NEW YORK CITY EPIDEMIOLOGY FORUM

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Jashvant Poeran, Weill Cornell Medical College
Ruth Loos, Icahn Medical School at Mount Sinai
New York City Epidemiology Forum

8:00 AM  Registration

8:30 AM  Opening
Dennis Charney, Dean of Icahn School of Medicine at Mount Sinai
Paolo Boffetta

Oral Session 1
Chairs: Sara Olsson, Tiffany Harris

9:00 AM  Guest Speaker:
Muin J. Khoury, MD, PhD, Director, Office of Public Health Genomics,
Centers for Disease Control and Prevention
Transforming Epidemiology for 21st Century Medicine and Public Health

9:45 AM  Oral Presentation 01
Raquel Duchen
Mental Health Hospitalizations Among Children and Youth in New York City

10:00 AM  Oral Presentation 02
Semanti Mukherjee
Excess of Homozygosity in the Major Histocompatibility Complex in Schizophrenia

10:15 AM  Break for Coffee

10:30 AM  Oral Presentation 03
Alice Welch
Tobacco Use and Mental Health Among World Trade Center Health Registry Enrollees, 2003-2012

10:45 AM  Oral Presentation 04
Shijian Li
Poor Mental Health and Cigarette Smoking Among Asian American Populations in New York City

11:00 AM  Oral Presentation 05
Sarah Kerns
Radiogenomics Consortium Meta-Analysis of Four Genome Wide Association Studies (GWAS) of Late Toxicity after Radiotherapy for Prostate Cancer

11:15 AM  Oral Presentation 06
Richard B. Hayes
Ambient PM2.5 and CVD Morality in a Prospective Cohort Study using Ordinary Kriging and Land Use Regression

11:30 AM  POSTER SESSION 1

12:30 PM  Lunch Break

1:30 PM  POSTER SESSION 2
Oral Session 2  
Chairs: Alicia McDonald, Jiyoung Ahn

2:30 PM  Oral Presentation 07  
Elizabeth Widen  
Excessive Gestational Weight Gain is Associated with Childhood Body Composition at Seven Years in African American and Dominican Children in the Bronx and Northern Manhattan

2:45 PM  Oral Presentation 08  
Hannah Simons  
The Relationship between Generational Status and Perinatal Depressive Symptom Trajectories among Adolescent Women in New York City

3:00 PM  Oral Presentation 09  
Robert Arciuolo  
Measles Outbreak Among Members of the Orthodox Jewish Community – Brooklyn, New York, March – June, 2013

3:15-3:45 PM  Coffee Available

3:15 PM  Oral Presentation 10  
Christine Dominianni  
Personal Determinants of the Human Gut Microbiome

3:30 PM  Oral Presentation 11  
Molly Jung  
Added Sugars Intake, Diet Quality and All-Cause Mortality Among US Adults: Prospective Data from National Health and Nutrition Examination Survey III

3:45 PM  Oral Presentation 12  
Sungwoo Lim  
Exploring Bias due to Sample Selection in Propensity Score Matching for a Supportive Housing Program Evaluation in New York City

4:00 PM  Closing: NYCEF Awards, Future Plans  
Pam Factor-Litvak
Abstracts

Guest Speaker

001 - Dr. Muin J. Khoury  Transforming Epidemiology for 21st Century Medicine and Public Health

Oral Presentations

01 - Raquel Duchen  Mental Health Hospitalizations Among Children and Youth in New York City

02 - Semanti Mukherjee  Excess of Homozygosity in the Major Histocompatibility Complex in Schizophrenia

03 - Alice Welch  Tobacco Use and Mental Health Among World Trade Center Health Registry Enrollees, 2003-2012

04 - Shijian Li  Poor Mental Health and Cigarette Smoking Among Asian American Populations in New York City

05 - Sarah Kerns  Radiogenomics Consortium Meta-Analysis of Four Genome Wide Association Studies (GWAS) of Late Toxicity after Radiotherapy for Prostate Cancer

