare.

Primary topic area: Healthy Food Access | Secondary topic area: Stakeholder and Community Engagement
44. Effects of periodical multi-component exercise training and de-training for 18 months on physical function in older adults with dementia

Authors
Seung youn Hong

Abstract
Background: Purpose: To verify the effects of periodical multi-component exercise training and de-training, and retraining on the physical function in older adults with dementia.

Methods: Seventeen older adults with dementia (mean age 72, MMSE 17.8) performed multi-component exercise twice a week for a total of 18 months. The assessment was made six times: 1) at the baseline, 2) 24 weeks of training, 3) 12 weeks of first detraining, 4) 12 weeks of retraining, and 5) 12 weeks of second retraining after second 12 weeks of detraining. Sit to stand, arm curl, 8 feet Time to up and go, 4-meter walk test, Short Physical Performance Battery were assessed. Nonparametric Friedman’s test and Wilcoxon matched pairs signed rank test was conducted with an alpha-level of 0.05.

Results: Significantly training-related improvements for the sit to stand, arm curl, 8-foot TUG, 4-meter walk, and SPPB. Following two times of 12 week-detraining and retraining, significantly enhanced performance (compared to baseline) was still presented in sit to stand and insignificantly maintained performance (compared to baseline) was presented in arm curl, 8-foot TUG, 4-meter walk and SPPB.

Conclusions: The present study tested and confirm that the effectiveness of periodical multi-component exercise training and detraining improved or maintained physical function in older adults with dementia.

Primary topic area: Mental Health | Secondary topic area: Diet, Physical Activity, and Obesity
45. The role of cardiovascular disease in the relationship between chronic exposure to air pollution and dementia

Authors
Sindana Ilango, Hong Chen, Tarik Benmarhina

Abstract

**Background:** Cardiovascular disease is a known determinant of dementia. Epidemiologic studies have shown that chronic exposure to air pollution may play a role in the development of dementia and cardiovascular disease. This motivated us to apply a causal mediation analysis to examine the relative contribution of cardiovascular disease to the relationship between air pollution and dementia.

**Methods:** A population-based cohort comprised of Canadian-born residents of Ontario, Canada were followed from 1996 through 2013 or until dementia diagnosis. Chronic exposure to fine particulate matter [PM2.5] and nitrogen dioxide [NO2] was assessed using a 3-year running average with a 5-year lag before dementia diagnosis. Incident cardiovascular disease occurring prior to dementia was evaluated as a potential mediator. We used multi-level Cox regression models, adjusting for individual- and neighborhood-level risk factors, to estimate hazard ratios (HR) for every interquartile range increase in exposure to PM2.5 and NO2. We applied the generalized product method to estimate the effect of air pollution on dementia and the proportion mediated through cardiovascular disease.

**Results:** The risk of dementia was moderately higher among those exposed to NO2 (HR=1.11 95% CI=1.03, 1.19) and PM2.5 (HR=1.06 95% CI=0.97, 1.14) after adjusting for covariates. We estimate 4.0% and 10.5% of the observed association between NO2 and PM2.5, respectively, and dementia to be mediated through cardiovascular events.

**Conclusions:** These results suggest that some of the association between chronic air pollution and dementia is mediated through its effect on cardiovascular disease. Improving cardiovascular health may prevent dementia in areas with higher exposure to air pollution.

**Primary topic area:** Environmental Health | **Secondary topic area:** Chronic Disease
Effects of compounding exposure to environmental stress on insulin resistance in Hispanic and non-Hispanic adults

Authors
Martha Jankowska, Dorothy Sears, Suneeta Godbole, Jacqueline Kerr

Abstract
Background: The US population has experienced dramatic increases in obesity, metabolic syndrome, and type 2 diabetes, which have disproportionately impacted Hispanics/Latinos. Insulin resistance is mechanistically linked to the promotion of these diseases, and can be reversed through lifestyle intervention, reducing risk of disease onset and complications. Numerous studies have demonstrated ethnic disparities in environments that predict insulin resistance and related behaviors. The goal of this study is to assess how exposure to environmental stressors may preferentially predispose Hispanic/Latino individuals to insulin resistance.

Methods: A cohort of 602 individuals (253 Hispanic) were recruited in San Diego County and completed one week of wearing GPS/accelerometer sensors, blood draws, and surveys. GPS data was used to measure exposure to three aspects of environmental stress that have considerable variability throughout the San Diego region with underlying ethnic disparities: structural (walkability, recreation space, built food environment, green space, transit access, road safety), socio-cultural (ethnic/racial diversity, linguistic diversity, economic, crime), and hazards (air pollution, water quality, noise pollution, and light pollution). Separate and combined indexes of exposure to environmental stress were placed into a regression model as predictors of insulin resistance measured by HbA1c.

Results: We hypothesize that Hispanics experience greater exposure to hazardous environments, and as a result take on a disproportionate burden of insulin resistance when compared to non-Hispanics.

Conclusions: This study will add to our understanding about how disparities in environmental exposures may influence biomarker health outcomes such as insulin resistance in minority populations.

Primary topic area: health Equity and Disparity | Secondary topic area: Environmental Health
47. The Association Between the Gut Microbiome and Poor Sleep in Older Men

Authors
Lingling Jiang, Zech Xu, Jiam Shen, Gail Ackerman, Eric Orwoll, Rob Knight, Deborah Kado

Abstract
Background: With the aging demographic, an important public health priority should be to minimize the burden of chronic diseases, of which sleep disorders affect up to 50% of those aged greater than 65 years. Interactions between the gut-brain axis and circadian rhythms have been described, but the mechanisms are not well understood. One intriguing hypothesis is that sleep health may influence the composition of gut microbiota.

Methods: To identify gut microbiome characteristics of disordered sleep, we will use the 16S ribosomal RNA sequencing data from 599 fecal samples submitted by the participants of MrOS (the Osteoporotic Fractures in Men) Study between 2015-2016. We will use the validated Pittsburgh Sleep Quality Index questionnaire (PSQI) that was administered during this same period, and apply a two-step logistic regression to examine whether sleep characteristics may be associated with gut microbial diversity and specific taxonomies. Potential confounding factors to be considered including age, race, geographic location, dietary habits, lifestyle factors, self-reported health status and medication history.

Results: Men were an average age of 84 (SD = 4.1), with a mean BMI of 27 kg/m2, and 89% reported good or excellent health. However, 40% subjects reported having poor sleep, defined as a PSQI global score less than 5. Preliminary results demonstrate significant adjusted associations between microbial diversity, specific taxonomies and poor self-reported sleep.

Conclusions: Compared to men without sleep difficulties, those who reported poor sleep have altered gut microbial composition, suggesting that potential interventions involving the gut microbiome may lead to improved sleep quality.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Mental Health
48. Anticipated pain during IUD placement in nulliparous women

Author
Berenice Jimenez

Abstract
**Background:** Intrauterine devices (IUDs) are highly effective, but some women are deterred by potential pain. This study examines the relationship between anticipated pain and actual pain and provides real-time pain scores at the different steps of the IUD placement procedure.

**Methods:** A secondary analysis was performed using a subset of data from “Pain control for intrauterine device placement: A randomized controlled trial of paracervical block.” This secondary analysis examined the patients who received no form of pain control. The primary outcome of this analysis was the patient’s score of the level of actual pain experienced during IUD placement itself as well as other time points recorded on a 100-mm visual analog scale.

**Results:** 31 nulliparous patients were included in analysis. The median anticipated pain score was 51; median experienced pain score during sounding and IUD placement was 47 and 54 respectively. There was a correlation of 0.415 and 0.364 between anticipated pain versus experienced pain at sounding and IUD placement respectively. Relative risk of experiencing more pain at sounding if a patient expected increased pain 2.34 (CI 0.93-5.89; P = 0.07).

**Conclusions:** We found a correlation between anticipated pain versus experienced pain at sounding and IUD placement and a trend to significance between anticipated pain and experienced pain during sounding. Given that the pain scores were recorded in real-time, scores are likely to be an accurate representation of the level of discomfort felt at each step of the procedure, which can also be used to counsel patients in the future.

**Primary topic area:** Reproductive Health | **Secondary topic area:** Patient Education
49. Peer Perspectives about Engagement with Behavior Health Services after Hospitalization

Authors
Logan Johnson, Regina Misch, Jessica Rampton, Anne Charles, Brittney Carroll, Andrew Sarkin

Abstract
Background: A large number of San Diegans who are hospitalized for psychiatric needs do not connect with regular behavioral healthcare services following their hospitalization. Untreated mental health problems can result in poor health and rehospitalization. Peer support specialists are able to offer support and use their lived experience to assist those in navigating the mental health system to receive necessary resources. Additionally, peer support specialists are able to work with people during and after psychiatric hospitalization and can provide insight that might improve our understanding of this problem.

Methods: HSRC asked 33 staff members of a San Diego-based peer-counseling program, Next Steps, to give us their perspective on this issue as part of a larger interview to strengthen their services in San Diego County. Grounded Theory methodology was used to allow ideas to emerge directly from the data. Analysis included using Descriptive and In Vivo coding.

Results: The most common themes found from the interviews focused on systemic issues related to accessing ongoing services, rather than people’s motivation to seek help. These included seeking services in response to homelessness and difficulty with enrollment processes that present barriers, such as wait lists and requirements to receive timely care. Other common themes mentioned included a lack of family support, limited resources to address basic needs, and resistance to receiving treatment that involves medications.

Conclusions: This qualitative study provided for four recommendations for the implementation of a peer program. The program will use this information to continue improving their methods of providing the best support for people to get the services they need.

Primary topic area: Mental Health | Secondary topic area: Barriers to Treatment
50. Trends in Refill Prescription and Long-Term Use of Sedative-Hypnotic Medications in the United States, 1993-2014

Authors
Christopher Kaufmann, Adam Spira, Ramin Moitabai

Abstract
Background: Sedative-hypnotic medications (including benzodiazepines [BZDs; e.g., alprazolam] and non-BZD hypnotics [e.g., zolpidem]) have grown in popularity over the past two decades. Concerns exist regarding their deleterious effects (e.g., falls, hip-fractures, etc.), especially when used chronically. These concerns have promoted development of guidelines advocating short-term use. We examined national trends in prescribing and use of these medications from 1993 to 2014.

Methods: We used data from two US nationally representative data sources: the 1993-2010 National Ambulatory Medical Care Survey (NAMCS), an annual cross-sectional survey of physician-patient encounters, and the 1999-2014 National Health and Nutrition Examination Survey (NHANES), a biennial cross-sectional survey of population health. We assessed temporal trends in prescription of sedative-hypnotics using NAMCS data and use of these agents using NHANES data.

Results: Between 1993-2010, increases were seen for prescriptions of BZDs (2.6% to 4.4%, p<0.001) and non-BZD hypnotics (0% to 1.4%, p<0.001). These increases were almost entirely due to increases in refill (vs. new) prescriptions. In line with prescription trends, increases were also seen from 1999-2014 for use of BZDs (2.0% to 4.2%, p<0.001) and non-BZD hypnotics (0.4% to 1.6%, p<0.001), driven by use of more than 6-months duration.

Conclusions: Despite concerns of adverse outcomes, BZDs and non-BZD hypnotics continue to be widely prescribed and used by patients in the US. Contrary to clinical recommendations, increases appear to be due to growth in refill prescription and chronic use. Future research needs to identify strategies to discourage problematic prescribing and use of these agents.

Primary topic area: Health Services | Secondary topic area: Mental Health
51. Synergistic effects of cardiometabolic risk factors and cellular inflammation regulation on cognition in the elderly

Authors
Jordan Kohn, Laura Redwine, Nicholas Guay-Ross, Meredith Pung, Kathleen Wilson, Gary Lyasch, Suzi Hong

Abstract
Background: Cardiometabolic risk (CMR) factors, inflammation, and autonomic imbalance have been independently associated with cognitive deficits in aging, but their interactive effect on cognition remains unclear. Here, we quantified their associations with cognitive function and determined the extent to which the links were synergistic.

Methods: Eighty dementia-free participants aged 60-93 years (mean=73.6, SD=8.3, 66% female) were recruited for a behavioral intervention study. Cognitive function was assessed with the Montreal Cognitive Assessment (MoCA) and aggregate CMR was ascertained using principal components analysis (PCA) on serum measures of glucose, lipids, and resting BP. Autonomic balance was calculated as delta-mean blood pressure (ΔMBP) between 10 min steady-state exercise and 1 min cool-down. Beta-adrenergic receptor-mediated inflammation control (BARIC) was quantified by stimulating immune cells in vitro with lipopolysaccharide, while simultaneously administering a beta-agonist, isoproterenol, for monocyte-produced cytokine (TNF-α) expression. Data were analyzed using stepwise multivariate linear regression.

Results: Of 76 participants who completed the MoCA, cognitive function was impaired in 21 (27.6%; MoCA≤23) and correlated with age (βstd=-0.30, p=0.013), but not BMI or gender. For CMR factors, the first PC explained 31.8% of total variance, for which higher values reflected a hyperglycemic, dyslipidemic profile, and significantly predicted lower MoCA scores (βPC1=-1.83, p<0.001). Impaired BARIC and more rapid MBP recovery were independently associated with lower MoCA scores (βBARIC=-1.18, p=0.004; βΔMB=0.86, p=0.026), adjusted for CMR effects. Furthermore, there was evidence of a synergistic effect of CMR and BARIC on MoCA scores (βBARIC*PC1=-0.93, p=0.002) in the full model.

Conclusions: CMR factors, autonomic balance, and inflammation exert both independent and synergistic effects on cognition in the elderly.

