



# **SAN DIEGO COUNTY OPERATIONS CENTER**



**APRIL 27, 2018**

# **SAN DIEGO EPIDEMIOLOGY RESEARCH EXCHANGE**

## **Program Schedule and Abstracts**

**April 27, 2018**

**San Diego Country Operations Center  
5520 Overland Avenue, San Diego, CA**

**Conference Co-Chairs:** Stephanie Brodine, MD  
Richard Shaffer, PhD, MPH  
Gail Laughlin, PhD  
Andrea LaCroix, PhD

**Coordinators:** Nicole Glass, MPH  
Hollie Ward  
Ruby Lopez

### **Sponsored by:**

Abram S. Benenson Distinguished Lecture Series  
San Diego State University - School of Public Health  
San Diego State University - College of Health & Human Services  
University of California San Diego – Family Medicine & Public Health  
County of San Diego Health & Human Services Agency  
Naval Health Research Center

**SAN DIEGO**  
**EPIDEMIOLOGY RESEARCH EXCHANGE**

**27 April 2018**

**8:30 REGISTRATION & CONTINENTAL BREAKFAST**

**9:00 WELCOMING REMARKS**  
**Eric McDonald MD, MPH**

**MODERATOR:** Caroline Thompson, PhD, MPH

**9:10 INVITED ADDRESS**

*Interventions to Prevent Big Data from Killing Epidemiology*

**James V. Lacey, Jr., PhD**

Director, Division of Cancer Etiology, Department of Population Sciences,  
City of Hope

**9:40 INVITED ADDRESS**

*Epidemiology in the Age of Biosensors and Big Data*

**Michael Hogarth, MD, FACP, FACMI**

Clinical Research Information Officer, University of California San Diego

**10:10 SPEAKER PANEL**

*Epidemiology in the Age of Big Data*

James Lacey, Michael Hogarth, Caroline Thompson

**10:40 BREAK**

**MODERATOR:** Stephanie Brodine, MD

**11:00** Another Vaccine Preventable Disease Returns: Hepatitis A in San Diego  
**Eric McDonald, MD, MPH**

**11:20** Reduced Population Mobility Associated with Travel Restrictions during the Ebola Epidemic in Sierra Leone: Use of Mobile Phone Data  
**Corey Peak, ScD, MS**

**11:35** Development and validity of an algorithm to classify mammogram results using cancer registry-linked transactional electronic health record data  
**Purva Jain, MPH**

**11:50 LUNCH & POSTER SESSION**

Evaluation of the Teen Achievers Program at Copley-Price YMCA  
**Christopher Badalof**

Race/Ethnicity and Head Computed Tomography Use in a Pediatric Emergency Department  
**Daniel Gehlbach**

Who Follows Traffic Rules, Anyway? A Comprehensive Assessment of the UCSD Bicycle and Skateboard Use Policies  
**Hunter Green**

The Association between Serving in the U.S. Armed Forces & Cigarette Smoking among 18-49 Year-Old Adults in California, CHIS 2015  
**Alnino Guarino**

Urinary Nitrates in Relation to Glomerular Filtrate rate (GFR) and Albumin-creatinine rate (ACR)  
**Kelly Hagadorn**

Using Social Media to Complement Hepatitis A Outbreak Efforts  
**Taufa Islam**

Is Combat Deployment Associated with Sexual Health Among Military Service Members?

**Claire Kolaja, MPH**

The Association between Access to Fruits and Vegetables and Type II Diabetes in Adults aged 18 to 45 years old in California

**Kristina Mardinian**

Vegetables and Urinary Nitrates

**Intan Purnajo**

A Topsy Act? An Alcohol Policy Evaluation of the UCSD Campus and Community

**Amanda Moreno**

Depression and aging with HIV: Associations with health-related quality of life and positive psychological factors

**Alexandra Rooney**

Evaluation of a Wellness Program for Health-Seekers at the Copley-Price Family YMCA: Barriers, Challenges, and Recommendations

**Divya Raman**

Intranasal Fentanyl versus Intravenous Opioids and Length of Stay in Pediatric Emergency Patients with Extremity Deformities

**McKayla Smith**

Meat Consumption, Meat Cooking Methods and Urinary Nitrates

**Christine-Thanh Nguyen**

Disaggregating Hispanic American Cancer Mortality Burden by Detailed Ethnicity

**Steven Zamora**

**MODERATOR:** Andrea LaCroix, PhD

**1:15** Associations between changes in socioeconomic status and lipoproteins in Chilean adolescents: a 16-year longitudinal study

**Zachary Madewell, MPH**

- 1:30** Smoking modification of the relationship between known diabetes associated genetic variants and the risk of incident type 2 diabetes  
**Sara McElroy, MS**
- 1:45** Air pollution and preterm birth in California: identification of critical exposure windows  
**Paige Sheridan, MPH**
- 2:00** The Association of Insurance and Receipt of Contraception Among California Women Aged 18 to 44 using the CHIS 2015 Database  
**Meg Flanagan**
- 2:15** Enhanced Surveillance of Coccidioidomycosis in San Diego County, 2014-2016  
**Olivia Arizmendi, PhD, MPH**

**2:35 BREAK**

**MODERATOR:** Richard Shaffer, PhD, MPH

- 3:00** Association Between Physical Activity and Automobile Crashes Among Older Drivers  
**Amish Talwar, MD**
- 3:30** Examining Associations Between Flu Vaccination and Asthma, Age and Healthcare Use in CHIS 2015  
**Megan Webb-Morgan**
- 3:45** San Diego Racism and Heart Health Project (SD-RAHHP): Associations of Police-Related Racial Stress with Cardiometabolic Diseases  
**Naeemah Munir, MPH**
- 4:00** **ABRAM S. "BUD" BENENSON AWARD**  
**EPI EXCHANGE STUDENT AWARD**  
**SCIENCE OLYMPIAD STUDENT AWARDS**  
**CLOSING REMARKS**

## Enhanced Surveillance of Coccidioidomycosis in San Diego County, 2014-2016

Arizmendi, Olivia<sup>2</sup>; Fabian, Eva<sup>1</sup>; Balagot, Caroline<sup>2</sup>; Iniguez-Stevens, Esmeralda<sup>2</sup>; Kao, Annie<sup>1</sup>

<sup>1</sup>Epidemiology & Immunization Services Branch, County of San Diego Health & Human Services Agency, San Diego, CA

<sup>2</sup>Office of Binational Border Health, California Department of Public Health, San Diego, CA

**Introduction:** Coccidioidomycosis (Valley Fever) is a respiratory infection caused by *Coccidioides immitis* or *Coccidioides posadasii*. These pathogenic fungi thrive in desert regions such as those in the southwestern region of the US. The County of San Diego, CA is an area with the environmental, demographic, and occupational settings associated with the dissemination of coccidioidomycosis. Therefore, the California Border Infectious Disease Surveillance Program conducted enhanced surveillance of coccidioidomycosis in order to further the knowledge of the disease in this region.

**Methods:** A questionnaire detailing symptoms, occupational and travel exposures was administered to confirmed coccidioidomycosis cases in San Diego County. Medical and laboratory data were used to categorize cases as acute or chronic. The geographical distribution of cases was determined with ArcGIS. Descriptive statistics were evaluated with SAS 9.4.

**Results:** Of the cases identified (n=337) via enhanced surveillance, 48% were acute (n=161), 24% were chronic (n=80), and 28% were chronic cases among inmates (n=96). Seventy-five percent were male (n=254). Sixty-one percent (n=131) specified ethnicity; of those, 42% were Hispanic (n=86). Dissemination to bones, joints, and organs occurred in 22 cases. Acute cases indicated they sought care approximately one month after symptom onset (mean=26.4, median=9.5 days). Acute cases occurred at a rate of 5.1 per 100,000 in San Diego County, with the highest rate of 12.9 per 100,000 cases in the South Suburban area of the county.

**Conclusion:** The residents of San Diego County are at an elevated risk of coccidioidomycosis due to the environmental features of the region. Enhanced surveillance of coccidioidomycosis cases showed there were delays in seeking care among acute cases. Additionally, the south region of the county had a higher rate of cases reported. These results warrant further examination into the factors that could be determining the increasing rates of coccidioidomycosis in California.