06 - Richard B. Hayes  Ambient PM2.5 and CVD Morality in a Prospective Cohort Study using Ordinary Kriging and Land Use Regression

07 - Elizabeth Widen  Excessive Gestational Weight Gain is Associated with Childhood Body Composition at Seven Years in African American and Dominican Children in the Bronx and Northern Manhattan

08 - Hannah Simons  The Relationship between Generational Status and Perinatal Depressive Symptom Trajectories among Adolescent Women in New York City


10 - Christine Dominianni  Personal Determinants of the Human Gut Microbiome

11 - Molly Jung  Added Sugars Intake, Diet Quality and All-Cause Mortality Among US Adults: Prospective Data from National Health and Nutrition Examination Survey III

12 – Sungwoo Lim  Exploring Bias due to Sample Selection in Propensity Score Matching for a Supportive Housing Program Evaluation in New York City
Poster Presentations

Poster Session 1

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1-02 Christian N. Nouryan – Happiness and Satisfaction with Life in Older Patients

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1-04 Cheryl Mensah – Neutrophil-Lymphocyte Ratio and Breast Cancer Prognosis in African American Women

1-05 Levi Waldron – Meta-Analysis of Public Microarray Databases for Prognostic Gene Signatures and Subtypes of Cancer

1-06 Matthew L. Romo – Effect of Pharmacologic Androgen Deprivation Therapy on Cardiovascular Risk Factors in Men with Prostate Cancer

1-07 Jiyoung Ahn – Oral Microbiome and Risk of Head and Neck Cancer, A Nested Case-Control Study

Cardiovascular Diseases & Stroke:

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1-09 Stella Yi – Use of Regional Data to Validate and Recalibrate Self-Reported Hypertension: Highlighting Differences in Ethnically Diverse Immigrant Groups in New York City

1-10 Hilary F. Armstrong – Pulmonary Function and QT Duration: the Multi Ethnic Study of Atherosclerosis

1-11 C. Mary Schooling – Fruit and Vegetable Consumption and Cardiovascular Risk in Older Chinese: The Guangzhou Biobank Cohort Study

1-12 Shohreh F. Farzan – Prenatal Arsenic Exposure and Blood Pressure in a US Pregnancy Cohort

1-13 Antoinette Schoenthaler – An EHR for a Church? The Uses of Health Information Technology in Faith-Based Cardiovascular Health Promotion

1-14 Zoey Laskaris – WTC Heart: A Cohort Study of Cardiovascular Diseases Among World Trade Center Responders
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1-16 Monica Sull – Adolescent Vaccine Administration, Coverage, and Missed Opportunities, New York City, 2006-2012

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1-24 Basit Quayyum – Inflammatory Myositis-Increased Incidence in Fire Department of New York Firefighters After World Trade Center Exposure

1-25 Monica Sethi – Characterizing Bicyclist Injuries and Helmet Utility Within a Congested Urban Setting

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1-29 Darlene Kelley – Trends in Fatal Occupational Injuries in New York City, 1992-2011
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Maria Lahuerta – Reporting and Case Management of Bloodborne Pathogen Exposure Among Health care Workers in Tanzania

Fen Wu – Interaction Between Arsenic Exposure From Drinking Water and Genetic in Cardiovascular Disease Risk and Carotid Artery Intima-Media Thickness in Bangladesh

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Stephen J. Mooney – To Match or Not to Match: Control Selection Strategies in Cancer Biomarker Discovery Studies

Katharine H. McVeigh – Electronic Health Record Surveillance Systems: A New Approach to Chronic Disease Surveillance

Kacie Seil – Evaluating the Capacity of New York City’s Syndromic Surveillance System to Track Injuries in Real-Time

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1-48  Patrick L. Sutton – Molecular Methods Reveal Extensive Subpatent Infections in Epidemiology Study in India

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1-56  Anne Siegler – Experiences with Drug Overdose Among a Population of NYC Drug Users Who Received Training on Naloxone Use