Primary topic area: Healthy Aging | Secondary topic area: Chronic Disease
The Use of a Psychometric Scoring Methodology to Identify Gaps in Health-based Gender Equality and Empowerment Measures

Authors
Cassidy Koo, Rupa Jose, Amruta Trivedi, Anvita Dixit, Anita Raj

Abstract
Background: To reduce disparities in women's health globally, greater attention should be focused on evidence-based measurement tools that will enable researchers to better evaluate health programs and policies. In this project we categorize health-based gender equality and empowerment (GE/E) measures into content-specific groups, assess measure quality using a psychometric scoring methodology, and provide recommendations to improve the rigor of future health-based GE/E measures.

Methods: Using field expert input, we identified 36 health-based measures widely used in GE/E research. Measures were grouped by construct: Gender Based Violence (GBV; n = 13), Maternal Health (n = 4), Physical/Mental Health (n = 2), and Sexual/Reproductive Health (n = 17). A psychometric scoring methodology was applied to assess the presence and quality of different types of formative research (e.g., qualitative research), reliability (e.g., test-retest reliability), and validity (e.g., construct validity).

Results: Higher validity compared to reliability was reported for all measure groups except for Maternal Health. The lowest reliability score was recorded for GBV measures (M = 26.9; SD = 33.0). The most common types measured were content validity and internal reliability. Few measures assessed criterion validity (n = 4) and test-retest reliability (n = 6). Sexual/Reproductive Health and Physical/Mental Health measures had the best psychometric properties. All measures, irrespective of group, included existing literature/theoretical framework as a form of formative research.

Conclusions: Future efforts in health-based GE/E measure development or testing should therefore focus more on criterion validity, construct validity, test-retest reliability, and formative research efforts which rely on experts, qualitative research, or cognitive interviewing/pilot testing.

Primary topic area: Health Equity and Disparity | Secondary topic area: Global Health
53. Eat Well at Work: Creating a Healthy Food and Beverage Landscape with San Diego Businesses

Authors
Rachel Kramer, Kelley Axelson, Aaron Kunst, Blanca Melendrez, Michelle Zive, Chelsey Blevins, Amelia Barile-Simon

Abstract

**Background:** The average American typically works 40 hours a week from ages 20 – 65, spending over 10 years of their life at work. This is significant in how the workplace food environment can play an integral role in shaping the health of an entire workforce. The Live Well @ Work (LW@W) initiative partners with the San Diego business community to create healthy food and beverage landscapes for employees who experience disproportionally higher rates of diet-related chronic diseases.

**Methods:** LW@W uniquely prioritizes working with low-wage industries such as hospitality, agriculture, gaming, non-profit, and healthcare in an effort to engage those employers who traditionally have minimal employee wellness programming. LW@W utilizes an employer engagement model to create healthy, sustainable food environments which includes a workplace assessment, strategic action plan, program implementation and evaluation, and policy adoption or revision.

**Results:** From 2013 – 2018, LW@W partnered with N=51 local businesses from diverse sectors to improve access to healthy foods and beverages, reaching 65,000 predominantly low-wage earners. LW@W found the following evidence-based strategies most effective: 1) Implementation of healthy cafeteria guidelines to feature fresh, local fruits and vegetables and healthy menu items; 2) Implementation of healthy vending policies to include nutrition standards; 3) Adoption of healthy meeting policies; and 4) Installation of hydration stations to improve access to fresh drinking water.

**Conclusions:** Environmental supports and organizational policy adoption are replicable strategies that increase access to healthy food and beverage options for employees, which can positively impact the health of employees, their families, and the San Diego workforce.

**Primary topic area:** Occupational Health | **Secondary topic area:** Health Equity and Disparity
54. Changes in Children's Oral Health Needs and Behaviors After Establishment of a School-Based Free Dental Clinic

Authors
Donna Kritz-Silverstein, Irvin Silverstein, Ellen Beck

Abstract

Background: Lemon Grove Academy is a public school located in an underserved area within San Diego. This reports an evaluation of changes in oral health needs and behaviors one year after a free dental clinic opened within the school.

Methods: A baseline needs assessment in the form of a survey was developed and distributed to parents in April 2012, prior to the dental clinic opening. Information on the child's dental needs and oral health behaviors were obtained. Parents were re-surveyed with the same questions in April-May 2013, approximately one year after the clinic had opened and began providing treatment to children lacking access to care. Responses at baseline and follow-up were compared using chi-square analysis.

Results: 176 parents responded at baseline; 239 at follow-up. Comparisons showed a reduction of over 10% in parents who reported that their child did not have a dental home (from 35.2% to 25.1%, p=.03) and reductions in the proportions of parents reporting that their child had tooth pain, problems chewing or eating, and broken teeth. Absences from school due to dental problems decreased from 12.5% to 9.2%. At baseline, 4% of parents reported their child did not brush daily which was reduced to 0% at follow-up (p=0.007). Additionally, parents reported lower rates of rewarding with candy (baseline=31.3% vs. follow-up=24.7%, p=0.08) and gave less cariogenic snacks (crackers, 71.0% vs. 51.9%, p<.001 and juice, 76.7% vs. 66.5%, p=.03) on follow-up.

Conclusions: Results suggest the efficacy of a school-based dental clinic for increasing access to care and promoting oral health.

Primary topic area: Needs Assessment | Secondary topic area: Oral Health
CRIC: Revealing Predictors and Patterns of Kidney Function Decline in Type 2 Diabetics

Authors
Brian Kwan, Loki Natarajan, Kumar Sharma, Manjula Darshi, Guanshi Zhang, Tobias Fuhrer, Jing Zhang

Abstract
Background: Type 2 diabetes is associated with significant comorbidities, including chronic kidney disease. Early detection of patients with kidney function decline can lead to effective intervention of high risk of developing diabetic kidney disease (DKD). There is significant heterogeneity in the rate of kidney function decline among Type 2 diabetics, which signals a critical need to better identify patients at high risk of rapid kidney function decline. Metabolomic analysis combined with advanced computational and statistical methods could play a key role in building clinically useful signatures of kidney function decline. Our overarching objective is to develop and validate a new clinical-metabolomics signature that can accurately predict future kidney function decline among Type 2 diabetics.

Methods: We will use metabolomics and clinical data from a funded study within the Chronic Renal Insufficiency Cohort (CRIC), which comprises of 1003 patients with Type 2 diabetes and 10 years of annual follow-up. Using serial measures of eGFR, we will fit linear mixed-effects models to predict individual-level 1-year rate of eGFR decline. Regression models were fitted to the subject-specific eGFR slope outcomes on an a priori 16-metabolite set as well as clinical variables. We will quantify the prognostic value of our 16 metabolites by comparing the prediction error of various metabolite and non-metabolite models using 5-fold cross-validation.

Results: Our metabolite models do not appear to be better predicting future kidney function decline than our non-metabolite models. We find that the citric acid metabolite was a significant predictor of future kidney function decline in almost all metabolite models.

Conclusions: The findings will serve as pilot data for future analyses to expand our list of candidate metabolite predictors for future kidney function decline.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Chronic Disease
Socio-demographic and health factors associated with child influenza vaccination: identifying subgroups for intervention

Authors
Hiu Yu Erica Lam, John Bellettiere, Vincent Berardi

Abstract
Background: The American Academy of Pediatrics recommends that all children over 6 months receive influenza vaccinations annually. The purpose of this study was to identify household-, parent-, and child-level factors associated with influenza vaccination to inform the development of behavioral interventions.

Methods: Using pooled data from the 2011-2014 National Health Interview Survey (NHIS; n=34,843 children under 18), we compared parent reports of child's influenza vaccination across gender, age (0-2, 3-5, 6-11, 12-17 years), race-ethnicity (Black, Hispanic, White, other), child’s health status, child’s health insurance status, household income, parents’ education level, and parental status (single parent vs. two parent households). Statistical significance was assessed using chi-squared tests and multivariable logistic regression with p<0.05 considered significant.

Results: Influenza vaccination was received by 14,890 (46.0%) children. Influenza vaccination rates were significantly associated with age, race-ethnicity, child health insurance status, parent’s education level, and parental status in multivariable analyses (all p<0.001). The lowest vaccination rates were observed for children: ages 12-17 (38.2%); of Black or White race-ethnicity (44.3% and 44.2%, respectively); without health insurance (30.9%); whose parents’ highest education was high school or above (45.7%); and children in single-parent households (42.6%).

Conclusions: This study identified several subgroups with low influenza vaccination rates, particularly children ages 12-17 and those without health insurance. However, the overall low rates observed in this US population-based sample highlight an important need for interventions to increase children’s receipt of influenza vaccination. Further studies should investigate how factors not measured by the NHIS are associated with child influenza vaccination.

Primary topic area: Maternal and Child Health | Secondary topic area: Health Equity and Disparity
57. Environmental data fidelity and spatiotemporal exposure measurement error: implications for epidemiologic analysis of rainfall effects on waterborne diseases

Authors
Morgan Levy, Phillip Collender, Elizabeth Carlton, Howard Chang, Matthew Strickland, Joseph Eisenberg, Justin Remais

Abstract
Background: A wide literature has established significant relationships between rainfall, especially extreme rainfall, and waterborne infectious diseases in a variety of settings. Most research to date has disregarded exposure measurement error contributed by the limited spatiotemporal fidelity of environmental data, which has the potential to yield biased estimates of the health effects of climatic exposures.

Methods: Here, we use a simulation analysis to estimate bias in effect estimates associated with mischaracterization of highly spatially heterogeneous environmental exposures, using extreme rainfall as an example. The knowledge gained is then applied to an epidemiologic study in Ecuador examining extreme rainfall and diarrheal diseases.

Results: We find that the limited spatial fidelity typical in common spatiotemporal rainfall datasets generates significant negative bias in effect estimates. The simulation analyses indicate that the health effects of exposure to extreme rainfall (occurrence) and wet conditions (accumulated totals) were biased towards the null by 40-60% when using common low-resolution, interpolated data or satellite data. Furthermore, these negative biases were evident in real-world application, as analysis of rainfall and disease in an epidemiologic study in Ecuador indicated the estimated effect of extreme rainfall on diarrheal disease incidence was downwardly biased by approximately 42%.

Conclusions: The results call for greater attention to the use of spatially heterogeneous meteorological datasets in epidemiologic studies of the health effects of weather and climate. Specific recommendations are presented that would yield improved estimates of the magnitude of effects of extreme climate on disease.

Primary topic area: Environmental Health | Secondary topic area: Global Health
Analysis of Developing Drinking Behaviors in Adolescence

Authors
Wenyi Lin, Wesley Thompson

Abstract
Background: “Adult behaviors” in adolescence, such as alcohol drinking, are likely to be potentially deleterious agents may result in accelerated gray matter loss, attenuated white matter growth, or both. Abnormal growth patterns were observed in recent longitudinal studies of youths who initiated and continued heavy drinking. Our main interest is to explore which characteristics of an adolescent would affect the development of one’s drinking behavior. The participants were 495 adolescents (ages 12-21 at study entry) who had 1-year follow-up data. In our study, at baseline, all participants met the study entry criteria for no or low drinking and drug use.

Methods: A first-step simple logistic regression will be applied on adolescents’ drinking status. Ordinal logistic regression and zero-inflated Poisson will be needed in further studies.

Results: At the 1-year follow-up, 324(65.5%) youths remained in the no drinking status while 171(34.5%) youths transitioned from the original group to drinking group. Age is a significant predictor in the regression model, with p-value < 0.05. Older youths were more likely transitioned to drinking status compared with younger adolescents. BMI percentage of an adolescent and income level of one’s parents are also potential predictors in the model.

Conclusions: There is a strong relationship between age and developing drinking behavior. Other characteristics should be included in the analysis as supplemental explanatory predictors.

Primary topic area: Biostatistics and Bioinformatics

Authors
Jinyuan Liu, Angela Meier, Jenny Yang, Jeremy Beitler, Xin Tu, Robert Owens, Rebecca Sell

Abstract
**Background:** The percentage of women applying to medical schools continues to increase, however, only 33% of trainees in critical care are women. Studies in other areas of medicine have demonstrated an association between female physicians and good outcomes. However, some studies suggested that women may be inferior leaders in critical situations. We aim to examine the relationship between the gender of the physician code leader and return of spontaneous circulation (ROSC) in a large database of actual cardiac arrests.

**Methods:** This is a retrospective review of all adult inpatient cardiac arrests occurring between 2005 and 2017 at two academic urban hospitals. We examined the relationship between the gender of the physician code leader and ROSC, survival to discharge when controlling for demographics.

**Results:** During the study period, 1082 cardiac arrests occurred with resuscitation attempted. Of all arrests, 327 (30.2%) were run by female physician code leaders with 251 (76.8%) obtaining ROSC, and 122 (37.3%) surviving to discharge. When controlling for patient age, patient sex, shockable rhythm, time of day/week and ICU level of care, female physician code leader gender was associated with a higher likelihood of ROSC (OR 1.36, 95% CI [1.0051, 1.8500], p = 0.049). Female physician code leader gender was also associated with survival to discharge (OR 1.53, 95% CI [1.1511, 2.0219], p<0.01).

**Conclusions:** This retrospective review of a comprehensive database of inpatient cardiac arrests demonstrates a clear positive association between female code leader and the likelihood of ROSC and survival to discharge. There is no evidence of inferiority.

**Primary topic area:** Biostatistics and Bioinformatics | **Secondary topic area:** Health Equity and Disparity
60. Backyard Growers Network: Building Neighborhood Food Security in Mountain View, San Diego

Authors
Bianca Lorenzana

Abstract
Background: Many studies define access to healthy food as proximity to food retail establishments, such as supermarkets, grocery stores, restaurants, and community resources such as community gardens. However, more resources could be found within the community itself through the knowledge and capacity community members have to grow their own food.

Methods: This study partnered with the Ocean View Growing Grounds, a community garden located in the Southeastern San Diego neighborhood of Mountain View, to locate homes in the neighborhood that are growing their own fruits and or vegetables as part of the Backyard Growers Network project. Community outreach was conducted and homes that were growing food were mapped using GIS. GIS was also used to produce a map to identify food retail establishments in the community and within a half-mile buffer around the community.