Olivia Arizmendi  
California Department of Public Health  
Olivia.Arizmendi@cdph.ca.gov

# Evaluation of the Teen Achievers Program at Copley-Price YMCA

**Christopher Badalof**, Jenna Dern, Debbie Gunawan, Crystal Im, Brittney Lu  
University of California San Diego, Department of Family Medicine and Public Health

**Background:** Many high school students from the San Diego's City Heights area face economic hardship and lack the support system necessary for successful transition to adulthood. The Copley-Price YMCA Teen Achievers Program aims to help low-income, at-risk high school students from Hoover High and other local schools to develop a positive life plan by providing mentorship, tutoring and activities geared towards academic success, physical and mental wellbeing, and civic engagement. The primary goals of this evaluation were to determine to what extent the program enrolls its target population of at-risk students and to compare demographic, academic and health behavior characteristics of Teen Achievers to youth in the community.

**Methods:** This cross-sectional evaluation used a Google Forms online questionnaire to assess demographic, academic, and health behavior characteristics of program participants between December 2017 and March 2018. Teen Achievers were contacted via email and in-person during visits to the YMCA's Teen Center. Data analysis was performed in Epi Info 7 and Open Epi. We used chi square and Student t-tests to compare the Teen Achiever demographic and academic characteristics with Hoover High student characteristics retrieved from the 2017 School Accountability Report Card and to compare their self-reported health behaviors with results from the 2015 San Diego High School Youth Risk Behavior Survey (YRBS).

**Results:** Forty-nine of the 64 Teen Achievers (77%) completed the questionnaire, of whom 67% attended Hoover High. Compared to the 2,135 Hoover students, Teen Achievers were more likely to be female (57% versus 48%;  $p=NS$ ). The percent who belonged to racial/ethnic minorities was similar (96% versus 99%;  $p=NS$ ), as was percentage of students eligible for free or reduced-priced lunches (88% versus 90%;  $p=NS$ ). Teen Achievers were slightly more likely to have parents without a high school degree (39% versus 32%;  $p=NS$ ) but were less likely to speak a language other than English at home (76% versus 87%;  $p=0.05$ ). Teen Achievers reported a higher mean GPA ( $t = -3.6$ ;  $p < 0.05$ ). Advanced Placement course enrollment was lower for Teen Achievers (22% versus 30%), but the difference was not statistically significant. Additionally, the Teen Achievers data show some healthier behaviors in the 7 days preceding the survey compared to San Diego youth participating in the YRBS: Teen Achievers were more likely to be physically active (80% versus 51%;  $p < 0.05$ ) and to eat breakfast (92% versus 37%;  $p < 0.05$ ) than the San Diego youth.

**Conclusions:** Our evaluation suggests that the Teen Achievers program is successful in enrolling its target population of at-risk youth and that participants have higher academic performance and some healthier habits when compared to their peers. However, because of the cross-sectional study design, a causal relationship cannot be established. The digital database system created for this project will permit prospective monitoring and further evaluation of the Teen Achievers Program.

Christopher Badalof  
UCSD, Department of Family Medicine and Public Health  
BSPH Student  
Cbadalof@ucsd.edu

# The Association of Insurance and Receipt of Contraception Among California Women Aged 18 to 44 using the CHIS 2015 Database

**Meg Flanagan**

San Diego State University

**Background:** One provision of the Affordable Care Act required all health plans to cover any method of birth control at no cost to the recipient beginning in 2013. It is important to study the effectiveness of this policy by examining if insurance coverage increases uptake of contraception methods.

**Objective:** The purpose of this study is to assess whether being currently insured was associated with receipt of any type of birth control method within the past year among California women using the CHIS 2015 database. The working hypothesis is that insured women aged 18 to 44, who report not being pregnant, are more likely to receive birth control from a medical provider within the past year than uninsured women.

**Methods:** This study uses a cross-sectional design to analyze California Health Interview Survey data from 2015. Women, aged 18 to 44, who reported not being pregnant at the time of interview were included in the analysis for a final sample size of 3,172. The main outcome, receipt of birth control within the past year from a medical provider, was assessed using self-report measures. Birth control receipt included over-the-counter methods, prescriptions, and male contraceptives. Current insurance status was defined as responding affirmatively to any one question about the respondent's current insurance type. Multivariable logistic regression analyzed receipt of birth control among insured versus uninsured population while controlling for socioeconomic characteristics.

**Results:** Most women in California were currently insured (89.5%) and reported no receipt of any method of birth control within the past year (68.6%). Adjusting for age, race, and family poverty threshold level, insured women aged 18 to 44 years old were 1.69 times more likely to receive birth control from a medical provider than uninsured women of the same age (95% CI: 1.27-2.23). After adjustment, all younger age groups were significantly more likely to receive birth control from a medical provider than women aged 40 to 44. Self-reporting Asian and Hispanic women were 51% and 20% less likely, respectively, to receive birth control compared to white women. Women at lower poverty threshold levels experienced lower rates of birth control receipt than women at or above 400%.

**Conclusions:** This study suggests that insurance coverage may reduce the burden of unplanned pregnancy because insured women were more likely to receive birth control from a medical provider. Additionally, these results identify certain groups at risk of unplanned pregnancy in California such as Asian and Hispanic women.

Meg Flanagan

SDSU Graduate School of Public Health

MPH Student

megflanny@yahoo.com

## **Race/Ethnicity and Head Computed Tomography Use in a Pediatric Emergency Department**

**Daniel L. Gehlbach, BS<sup>1,2</sup>**; Karen L. Ferran, PhD, MSPH<sup>1,2</sup>; Heather Conrad, MD<sup>2,3</sup>; Amanda Cowell, BS<sup>2</sup>; McKayla L. Smith, BS<sup>1,2</sup>; Kathryn A. Hollenbach, PhD, MPH<sup>2,3</sup>, Graduate School of Public Health, San Diego State University<sup>1</sup>; Division of Emergency Medicine, Rady Children's Hospital San Diego<sup>2</sup>; Department of Pediatrics, School of Medicine, University of California San Diego<sup>3</sup>

**Background:** Head injuries result in over 600,000 Emergency Department (ED) visits annually for children aged 0-13 and of those who receive head CT scans, less than 10% have positive findings, and less than 1% require neurosurgical intervention. Due to potential long-term deleterious health effects of radiation exposure in children receiving head CT scans, the Pediatric Emergency Care Applied Research Network (PECARN) published clinical guidelines on when head CTs are recommended. Nationally, race/ethnicity has been associated with numerous health disparities, including the use of diagnostic tests.

**Methods:** Electronic medical records of patients < 16 years presenting with a chief or secondary complaint of head injury, concussion, or head trauma from July 2014 to June 2016 were identified and a random selection of records were abstracted. Information collected included patient race/ethnicity, age, gender, acuity, insurance status, PECARN risk of clinically important traumatic brain injury (ciTBI), Glasgow Coma Score, CT use, and patient disposition. Attending physician race/ethnicity was recorded to determine if physician-patient race/ethnicity concordance was associated with CTs being obtained. Logistic regression was used to examine the association between head CT use and race/ethnicity and whether physician-patient race/ethnicity concordance influences this association among children with a head injury presenting to the Rady Children's Hospital San Diego ED.

**Results:** Of 1,173 children seen for head trauma, 17.3% received a CT scan. Percent receiving CT by race/ethnicity were: 22.0% Caucasian; 15.2% Hispanic; 15.1% Asian; and, 10.3% African American. After adjusting for acuity and ciTBI, Caucasian patients had nonsignificant higher odds of receiving a head CT scan compared to African-American patients (OR = 1.98; 95% CI = 0.82, 4.05), Hispanic patients (OR = 1.07; 95% CI = 0.74, 1.56), and Asian patients (OR = 1.85; 95% CI = 0.84, 4.05). Physician-patient racial/ethnic concordance was not statistically associated with CT use (OR= 1.27; 95% CI 0.90-1.80).

**Conclusions:** No statistical associations were found between receiving a CT scan and race/ethnicity or physician-patient racial/ethnic concordance among children presenting to Rady Children's Hospital ED. Future studies should seek to examine whether the observed slight increased odds of head CT among Caucasians may be partially explained by parental anxiety or request.

Daniel Gehlbach  
SDSU Graduate School of Public Health  
MPH Student  
dgehlbac@gmail.com

# Who Follows Traffic Rules, Anyway? A Comprehensive Assessment of the UCSD Bicycle and Skateboard Use Policies

Hunter R Green, G Tran, M Simon, H Cheng, D Forster, L Hill, N Binkin  
University of California San Diego, Department of Family Medicine and Public Health

**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 bicycle, skateboard, and motorized cart traffic. To reduce the risk of accidents and ensure a safe campus environment, UCSD has developed policies and posted signage on use of these vehicles. In early 2018, we evaluated the status of signage and adherence with the current policy, which bans bicycles and skateboards from key walkways.