1-57  Anne Siegler – Does Drug Treatment Improve Patient Quality of Life? A Pilot Study of the Outcomes of a Quality of Life Assessment in New York City Outpatient and Opioid Treatment Programs

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Since 2012, the National Cancer Institute (NCI) has engaged the scientific community to provide a vision for cancer epidemiology in the 21st century. Eight overarching thematic recommendations, with proposed corresponding actions for consideration by funding agencies, professional societies, and the research community emerged from the collective intellectual discourse. The themes are (i) extending the reach of epidemiology beyond discovery and etiologic research to include multilevel analysis, intervention evaluation, implementation, and outcomes research; (ii) transforming the practice of epidemiology by moving toward more access and sharing of protocols, data, metadata, and specimens to foster collaboration, to ensure reproducibility and replication, and accelerate translation; (iii) expanding cohort studies to collect exposure, clinical, and other information across the life course and examining multiple health-related endpoints; (iv) developing and validating reliable methods and technologies to quantify exposures and outcomes on a massive scale, and to assess concomitantly the role of multiple factors in complex diseases; (v) integrating "big data" science into the practice of epidemiology; (vi) expanding knowledge integration to drive research, policy, and practice; (vii) transforming training of 21st century epidemiologists to address interdisciplinary and translational research; and (viii) optimizing the use of resources and infrastructure for epidemiologic studies. These recommendations can transform cancer epidemiology and the field of epidemiology, in general, by enhancing transparency, interdisciplinary collaboration, and strategic applications of new technologies. They should lay a strong scientific foundation for accelerated translation of scientific discoveries into individual and population health benefits.
Abstract #: O-01

Mental Health Hospitalizations among Children and Youth in New York City

Authors: Raquel Duchen*, Carol Quinlan1, Caroline Mills1, Cynthia Driver1

Affiliations:

1Division of Mental Hygiene, New York City Department of Health and Mental Hygiene *rduchen1@health.nyc.gov

Background: The prevalence of diagnosed mental disorders has been increasing among children and youth in the United States. Hospitalization rates are indicators of prevalence of severe mental illness and access and quality of the treatment system. The purpose of this analysis was to describe the trends and characteristics of hospitalizations with a principal diagnosis of a mental health condition among children and youth ≤ 24 years old residing in New York City.

Methods: Using the data from the Statewide Planning and Research Cooperative System (SPARCS), hospitalization rates were calculated annually from 2000 to 2010 by sex and by age group. In 2010, age-adjusted rates were also calculated by the following neighborhood-level characteristics: poverty, majority race/ethnicity and percent foreign-born. Trends in hospitalization rate over time were assessed using Joinpoint regression and the association between neighborhood level variables and psychiatric hospitalization rate was examined using Negative Binomial regression. The top five principal diagnoses by age group were determined for 2010.

Results: 9.6% of hospitalizations among children and youth in NYC were for mental health conditions. Hospitalization rates by year were between 448 (95% CI 440, 455) and 511 (95% CI 503, 520) per 100,000 children. Rates were higher among boys and older children. From 2001 to 2010 a decrease in the hospitalization rate was observed overall (Average Percent Change (APC) -1.0, p<0.05) and for 18-24 year olds (APC -1.4, p<0.05). The lowest rates were observed in 0-4 year olds, ranging between 43 (95% CI 8, 6) and 72 (95% CI 11, 17) per 100,000, with a significant increase over time (APC 3.5, p<0.05). The impact of neighborhood poverty on hospitalization rate differed by age group. The rate of hospitalization for children aged 5-12 years residing in the highest poverty zip codes was 3.7 times higher than for those residing in the lowest poverty zip codes (95% CI 2.3, 6.0) when adjusting for neighborhood majority race/ethnicity and percent foreign-born. In contrast, no significant neighborhood poverty effect was observed among 13-17 or 18-24 year olds in the multivariable model. Reasons for mental and behavioral health hospitalization also differed by age group; The leading cause among 5-12 year-olds was behavioral conditions, such as ADHD (39%); among 13-17 year-olds was mood disorders, such as depression (54%); and among 18-24 year-olds was schizophrenia (28%).