Results: Out of the 460 homes that were canvassed, it was found that 99 homes or 21% grow fruits and/or vegetables. There were also no food retail establishments within the community except for two grocery stores, and there was one supermarket, nine restaurants, eight fast food restaurants, and one liquor store within the half-mile buffer.

Conclusions: While there are only a few sources of healthy food in and around the community, the outreach results show there is a considerable amount of residents that have the knowledge and capacity to grow food, and the community has the potential to be mobilized to serve as a resource for accessing healthy food.

Primary topic area: Community food access, food justice, urban agriculture | Secondary topic area: Diet, Physical Activity, and Obesity
Cooking for Salud: A Peer-Led Nutrition Educational Program for Bettering Immigrant Health

Authors
Kevin Lu

Abstract
Background: Olivewood Garden’s Cooking for Salud (CFS) is a peer-led nutrition program based in National City, California - where there is a high immigrant and overweight population. The goal is to promote community health by focusing on eating behavior and healthy cooking. Migrant families face elevated risk of obesity in the United States. Previous research has evaluated peer-led nutrition education of parents. We seek to investigate the effectiveness of peer-led nutrition education of a predominant immigrant community via body mass index (BMI), assessment scores of nutritional knowledge, and reported healthy food consumption.

Methods: A retrospective case study of surveys from participants of CFS was conducted to determine fruit, vegetable, and whole-grain consumption. We examined pre- and post-assessment scores and change in weight measurements of CFS participants.

Results: Of the students participating in weight measurements (n=74), a statistically significant average decrease in BMI of 0.21 kg/m² (p<0.001) was observed. In addition, participants showed a 14.3% significant improvement (p<0.001) between the pre- and post-assessment. A subset of students (n=50) was asked to report 6 typical meals. On the post-survey there was a 25.5% significant increase (p=0.00477) in meals that included at least one vegetable. There was no significant increase in fruits and whole-grains.

Conclusions: CFS has the intended effect on immigrant community health via results of decreased BMI, increased vegetable consumption and assessment scores. We recommend examination of CFS via a case-control study to further support the efficacy of the program.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Immigrant Health
62. Semantic Processing in Overweight and Healthy Weight Adults

Authors
Victoria Mac, Samantha Pecenka, Michael Manzano, Sara Appleton-Knapp, Kerri Boutelle

Abstract
Background: Adults with overweight/obesity have been shown to have deficiencies in learning and memory. In list learning tasks, the extent to which a word’s meaning is encoded (semantic processing) can affect how well a word is recalled later. The current study investigates the association between weight status and semantic processing.

Methods: The California Verbal Learning Test-II was adapted to include high-calorie food words, low-calorie food words, and non-food words. Twenty-two adults (ages 18-65) with overweight/obesity (25 < BMI < 45) entering weight loss treatment completed this test prior to treatment. Responses were compared to those of a control group of 22 healthy weight adults (19 < BMI < 24). Output order of the words was recorded to determine semantic clustering of responses. Semantic clustering measures how often words in a given semantic category were recalled adjacent to one another. Higher levels of semantic clustering lead to better recall.

Results: Average semantic clustering in each category was compared between the two groups. Healthy weight participants showed significantly higher semantic clustering in the low-calorie food category (m=.83, sd=.80) and in the non-food word category (m=12.90, sd=5.97) than participants with overweight/obesity (low-calorie m=.36, sd=.72, p=.049, t=-2.03; non-food m= 7.76, sd=5.75 p=.006, t=-2.91).

Conclusions: These results further support that individuals with overweight/obesity have poorer learning and memory processing. Future research should address the relationship between weight and memory, and its clinical implications.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Chronic Disease
Ma. Hoyenongon, Stan Miller, Jake McGough, Michelle Zive

**Abstract**

**Background:** There is a wealth of information pertaining to guidelines on child nutrition and physical activity standards that can be applied to the childcare setting. But little evidence exists on methods and strategies to incentivize healthier childcare environments to parents, more specifically; Hispanic/Latino parents of preschool aged children living in predominantly low-income communities. The YMCA Childcare Resource Service (YMCA CRS) of San Diego offers a Wellness Champion (WC) designation to licensed facilities willing to be trained and comply with elevated wellness standards, in turn qualifying the facility for priority referral to parents seeking childcare through the YMCA.

**Methods:** Parent surveys and key informant interviews were conducted. Parent key informant interviews were designed as an extension of the WC survey to capture parent expectations and feedback specific to nutrition and physical activity at WC facility. Key informant interviews with providers provided insight into observed effective strategies to direct and maintain healthy child behavior as well as the day to day challenges of implementing evidence-based wellness strategies.

**Results:** Surveyed parents prioritized increased standards of healthy foods and physical activity, as leading factor affecting enrollment decision. Parents reported observed positive child behavior change in healthful eating habits as result of attendance at a WC facility. Providers described challenges of enforcing healthy facility policies which are in contrast to child home life.

**Conclusions:** Parent education and provider self-efficacy were the key variables related to positive nutrition and physical activity behavior outcomes for preschool aged children in early childhood setting.

**Primary topic area:** Descriptive Program Analysis | **Secondary topic area:** Diet, Physical Activity, and Obesity
64. Impact of Sodium Thiosulfate and Incubation Temperature on Isolation of Mycobacterium Chimaera from Water Samples

Authors
Esther Mak, Li-Hwei Sng, Rebecca Colman, Marva Seifert

Abstract
Background: Contaminated Heater-Cooler units (HCUs) have been implicated in the recent global outbreak of Mycobacterium chimaera infection among post-operative surgery patients. The addition of sodium thiosulfate (NaT) to HCU water samples is recommended when culturing M. chimaera, however the impact of NaT and temperature on M. chimaera recovery is not well understood.

Methods: Paired water samples were drawn from potentially contaminated HCUs. One sample from each pair was processed with NaT. Following decontamination, all samples were aliquoted and used to inoculate 7H10 and LJ plates, as well as MGIT tubes, and were incubated at 37°C. For a subset of samples an additional MGIT tube was incubated at 30°C. Cultures were read weekly, and positive cultures were subjected to confirmatory molecular testing.

Results: Among samples where at least one aliquot was positive for M. chimaera, culture positivity was not significantly different between aliquots that had been processed with NaT compared to those that were not, 58% (32/77) and 63% (50/80) respectively. Contamination occurred less frequently in aliquots processed with NaT (15/43, 34.8%). In a multivariable logistic regression model, the impact of adding NaT (P=0.037) and incubation at 37°C (P=0.000) were significantly associated with reduced growth of both fungi and other non-tuberculosis mycobacteria even after controlling for media type.

Conclusions: Based on our study, processing with NaT did not significantly affect M. chimaera recovery. However, both NaT processing and incubation temperature were significantly associated with reduce contamination.

Primary topic area: Infectious Disease | Secondary topic area: Environmental Health
Promoting Awareness of Hypertension and Obesity to Families at the Preuss School.

Authors
Luis Mandujano, Rana Tawfil, Becky Marquez

Abstract
Background: Hypertension and obesity are two major risk factors for cardiovascular disease. Hypertension is classified as systolic/diastolic blood pressure $\geq 130/80$ mmHg. Obesity is classified as body mass index (BMI) of $\geq 30$ kg/m$^2$. We conducted blood pressure and BMI screenings and provided health education to low-income parents attending the Preuss School.

Methods: Participants were men and women attending a monthly PTA meeting at The Preuss School UCSD. Participants provided demographic and health history information. Blood pressure was measured using an Omron Blood Pressure Monitor. BMI was calculated from measured height using a Seca stadiometer and weight using a Tanita digital scale. Participants received a report with their measurements and brief lifestyle counseling.

Results: Blood pressure and BMI measurements were conducted on 61 adults (mean age 42 years). Participants were mostly Spanish-speaking Latinos and women. Although only 5% indicated they had been previously diagnosed by a physician with hypertension, 38% had blood pressure values meeting the criteria for hypertension. While only 5% reported having obesity, 41% had BMI values meeting the criteria for obesity.

Conclusions: The majority of participants were unaware of their hypertension and obesity status. Increasing awareness is important particularly among low income and minority groups which have limited access to care.

Primary topic area: Obesity | Secondary topic area: Diet, Physical Activity, and Obesity
Racial/ethnic disparities in the effect of fine particles on respiratory hospital admissions in San Diego County, CA

Authors
Shivani Mehta, Devesh Vashistha, Lara Schwarz, Isabel Corcos, Alexander Gershunov, Kristen Guirguis, Rupa Basu

Abstract
Background: Socio-economic status and race/ethnicity have been shown to influence an individual’s vulnerability to environment health risks. By understanding which socio-demographic groups are most affected by the impacts of environmental hazards, interventions can be developed to reduce these inequalities. This study aims to assess the racial and ethnic disparities in vulnerability to air pollution with regards to respiratory hospital admissions in San Diego County, California.

Methods: Daily PM2.5 levels were estimated at the zip-code level using a spatial interpolation using inverse-distance weighting from monitor networks. The association between daily PM2.5 levels and respiratory hospital admissions in San Diego County was assessed with a time-series analysis using a multi-level Poisson regression model. Cochran Q tests were used to assess the effect modification of race/ethnicity on this association.

Results: A positive association was found between PM2.5 concentrations and respiratory hospital admissions in the entire San Diego County population. Exposure to PM2.5 was strongly associated with increased respiratory hospital admissions for Black and White individuals, but no association was found among Asian and Hispanic individuals. The results of the Cochran Q tests showed that Black individuals are the most vulnerable to PM2.5 concentrations when compared to other ethnicities. White individuals were more vulnerable to PM2.5 exposure when compared to Hispanic individuals.

Conclusions: Higher levels of PM2.5 levels are associated with an increase in respiratory hospital admissions in San Diego. There is an unequal burden of health effects caused by this air pollution, and Black individuals are most vulnerable to these exposures.

Primary topic area: Environmental Health | Secondary topic area: Health Equity and Disparity
67. Defining and Validating Latino Food Environments using Commercial and Crowd Sourced Data

Authors
Cassandra Meraz, Tesia Sun, Jiue-An Yang, Cinthia Sanchez, Marta Jankowska

Abstract

**Background:** Studies assessing the role of the built food environment on health outcomes and food-related behaviors rely on commercial food environment datasets. However, little is known if such datasets are representative of ethnic food environments, which are important to consider as potential drivers in food behaviors for ethnic sub-groups. Our aims were to 1) define a Latino food environment for restaurants and stores, 2) extract a Latino food environment for San Diego County using commercial data and crowd data sources, and 3) validate them throughout SD County.

**Methods:** A Latino food environment-coding scheme was developed. Commercial data was drawn from 2017 Dun and Bradstreet data. Crowd sourced data was drawn from Yelp. Latino food environment code rules were applied to both datasets, and all food outlets were geocoded in ArcGIS. On the ground validation was performed in a sub selection of ethnically and racially diverse census tracts.

**Results:** Crowd sourced and commercial data sets will be compared against on-the-ground observations using validity measures. Results will assess if there are different rates of agreement in census tracts with more vs. less Hispanic residents.

**Conclusions:** We hypothesize smaller ethnic restaurants and grocery stores aren’t well represented in commercial data, but crowd sourced data may be able to fill these gaps. This may result in ethnic food environments’ influence being undermined when considering Hispanic/Latino health behaviors.

**Primary topic area:** Immigrant Health | **Secondary topic area:** Environmental Health
68. HIV-Positive Women’s Perspectives on Integrating a Screening and Brief Intervention for Intimate Partner Violence and Alcohol Harm Reduction into HIV Post-Test Counseling; Qualitative Findings from Three Ugandan Fishing Villages

Authors
Amanda Miller, Godfrey Kigozi, Erika Bonnevie, Neema Nakyanjo, William Ddaaki, Charles Ssekyewa, Fredrick Nalugoda, Jennifer Wagman

Abstract
Background: In the fishing villages of Rakai, Uganda, HIV prevalence approaches 37%, alcohol use (AU) is common, and 60% of all women have experienced intimate partner violence (IPV). Evidence from high-income settings suggests addressing AU and IPV in healthcare-based screening and brief intervention (SBI), is a low-cost approach for reducing hazardous AU, IPV, and HIV infection. Little is known about the feasibility and effectiveness of this approach in low-income settings.

Methods: Qualitative interviews were conducted in January 2017 with twenty HIV-positive women from three Rakai fishing villages. Participants were drawn from Rakai Community Cohort Study respondents who requested an HIV testing and post-test counseling. Participants were asked about knowledge of how AU by one or both partners relates to IPV and HIV risk behaviors, and perceptions of the acceptability of receiving an IPV and alcohol reduction SBI during HIV post-test counseling.

Results: Mean age of participants was 31 years; and 80% were married. Participants overwhelmingly viewed AU, by either partner, as a contributor to IPV and HIV infection because it increases likelihood of engaging in risky sex behaviors (e.g., multiple concurrent partnerships); and in arguments escalating to physical violence. Participants narrated personal experiences of IPV and how AU by one or both partners often preceded incidents. Most felt time of HIV results notification was appropriate for discussing and intervening on AU and IPV and counseling should include sexual partners.

Conclusions: Integration of an IPV and AU reduction SBI into HIV post-test counseling was perceived as acceptable in this setting.

Primary topic area: Global Health | Secondary topic area: Injury and Violence Prevention
Mobile Technology Intervention in Adolescents with Childhood Trauma

Authors
Jyoti Mishra, Sana Parveen, Rajesh Sagar, Kiran Modi

Abstract

Background: Individuals with early childhood trauma are at risk for several mental and physical health problems during their lifetime and pose a huge healthcare and socio-economic burden. It is imperative to better understand and serve the mental health needs of this vulnerable population.