**Methods:** Campus signs pertaining to bicycle and skateboard use were geo-mapped, photographed, and classified as intact, weathered, unreadable, and/or having graffiti. We conducted 15-minute video recordings in 14 areas (e.g. Library Walk, Ridge Walk, and Revelle Plaza) during morning, mid-day, and afternoon times during the five weekdays, for a maximum total of six recordings per area and counted the number of pedestrians and personal vehicle riders (e.g. bicycles, skateboards, scooters) for each session. For each of the 14 areas, we calculated an overall ratio of total personal vehicles:pedestrians and examined differences between the 8 areas where personal vehicles were prohibited and the 6 areas where they were allowed. Data was also obtained from the campus police on the total number of warnings and fines issued in 2017.

**Results:** Of the 103 personal vehicle signs on campus, 66% were weathered, 25% were unreadable and 29% had graffiti. Among the six areas with  $\geq 10$  signs, between 40% (Marshall College) and 100% (Revelle College) of signs had  $\geq 1$  problem. The observed number of pedestrians for each 15-minute observation period ranged from 90 to 3471, while the number of personal vehicles ranged from 15 to 229. For the 14 areas, the lowest ratio of personal vehicles to pedestrians was 2/100 and the highest was 17/100. The median ratio of vehicle traffic to pedestrians was greater in areas that prohibit bike and skateboard access (10/100; range 4/100 to 17/100) than in areas where they were allowed (6/100; range 2/100 to 9/100);  $p < 0.0001$ . In 2017, 51 fines, 17 written warnings, and 309 verbal warnings were issued for bicycle and skateboard infractions.

**Conclusions:** Bicycle and skateboard signage is neither equally distributed nor adequately maintained, and few warnings and fines are issued. Areas on campus that prohibit personal vehicles actually have a higher ratio of use than those where they are allowed. Efforts are needed to augment and replace damaged signage, educate personal transport riders, and conduct additional enforcement.

Hunter Green  
UCSD, Department of Family Medicine and Public Health  
BSPH Student  
h1green@ucsd.edu

# **The Association between Serving in the U.S. Armed Forces & Cigarette Smoking among 18-49 Year-Old Adults in California, CHIS 2015**

**Alnino H. Guarino**

San Diego State University

**Background:** The health implications of cigarette smoking, especially among the military population, have been well-researched. However, few studies have investigated the association between history of serving in the U.S. armed forces and smoking in young California (CA) adults.

**Methods:** This study used data from 7,414 adults aged 18-49 who participated in the 2015 California Health Interview Survey (CHIS), the largest cross-sectional state health survey in the nation that provides representative data on all 58 counties in CA. CHIS participants self-reported smoking (one or more cigarettes per day in the past 30 days vs. none) and a history of serving on active duty in the U.S. armed forces (yes vs. no). Odds ratios for the association between military service and smoking, unadjusted and adjusted for alcohol use in the past 12 months, poverty level, body mass index (BMI), age, gender, race, marital status, and education, were estimated using logistic regression analysis at an alpha level of 0.05.

**Results:** Among the 412 (un-weighted) 18-49 year-olds who reported smoking one or more cigarettes per day in the past 30 days, 26 (0.35%) had ever served on active duty in the U.S. armed forces. In unadjusted analyses, ever serving on active duty in the U.S. armed forces was associated with a 39% increase in odds of smoking one or more cigarettes per day in the past 30 days (OR 1.39, 95% CI 0.78-2.48). After covariate-adjustment, this association was completely attenuated (OR 1.02, 95% CI 0.60-1.73).

**Conclusions:** Results of this study suggest that smoking may not be a frequent habit among 18-49 year-olds in California. The results of the multivariable logistic regression analysis are in contrast with most of the existing literature on this topic. Additional studies with a more robust study design are needed to conclusively address this major public health issue.

Alnino Guarino

SDSU Graduate School of Public Health

MPH Student

alnino.guarino@gmail.com

# Urinary Nitrates in Relation to Glomerular Filtrate rate (GFR) and Albumin-creatinine rate (ACR)

Kelly A Hagadorn, S Sonoda, T Wu  
San Diego State University

**Background:** Animal studies have shown that the production of nitric oxide (NO) is reduced in chronic kidney disease (CKD) and is associated with the progression of CKD. Until now, no studies have examined the association between NO production and renal function among healthy individuals who have not been diagnosed with CKD. One-way to assess endogenous NO production is to measure urinary nitrates. Glomerular filtrate rate (GFR) and albumin-creatinine rate (ACR) have been used to assess renal function. Our study aimed to determine if there was an association between urinary nitrates and GFR or ACR.

**Methods:** Using a cross-sectional design, we analyzed data obtained from 5,071 adults, ages 18-85, enrolled in the 2005-2006 National Health and Nutrition Examination Survey (NHANES). Demographic data were obtained and urinary nitrates, creatinine, GFR and ACR ratio were assessed among these individuals. We classified GFR into three categories:  $\geq 90$  mL/min/1.73 m<sup>2</sup> (normal renal function), 60-90 mL/min/1.73 m<sup>2</sup> (renal insufficiency) and  $< 60$  mL/min/1.73 m<sup>2</sup> (abnormal renal function) and ACR into two categories:  $< 30$  mg/g (normal renal function) and  $\geq 30$  mg/g (abnormal renal function). A linear regression model was used to analyze the association of urinary nitrates with GFR or ACR, treating creatinine adjusted urinary nitrates as the dependent variable.

**Results:** We have found that urinary nitrates were inversely associated with renal function. After adjusting for gender, age, race, BMI, smoking status, physical activity, blood pressure, diabetes status, benign prostatic hyperplasia, and fasting status, individuals with GFR  $< 60$  mL/min/1.73 m<sup>2</sup> and 60-90 mL/min/1.73 m<sup>2</sup> had 40% and 15% lower urinary nitrates, respectively, than individuals with GFR  $\geq 90$  mL/min/1.73 m<sup>2</sup> ( $p < 0.0001$  for both categories). Individuals with ACR  $\geq 30$  mg/g had 8% lower urinary nitrates than those with ACR  $< 30$  mg/g ( $p$ -value = 0.005).

**Conclusions:** Our study demonstrated that low urinary nitrates are strongly associated with reduced renal function even among healthy adults who have not been diagnosed with CKD. Longitudinal studies are needed to confirm our findings. Our results will have important implications for preventing CKD. Future studies focusing on dietary and lifestyle factors that can change urinary nitrates are warranted.

Kelly Hagadorn  
SDSU Graduate School of Public Health - Epidemiology  
MPH Student  
khagadorn@sdsu.edu

## Using Social Media to Complement Hepatitis A Outbreak Efforts

E Oren, Ph.D.<sup>1</sup>, I Purnajo<sup>1</sup>, L Martinez, PhD<sup>1</sup>, **Taufa Islam**<sup>2</sup>, E Hensley<sup>1</sup>, P Jain, MPH<sup>1,2</sup>, A Nara, Ph.D.<sup>1</sup> and M Tsou, PhD<sup>1</sup>

(1)San Diego State University, San Diego, CA (2)University of California San Diego

**Background:** The use of social media has become an increasingly informative approach in exploring highly contagious health concerns such as the flu. Social media platforms, such as Twitter, can be used to investigate the public's view of the ongoing Hepatitis A outbreak in San Diego County, with over 500 confirmed cases since November 2016 and 20 deaths. Understanding public perceptions regarding the outbreak can aid public health professionals in addressing existing concerns and increasing knowledge of individuals at risk for contracting the virus. Objective: To examine Hepatitis A outbreak communication and response using Twitter data

**Methods:** Real-time tweets were collected using the Social Media Analytic and Research Testbed (SMART) dashboard, a tool to collect tweets with selected keywords in a user-specified geographic region, from October-November 2017. A total of 3,157 tweets (including retweets) by 934 users were collected using keywords related to Hepatitis A. Real-time social media analytics included spatial mapping of tweets, and the recognition of high frequency users and thematic patterns.

**Results:** There were a total of 2,289 Hepatitis A-related tweets in San Diego County with 861 retweets (total 3,150 tweets). The main opinion leaders ranged in frequency from 25-183 tweets. These accounts included a mix of local news outlets, community organizations, and official public San Diego County accounts. Peaks in Hepatitis A-related tweets aligned with emergency announcements (e.g. declaration of a public health emergency) by public officials. Thematic patterns were recognized for information, policy, outbreak source, stigma, and risk perception.

**Conclusions:** Analyzing tweets in real time during a rapid and fluid outbreak has many potential benefits in helping to understand the public's risk perception and concerns. The analytic results of social media can offer public health professionals an opportunity to tailor more effective responses to outbreaks while targeting groups that require the greatest need for intervention.