Conclusions: Although rates of mental health hospitalizations among children and youth are decreasing in NYC, they represent an important public health problem accounting for almost 1 in 10 hospitalizations. Resources and interventions should be age and condition specific and targeted towards high-poverty neighborhoods, where children and youth are at increased risk.
Abstract#: O-02

Excess of Homozygosity in the Major Histocompatibility Complex in Schizophrenia

Authors: Presenting Author: Semanti Mukherjee$^{1,2,*}$

Saurav Guha,$^{1,2}$ Masashi Ikeda,$^5$ Nakao Iwata,$^5$ Anil Malhotra,$^1$ Itsik Pe’er,$^3$ Ariel Darvasi,$^4$ and Todd Lencz$^{1,2}$

Recent genome wide association studies (GWAS) in schizophrenia have begun to identify loci that replicably increase risk for the illness, but GWAS to date have focused on additive allelic effects, which only account for a portion of the total genetic variance. In order to examine potential recessive effects, we applied a novel approach to identify regions of excess homozygosity in an ethnically homogenous case-control cohort. We genotyped 904 schizophrenia cases and 1640 healthy controls drawn from the Ashkenazi Jewish (AJ) population using the Illumina HumanOmni1-Quad array. Genomewide examination of runs of homozygosity identified an excess in cases localized to the major histocompatibility complex (MHC). To refine this signal, we used the recently developed GERMLINE algorithm to identify chromosomal segments shared identical-by-descent (IBD) across ≥ 3 chromosomes in our dataset, and compared homozygosity at such segments in cases and controls. We found a significant excess of homozygosity in schizophrenia cases compared to controls in the MHC (p-value $=1.59\times10^{-54}$). This finding was replicated in an independent cohort of 548 schizophrenia cases from Japan and 542 matched healthy controls. Most of the homozygous regions which were over-represented in cases were located within the classical MHC class I regions, with the strongest case-control differences observed near HLA-A, in a segment encompassing three poorly annotated genes, TRIM10, TRIM15 and TRIM40. Homozygosity in the classical MHC region appears to convey significant risk for schizophrenia, consistent with the ecological literature suggesting that homozygosity at the MHC locus may be associated with vulnerability to disease.
Abstract#: O-03

Tobacco Use and Mental Health among World Trade Center Health Registry Enrollees, 2003-2012

Authors: Alice E. Welch, DrPH, MPH, RPh*¹, Michael Johns, PhD², Kimberly Caramanica, MPH¹, Mariana Chiles¹², John Jasek, MPA²

Affiliations: ¹Division of Epidemiology, New York City Department of Health and Mental Hygiene, 42-09 28th Street, Queens, NY 11101
²Bureau of Chronic Disease Prevention and Tobacco Control, New York City Department of Health and Mental Hygiene, 4209 28th Street, Queens, NY 11101

*Presenting author awelch1@health.nyc.gov

Background: Smoking remains an important public health concern and is a leading preventable cause of mortality in the United States (US). Few longitudinal studies have examined factors related to cigarette smoking among persons exposed to a large scale traumatic event. The World Trade Center Health Registry (Registry) is a cohort study of survivors of the 9/11 terrorist attacks. Enrollees include exposed lower Manhattan residents, area workers, passers-by and rescue/recovery/clean-up workers. This study examined mental health factors associated with cigarette use among enrollees over a 10 year period.

Methods: Registry data were collected via survey at three time points: Wave 1 (W1) (2003-04), Wave 2 (W2) (2006-07) and Wave 3 (W3) (2011-12). This analysis was limited to enrollees who were aged 25 or older at W1 and completed all three surveys (n=35,112). At W1, enrollees were asked if they had smoked at least 100 cigarettes in their lifetime and at each wave if they smoked every day, some days or not at all. Enrollees were categorized as current, former or never smokers at each wave based on their responses to these questions. Enrollees smoking at least some days were considered current smokers. Former smokers who reported smoking at a subsequent wave were considered to have relapsed and current smokers who reported not smoking at a subsequent wave were considered to have quit. Probable posttraumatic stress disorder (PTSD) was defined as a score of 44 or greater on the PTSD checklist-Civilian Version and non-specific psychological distress (NSPD) was defined as a score of 13 or greater on the Kessler-6. Data were age-adjusted to the US 2000 Standard Population.