Methods: In this global health project, we investigated whether mobile digital interventions can impart multidimensional mental health benefits in adolescents with childhood trauma. We enrolled 45 adolescents with a history of neglect and trauma, recruited from a Child Welfare Center in India. Study participants underwent neuro-cognitive assessments, including functional MRI measures, and behavioral assessments of attention deficit and hyperactivity. Adolescents were then cluster randomized to digital intervention arms: (i) internal attention (breath-focused) training, (ii) external attention (video game) training, and (iii) a no intervention (life as usual) arm. The intervention period lasted 6 weeks (engagement for ~30 min/day over 30 days). Neuro-cognitive and behavioral assessments were repeated at post-intervention and at one-year follow-up.

Results: We found that only internal attention training imparted neuro-cognitive and behavioral benefits, including (i) enhanced functional connectivity of brain networks implicated in sustained focus maintenance; (ii) enhanced cognitive performance on tests of sustained attention and distractibility; and (iii) reduced hyperactivity behaviors. Notably, reductions in hyperactivity were sustained at the one-year follow-up.

Conclusions: Our study demonstrates that a mobile, cost-effective & scalable intervention, which trains internal focus on the breath can significantly improve mental health in adolescents with trauma.

Primary topic area: Health Technology | Secondary topic area: Global Health
70. Impact of food pantry services co-located within free clinics

Authors
Billy Nguyen, Sean Spiering, Rhaya Alkafaji, Christina Cui, Sandra Perez, Maria Perez, Sunny Smith

Abstract
Background: Food insecurity screening and referrals to appropriate resources are now recommended as a part of routine clinical care. However, many barriers exist to utilization of these services including shame, stigma, and fear. Therefore, we implemented onsite food pantry services that include food prescriptions with nutritious distributions for all patients within three free clinic sites of the UCSD Student-run Free Clinic Project to examine acceptability and impact on health outcomes.

Methods: In June 2016, we implemented a food prescription program in which all patients were offered a monthly food distribution of approximately 20 lbs of fresh produce and 20 lbs of nutritious shelf-stable food. We examined household food insecurity using the USDA food security survey 6-item short form at baseline and every 6 months afterward. We examined clinical outcomes including mental health outcomes by querying the electronic health record. Pre/post outcomes were examined with paired t tests.

Results: Over 2000 food distributions occurred in 6 months. Over 99% of food distributions were accepted by patients. Overall household food insecurity score decreased from 2.88 (SD 1.97) to 2.58 (SD 1.86), p 0.004 at 6 months. Depression outcomes utilizing PHQ2 and PHQ9 will be available by the time of conference.

Conclusions: Onsite food pantry services including monthly nutritious food distributions were integrated into routine clinical practice and decreased overall household level food insecurity.

Primary topic area: Food insecurity | Secondary topic area: Chronic Disease
71. Home Based Primary Care (HBPC) Reduces Hospitalizations to Produce Savings in the Independence at Home (IAH) Demonstration

Authors
Greg Norman, Richard Kronick, Bruce Kinosian, Tyler Kent, Joanna Kubisiak

Abstract
Background: The Independence at Home (IAH) CMS demonstration has produced over $35M in savings over its first two years among 10,000 beneficiaries. IAH is a provider-managed shared savings program that aligns incentives for home-based primary care (HBPC) providers, mobile inter-professional teams who manage medically complex frail Medicare beneficiaries at home. However, IAH impact on hospital utilization has not been reported.

Methods: We used 100% Medicare claims to identify 15 IAH practices and their IAH-eligible beneficiaries. We selected IAH-eligible controls that fit the age, disease, and utilization trajectory profiles of IAH-eligible patients. Benchmark rates were created for each practice county, and were compared to the hospitalization rates of the IAH practices. IAH-eligibility was defined as hospitalization and post-acute care in the 12 months prior to eligibility, two or more chronic conditions, and two or more ADL dependencies. Savings are publicly reported IAH Demo evaluation results for Years 1 and 2.

Results: We found 6404 IAH claims-eligible patients in demo practices, with 8712 IAH-eligibles in the demo practice counties not receiving HBPC. IAH rate ratio for hospitalizations overall was .84 (95% CI .74-.92) from a control rate of 12.5/100 beneficiary months. The top savings tertile (13.6% savings, n=2173 beneficiaries) and mid savings tertile (5.4% savings, n=2370) had similar reductions in hospitalization (26% and 29%, respectively), while the lowest savings tertile (-.1% savings, n=1861) had no hospitalization impact. (-3%). Reduced hospitalization was correlated across savings tertiles (r=.71).

Conclusions: HBPC, operating under IAH’s aligned incentives, reduces hospitalizations among successful programs, although not among programs who do not produce savings.

Primary topic area: Health Services | Secondary topic area: Chronic Disease
Implementing UCSD RELINK: A health and wellness program aimed at reducing health disparities among Transition Age Youth on Probation from San Diego County Jail

Authors
Victoria Ojeda, Emily Verliant, Sarah Hiller, Cielo Jimenez, Tamara Parker, Zephon Lister, Sarah Linke

Abstract
Background: Southern San Diego exhibits many risk factors associated with health disparities and cycles of incarceration. The UCSD RELINK Program- funded by the Federal Office of Minority Health- offers 6-months of Service Navigation support and Health Coaching to justice-involved young adults ages 18-26 who are on probation in the South San Diego region.

Methods: We describe the design, implementation and evaluation of the UCSD RELINK program. Baseline survey needs assessment data for 26 participants recruited in 2017 (year 02 of the study) are described below.

Results: Clients are mostly male (81%), younger: (42% are 18-20 years), 54% are Hispanic/Latino, 27% are Black/African American. Nearly one-quarter (23%) of our clients are parents, less than half have completed high school (46%), 38% were seeking employment. Nearly one-quarter of clients (23%) rated their health as “fair/poor,” 50% showed mild or moderate depressive symptoms (PHQ9), 23% reported anxiety symptoms (GAD2), 81% reported at least one Adverse Childhood Event (ACEs) and 38% reported four or more ACEs. Clients engage in a 6-month individually tailored service navigation and linkage and personalized health coaching, if desired. Participants assessed the Service Navigation component of the program to be very helpful and cited specific examples to support this assessment, including connection to useful resources (e.g., jobs, health insurance), support in determining how to affordably fulfill terms of probation (e.g., mandatory DUI and anger management classes), and assistance navigating complex bureaucratic systems (e.g., health systems and job applications). Group sessions are also offered.

Conclusions: Comprehensive wrap around services are needed by young adult minority reentrants. UCSD RELINK will assess its impact on recidivism.

Primary topic area: Health Equity and Disparity | Secondary topic area: Mental Health
73. **Eating Behavior and Body Composition in Chilean Young Adults: Results from the Santiago Longitudinal Study**

**Authors**
Lorena Pacheco, Estela Blanco, Raquel Burrows, Paulina Correa-Burrows, Jose Luis Santos, Sheila Gahagan

**Abstract**

**Background:** Obesity is multi-faceted encompassing behavioral and psychological factors. The aim of this cross-sectional study was to examine cognitive restraint (CR), uncontrolled eating (UE) and emotional eating (EE) dimensions and body composition in a sample of Chilean young adults.

**Methods:** Using data from 429 participants of the Santiago Longitudinal Study (mean age 22.5±0.4 years), sex-specific linear and logistic regression models assessed the independent associations between three eating behavior dimensions, using the Three Factor Eating Questionnaire, and BMI, percent body fat, and central obesity, accounting for covariates.

**Results:** The sample was 51% female and mean BMI of 26.9±6.1. Mean percent body fat was 30.5±7.6% in males and 41.8±6.9% in females. CR was related to a 2.4 (95% CI 1.2, 4.8) and 2.5 (95% CI 1.4, 4.5) greater odds of obesity (>25% and >37% body fat for males and females, respectively), compared to non-obese counterparts. The EE dimension was also significantly associated with percent body fat in both sexes. The greatest effect size in the linear regression models was observed for central obesity. For every point increase in CR, waist circumference increased by 5.1 cm (95% CI 2.1-8.1) and 4.1 cm (95% CI 1.5-6.7) in males and females, respectively. EE was positively associated with central obesity in females.

**Conclusions:** In this sample of Chilean young adults, CR and EE were associated with obesity, central obesity and percent body fat. The UE dimension was not associated with body composition. Understanding the dynamics and interplay of eating behaviors and body composition can provide evidence for future effective interventions.

**Primary topic area:** Diet, Physical Activity, and Obesity | **Secondary topic area:** Global Health
Effects of 12-week combined cognitive and exercise interventions on physical, cognitive function and health-related quality of life (QOL) in elders with mild cognitive impairment (MCI)

Authors
Youngran Park, Seung youn Hong

Abstract
Background: Elders are vulnerable to dementia, physical impairments, social isolation and poor quality of life. Senior center-based physical activity plus cognitive intervention may improve physical, cognitive function and health-related QOL but a few combinations have been investigated. To investigate the effect of 12-week Good memory school trial on physical, cognitive function and health-related QOL of normal and MCI elders in 30 senior centers.

Methods: Participants with MCI (n=300, age 76.92 years, 78.6% women) and normal (n=292, age 75.48 years, 76% women) were recruited from 30 local senior centers for 12 weeks of 120 minute exercise (aerobic/ resistance and stretching 30 min per session) and cognitive activity (education/ 60 min per session). Assessments included K-MMSE, EQ-5D, 2-min step test (physical function) and Geriatric depression scales.

Results: We observed improvements over time in physical function (p<.001, p<.001), cognitive function(p<.001, p<.01), depression (p<.001, p<.001) in normal and MCI group, respectively. Among the QOL dimension, mobility (p<.05) and anxiety/depression(p<.001) were significantly improved in the normal group, whereas all domains(p<.05) except mobility in MCI group were improved after intervention. Self-perception of memory, the satisfaction of social participation were significantly improved in both groups (p<.001). There was no difference in change between group (group*time) in most variable except K-MMSE (p<.001).

Conclusions: A twelve-week combined physical and cognitive intervention improve both physical function, cognitive function and QOL among both normal and MCI elders and imparted cognitive benefits in seniors with MCI.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Mental Health
75. Cognitive domains sensitive to the earliest stages of Alzheimer’s disease: Evidence from the National Alzheimer’s Coordinating Center (NACC) cohort

Authors
Guerry Peavy, Ruixuan Zhou, Lu Tian, Steven D. Edland

Abstract
Background: As we move toward earlier stage interventions, there is a need for clinical trial cognitive outcome measures appropriate for 1) primary prevention trials and 2) secondary prevention trials targeting the earliest pre-clinical stages of Alzheimer’s disease (AD). Domains of function that are observed to decline within normal subjects at risk of AD-associated decline are likely candidates from which to construct such an outcome measure. We investigated this in the NACC normal cohort by comparing rate of decline in subjects with and without the APOE 4 genetic risk factor for AD.

Methods: Rate of progression for each component of the NACC neuropsychometric battery was modeled by linear mixed effects model regression with random intercepts and slopes (N=1,575 subjects, mean age 81.7 years, 22% with an 4 allele). To approximate the progression and study subject dropout profile of a three year clinical trial, we restricted to newly recruited subjects recruited at least three and a half years prior to our data freeze and acquisition from NACC. Regression models tested for an 4 effect on slope after controlling for age, gender, and education effects on level and slope. A baseline visit offset term was used to test for practice effects.

Results: 4-positive subjects had a faster rate of progression for Digit Symbol, Trails B, Animal Fluency, Block Design, and delayed Paragraph Recall, (all p-values < 0.05), with no significant differences observed for Vegetable Fluency, Digit Symbol Test (forward and backward), or Object Naming. Practice effects were common, sometimes continuing for up to the 4th annual exam (Logical Memory).

Conclusions: In the NACC normal cohort, instrument dominated by memory performance and speed of processing declined more quickly in subjects with an 4 allele and therefore more likely to have an underlying AD neurodegenerative process. Instruments sensitive to these domains are likely candidate endpoints for early stage AD clinical trials.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Chronic Disease
Possible Epigenetic Influence in ASD

Authors
Benjamin K. Pham, Valentina L. Kouznetsova, Igor F. Tsigelny

Abstract
Background: Autism Spectrum Disorder (ASD) is a range of neurodevelopmental disorders that cause severe communication, behavioral, and learning problems. ASD-significant genes are organized into coherent-gene groups (CGGs) and are heavily co-expressed with the same regulatory elements during vital developmental periods. Epigenetic influence could also influence these ASD genes during the development period. Our goal is to organize ASD-significant genes into CGGs and to discover potential epigenetic effects on CGGs.

Methods: ASD-risk genes were extracted out of various papers and cross-examined with significant ASD genes in microarray samples of ASD patients, by Significance Analysis for Microarray (SAM) tests. These ASD-significant genes were grouped into CGGs via Gene Friends, which utilizes co-expression data from RNA sequencing. The most-connected CGG network was then submitted into IPA for analysis.

Results: The genes in the CGG mapped to a synapse of a neuron, as seen with the presence of both pre-synaptic and post-synaptic neuron-specific biomarkers in the network such as voltage-gated sodium, potassium, and calcium channels. The neuron modelled in IPA is located in the brain, because Neurexin and Neuroligin are present. The synapse appears to be GABAergic as there are GABA-pathway-related metabolites such as GABA receptors, GAD1, glutamate receptors, and glutamate. Epigenetic influences such as androgens and estrogens are found to be present in the network.