Taufa Islam  
SDSU Graduate School of Public Health  
MPH Student  
tislam@sdsu.edu

## **Development and validity of an algorithm to classify mammogram results using cancer registry-linked transactional electronic health record data**

**Purva Jain**, J Li, A Kurian, H Luft, C Thompson  
San Diego State University, Graduate School of Public Health

**Background:** After 10 consecutive annual mammograms in 1,000 50-year old women who are of average risk for breast cancer, up to 670 of them will have had at least one false-positive test. False-positive results have psychological harms, and, if repeatedly experienced, may reduce return to annual screenings or impact treatment decisions among women diagnosed with breast cancer. Mammogram encounters are date stamped in the electronic health record (EHR), but the results are often buried in text notes. As a result, the utility of EHR data analysis to understand provider guidance and patient behavior following a false positive test may be limited. In this study, we developed and validated a date-based algorithm to classify mammogram results using cancer registry-linked electronic health records from a large health care system in Northern California.

**Methods:** Suspicious or abnormal mammograms were identified from transactional EHR data as those women who either had a screening mammogram followed by a diagnostic mammogram and/or fine needle biopsy. Each mammogram was classified as true negative, true positive or false positive based on the presence/absence of a breast cancer diagnosis in the statewide cancer registry within 6 months of the screening date. The results from this date-based algorithm were then compared to a convenience sample of mammograms for which the true mammogram result was coded in the EHR using data. The classification of the algorithm was assessed statistically using Cohen's kappa coefficient.

**Results:** The final analysis included 13,816 mammogram classifications. The overall kappa agreement for the date-based algorithm compared to the true mammogram result ranged from substantial agreement to almost perfect agreement when testing the overall association across all years and also when stratified by the year of the mammogram. The overall kappa agreement was 0.86 ( $p=0.013$ ). The following were the kappa values for 2010-2013; 2010: ( $n=5,468$ ,  $\text{kappa}=0.89$ ,  $p=0.010$ ), 2011: ( $n=1,428$ ,  $\text{kappa}=0.71$ ,  $p<0.001$ ), 2012: ( $n=1,218$ ,  $\text{kappa}=0.91$ ,  $p=0.064$ ), 2013: ( $n=5,702$ ,  $\text{kappa}=0.85$ ,  $p<0.001$ ).

**Conclusions:** The date-based algorithm has the potential to assess a woman's breast cancer diagnosis using data from EHR. This could add valuable information for research studies in which coded mammogram results are not available but transactional data are.

Purva Jain  
SDSU/UCSD Joint Doctoral Program, Epidemiology  
Doctoral Student  
jpurva89@gmail.com

# Is Combat Deployment Associated with Sexual Health Among Military Service Members?

Claire Kolaja, MPH<sup>1</sup>; R Armenta, PhD<sup>1,2</sup>; C LeardMann, MPH<sup>1</sup>; K Roenfeldt, MAS<sup>1</sup>; A Schuyler, MPH<sup>3</sup>; J Orman, ScD, MPH<sup>4</sup>; V Stander, PhD<sup>5</sup>

<sup>1</sup> Henry M. Jackson Foundation for the Advancement of Military Medicine, Bethesda, MD

<sup>2</sup> College of Education, Health, and Human Services, California State University San Marcos, CA

<sup>3</sup> College of Public Health and Human Sciences, Oregon State University, Corvallis, OR

<sup>4</sup> Joint Trauma System, Department of Defense, JBSA Fort Sam Houston, TX

<sup>5</sup> Deployment Health Research Department, Naval Health Research Center, San Diego, CA

**Background:** Military-related experiences, including combat experiences and sexual assault, may negatively affect sexual health; however, there is limited research available on the sexual health of service members and veterans. The aim of this study was to prospectively examine the associations between military-related experiences and sexual health.

**Methods:** The study population consisted of 29,386 Millennium Cohort participants who completed questionnaires in 2011-2013 (baseline) and 2014-2016 (follow-up). Logistic regression was performed to estimate the unadjusted and adjusted effects of military-related experiences on sexual health.

**Results:** Overall, 73% of participants were male with a mean age of 38.8 years (SD=9.6). In unadjusted analyses, enlisted paygrade and Army service were associated with poor sexual health. Increased odds of poor sexual health were observed among those who experienced the highest levels of recent combat compared with those deployed without combat (OR: 2.46, 95%CI: 2.03, 2.99). Also, those who were deployed for over 15% of their military career had increased off for poor sexual health, compared with those deployed 0-4% (OR: 1.46, 95%CI: 1.32, 1.61).

**Conclusions:** Military-related experiences were associated with sexual health at follow-up. Results indicate the need for expanded treatment for sexual health problems among service members and veterans.

Claire Kolaja

Henry M. Jackson Foundation

Claire.a.kolaja.ctr@mail.mil

# Associations between changes in socioeconomic status and lipoproteins in Chilean adolescents: a 16-year longitudinal study

Zachary J Madewell<sup>1</sup>, E Blanco<sup>1</sup>, R Burrows<sup>2</sup>, B Lozoff<sup>3</sup>, S Gahagan<sup>1</sup>

<sup>1</sup> University of California, San Diego, La Jolla, CA

<sup>2</sup> University of Chile, Santiago, Chile

<sup>3</sup> University of Michigan, Ann Arbor, MI

**Background:** The socioeconomic landscape in Chile has improved over the last several decades, but obesity rates have increased in children. This longitudinal study assessed whether changes in socioeconomic status (SES) from infancy to adolescence were associated with plasma HDL-c and LDL-c concentrations in adolescence.

**Methods:** We evaluated 665 participants from the Santiago Longitudinal Study enrolled at infancy in an iron-deficiency anemia preventive trial and examined every 5 years to age 16. Change in SES, assessed using the modified Graffar Index, was calculated at years 1, 5, 10, and 16. Principal components factor analysis with varimax rotation extracted two orthogonal SES factors, termed “environmental capital” (EC) and “social capital” (SC). Generalized linear models were used to analyze associations between EC and SC at years 1 and 16 and outcomes (HDL-c, LDL-c) at 16 years, as well as changes in EC and SC from years 1-5, 5-10, 10-16, and 1-16, and outcomes (HDL-c, LDL-c) at 16 years.

**Results:** 35.3% of adolescents had low HDL-c (girls:  $\leq 38$  mg/dl; boys:  $\leq 34$  mg/dl) and 9.3% had high LDL-c (girls:  $\geq 129$  mg/dl; boys:  $\geq 123$  mg/dl). SC in infancy and EC in adolescence were positively associated with HDL-c and LDL-c during adolescence, respectively. Adjusting for relevant covariates, the change in EC from years 1-16 was positively associated with LDL-c.

**Conclusion:** We found evidence that improvements in SES throughout childhood may influence lipoprotein concentrations in adolescence. Future research might examine expanded lipoprotein metabolism profiles.

Zachary Madewell  
SDSU/UCSD Joint Doctoral Program, Epidemiology  
Doctoral Student  
zmadewel@ucsd.edu

# **The Association between Access to Fruits and Vegetables and Type II Diabetes in Adults aged 18 to 45 years old in California**

**Kristina Mardinian**, T. Wu, E. Oren, and J. Alcaraz  
San Diego State University

**Background:** Poor diet, physical activity, and genetic predisposition have been previously reported to be associated with Type II Diabetes (T2D), but few research studies have investigated the influence of environmental factors, such as healthy food availability, at a community level on T2D. Predominantly diagnosed in older adults, the prevalence of T2D among individuals under 45 years old is rising<sup>1</sup>. The current study examined whether T2D was associated with access to fresh fruits and vegetables in one's neighborhood among individuals 18 -45 years old to better understand this association in this younger at risk group.

**Methods:** This cross-sectional study utilized the 2015 CHIS (California Health Interview Survey) dataset to analyze the association between T2D and access to fresh fruits and vegetables in adults under 45 years old (N=7336). Self-reported data, including access to fruits and vegetables, T2D status, socioeconomic, demographic, and lifestyle characteristics were collected. Access to fruits and vegetables was defined using the question "Have you ever been told that you have Type I or Type II diabetes". With final categorizations of never/sometimes, usually and always. T2D was defined as a physician diagnosis prior to the CHIS survey. Descriptive frequencies, including both unweighted and weighted N's, percentages, and standard errors were reported as well as unadjusted and adjusted odds ratios from both bivariate and multivariable analysis. Multivariable logistical regression was conducted using SAS Studio 9.4 edition and variables included in the final model as covariates were age, gender, ethnicity, BMI, sugar intake, education, and geography using a forward stepwise model building method. P-value of 0.05 was used to determine statistical significance and final retention in the model.

**Results:** The proportion of participants with T2D that had reported never or sometimes having access to fruits and vegetables was 4.2%. Among adults 18-45 years old, participants who reported never or sometimes having access to fruits and vegetables were 1.43 times (95% CI 1.19-1.71) significantly more likely to report they had T2D than participants who always had access to fruits and vegetables, after adjusting for all covariates.

**Conclusions:** Currently, T2D screening guidelines exclude adults under the age of 45 years old, but these data suggest this group has a high prevalence of T2D and should be included. Access to fruits and vegetables is a highly modifiable factor and these data suggest higher access is associated with lower T2D. These data can inform further studies that explore design of prevention efforts and policies to reduce T2D in this age group.

Kristina Mardinian  
SDSU Graduate School of Public Health  
MPH Student  
mardiniank@gmail.com

## **Smoking modification of the relationship between known diabetes associated genetic variants and the risk of incident type 2 diabetes**

**Sara McElroy**, Rany Salem

University of California San Diego, Department of Family Medicine and Public Health

**Background:** Diabetes affects approximately 30 million Americans nationwide and type 2 diabetes (T2D) accounts for 90-95% of these diagnosed cases<sup>1</sup> and is the seventh leading cause of death in the United States. Smoking is a known cause of T2D and smokers are 30-40% more likely to develop T2D than non-smokers. However, little is known about gene-smoking interactions concerning incident T2D risk over an extended period of follow-up

**Methods:** To examine if smoking modifies the relationship between known diabetes-associated SNPs and risk of incident type 2 diabetes we studied the interaction of smoking with 89 and 128 SNPs and a weighted genetic risk scores for both European and African Americans, respectively in the ARIC cohort. Incident T2D risk was estimated from both baseline and time-varying Cox proportional-hazards regressions over 11 years follow-up. Analyses utilizing the identical genetic variants were replicated in the MESA cohort to account for type I error.

**Results:** Baseline and time-varying results showed no modification of smoking on the association of the weighted genetic risk score and incident T2D risk. A small subset (6) of the 89 SNPs for European Americans and five out of 128 SNPs for African Americans were found to be nominally significant in the ARIC cohort. One SNP (rs9911305) that was found to be associated with T2D risk and modified by smoking in African Americans replicated in the MESA cohort.

**Conclusions:** This 11-year study period exemplified smoking interaction with rs9911305, which is located on a gene mainly associated with brain function, increases risk for T2D.

Sara McElroy

SDSU/UCSD Joint Doctoral Program, Epidemiology

Doctoral Student

s1mcelroy@ucsd.edu

# A Tipsy Act? An Alcohol Policy Evaluation of the UCSD Campus and Community

**Amanda Moreno**, Cynthia Frausto, Tong Qi, L Samaniego-Kraus, M Novak,  
H Pines, N Binkin  
BSPH Honors Practicum, Department of Family Medicine and Public Health, UCSD

**Background:** Underage and binge drinking among college students increases risks of physical and sexual assault, injury, and death. California's alcohol policy requires that alcohol-serving venues 1) check IDs, 2) deny service to those giving alcohol to underage companions, and 3) deny alcohol to obviously inebriated individuals. UCSD has additional requirements that on-campus venues provide only single servings of alcohol at a time and that prohibit alcohol advertising and promotions. We visited all on-campus venues that serve alcohol and the 10 off-campus venues that are most popular among students to assess compliance with their respective alcohol policy.

**Methods:** We identified all on-campus venues serving alcohol and interviewed a convenience sample of 100 students to identify the most popular off-campus drinking venues. Between January and March 2018, we performed environmental scans during two separate visits to the 10 on-campus alcohol-serving venues (i.e., bars, restaurants, and events) and the 10 most popular off-campus venues. The Responsible Hospitality Coalition provided the environmental scan instrument and training on assessing identification checks, alcohol service, and alcohol-related advertising. We calculated percentages of venues compliant with the three key California policy elements, and for on-campus venues, those compliant with the additional UCSD policy elements.

**Results:** Of the 10 on-campus venues, 90% performed ID checks, 70% consistently denied alcohol service to individuals giving alcohol to underage companions. No intoxicated individuals were observed. In the off-campus venues, the proportions were identical for ID checks and denying service to those giving alcohol to underage companions. However, 40% of the off-campus venues served alcohol to inebriated individuals or allowed them to remain on premise. Compliance with the UCSD policies for the 10 on-campus venues was moderate: 30% of venues always provided one drink at a time, and 30% had no alcohol-related advertising or promotions.

**Conclusions:** On- and off-campus alcohol-serving venues are not fully compliant with their respective alcohol policy. Of particular concern were the proportion both on- and off-campus venues allowing individuals to obtain drinks for underage companions, of off-campus venues serving alcohol to inebriated patrons, and of on-campus venues not compliant with UCSD policies on single-drink servings 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 and restaurant managers and staff.

Amanda Moreno  
UCSD, Family Medicine & Public Health  
BSPH Student  
aamoren@ucsd.edu

## **San Diego Racism and Heart Health Project (SD-RAHHP): Associations of Police-Related Racial Stress with Cardiometabolic Diseases**

**Naeemah Munir**, J Ramirez, E Ross, I Howard, V Garin, G Nunez, B Asmerom, R Hood, A DeMaria.  
UC San Diego, School of Medicine.

**Background:** Police brutality disproportionately affects African American (AA) health in various ways, from increased direct morbidity to increased stress. From the excessive documented beatings of Rodney King in 1991 to the murder of Stephon Clark in 2018, AAs have been exposed to pervasive brutality. Negative, discriminatory media coverage of such excessive force is an additional stressor among AAs and contributes to overall lifetime wear and tear, allostatic load. Such racial stressors disparately affect AAs and are also associated with increased morbidity and mortality.

**Objective:** To assess the association between police-related racial stress (PRRS) and cardiometabolic diseases (CMD) among  $\geq 40$ -year-old AAs in San Diego County. We hypothesize that compared to those with low PRRS, AAs with high PRRS will have higher CMD prevalence.

**Methods:** Adult participants enrolled in the San Diego- Racism and Heart Health Project (SD-RAHHP), a cross sectional, community based participatory research study from 2015-2018. Community members (n=201) completed a self-administered survey assessing PRRS and physician diagnosed CMDs. Using one item from the Index of Race Related Stress, participants rated how upsetting this statement was “*You notice that when Black people are killed by the police, the media informs the public of the victims criminal record or negative information in their background, suggesting they got what they deserved*”. We categorized PRRS into low (*never happened, not or a little upsetting*) and high (*somewhat or very upsetting*). CMDs included 1) hypertension (HTN), 2) diabetes mellitus (DM); 3) hyperlipidemia (HLD); and 4) HTN and either DM or HLD. Multivariable logistic regression adjusted for age, gender, college education, income, and smoking history.

**Results:** 83% of participants reported high PRRS; and prevalence did not significantly differ by age, gender, complexion, marital status, college education, income, and smoking history. Disease prevalence were HTN: 55%, DM: 21%, HLD: 33%, HTN+DM or HLD: 31%. Compared to participants with low PRRS, high PRRS was significantly associated with higher odds of HLD (adjusted Odds Ratio (aOR): 3.2, 95% Confidence Interval (CI): 1.1 – 9.4, p=0.032) and HTN+DM or HLD (aOR: 3.2, CI: 1.1, 9.4, p=0.034). PRRS was not associated with HTN or DM.

**Conclusions:** Among San Diegan African American adults, negative and insensitive media coverage of police excessive force against Blacks was common; and community members who rated negative media coverage as upsetting had higher odds of hyperlipidemia and hypertension with diabetes or hyperlipidemia.

Naeemah Munir, MPH  
UCSD School of Medicine PRIME-HEq  
nmunir@ucsd.edu

# Meat Consumption, Meat Cooking Methods and Urinary Nitrates

Tianying Wu, C Nguyen, S Sonoda  
San Diego State University, Graduate School of Public Health

**Background:** Circulating nitrates have emerged as an important biomarker for predicting and monitoring the progress of several chronic diseases, e.g. prostate cancer and hypertension. Thus, studying dietary factors that may influence these circulating nitrates can help design prevention strategies for chronic diseases. Meat consumption and cooking methods can significantly influence gut microbiome, a critical factor that influences circulating nitrates by modifying the production of nitric oxide and nitrate metabolism. As studies that examine the impact of cooking methods on circulating nitrates are still lacking, this study helps determine the associations between meat cooking methods and urinary nitrates.