Conclusions: The presence of epigenetic elements entertains the possibility that dysfunctional ASD-significant genes expression that give rise to ASD are not solely influenced by traditional regulatory effects. If explored, this could potentially lead to novel drug design.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Mental Health
Differences in Developmental Screening across Racial and Ethnic Groups

Authors
Christie Pham, Elizabeth Bacon, Karen Pierce

Abstract
Background: Early developmental screening has been established as an effective method to detect delays in toddlers (Brothers, Glascoe, & Robertshaw, 2008; Pierce et al., 2011) and may be particularly effective in helping to reduce disparities in access to care (Herlihy et al., 2015). However, there is limited information available regarding differences (or lack thereof) in parent response to developmental screening across ethnic and racial groups.

Methods: The Communication and Symbolic Behavior Scales, Developmental Profile Infant-Toddler Checklist (CSBS, Wetherby & Prizant, 2002), is a parent report developmental broadband screening form used to assess for social and communicative delays through the evaluation of social, speech, and symbolic play skills. Over 150 pediatricians in San Diego were recruited to perform the CSBS screener during 12, 18, and 24 months well-baby check-ups to assess development. 24,375 screens were completed (mean age = 18.24 months) and differences in failure rates on the CSBS screener were compared by race and ethnicity.

Results: A chi-square analysis revealed significantly more toddlers from minority backgrounds (14.0%) failed the CSBS when compared to toddlers from the majority background (8.6%) ($\chi^2 = 132.9565, p < 0.001$). This difference highlights the potential impact of cultural differences and disparities in standardized developmental screening.

Conclusions: Variance between specific racial and ethnic groups and responses to specific question types (social, speech, or symbolic play) will be explored. This information will help us further understand the basis behind differences across racial and ethnic groups, allowing us to improve cross-cultural measure applicability.

Primary topic area: Health Equity and Disparity | Secondary topic area: Maternal and Child Health
Design of a Large-scale Self-Experimentation Tool to Promote Scientific Self-Explorations

Authors
Sayali Phatak, Elaine Chen, Stephen Schueller, Ida Sim, Richard Kravitz, Christopher Schmid, Eric Hekler

Abstract
Background: Multiple interventions can improve a person’s health, however, not everyone receives the same benefit. In partnership with WNYC Radio, we are designing a tool to support people in carrying out simple behavioral N-of-1 self-experiments to help them figure out whether healthy activities (e.g., meditation, exercise) that work in general, improve their own health and wellbeing (e.g., perceived energy or focus). This work describes insights from user research to inform the tool’s design and highlight design implications for n-of-1 experimentation.

Methods: WNYC listeners (N=550) were surveyed, a subset (n=18) were interviewed, and a subset (n=9) tested a lo-fi prototype to gain insights about activities/outcomes of interest, and to understand motivations and expectations related to participation and self-experimentation.

Results: Key motivators were an interest in habit formation, accountability, being part of a group/big project, and trust in WNYC. Interventions were often chosen to improve outcomes other than ones they selected in the survey, and also to develop traits and skills. Counter to expectations, participants did not doubt whether the activity (e.g., meditation) would be valuable for them. Although we believed that comparing interventions made sense from a methodological perspective, participants did not intuitively understand the value in comparing two active interventions.

Conclusions: Design implications include supporting participants’ interest in habit formation, tracking multiple health outcomes instead of a single outcome, simplifying the experimental design (e.g., testing only one intervention), and highlighting existing heterogeneity of responses to interventions to improve understanding of the logic of self-experimentation.

Primary topic area: Health Technology | Secondary topic area: Needs Assessment
Compliance with UCSD’s Alcohol Policy at On-Campus Alcohol-Serving Venues, 2018

Authors
Qi Tong, Amanda Moreno, Cynthia Frausto, Luke Samaniego-Kraus, Marina Novak, Nancy Binkin, Heather Pines

Abstract
Background: Underage and binge drinking amongst college students increases risks of physical and sexual assault, injury, and death (NIH). UCSD has an alcohol policy to promote responsible drinking, but its level of implementation and effectiveness are unknown.

Methods: To assess venue compliance with the UCSD alcohol policy, we conducted environmental scans (ES) during two separate visits to 10 on-campus alcohol-serving venues (i.e., bars, restaurants, and events). Health Promotion Services provided the ES instrument, and the Responsible Hospitality Coalition trained us to assess identification checks, alcohol service, and alcohol-related advertising. We calculated percentages of venues compliant with five key elements of UCSD’s alcohol policy; (1) presentation of valid ID to purchase alcohol, (2) denying alcohol service to individuals giving alcohol to underage companions, (3) denying alcohol service to obviously intoxicated individuals, (4) providing single servings of alcohol at a time, and (5) prohibiting alcohol-related advertisements or promotions.

Results: Of the 10 venues, 90% performed universal ID checks, 70% consistently denied alcohol service to individuals giving alcohol to underage companions, 30% of venues always provided one drink at a time, and 30% of venues had no alcohol-related advertising. No intoxicated individuals were observed.

Conclusions: On-campus alcohol-serving venues are not fully compliant with the UCSD alcohol policy, especially regulations on drink limits and alcohol advertisements. To better understand factors influencing poor compliance and to identify the most appropriate interventions, we are conducting knowledge, attitudes, and practice interviews with bar restaurant managers and staff.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Policy
80. Identifying Cognitive Subtypes of Mild-to-Moderate Alzheimer’s Disease Using the National Alzheimer’s Coordinating Center Uniform Dataset Neuropsychological Test Battery

Authors
Yuqi Qiu, Diane Jacobs, Karen Messer, David Salmon, Howard Feldman

Abstract
**Background:** Typical AD is characterized by early, significant episodic memory loss, greater than loss in other cognitive domains. A smaller, atypical group of AD patients has early loss greater in non-memory than memory domains. We determined whether the NACC Uniform-Data-Set (UDS) neuropsychological test battery could effectively identify “typical” and “atypical” patterns of cognitive deficit in clinically diagnosed AD patients.

**Methods:** Principal component (PC) and cluster analyses were applied to cognitive tests from 962 probable AD patients with MOCA scores 6-20 (mean=13.8, sd=4.1). Mean age was 75.1 (sd=9.9); mean education was 15.3 (sd=3.0). Tests included measures of memory, attention, executive function, language and visuospatial ability. Derived scores were regressed on clinical and demographic characteristics.

**Results:** Two PCs explained 49% of total variance. PC1 represented general severity of impairment across all cognitive domains. PC2’s loadings had opposing signs for memory and non-memory domains; patients with relatively greater memory impairment scored lower on PC2. Model-based clustering of PCs yielded 2 clusters, one with low scores on PC2 and broad representation on PC1 (“typical”), and the other with moderate scores on PC1 and higher scores on PC2 (“atypical”). Degree of “atypicality” was associated with younger age, fewer APOE e4 alleles, less global impairment and worse depression.

**Conclusions:** PCA from the UDS cognitive test battery yields a continuous score which can classify “typical” and “atypical” AD patients that differ in clinical and demographic characteristics. Future work will investigate diagnostic accuracy and longitudinal decline as functions of classification, with an eye towards impact on clinical trial outcomes.

**Primary topic area:** Aging and Alzheimer’s Disease | **Secondary topic area:** Biostatistics and Bioinformatics
81. Health Benefits to Increased Duration of Moderate-to-Vigorous Physical Activity Bouts

Authors
Chase Reuter, Suneeta Godbole, Michelle Takemoto, Jacqueline Kerr, Cheryl Rock, Loki Natarajan

Abstract
**Background:** Higher levels of moderate-to-vigorous physical activity (MVPA) confer overall health benefits. Of particular interest is how different lengths of MVPA bouts can affect this relationship.

**Methods:** In this analysis, the relationship between health outcomes and MVPA was tested with respect to the bout length of MVPA in obese women (N=234). Overall time spent in MVPA was measured and differentiated by the length of the bout that it was acquired in. Cumulative minutes of MVPA acquired from thresholds of at least 10, 20, and 30 minute bouts, were compared against total cumulative minutes acquired regardless of bout length. Differences in MVPA-health associations between total MVPA versus MVPA accumulated in bouts for each threshold were tested using generalized estimating equations. Outcomes examined were BMI, physical and mental quality of life, insulin, and C-reactive protein, a marker of inflammation.

**Results:** Significant differences were observed for all outcomes, in which a more pronounced relationship existed in higher thresholds of bout duration compared to the overall total.

**Conclusions:** This implies increased time spent in longer bouts of MVPA is more highly associated with better health outcomes.

**Primary topic area:** Diet, Physical Activity, and Obesity | **Secondary topic area:** Global Health
Dietary Patterns and Cognitive Function Among Community-Dwelling Adults: The Rancho Bernardo Study

Authors
Erin Richard, Gail Laughlin, Donna Kritz-Silverstein, Emilie Reas, Elizabeth Barrett-Connor, Linda McEvoy

Abstract
Background: Diet may be an important modifiable risk factor for maintenance of cognitive health. The purpose of this study was to examine the association between common dietary indices or dietary patterns defined by factor analysis and cognitive function in community-dwelling adults.

Methods: This study included 1,499 participants, aged 50+ from the Rancho Bernardo Study. Dietary information from a 1988–1992 visit was used to calculate the alternative Mediterranean score, AHEI-2010 score and factor scores derived from exploratory factor analysis of nutrients. Multiple domains of cognitive function were assessed in approximate four-year intervals between 1988 and 2016. Linear mixed models were used to examine the association between dietary patterns and cognitive trajectories controlling for potential confounders.

Results: In adjusted models, greater adherence to the Mediterranean score was associated with higher baseline global cognitive function (β(95%CI)=0.34(0.12,0.56) for highest vs lowest tertile) and higher category fluency scores β(95%CI)=0.52(0.01,1.02) for highest vs lowest tertile). AHEI-2010 score was not significantly associated with cognitive performance after adjustment. Higher loading on a plant PUFA/vitamin E factor was associated with global cognitive function and executive function after adjustment (β(95%CI)=0.28(0.07,0.48) and β(95%CI)=-7.66(-13.17,-2.15) for highest vs lowest tertile, respectively). The sugars/low protein factor was inversely associated with baseline cognitive function across multiple domains in adjusted models (p’s<0.05). Dietary patterns were not associated with cognitive decline over time.

Conclusions: Our results suggest that the adherence to the Mediterranean diet may be beneficial for cognitive health in late life. The potential role of dietary patterns defined by factor analysis warrants further study in other populations.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Aging
83. Depression and HIV in middle-aged to older adults: Associations with health-related quality of life and positive psychological factors

Authors
Alexandra Rooney, Raeanne Moore, Emily Paolillo, Ben Gouaux, Anya Umlauf, Dilip Jeste, David Moore

Abstract
Background: Depression is highly prevalent among persons living with HIV (PLWH), yet little is known about factors associated with elevated depressive symptomatology. We investigated relationships between health-related quality of life (HRQoL), positive psychological factors (resilience, grit, and self-rated successful aging [SRSA]), and depressive symptomatology between PLWH and HIV- individuals.

Methods: One hundred twenty-two PLWH and 94 HIV- individuals, recruited in three age decades (36-45, 46-55, 56-65), completed self-report questionnaires on current depressive symptoms (CES-D), HRQoL, and positive psychological factors. Participants were classified into four groups: HIV status and elevated depressive symptoms (H+/D+; H-/D+) and HIV status and non-elevated depression (H+/D-; H-/D-).

Results: Fifty-eight percent of PLWH had elevated depressive scores, compared to 33% of HIV- individuals (p<0.05). The proportion of individuals reporting elevated depressive symptoms differed among those aged 36-45 (HIV+/D+ group: 61.5%; HIV-/D+ group: 17.9%; p<0.001); however, there were no group differences in the other age decades (p>0.05). Within each age decade, the H+/D+ group reported the lowest physical and mental HRQoL and lowest scores on the positive psychological factors compared to the other three groups. However, those in the oldest H+/D- age group reported the highest SRSA (p<0.001).

Conclusions: PLWH aged 36-45 years may be especially vulnerable to elevated depressive symptomatology compared to age-matched HIV- individuals. Additionally, compared to HIV- individuals depressive symptoms may have a stronger association with HRQoL among PLWH; conversely, a lack of elevated depressive symptoms may relate to greater SRSA. Future work should examine the complexities of depression and HIV across the lifespan.

Primary topic area: Mental Health | Secondary topic area: Infectious Disease
Physician Communication of Genomic Results in a Diagnostic Odyssey Case Series: A Preliminary Study

Authors
Caryn Kseniya Rubanovich, Cynthia Cheung, Ali Torkamani, Cinnamon Bloss

Abstract
Background: The availability of whole genome sequencing (WGS) in clinical care is increasing and WGS has been shown to be promising for diagnostic odyssey cases. Physicians’ ability to effectively communicate genomic information, however, is unclear. This study assessed physicians' communication of patient genome sequencing information in a diagnostic odyssey case series from multiple perspectives.

Methods: We evaluated physician communication of genome sequencing results in an ongoing study of WGS utility for diagnosis of rare, idiopathic diseases. A modified Medical Communication Competence Scale (MCCS) was used to compare patients' ratings of their physician's communication of general medical information versus communication of genome sequencing information. Physician self-ratings were also compared to patient ratings.

Results: A total of 47 patients, parents, and physicians across 11 diagnostic odyssey cases participated. In 6 of 11 cases (54%), the patient respondent rated the physician’s communication of genome sequencing information as worse than general medical information (p = .110). In 9 of 11 cases (82%), physician self-ratings of communication of genome sequencing information were lower than the patient respondents' (p = .062). Physician self-ratings were positively associated with identification of a diagnosis (p = .021), but diagnosis was not associated with patient respondent ratings (p = .330).

Conclusions: Findings from this study suggest that even in diagnostic odyssey cases where genome sequencing is of clinical benefit, physicians may not be well-equipped to communicate this type of information. Future studies may benefit from using a multi-perspective approach to assess and understand physician communication of genome sequencing information.