**Methods:** Using a cross-sectional design, data was analyzed from the 2005-2006 National Health and Nutrition Examination Survey (NHANES). A non-quantitative food frequency questionnaire (NFFQ) and demographic information were collected and urinary nitrates were measured in 2,048 men and women.

**Results:** Four types of meat cooking methods-- fried, baked, roasted, and cold-- and three types of meat-- red meat, white meat, and processed meat were analyzed. A linear regression model was used and potential confounding variables of age, body mass index, gender, race, and smoking status were controlled for. Fried meats, roasted meats, and cold meats were significantly and inversely associated with urinary nitrates when each cooking method was analyzed separately ( $p < 0.05$  for each cooking method). Furthermore, red meat was inversely associated with urinary nitrates in the model when red, white, and processed meat, but not cooking methods, were adjusted. In the final full model that assessed all cooking methods and red, white and processed meat, only roasted and cold meats and red meat were significantly and inversely associated with urinary nitrates ( $p < .05$  for all three variables).

**Conclusions:** The study clearly suggests that both cooking method and type of meat can influence urinary nitrates. Roasted and cold meats were associated with reduced urinary nitrates, regardless of whether red or white meats were roasted or cold. Further, red meat was associated with reduced urinary nitrates, regardless of the cooking method used. Future mechanistic studies are thus warranted to unravel the interplays between cooking methods, type of meats, urinary nitrates, and gut microbiome composition.

Christine-Thanh Nguyen  
SDSU Graduate School of Public Health  
MPH Student  
nguyenchristine.th@gmail.com

# Reduced Population Mobility Associated with Travel Restrictions during the Ebola Epidemic in Sierra Leone: Use of Mobile Phone Data

Corey M Peak<sup>1,2</sup>, Amy Wesolowski<sup>1,3</sup>, Elisabeth zu Erbach-Schoenberg<sup>2,4</sup>, Andrew J Tatem<sup>2,4</sup>, Erik Wetter<sup>2,5</sup>, Xin Lu<sup>2,6,7</sup>, Daniel Power<sup>2</sup>, Elaine Weidman-Grunewald<sup>8</sup>, Sergio Ramos<sup>8</sup>, Simon Moritz<sup>8</sup>, Caroline O Buckee<sup>1</sup>, Linus Bengtsson<sup>2,6</sup>

1 Center for Communicable Disease Dynamics, Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, MA 02115 USA.

2 Flowminder Foundation. Roslagsgatan 17, SE-11355 Stockholm, Sweden.

3 Department of Ecology and Evolutionary Biology, Princeton University, Princeton, NJ 08540 USA.

4 WorldPop, Department of Geography and Environment, University of Southampton, Southampton SO17 1BJ United Kingdom.

5 Stockholm School of Economics. Sveavägen 65, 113 83 Stockholm, Sweden.

6 Department of Epidemiology and Public Health Sciences. Karolinska Institute. 171 77 Stockholm. Sweden.

7 College of Information System and Management, National University of Defense Technology, Changsha, 410073, China.

8 Ericsson. Torshamnsgatan 23, Stockholm 16483, Sweden.

**Background.** Travel restrictions were performed on an unprecedented scale in 2015 in Sierra Leone to contain and eliminate Ebola virus disease. However, the impact of epidemic travel restrictions on mobility itself remains difficult to measure with traditional methods. New “big data” approaches using mobile phone data can provide, in near real-time, the type of information needed to guide and evaluate control measures.

**Methods.** We analyzed anonymous mobile phone call detail records (CDRs) from a leading operator in Sierra Leone between March 20th and July 1st in 2015. We used an anomaly detection algorithm to assess changes in travel during a national “stay at home” lockdown from March 27th to 29th. To measure the magnitude of these changes and to assess effect modification by region and historical Ebola burden, we performed a time series analysis and a crossover analysis.

**Results.** Routinely collected mobile phone data revealed a dramatic reduction in human mobility during a 3-day lockdown in Sierra Leone. The number of individuals relocating between chiefdoms decreased by 31% within 15 kilometers, by 46% for 15-30 kilometers, and by 76% for distances greater than 30 kilometers. This effect was highly heterogeneous in space, with higher impact in regions with higher Ebola incidence. Travel quickly returned to normal patterns after the restrictions were lifted.

**Conclusions.** The effects of travel restrictions on mobility can be large, targeted, and measurable in near real-time. With appropriate anonymization protocols, mobile phone data should play a central role in guiding and monitoring interventions for epidemic containment.

Corey M Peak, ScD, MS  
CDC / County of San Diego  
corey.peak@sdcounty.ca.gov

## Vegetables and Urinary Nitrates

Intan Purnajo, S Sonoda, T Wu

San Diego State University, Graduate School of Public Health

**Background:** Nitrate has been found to have protective effects for cardiovascular and other chronic diseases. Several nitrate-contributing vegetables, such as green leafy vegetables (kale, lettuce, and spinach) can significantly increase circulating nitrates; however, whether other types of vegetables can also change circulating nitrates has not been examined. This study seeks to determine the association between the intake of different groups of vegetables and urinary nitrates.

**Methods:** A cross-sectional analysis was conducted using data from the 2005-2006 National Health and Nutrition Examination Survey (NHANES) for adults older than 18 (n=2,042). Dietary data were collected from a non-quantitative Food Frequency Questionnaire, and urinary nitrates were measured in each participant. Linear regression was conducted to assess the associations between the adjusted urinary nitrate/creatinine and different groups of vegetables.

**Results:** Vegetables were classified into the following categories: Cruciferous (cauliflower, broccoli, coleslaw, sauerkraut), Allium and spicy (onion, garlic and pepper), yellow/orange/red vegetables (tomato, carrot, pumpkin and corn) and nitrate-contributing leafy green vegetables (lettuce, salad greens, celery, beet, spinach, and kale). Controlling for the potential confounding variables such as age, body mass index, gender, race, smoking status and different types of meat, we found that the nitrate-contributing vegetables (p=0.0031), allium and spicy vegetables (p=0.01), and yellow/orange/red vegetables (p=0.03) were each positively associated with urinary nitrate when analyzed separately. The other types of vegetables were not significantly associated with urinary nitrates. In the final full model that assessed all these types of vegetables, only nitrate-contributing and allium and spicy vegetables were found to be significantly and positively associated with urinary nitrates.

**Conclusions:** These results suggest that both nitrate-contributing and some non-nitrate contributing vegetables (allium and spicy vegetables) are associated with increased urinary nitrates. Future studies should focus on why some non-nitrate contributing vegetables can increase urinary nitrates. It is known that urinary nitrates can be influenced by endogenous nitric oxide production and nitrate metabolism, but whether allium and spicy vegetables can also influence nitrate metabolism and nitric oxide production merits further investigation.

Intan Purnajo

SDSU Graduate School of Public Health

MPH Student

ipurnajo@sdsu.edu

## **Evaluation of a Wellness Program for Health-Seekers at the Copley-Price Family YMCA: Barriers, Challenges, and Recommendations**

Ashley Moore, **Divya Raman**, Monique Sim, Selina Villaneda, N Binkin, and G Merchant  
University of California, San Diego, Department of Family Medicine and Public Health

**Background:** The KickStart program at the Copley-Price Family YMCA in City Heights is designed to encourage health-seekers  $\geq 18$  years to develop and adopt healthy lifestyles by pairing participants with wellness coaches for three one-on-one sessions over a one-month period. Although the program has successfully recruited participants, a majority fail to complete the entire program. In this study, we explored completion rates, participant reasons for completing or dropping out and suggestions for improvement, and wellness coach perceptions of why participants drop out.

**Methods:** We used the YMCA's MobileFit tracking system to examine KickStart completion rates for participants who enrolled between January 1 and March 31, 2018. Participants who completed all three appointments were e-mailed a Completer Survey questionnaire that included basic demographic information and open-ended questions on what they enjoyed about the program and what they thought could be improved. Those who did not return after the first or second visit received a Dropout Survey that included basic demographics and open-ended questions on their level of satisfaction with KickStart and any challenges they faced in the program. We additionally interviewed wellness coaches in person at the YMCA to gain a deeper understanding of the training they received, barriers they encountered, and further insight into their experiences working with KickStart participants.