Primary topic area: Health Technology | Secondary topic area: Health Communication
“No hay drama:” Precarity, Illness and Neglect among Female Mental Health and HIV-Aids Patients in Northern Santiago, Chile

Authors
Paula Saravia

Abstract
Background: During the last decade there has been an increase in the diagnosis of mental health illnesses and HIV-Aids in the rural, semi-rural and mostly underserved communities of the Northern metropolitan area of Santiago, Chile. What are the meanings behind the narratives of precarization, alcoholism, and neglect expressed by mental health and HIV-Aids patients in Lampa?

Methods: Ethnographic work was conducted in Lampa during August and September of 2016 with the Chile Global Health Field School and included 25 in-depth interviews, participant observation, and 140 surveys focused on illness experience, subjective well-being, and community engagement.

Results: Three case studies illustrate ways in which the frontiers between medical categories and diagnoses about illnesses of the “body” and “mind” are blurred. In Lampa, cultural epidemiology of depression refers to an embodied experience of the life of the “poor,” linking this experience to precarity and everyday forms of structural violence. Hence, cultural categories such as “drama” and “stress” become relevant for keeping pain, suffering, fear, and anguish in the shadows. These meaningful sociosymbolic structures are also oriented towards ways of being in the world that neglect the reality of “imaginary” suffering and focus instead on “natural” bodily suffering, one that is socially accepted and that allows for hope and healing.

Conclusions: Diagnosed patients lived illness experience is linked to broader sociopolitical processes (struggles for ethnic reivindication and citizenship) and to social conflicts that emerge from accelerated international migration - indigenous and non-indigenous - in Northern Santiago.

Primary topic area: Mental health and Indigenous Peoples | Secondary topic area: Mental Health
A Free Toolkit for Evaluation and Assessment in Adult Programs

Authors
Andrew Sarkin, Frances Reyes, Edith Wilson

Abstract

Background: The Mental Health Services Oversight and Accountability Commission (MHSOAC) is offering California counties and programs various tools to evaluate mental health outcomes. The Toolkit for Evaluation, Assessment, and Measurement for Adult Community Services and Supports (CSS) Programs (the Toolkit) is a free resource for CSS programs that offer a variety of ongoing clinical treatment modalities. The MHSOAC wants to equip such programs with the means to evaluate various behavioral health services in meaningful ways and to empower them with the information needed to better serve clients and highlight client progress toward recovery.

Methods: A major activity in the creation of the Toolkit was collecting stakeholder feedback in the development of a feasibility checklist, assessment measures, data entry and reporting tools, and training materials. Key individuals (e.g., subject matter experts, mental health directors, program staff and clients) provided input as part of an advisory committee. In addition, the Toolkit was presented at two large regional meetings in California where attendees reviewed and commented on the materials contained in the Toolkit.

Results: The intensive stakeholder input resulted in a comprehensive Toolkit that includes assessment measures, data entry and reporting tools, and implementation materials that allow for a comprehensive evaluation of CSS programs. The Toolkit was completed by HSRC in the summer 2017. The poster highlights materials included in the Toolkit, including examples of assessments, outcome dashboards, and a feasibility tool.

Conclusions: The Toolkit was positively received by the MHSOAC and components of the Toolkit are being considered for implementation in San Diego County. The Toolkit will be available on the MHSOAC website by the end of 2018.

Primary topic area: Mental Health | Secondary topic area: Evaluation and Assessment
Public Outreach and Community Engagement for Genetically Engineered Mosquitoes: Lessons from Oxitec and MosquitoMate

Authors
Cynthia E. Schairer, Cinnamon S. Bloss

Abstract
Background: Concerns about the spread of invasive species of mosquito in the continental U.S. has sparked interest in creating genetically engineered mosquitoes to curb the threat of malaria, zika, dengue, and chikungunya. However, public anxieties about the power of genetically modified organisms (GMOs), in part, has stymied efforts to effectively regulate and test these technologies.

Methods: Based on media reports and interviews with key informants, we compare the case of Oxitec's efforts to test their genetically engineered mosquito in the U.S. with MosquitoMate's similar but more successful trials of their Wolbachia infected mosquitoes.

Results: While MosquitoMate does not describe its mosquitoes as genetically engineered, there are compelling technical similarities between Wolbachia infected mosquitoes and Oxitec's sterile male mosquitoes. However, in addition to their rhetorical advantage in eschewing the label of GMO, MosquitoMate has managed to avoid obstacles in the regulatory process and community engagement that have plagued Oxitec.

Conclusions: The comparison highlights the complex relationship between regulation, public outreach, and public perceptions of emerging technologies. Analysis of these case studies clarifies the different forms that public outreach and community engagement can take, as well as the variety of technology champions who may initiate outreach and engagement. When planning public outreach or community engagement, the form must fit the stage in the technology's development and appropriately reflect the position of the agents who initiate engagement. Specifically, we suggest forms of messaging and inquiry suitable for engagement by different actors at different stages of technological development.

Primary topic area: Stakeholder and Community Engagement | Secondary topic area: Infectious Disease
The Impact of Hoarding Disorder on Veterans and the Community

Authors
Lauren Schwarz, Mary Dozier, Catherine Ayers

Abstract
Background: Hoarding disorder is a debilitating psychological disorder impacting individuals and their surroundings. Frequent and costly interventions are required of various governmental and health agencies. These agencies are burdened by hoarding interventions, which can affect entire communities.

Methods: Data is presented using the baseline responses of 55 Veterans participating in an ongoing treatment study for hoarding disorder.

Results: Participants were mostly older (mean age 61.2, SD = 10.77, range: 26-82), Caucasian (64%), and male (60%). The majority of participants were currently unmarried (78%), with 29% of participants reporting that they had never been married. Participants reported an average of three hospitalizations in their lifetime (mean = 3.13, SD = 7.32, range: 0-54). The majority of participants lived in a single-family home (53%) or in an apartment (35%). Almost half of all participants (47%) reported living alone. Thirty-five percent of participants reported having had at least one intervention attempt in their lifetimes and 29% of participants reported having had an intervention from their landlord. Fifty-six percent of participants reported having had at least one fall in their home in the past year and 70% of participants reported having had a fall in their home in the past three years. Seventy-two percent of participants reported having a family history of hoarding.

Conclusions: The clinical impact of these findings is examined in addition to a future direction.

Primary topic area: Mental Health | Secondary topic area: Health Services
A comparison of sports-related concussion diagnosis in high school fall sports before and after the employment of athletic trainers

Authors
Alan Shahtaji, Alex Collins

Abstract
Background: Concussions are recognized as a major public health crisis and pose a notable concern for athletes and their parents. Due to a lack of reliable objective measurements, recognition and diagnosis of concussions is difficult. In fall of 2016, UCSD employed an athletic trainer at each of the 16 high schools in the San Diego Unified School District. We sought to study how the implementation of athletic trainers impacted data collection and concussion diagnosis rates.

Methods: Concussion numbers were obtained by contacting each school's athletic director and campus nurse for the 2015 fall sports. UCSD athletic trainers collected concussion numbers for the 2016 and 2017 fall sports.

Results: In 2015, 13 out of the 16 schools were able to provide data on the number of diagnosed concussions. For the 2015 season, concussion data was not categorized for specific sports. The mean number of concussions per school for 2015 was 13.38. In 2016 and 2017, 16 out of 16 schools reported concussion data with specific statistics for each of the 6 fall sports. The mean number of concussions for each school in 2016 and 2017 was 11.6 and 4.7, respectively.

Conclusions: The employment of athletic trainers contributed to enhanced collection and organization of concussion data. During the 2016 season, the standard deviation and range of diagnosed concussions for the school district decreased. Due to the nature of retrospective data, it is not possible to attribute this to the employment of athletic trainers. However, the results suggest athletic trainers improve recognition, documentation and consistency with sports related concussions in high school athletics.

Primary topic area: Injury Surveillance/Epidemiology | Secondary topic area: Sports Medicine
90. Air pollution and preterm birth in California: assessment of critical exposure windows

Authors
Paige Sheridan, Tarik Benmarhnia

Abstract
Background: Exposure to air ambient PM2.5 air pollution during pregnancy is associated with preterm birth, a leading cause of infant morbidity and mortality. Results from studies attempting to identify etiologically relevant exposure periods of vulnerability have been inconsistent, possibly due to incorrect treatment of both exposure and outcome. The objective of this study is to identify critical exposure windows for the effect of PM2.5 exposure on risk of preterm birth.

Methods: All live singleton births in California from 2005 – 2010 were linked with air pollution monitoring data by zip code to create a retrospective cohort that includes both birth and air pollution data. Average weekly PM2.5 (μg/m3) exposure levels were assigned by week of gestation for each pregnancy. Associations were assessed using Cox proportional hazards models.

Results: The prevalence of preterm birth and very preterm birth in this population was 8.5%, and 1.4%, respectively. The average age of mothers was 28 (SD 6.4), 47% had at least some college education, and the majority were white (76.1). The average PM2.5 exposure across gestation among full term births was 13.7 μg/m3 and 13.9 μg/m3 among preterm births. There was increased risk of preterm birth across the gestation period, and additional risk at the end of the first trimester into the beginning of the second trimester.

Conclusions: Identifying windows of vulnerability is highly informative in the context of adverse birth outcome prevention efforts. These results extend our knowledge about specific periods during pregnancy that have the greatest impact on preterm birth.

Primary topic area: Environmental Health
91. Composite Endpoints for Alzheimer’s Disease Clinical Trials: Improved Performance Via Optimal Weighting of Component Measures

Authors
Benjamin Shifflet, Diane Jacobs, David Salmon, Emily Edmonds, Nandini Raghavan, Douglas Galasko, Steven Edland

Abstract
Background: Composite scales have been proposed as outcome measures for clinical trials in Alzheimer’s disease (AD). These scales are typically constructed as the sum of component measures which have been z-score normed to a reference population, such as the NTB-7 [Berres et al. 2014]. Alternatively, we have described weighted sum composites that maximize signal-to-noise of the resulting score and optimize performance of the composite as an endpoint for clinical trials [Ard, et al. 2015].

Methods: We use data from the Alzheimer’s Disease Neuroimaging Initiative (ADNI) cohort study to demonstrate the performance of optimally weighted composites vis-a-vis their standard scoring in the context of clinic trials targeting early stage AD. To approximate the population of persons these trials will be recruiting from, we restricted to cases with moderate impairment and CSF biomarker levels consistent with an underlying AD neurodegenerative process. As a pragmatic metric of endpoint performance, we use standard power calculation formulas informed by the pattern of progression observed in ADNI to estimate the relative sample size required for a 12 month trial powered to detect a 25% slowing of decline on the respective outcome measures.

Results: Trials using the optimally weighted composite require 31% less subjects than trials using the z-score normed composite. Compared to the industry standard cognitive endpoint, called the ADAS-cog13, the optimal composite requires 55% less subjects.

Conclusions: Improvement in trial efficiency by optimal composite endpoints is of practical significance and would allow more trials to be performed at decreased cost and with less human subject burden.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Chronic Disease
92. Challenges and Strategies in Recruiting Hispanic/Latino inpatients in a Safety-Net Hospital Setting

Authors
Alexandra Soto, Kimberly Savin, Madison Holland, Julia Bravin, Linda Gallo, Adelaide Fortmann

Abstract
Background: Racial and ethnic minorities are disproportionately burdened by chronic conditions and further suffer inequities in access to healthcare and quality of care received. Randomized controlled trials (RCT) can greatly improve healthcare delivery and health outcomes. The current study aims to provide a preliminary description of the challenges encountered by an RCT’s recruitment efforts, as well as identify successful strategies that have been used to meet recruitment goals in a safety-net hospital setting.

Methods: Mi Puente is a RCT that aims to provide more holistic discharge services to hospitalized Hispanic/Latino adults managing two or more chronic conditions and one or more behavioral health concerns, who are being discharged to home/community settings. Currently, 1706 Hispanic/Latino individuals meeting eligibility criteria have been identified for enrollment. For each individual, recruitment outcomes have been categorized into 28 different outcomes. Descriptive analyses were conducted to identify the most frequently cited barriers in recruitment.

Results: The three main non-enrollment reasons were as follows: Patients were unexpectedly discharged to a Skilled Nursing Facility (SNF) (12.7%, n=228); eligible patients refused participation (12.3%, n= 231) and; patients had a neurological impairment (12%, n=216). Successful recruitment strategies included developing a system to determine, before direct contact, patients at risk of being discharged to a SNF and patients with neurological impairments. For direct refusals, trainings and workshops for staff have been developed.

Conclusions: Challenges for recruitment in an inpatient setting are still not well understood. This study presents barriers encountered for Mi Puente and innovative strategies used.

Primary topic area: Dissemination and Implementation
Secondary topic area: Descriptive Program Analysis
Cardiorespiratory fitness and metabolic syndrome among City of San Diego firefighters

Authors
Sankar Sridaran, Jeanne Nichols, Katie Rusk, Jill Waalen, Eyal Oren

Abstract
Background: Sudden cardiac death is the leading cause of on-duty firefighter fatalities in the United States. Metabolic syndrome is a pre-morbid condition that often precedes cardiovascular disease and low cardiorespiratory fitness (CRF) is associated with this condition. The Fire Service Joint Labor Management Wellness-Fitness Task Force recommends firefighters maintain a CRF level of at least 12.0 maximum metabolic equivalents (max METs). The goal of this study was to investigate the prevalence of metabolic syndrome and level of CRF among firefighters in the City of San Diego Fire Department from 2005 to 2015.

Methods: CRF was assessed using a maximal exercise testing protocol. An annual wellness program also screened for metabolic syndrome using the 2005 American Heart Association (AHA)/National Heart, Lung, Blood Institute (NHLBI) joint statement guidelines.

Results: Cross-sectional analysis revealed a decrease in the prevalence of metabolic syndrome from approximately 10% to 6% of the screened workforce from 2005 to 2015. This corresponded with a decrease in the fraction of firefighters with CRF level below 12.0 max METs from approximately 30% to 18% over the same time period.

Conclusions: City of San Diego firefighters have, on average, lower rates of metabolic syndrome and higher measures of CRF compared to previously documented rates for US firefighters. Fitness among City of San Diego firefighters enrolled in the annual wellness program appears to be improving, on average, from 2005 to 2015. This is unlikely to be explained solely by demographic changes in the workforce during this time period.

Primary topic area: Occupational Health | Secondary topic area: Chronic Disease
94. Association of e-cigarette flavor with smoking cessation: Findings from two nationally representative surveys

Authors
Joanna Sun, Anne Hartman, Yue-Lin Zhuang, Sharon Cummins, Shu-Hong Zhu

Abstract

Background: Many smokers report using e-cigarettes to help them quit smoking cigarettes. One reason commonly reported by users is that they like the variety of flavors available for e-cigarettes. This study uses nationally representative data to examine if flavor plays any role in smoking cessation.

Methods: A sample of 4,715 adults who were current e-cigarette users and who had smoked cigarettes in the past 12 months was obtained from two nationally representative, population-based surveys: the 2014-15 Tobacco Use Supplement to the Current Population Survey (TUS-CPS) (N=3,760), and a web-based survey conducted in 2014 (N=955) by the University of California, San Diego using GfK's Knowledge Panel. Data included e-cigarette use, flavor use/preference, and device type, as well as smoking and quitting behavior.

Results: Analysis of the TUS-CPS data showed that among current e-cigarette users who smoked cigarettes in the last 12 months, those who used flavored e-cigarettes were more likely to make a quit attempt (69.0% vs 58.5%, p<0.001) and be continuously abstinent for 6 months (20.5% vs 12.63%, p<0.01). The GfK surveys similarly revealed that flavor was related to abstinence, that is, preference for a non-tobacco flavor predicted successful quitting (p<0.01) after controlling for device type (i.e., tanks vs. cigalikes) and demographics.

Conclusions: Use of flavored e-cigarettes is associated with higher rates of quit attempts and greater success in quitting combustible cigarettes. This presentation will discuss the implication of the findings for tobacco regulatory control.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Policy
Arriba por la vida Estudio (AVE): Protocol for a Standing Intervention Targeting Postmenopausal Latinas

Authors
Michelle Takemoto, Megan Schechtman, Nicole Villa, Gregory Talavera, Dorothy Sears, Neville Owen, Dori Rosenberg

Abstract
Background: Postmenopausal Latinas are a growing population group in the US who are at high risk for cardiovascular disease. Epidemiological studies have shown that excessive sitting is related to cardiovascular disease risk. Older women, in particular, sit for prolonged periods. Increasing physical activity in this population is challenging and most individuals do not meet physical activity guidelines. Reducing sitting through increased standing may improve cardiovascular risk. More research is needed on how to intervene to increase standing in older Latinas.

Methods: Postmenopausal Latinas will be randomized to one of two study arms: an increase standing intervention or a heart healthy attention-comparison intervention. A total of 250 overweight postmenopausal Latinas will be recruited and followed for 12 weeks. AVE is based on cognitive-social models of behavior change including strategies such as self-monitoring, goal setting, and habit formation. Participants will receive three in-person health-counseling sessions (including one in-home visit) and five follow-up telephone calls using motivational interviewing techniques. Those in the attention-comparison condition will receive an equal number of contacts as the standing intervention with topics focused on healthy aging. The primary outcome is objectively-measured sitting time over three months measured via thigh-worn inclinometers and secondary outcomes include blood pressure, physical functioning and glucoregulatory and lipid biomarkers.

Results: Recruitment began in July 2017. To date, we have enrolled 20 postmenopausal Latinas and seven participants have completed the study.

Conclusions: The findings from this study will provide valuable information about effective approaches to increase standing time in postmenopausal Latinas and its impact on cardiovascular disease risk.

Primary topic area: Sedentary Behavior | Secondary topic area: Diet, Physical Activity, and Obesity
Simultaneous Confidence Bands (SCBs) for Functional Data with Small Sample Sizes and Applications

Authors
Fabian Telschow, Armin Schwartzman

Abstract
Background: Evaluating the variability of estimators is crucial for inference. SCBs are one way to visualize this variability for data, which consists of random functions. Unfortunately, all existing methods are either based on the bootstrap or on asymptotic evaluations, which both do not perform well on small sample sizes. The latter, however, are due to costs of experiments often encountered in applications.

Methods: We use the Gaussian Kinematic Formula for Gaussian related fields, especially t-fields to obtain SCBs, which are valid even for small sample sizes.

Results: The presented method gets the correct covering rate even for sample sizes as small as 10 sample curves, if the error processes are close to Gaussian processes, where bootstrap methods do not give any reasonable covering. Moreover, the variance in the width of our SCBs is much smaller asymptotically compared to bootstrap alternatives.

Conclusions: In most cases (not highly skewed error processes) our method outperforms the usual bootstrap or asymptotic SCBs. Moreover, it is computationally much faster than its competitors. Hence it is a valid alternative, which should be applied.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Neuroscience
Identify formation, engagement, and access to support in HIV care among women living with HIV/AIDS

Authors
Briana Thrift, Jamila Stokman, Erin Falvy, Ava Nicole Hoang, Eunhee Park, Laramie Smith

Abstract
Background: Late presentation to HIV treatment and early discontinuation of ART contribute towards disparities in AIDS-related disease burden and mortality among ethnic minority women living with HIV/AIDS (WLHA) in the US. Less is known how an HIV-positive diagnosis shapes the identity formation process among women living with HIV.

Methods: WLHA accessing local HIV support services completed a brief survey and semi-structured interview Jan.-Apr. 2015 (n=25). Interviews were audio recorded, transcribed verbatim. De-identified transcripts were analyzed for emergent themes by 3 trained independent coders using the Framework method.

Results: Most WHLA identified as either Black (47%) or Latino (27%) and had been living with HIV for 11.4 years (SD=8.0). Three themes emerged regarding the relationship between HIV diagnosis, identity formation, and HIV treatment perceptions. Presence or absence of trauma related to receiving an HIV-positive diagnosis: Traumatic responses to being diagnosed with HIV were observed between WHLA who experienced discrimination during their diagnosis and viewed HIV as a highly stigmatized disease. Periods of disengagement from HIV treatment are defined by severe HIV-related challenges: WHLA who experienced more negative reactions to their HIV-related experiences resulted in more defined periods of disengaging from HIV treatment. Identity salience was related to HIV treatment perceptions: Women who had developed a sense of HIV salience tended to relate HIV treatment and support services as positively improving their quality of life.

Conclusions: Experiences related to HIV diagnosis and severity of HIV-related challenges affected how salient HIV was to WLHA’s identity. Greater saliency was correlated with more positive perceptions of HIV treatment.

Primary topic area: Health Equity and Disparity | Secondary topic area: Health Services
98. Rethinking the Role of Location and Time in Measuring Access to Nutritional Foods

Authors
Vivian A. Trang, Jiue-An Yang, Marta M. Jankowska

Abstract
Background: The U.S. is plagued with widespread disparity in access to nutritious foods, contributing to the onset of chronic diseases such as obesity, cardiovascular disease, and cancer. Previous studies have analyzed the relationship between environmental exposure and access to food by counting food outlets within fixed distances but this approach tends to ignore the variability between individuals. This literature review will consolidate applicable factors of spatial and temporal variables of food access, and summarize existing methods of quantitatively measuring these factors, in order to incorporate geographic information systems (GIS) in assessing spatial and temporal environmental exposures for future diet intervention studies among low income communities.

Methods: We performed a literature analysis through the use of PubMed and Google Scholar. Search phrases include “spatial food outlets”, “food environment GIS”, “neighborhood and health”, and “food outlet time”.

Results: Review results in the outlining of variables which directly relate to the study of access to nutritious foods. The temporal variable can be understood by its components of: operating hours, seasonality, travel time, food assistance disbursement, promotions, and sales. Additionally, the spatial variable can be understood by its components of: transportation in relation to socioeconomic status, food density and intensity, safety, proximity, and mobile markets.

Conclusions: Concerning future diet interventions, it is important to consider the components of temporal and spatial factors. In addition, integrating emerging technology, like GIS, into health interventions allows comprehensive research regarding time and location as variables to be more feasible.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Health Technology
Application of personal sensing technologies to examine the influence of design on radiant exposures in outdoor play spaces: A Case Study in El Cajon, CA

Authors
Jennifer Vanos, Kelsey Fahy, Christine Tu, Todd Coleman

Abstract

Background: Ambient exposures to temperature and radiation are tightly connected to children’s risk of heat stress and sun burn, however minimal information exists that associates these ambient exposures to children’s physical activity (PA) and use of play spaces. The current study assesses children’s use of an outdoor play environment and via location and PA levels in relation to personal exposures to ultraviolet (UV) radiation and microclimate variables.

Methods: Eight children (aged 4-5) participated in the field study at an outdoor playspace in El Cajon, CA in early fall 2017. A portable weather station monitored a suite of on-site microclimate variables. Subjects wore UV dosimeters and heart rate (HR) monitors on each wrist and a GPS tracker around the waist, and played freely on the playground. UV and heart rate data were logged at 10-second intervals, and GPS data at 1-second intervals. A point-in-polygon function categorized subject position into seven play location groups defined by ground surface and shade amount. Sunburn potential was calculated with maximum erythemal doses (MED).

Results: Tree shade lowered the UV index by 75% of incoming UV and lowered the MED to unhazardous values; levels in sun-exposed locations were estimated to cause burns within 60 minutes. Although children spent ~79% of their time in the shade by choice, they performed more PA in the sunny locations (HRsun=141bpm versus HRshade=130bpm).

Conclusions: Children prefer shaded areas on hot sunny days, however perform less PA in shade. More shade may increase PA levels and the full use of the playground.

Primary topic area: Children's Health | Secondary topic area: Health Technology
Contextual factors that foster cognitive stimulation and cognitive function among middle-aged and older Hispanic/Latino adults in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

Authors
Priscilla Vasquez, Wassim Tarraf, Maria Marquine, Hector Gonzalez

Abstract
Background: Hispanic/Latino adults are at high risk for the development of cognitive impairment. It is believed that symptoms of Alzheimer’s disease may begin 7-years earlier for Hispanic/Latino adults compared to non-Latinos. Given that on average Hispanics/Latinos live 3-years longer than Whites, there is heightened urgency for prevention.

Methods: We analyzed cross-sectional data from (n=9,623) adults ages 45-74-years in 2008-2011 who participated in HCHS/SOL using complex survey design methods. We examined individual cognitive test scores and a derived global cognition measure based on the following: Brief-Spanish English Verbal Learning Test (B-SVELT) sum of scores, B-SVELT Recall, Word Fluency Test (WF), and the Digit Symbol Substitution Test (DSS). Cognitive stimulation is conceptualized as a combination of education, occupation, income, acculturation, and social networks based on the scientific literature. We used latent class analysis to incrementally extract and model risk groups based on these variables.

Results: The two class solution provided best fit to the data. The majority of our sample was in a putative lower cognitive stimulation group (78%). The higher cognitive stimulation class had a higher prevalence of individuals with 1) post-high school education, 2) earnings in higher income brackets, 3) higher skilled and professional occupations, 4) higher social and linguistic acculturation, and lastly, 5) more established family connections. Compared to being in the lower cognitive stimulation class, those with higher cognitive stimulation had higher global cognitive functioning, and scored consistently higher on our individual measures of learning and memory, verbal fluency, and executive function.

Conclusions: We found that higher education, more cognitively engaging occupations, and increased social networks were associated with higher cognitive function among diverse, middle-aged and older Hispanics/Latinos.

Primary topic area: Cognitive Health | Secondary topic area: Health Equity and Disparity
101. Validating Novel Evaluations of Consumer Reactions to Health Warnings on Cigarette Packaging Designs

Authors
Isabelle Velloze, Adriana Villasenor, Alexandra Angebrandt, Matthew D. Stone, Samantha Hurst, David R. Strong, John P. Pierce

Abstract
Background: Evidence is needed to link potential impacts of cigarette packaging designs to tobacco use behavior and support FDA regulators’ understanding of the efficacy of different plain packaging designs in the US.

Methods: Participant interviews were conducted using a centralized task of examining five different graphic varieties of cigarettes packaging, including their usual US standard (ST) packaging, plain packaging (PP), and three graphic varieties currently used in Australia (AM). Australian images were reprinted with permission from the Commonwealth of Australia. Quantitative text analysis of transcripts using an augmented dictionary method evaluated the affective reactions to each design with attention to the effectiveness of text and graphic warnings for tobacco products. All analyses are preliminary and rely upon an initial sample of participants (n=100).

Results: Concurrent validity of primary instruments was supported with significant relationships between baseline self-reports of brand appeal and sentiment analysis of verbal behavior describing handling of their own ST design (r=0.30, p<0.01). Concurrent validity of the sentiment ratings of verbal behavior when handling different pack designs was supported by the observed expected lower levels of positive appeal during handling of PP (d=0.59; p<0.001) and AM (d = 0.92-1.24; p<0.001) relative to ST packs, an effect that appeared consistent across brands. Objective sentiment ratings during the handling of AM (effect size r=0.37, p<0.02) and PP (effect size r=0.22, p=0.14) packs predicted levels of day-to-day reports of keeping the pack out of view.

Conclusions: Findings indicate robust relationships between pack behavior and health concerns.