**Results:** Of the 137 participants enrolled, 48 (35%) completed one visit, 28 (20%) completed two, and 15 (11%) completed all three; the remaining 46 (34%) failed to attend their initial appointment and were excluded from the study. Six (40%) of the 15 KickStart completers responded to the Completer Survey, while 14 (22%) of the 63 KickStart dropouts responded to the Dropout Survey. Of the 15 wellness coaches, 12 (80%) were successfully interviewed. Kickstart program completers and dropouts did not differ significantly by age or gender. Qualitative data from the Completer Survey showed that participants enjoyed learning about the equipment, although they saw inconsistencies in the training of the coaches. Qualitative Dropout Survey data revealed that participants struggled to connect and communicate with their wellness coaches, had scheduling conflicts or difficulties, and felt that the program was not tailored to their needs. These data aligned with results from the wellness coach interviews, which showed a wide range of training levels and inconsistencies in knowledge of fitness, although the coaches report an overall high confidence rate surrounding their ability to carry out the program.

**Conclusions:** The results suggest that tailoring the KickStart program to correspond more closely with individuals' interests may increase member retention rates. Providing adequate and consistent training for all wellness coaches may also improve participants' experiences in KickStart.

Divya Raman  
University of California, San Diego  
BSPH Student  
dlraman@ucsd.edu

## **Depression and aging with HIV: Associations with health-related quality of life and positive psychological factors**

**Alexandra S Rooney**, RC Moore, EW Paolillo, B Gouaux, A Umlauf, SL Letendre, DV Jeste, DJ Moore, and the HIV Neurobehavioral Research Program  
University of California San Diego

**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.

Alexandra S. Rooney  
University of California San Diego  
MPH Student  
arooney@ucsd.edu

## **Air pollution and preterm birth in California: identification of critical exposure windows**

**Paige Sheridan**, T Benmarhnia, University of California San Diego, School of Medicine  
Department of Family Medicine and Public Health

**Background:** Exposure to air ambient fine particulate matter  $<2.5 \mu\text{m}$  ( $\text{PM}_{2.5}$ ) air pollution during pregnancy is associated with preterm birth, a leading cause of infant morbidity and mortality. Studies attempting to identify etiologically relevant exposure periods of vulnerability have been inconsistent, possibly due to limitations from the treatment of preterm birth as a binary outcome, without considering time-varying exposure over the gestation period. The objective of this study is to identify critical exposure windows for the effect of  $\text{PM}_{2.5}$  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 using inverse distance weighting to create a retrospective cohort that includes both birth and air pollution data ( $n=2,288,995$ ). Average weekly  $\text{PM}_{2.5}$  ( $\mu\text{g}/\text{m}^3$ ) exposure levels were assigned by week of gestation for each pregnancy. Gestational age was treated as a time-to-event outcome where each pregnancy enters the risk set at the 27<sup>th</sup> week and exits at the 37<sup>th</sup> week. Associations were assessed using distributed lag models with a random effect at the zip code level to account for spatial clustering.

**Results:** The prevalence of preterm birth in this population was 8.5%. The average  $\text{PM}_{2.5}$  exposure across gestation among full term and preterm births was  $13.7 \mu\text{g}/\text{m}^3$  and  $13.9 \mu\text{g}/\text{m}^3$ , respectively. For a  $10 \mu\text{g}/\text{m}^3$  increase in  $\text{PM}_{2.5}$  exposure over the entire period of gestation there was an associated increase in risk of preterm birth (HR: 1.169, 95% CI: 1.153-1.184). Periods of increased vulnerability associated with  $\text{PM}_{2.5}$  exposure were identified in gestational weeks 9-13 and 19-28.

**Conclusions:** End of first and middle to end of second trimesters appear to be periods of increased vulnerability to  $\text{PM}_{2.5}$ . This corresponds with what is known about critical periods during fetal development. These findings extend our knowledge about the existence of specific exposure periods during pregnancy that have the greatest impact on preterm birth and should inform prevention efforts in adverse birth outcomes.

Paige Sheridan  
SDSU/UCSD Joint Doctoral Program, Epidemiology  
Doctoral Student  
paigesheridan23@gmail.com

## **Intranasal Fentanyl versus Intravenous Opioids and Length of Stay in Pediatric Emergency Patients with Extremity Deformities**

**McKayla L Smith, BS<sup>1,3</sup>**, K Ferran, PhD, MSPH<sup>1,3</sup>; D Gehlbach, BS<sup>1,3</sup>; K Yaphockun, DO<sup>2,3</sup>; S Shah, MD<sup>2,3</sup>; A Bryl, MD<sup>2,3</sup>; M McMahan, BS<sup>3</sup>; K Hollenbach, PhD, MPH<sup>2,3</sup>

<sup>1</sup>Graduate School of Public Health, San Diego State University; <sup>2</sup>Department of Pediatrics, University of California, San Diego, School of Medicine; <sup>3</sup>Division of Emergency Medicine, Rady Children's Hospital

**Background:** Increased length of stay (LOS) is associated with decreased quality of care and lower patient satisfaction ratings. Intranasal (IN) fentanyl provides faster pain control than oral opioids and is as effective for pain control as intravenous (IV) opioids. Our objective was to compare emergency department (ED) LOS among deformity fracture patients by mode of first opioid administration: IN fentanyl or IV opioid.

**Methods:** Electronic medical records were abstracted for all patients presenting to the ED with extremity deformities from 11/12/16-5/14/17 as part of a quality improvement project to reduce time to first opioids among these patients. Inclusion criteria consisted of pain score greater than or equal to 5, weight greater than 10 kilograms, age greater than 1 year, and no prior IV placement. Patients who were admitted to the hospital were excluded. Data abstracted included time of arrival, acuity, time and type of medications administered, time of discharge, and x-ray and IV orders. For purpose of this analysis, first opioid was identified as IN fentanyl or IV opioid and association with length of stay was assessed using multiple linear regression to control for confounding factors.

**Results:** A total of 116 participants met the inclusion criteria and were included in this study. Overall ED LOS in the IN fentanyl group was 18 minutes shorter (284.3 minutes) than in the IV opioid group (302.4 minutes). Age, acuity, and percent change in pain score were found to confound the association between first route of opioid administration and LOS. After adjusting for age, acuity, and percent change in pain score, patients who received IN fentanyl had a mean 15.4 minute shorter LOS ( $p=0.30$ ) than those who received IV opioids.

**Conclusions:** After controlling for age, acuity, and percent change in pain score, among patients presenting to the pediatric ED with extremity deformities, LOS in the IN fentanyl group was 15.4 minutes less than in the IV opioid group. This decrease brought the average LOS 5% closer to the ED target LOS of 150 minutes, which while not statistically significant ( $p=0.30$ ), may be clinically relevant.

McKayla L Smith  
SDSU Graduate School of Public Health  
MPH Student  
mckaylasmith5@gmail.com

# Association Between Physical Activity and Automobile Crashes Among Older Drivers

Amish Talwar, K Ferran, L Hill, J Waalen  
San Diego State University

**Background:** With nearly 40 million licensed drivers aged 65 years or older in the U.S., it is important to investigate ways to reduce the unique risks that this driving population faces while on the road. Physical activity levels have a well-known impact on several of the chronic conditions that are thought to be associated with vehicular crashes among older drivers. However, it is less clear if increased physical activity levels ultimately lead to fewer vehicular crashes in this population. The purpose of this study is to explore whether physical activity levels are associated with the number of motor vehicle crashes among a select cohort of older drivers.

**Methods:** This cross-sectional study uses data from the five-state LongROAD study of 2,990 older adult drivers. With this data, we derived logistic regression models analyzing the association between self-reported vigorous and moderate forms of physical activity and the number of self-reported motor vehicle crashes that participants experienced in the previous year as drivers. Additional covariates potentially affecting the relationship between physical activity and motor vehicle crashes were assessed and controlled for, including demographic information, driving behaviors, and indicators of physical health, cognitive health, mental health, and social health.

**Results:** Among the participants, over 11 percent reported any crash in the previous year. On multivariate analysis, neither vigorous nor moderate physical activity were significantly associated with reporting a motor vehicle crash in the previous year. However, reporting a history of falls in comparison to not reporting a fall history in the previous year was significantly associated with reporting a motor vehicle crash (AOR=1.38, 95% CI: 1.07, 1.77).

**Conclusions:** Although we were unable to detect a significant association between physical activity and motor vehicle crashes among this group of older drivers, a reported history of falls was significantly associated with reporting a crash. Since physical activity is known to improve fall risk, there is a possible indirect association between physical activity level and crashes that was unable to be detected through the present study.

Amish Talwar, MD  
SDSU Graduate School of Public Health  
MPH Student  
amishtalwar@gmail.com

# Examining Associations Between Flu Vaccination and Asthma, Age and Healthcare Use in CHIS 2015

**Megan Webb-Morgan**

San Diego State University Graduate School of Public Health

**Background:** In the U.S., seasonal flu infection causes thousands of illnesses, hospitalizations and deaths each year. Individuals with asthma are at increased risk of experiencing complications from flu that result in hospitalization or death. Flu vaccination can significantly decrease this risk.

**Methods:** Using cross-sectional weighted data from the 2015 California Health Interview Survey (CHIS), collected continuously between May 2015 and February 2016, the current study examines whether there is an association between asthma diagnosis and flu vaccination in the California adult population aged 18-64 years. Univariate statistics (% , 95% CI), bivariate and multivariable logistic regression (OR, 95% CI) were conducted for past-year flu vaccination, lifetime asthma diagnosis, and selected covariates using SAS Studio version 3.7. Mediation analysis assessed the indirect effect of proposed mediators on the multivariable associations. Statistical significance was defined as  $P \leq 0.05$ .

**Results:** The association between asthma and flu vaccination was significantly moderated by age. Among individuals aged 50-64 years, those who had ever been diagnosed with asthma by a doctor were 1.85 times (95% CI 1.19-2.89) significantly more likely to have been vaccinated for flu in the past year compared to those who did not have asthma, after adjusting for age, gender and race/ethnicity. Thirteen percent of this relationship was explained by having had a routine doctor visit in the past year. Among individuals aged 18-54 years, asthma diagnosis was not significantly associated with flu vaccination. However, women were 1.47 times (95% CI 1.05-2.06) significantly more likely than men to have been vaccinated for flu after adjustment, and similarly to women, 12.9% of this relationship was explained by having had a routine doctor visit in the past year.

**Conclusions:** Despite increased risk of severe health outcomes, having a diagnosis of asthma did not increase the odds of flu vaccination in those aged 18-49 years, but it was associated with increased prevalence of vaccination in adults aged 50-64 years. The vaccination rates of both groups remain far below national guidelines. There is a significant mediation effect of recent doctor visit in both groups. Future research should examine how health care use and access variables may act as mediators on the pathway to flu vaccination. A wide variety of appropriately-targeted intervention measures may help to reduce the disparities in flu vaccination observed in this study to achieve Healthy People 2020 vaccination goals.

Megan Webb-Morgan

SDSU Graduate School of Public Health

MPH Student

mwebb85@gmail.com

## **Disaggregating Hispanic American Cancer Mortality Burden by Detailed Ethnicity**

**Steven M. Zamora**, P Pinheiro, SL Gomez, K. Hastings, LP Palaniappan, J Hu, C Thompson,  
San Diego State University Graduate School of Public Health

**Background:** Hispanics are the largest minority population in the United States (17%). Hispanics represent a heterogeneous and growing population of any race who have origins in Mexico, the Caribbean, Central America, South America, or other Spanish-speaking countries. Cancer is the leading cause of death among Hispanics, yet few studies have described cancer mortality burden by specific Hispanic ethnicity.

**Methods:** Cancer-related deaths from U.S. death certificates for the years 2003-2012 were analyzed for decedents identifying as Mexican, Puerto Rican, Cuban, and Central/South American. We calculated descriptive measures of burden including potential years of lives lost (PYLL), age-adjusted rates, standardized-mortality ratios, and fitted JoinPoint regression models to evaluate annual trends by Hispanic group using non-Hispanic Whites (NHWs) as the reference population.

**Results:** We identified 4,866,777 total cancer deaths. Mortality trends were heterogeneous across Hispanic groups. Mexicans and Central/South Americans had greater average PYLL than NHWs and Cubans (Mexican 15.2 years vs. NHWs 9.2 years). Liver cancer was ranked among the top-5 cancer-related deaths for every Hispanic group, but not in NHWs. Stomach cancer mortality was twice as high for most Hispanic ethnicities when compared to NHWs and was especially high for Mexicans (male SMR, 2.07; 95% CI, 2.01-2.13; female SMR, 2.62; 95% CI, 2.53-2.71)

**Conclusions:** We observed heterogeneity in cancer mortality across Hispanic groups. Several cancers affect Hispanics disproportionality compared to NHWs. Disaggregated analysis of Hispanics is needed to fully understand cancer burden that affect this population. Screening programs in Hispanics should be considered for stomach and liver cancer.

Steven Zamora  
SDSU Graduate School of Public Health  
MPH Student  
Zamora.stvn@gmail.com



TM

*Exploring the World of Science*

## Science Olympiad Disease Detectives Event

In an effort to promote interest in the growing field of epidemiology, the high school winners of the Disease Detectives event of the Science Olympiad from Southern California will be honored at this year's Epidemiology Research Exchange Conference.

Science Olympiad competitions are like academic track meets, consisting of a series of 23 team events in each division (Division B is middle school; Division C is high school). Each year, a portion of the events are rotated to reflect the ever-changing nature of genetics, earth science, chemistry, anatomy, physics, geology, mechanical engineering, and technology. By combining events from all disciplines, Science Olympiad encourages a wide cross-section of students to get involved. Emphasis is placed on active, hands-on group participation. Through Science Olympiad, students, teachers, parents, principals, and business leaders bond together and work toward a shared goal.

Disease Detectives provides students an opportunity to hone their skills as science sleuths by learning the scientific method employed by epidemiologists – or disease detectives. The event requires students to apply principles of epidemiology to a published report of a real-life health situation or problem. The event is intended for teams of up to two people. Approximate time to completion is 50 minutes.

The competition requires students to use a systematic, scientific approach to investigating epidemics (e.g., finding and counting cases, comparative reasoning, hypotheses generation, hypothesis testing). Related task and knowledge areas of epidemiology and other biomedical sciences include:

- Basic definitions of epidemiological terms (e.g., epidemiology, epidemic, outbreak, incidence, rates, public health surveillance);
- Categories of disease-causing agents (e.g., bacteria, toxins, mechanical forces, behavior);
- Modes of disease spread (e.g., person-to-person, food borne, airborne, vector borne);
- The triads of elements of analysis of epidemiological data collected to investigate outbreaks and other problems (e.g., time/place/person, and agent/host/environment); and
- The basis for taking action to control and prevent the spread of disease.

For more information about Science Olympiad and the Disease Detectives event, please visit <http://soinc.org>



**Abram S. “Bud” Benenson, MD  
1914-2003**

The Benenson Distinguished Lecture series honors Abram Salmon Benenson, MD. Bud, as he was known since childhood, spent his life dedicated to two passions – his family and his medical career.

After graduation from Cornell Medical School in 1937 and completion of an internship, Bud worked in various settings fighting such disparate communicable diseases as smallpox, cholera, and AIDS. From 1970 to 1995, Bud was the editor of six editions of Control of Communicable Diseases in Man (CCDM), his “little handbook” that has been published by the American Public Health Association since 1915. He was most proud of the pirated editions of the book that found their way back to him – written in Chinese or Arabic, they showed him that the world valued his contribution and desperately needed the information he worked so diligently to provide.

In 1982, Dr. Benenson joined the faculty of the San Diego State University Graduate School of Public Health as Head, Division of Epidemiology and Biostatistics, a position he held until 1992, at which time he became Professor Emeritus and maintained a full schedule, including advising students with their theses. He also played a critical role in established the Public Health doctoral program with concentration in Epidemiology, offered jointly at San Diego State University and the University of California, San Diego.

Dr. Benenson received many awards in his lifetime, including the Legion of Merit; the Meritorious Civilian Award; the John Snow Award and the Award for Excellence, both from the American Public Health Association; and the K.F. Meyer Gold-Headed Cane Award from the American Veterinary Epidemiology Society. Bud was pleased with the awards he received, they validated his hard work and allowed his friends and family to share his honors.

He was the author or co-author of over 140 scholarly papers in the fields of preventative medicine, epidemiology, and communicable diseases. His early work focused on the diarrheal diseases and smallpox, while his later research dealt more the AIDS. Four children and seven grandchildren, and a great-grandchild survive Bud and his wife, Regina van Aalten Benenson: twins Mike and Tom, James, and Sonia, and their children.

The first Benenson lecture was delivered in 2007 in conjunction with the 25<sup>th</sup> anniversary of the SDSU GSPH. Subsequent lectures have been connected to the San Diego Epi Exchange. The Benenson Distinguished Lecture series highlights those areas most important to Bud – preventative medicine, military medicine, and “show-leather” epidemiology.

***Special Thanks to***

*Hollie Ward*

*Ruby Lopez*

*And to all those that contributed to making  
this year's Epidemiology Exchange happen!*