Primary topic area: Tobacco, Alcohol, and Other Drugs | Secondary topic area: Health Policy
102. Development of Dulce Digital-Me: An Adaptive mHealth Intervention for Underserved Hispanics with Diabetes

Authors
Daniela G. Vital, Kimberly L. Savin, Isaac Huicochea, Linda C. Gallo, Adelaide L. Fortmann

Abstract
Background: Hispanics are disproportionately affected by type 2 diabetes (T2DM), and often lack access to diabetes self-management education (DSME) due to practical barriers. Mobile health (mHealth) technology is promising to decrease such barriers by increasing access to DSME via Short Message Service (SMS). Dulce Digital-Me (DD-Me) was developed to address this need, as a mHealth intervention, aimed at improving diabetes management among Hispanics with poorly-controlled T2DM. The current study describes the development and design of DD-Me.

Methods: A preliminary randomized controlled trial, Dulce Digital (DD; N=126), used a culturally-appropriate DSME curriculum, and delivered motivational content, medication reminders, and blood glucose monitoring (BGM) prompts to participants via SMS. DD demonstrated significant improvements in glycemic control in the intervention group compared to usual care. Post-intervention focus groups (N=12) demonstrated high acceptability towards SMS and expressed a preference for a more personalized intervention.

Results: DD-Me aims to provide a personalized mHealth intervention tailored to patient’s individual needs and behavioral progress by addressing findings from DD and based on community stakeholder input. Objective real-time BGM and medication adherence data are collected. Glycemic control and other outcomes are measured at baseline, 6, and 12 months. Participants are randomized to either DD (educational messages only), DD-Me (educational messages + personalized behavioral feedback and goal-setting delivered via automated messaging), or DD-Me MA (educational messages + personalized medical assistant feedback phone calls).

Conclusions: DD-Me aims to improve diabetes clinical control in an underrepresented population and increase access to DSME. This study is currently in progress, enrolling participants and starting follow up visits.

Primary topic area: Health Technology | Secondary topic area: Chronic Disease
Impact of Neck Region of Interest (ROI) Placement on Estimates of Visceral Adiposity using Dual-Energy X-ray Absorptiometry (DXA)

Authors
Anh Vo, David Wing, Mia Green, Jeanne Nichols

Abstract
Background: Visceral adipose tissue (VAT) is a known correlate to heightened risk of cardiovascular diseases and diabetes. Recently, Dual-Energy X-ray Absorptiometry (DXA) has been gaining interest as a viable and valid tool for estimating VAT. DXA software auto-generates the region of interest (ROI) of the android area from which VAT is calculated. This calculation includes measurement of the distance between the neck and abdomen, and is framed by cut-lines which can be altered by the technician, who may unintentionally move the neck cut-line within the area between the chin and shoulders during analysis. Although machine manufacturers have guidelines on determining the boundaries of the android ROI, the degree to which VAT is altered by errors in cut-line placement has not been quantified. Such errors may potentially produce inconsistent results and failure to identify at-risk individuals.

Methods: We compared the two common ways that DXA scans are analyzed and the resultant differences on VAT and total body fat mass. A total of 290 scans from 172 participants were analyzed twice. Cut-lines were placed just beneath the chin-bone (manufacturer’s recommendation), or just above the soft tissue of the shoulders (common practice).

Results: Paired t-test comparisons of the mean differences between chin-bone and shoulder for VAT mass, volume (g/cm3) and total body fat percent were -76.182g±159.9,-81.063g/cm3±169.7,0.2034%±0.6 respectively, all statistically significant with p-values<0.2%

Conclusions: Strict adherence to the manufacturer’s recommendation for cut-line placement is crucial to identifying correct VAT and subsequent screening of at-risk individuals.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Muscle and bone health
104. Thirty-Day Readmissions among Elderly Patients Discharged with an Acute Myocardial Infarction

Authors
Caresse Vuong, Gary Vilke, Edward Castillo

Abstract
Background: The percentage of the United States population aged 65 years and older is increasing. The purpose of this study was to assess 30-day hospital readmission for myocardial infarction (MI) in seniors.

Methods: A retrospective longitudinal study of ED visits from 326 non-federal licensed acute care hospitals serving the state of California in 2014. ICD-9 codes were used to identify mental health disorders and drug/alcohol use. ICD-9 codes were also used to calculate the Charlson Comorbidity Index (CMI). Patient and clinical characteristics are reported. Logistic regression analysis was used to compare patients who were and were not readmitted within 30 days.

Results: Of the 3.8 million ED visits during the study period, 20,676 visits among 20,132 patients met inclusion criteria. At the index visit, the majority of patients were 75 years of age or older, male non-Hispanic White, had Medicare and primarily spoke English. There were 3,059 (15.2%) 30-day readmissions. Among these, 883 (28.9%) were seen at a different hospital than their index discharging facility. In the regression analysis, CMI score had the highest association with readmission (CMI 3-4, OR 2.25, 95% CI 1.97-2.59; CMI 5-6, OR 3.91, 95% CI 3.41-4.48; CMI >6; OR 7.18, 95% CI 6.30-8.19) followed by a diagnosis of a mental health disorder (OR 1.49, 95% CI 1.37-1.62).

Conclusions: We reported demographic and clinical factors that were associated with hospital readmission among geriatric patients who were discharged with an acute MI. Identifying utilization patterns among seniors will be important for ED planning as the US population ages.

Primary topic area: Health Services | Secondary topic area: Geriatrics
Building Partnerships and Achieving Health Equity for Refugees and Immigrant Communities in San Diego County

Authors
Rahwa Weldeselase, Reem Zubaidi, Amina Sheik Mohamed

Abstract
Background: The UC San Diego Center for Community Health’s Refugee Health Unit works toward a primary goal of achieving health equity for refugees and immigrants to San Diego County by working and partnering with Ethnic Community Based Organizations. These organizations struggle to develop and sustain interventions that meet community needs, largely due to a lack of funding and other resources, such as experienced staff members to develop, manage, and evaluate programs.

Methods: The Refugee Health Unit was created to address these problems. The Unit help facilitate the development of ECBO initiatives so that they can remain in control and ensure their community is well represented while at the same time getting access to tools, training, and possibly funding.

Results: Sharing the impact of the Refugee Health Unit programs

Conclusions: This poster presentation will allow the Refugee Health Unit to share some of their highlighted projects. These programs include mental health strategies to address a growing suicide rate among African males and an initiative intended to help break the stigma surrounding mental health. Just as important is the attempt to educate councilors and psychiatric response teams in cultural literacy so the professionals are better equipped to help those in need. Another example is women’s health focus that is also extends to training medical professionals. The Unit is currently training San Diego healthcare providers with cultural competency addressing the health issues of Female Genital Cutting affected girls and women.

Primary topic area: Immigrant Health | Secondary topic area: Health Equity and Disparity
The impact of time-restricted feeding (TRF) in patients with metabolic syndrome

Authors
Michael Wilkinson, Emily Manoogian, Adena Zadourian, Christiana Stark, Jeremy Pettus, Satchidananda Panda, Pam Taub

Abstract
Background: Chronic circadian rhythm disruption predisposes to metabolic diseases, while maintaining a daily rhythm of feeding and fasting promotes healthy metabolism. We are assessing whether patients with metabolic syndrome benefit from TRF for 10 hours/day (i.e. fasting 14-hours/night). By aligning dietary intake with the circadian rhythm, we predict that TRF will improve markers of cardiometabolic health.

Methods: We are actively enrolling participants ≥ 18 years with metabolic syndrome and an average eating period ≥ 14-hours per day. For 12-weeks, the daily eating period is reduced to 10-hours. Participants log dietary intake by taking photos with a smartphone "app". We obtain baseline eating patterns over two weeks, as well as pre- and post- anthropometric measurements, fasting blood tests, activity and sleep data, and mean glucose using 7-day continuous glucose monitor. Changes from baseline are assessed using the paired-samples t-test.

Results: We have enrolled 11 subjects, and 5 have completed the study. We have observed significant weight-loss and reductions in body mass index: mean (SD) change -13.7 (8.62) lbs and -1.9 (1.09) kg/m2 (p < 0.05 for both). We are observing trends toward improvements in percent body fat and systolic blood pressure: mean (SD) change -1.4 (1.14) % and -11 (10.7) mmHg (p = 0.056 and 0.083, respectively).

Conclusions: Time-restricted feeding appears to contribute to significant weight-loss among individuals with metabolic syndrome. TRF is a simple and inexpensive intervention which could be widely and rapidly adopted to promote weight-loss and may have other health benefits.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Chronic Disease
107. Sensor Based Contextual Model for Predicting Adverse Eating Events with Machine Learning Algorithm: Lessons Learned and Next Steps

Authors
Jiue-An Yang, Marta Jankowska, Suneeta Godbole, Mehrdad Yazdani, Jacqueline Kerr

Abstract
Background: Developing just-in-time intervention requires in-depth understanding of the dynamics of the targeted behavior, by considering possible variables involved in the decision-making. We present the first step of developing a sensor-based contextual model for predicting adverse eating events and with the goal of identifying important features about this behavior.

Methods: From two cohorts of women (n=40) at risk for breast cancer, data were collected with accelerometers, GPS device, and SenseCam to better discriminate types of sedentary behavior (SB) and physical activity (PA) in participants. A total of 6,742 hours data stream were collected after the 7-day wear period. Combining these features and GIS data, a total of 86 features were created for each data point and 5 randomly selected participants were used (X) to train a Logistic Regression classifier and a Random Forest classifier to predict the eating events (Y) identified by SenseCam imagery. We evaluate the algorithm performance by performing leave-one-day-out cross-validation. For each algorithm, we calculated the accuracy score and the area under the curve (AUC) score for each participant. To measure the usefulness of each feature, an importance score was computed.

Results: Based on the evaluation results the random forest classifier outperformed the logistic regression classifier in term of predicting eating behavior. The result shows the top 30 features belong to the SenseCam features and several GIS features.

Conclusions: We introduce the overall concept of the contextual model, describe the features used in our machine learning algorithm, and layout the next steps for Predicting Adverse Eating Events.

Primary topic area: Diet, Physical Activity, and Obesity | Secondary topic area: Environmental Health
108. Computation Developing of RAGE Inhibitors Using Artificial Intelligence

Authors
Shubham Gupta, Valentina L. Kouznetsova, Igor F. Tsigelny

Abstract
Background: An important role in Type 2 diabetes pathogenesis is played by advanced glycated end (AGE) products created by glycation, a process similar to the natural glycosylation but not regulated by enzymes. AGE products bind to receptor for AGE products (RAGE), which triggers a variety of pathophysiological conditions. A set of drug candidates are developed to inhibit RAGE. Our goal was to elucidate the set of descriptors related to inhibitors of RAGE and use them as descriptors for a machine-learning system that can be used for drug-candidates selection.

Methods: We trained WEKA, the machine learning program, with 31 known RAGE inhibitors and 131 arbitrary molecules, each with originally 1538 descriptors of chemical properties of these molecules. Then we selected significant descriptors and ran a J48 tree machine-learning algorithm in WEKA to identify what descriptors the machine used to correctly categorize the molecules. We removed those descriptors from the original data sheet, saved them, and repeated this process several times.

Results: Eventually, we selected 30 descriptors for machine learning. With this descriptor set, we ran a 66% split validation and achieved 96.30% accuracy of prediction. Then we ran a 10-fold cross-validation and achieved 92.59% accuracy.

Conclusions: We created a good starting point for identifying potential RAGE inhibitors. With further refinement and more data points the trained machine-learning model could identify more potential inhibitors of RAGE that can help in treatment of diabetes, Alzheimer's disease, and other related diseases.

Primary topic area: Biostatistics and Bioinformatics | Secondary topic area: Chronic Disease
**109. Two-Stage Residual Inclusion under the Additive Hazards Model for Competing Risks Data**

**Authors**
Andrew Ying, Ronghui Xu, James Murphy

**Abstract**

**Background:** We consider the 2SRI estimator under the Aalen additive hazards model for general survival data and in the presence of competing risks, which allows generalized linear models for the relation between the treatment and the instrument variable.

**Methods:** Two stage residual inclusion.

**Results:** We derive the asymptotic properties including a closed-form asymptotic variance estimate for the 2SRI estimator.

**Conclusions:** We carry out numerical studies in finite samples, and apply our methodology to the linked Surveillance, Epidemiology and End Results (SEER) - Medicare database comparing radical prostatectomy versus conservative treatment in early-stage prostate cancer patients.

**Primary topic area:** Biostatistics and Bioinformatics
110. Factors Influencing Pediatrician Referral Rates for Developmental Evaluations

Authors
Emily Yuen, Elizabeth Bacon, Karen Pierce

Abstract
Background: 15% of children are estimated to have a developmental delay (Boyle et al., 2011). The purpose of this study was to determine factors influencing pediatricians’ decision for developmental evaluation when suspecting delays.

Methods: Over 150 pediatricians were recruited to conduct a broadband developmental screening using the Communication and Symbolic Behavior Scales Developmental Profile Infant-Toddler Checklist (CSBS) at 12, 18, and 24 month well-baby checkups. The CSBS assesses skills across three domains: social, speech and symbolic play skills. 5255 toddlers were screened and 506 children had failing scores. Of the toddlers with failing scores, pediatrician referral rates for further evaluation were examined.

Results: Of those toddlers that failed, 54% were not referred. Of those not referred, 65% were borderline fails (i.e. failing by one point in a single domain). In addition, pediatricians’ indicated they believed that the toddler was typically developing in 75% of these cases.

Conclusions: While pediatricians refer a large number of toddlers that fail the CSBS, there is a substantial portion who fail the screener that are not rapidly referred for further evaluation. These results suggest that pediatricians’ often rely on their own clinical expertise when evaluating the child’s development and employ the “wait and see” approach, especially when results of the developmental screening indicate borderline scores. Overall, pediatricians are more likely to refer urgent cases and act more conservatively for unclear cases in this young population. Additional factors, such as parental concerns and responses across skill domains will be further analyzed to better understand the reasons behind pediatrician’s referral patterns.

Primary topic area: Maternal and Child Health | Secondary topic area: Health Services