Results: The prevalence of smoking among enrollees decreased over time from W1 to W2 to W3 (12.7%, 11.5%, and 9.2%, respectively). At W2, 7.4% of W1 former smokers had relapsed and at W3, 5.0% of W2 former smokers had relapsed. The incidence of quitting increased from W2 to W3 (28.6% and 33.6%, respectively). The prevalence of NSPD among smokers was higher than among non-smokers at all three waves (11.7% vs. 5.6%, 16.6% vs. 8.6% and 18.5% vs. 12.4%, respectively), as was the prevalence of 9/11-related PTSD (19.8% vs. 12.6%, 30.0% vs. 16.5%, and 26.4% vs. 14.7%, respectively). Moreover, enrollees with NSPD or PTSD were more likely to have relapsed and less likely to have quit compared to those without.

Conclusions: Examining smoking within the Registry allows for the identification of factors associated with trends in smoking prevalence, relapse and cessation over a decade in a large population exposed to a major disaster. These findings may be used to inform future cessation programs targeted at disaster-exposed populations as well as the general New York City population.
Abstract #: O-04

Poor Mental Health and Cigarette Smoking Among Asian American Populations in New York City

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Background: Despite a significant decline in adult cigarette smoking among New Yorkers over the past decade, a high prevalence of smoking persists among Asian American populations, particularly among some subpopulations. Previous research suggests that smoking rate among people with poor mental health is particularly high as compared with those with good mental health status. The current study intends to understand the smoking prevalence and patterns among Asian American populations who report their mental health status in the past month.

Methods: The three year's combined data from the REACH US Risk Factor Survey (RSF, 2009-2012) were used to estimate the cigarette smoking among Asian American populations in New York City. RSF is sponsored by CDC and implemented by the National Opinion Research Center (NORC) at the University of Chicago. It uses an address based probability sampling methods, allowing for the findings to be generalizable to larger Asian communities in NYC. The analytical sample of this study contains 3,215 individuals who identified themselves as Asian Americans. Poor mental health was measured by the number of mentally unhealthy days during the past 30 days. Current smokers were defined as individuals who reported having smoked at least 100 cigarettes during their lifetimes and currently smoked every day or on some days.

Results: During 2009–2012, the overall smoking prevalence was significantly higher among Asian males (18.5%) than females (4.4%) in the RFS sample. Overall, only 62% of Asian Americans reported no poor mental health days in the past month. Males were more likely than females to have no poor mental health days (65.6% vs. 58.2%). Smoking rates were significantly higher among those who reported one or more poor mental health days. For the Asian male population with “no unhealthy days”, “less than five unhealthy days” and “over five unhealthy days”, the smoking prevalence was respectively 16.6%, 22.5% and 22.2%. For females, the corresponding prevalence was 3.2%, 5.4% and 7.3% respectively.

Logistic regression results showed that poor mental health days, in particular, 1-5 poor mental health days are significantly associated with higher smoking rates among Asian Americans.

Conclusion: The prevalence of cigarette smoking is higher among individuals with poor mental health, especially Asian American females. Increased awareness is needed to enhance efforts to reduce smoking in Asian American population. Mental health-care providers should screen patients for tobacco use and offer evidence-based cessation treatments.
Radiogenomics Consortium Meta-Analysis of Four Genome Wide Association Studies (GWAS) of Late Toxicity After Radiotherapy for Prostate Cancer


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Purpose/Objective: Many studies have been conducted to identify genetic predictors (single nucleotide polymorphisms, SNPs) of normal tissue radio-induced toxicity. However, most studies have been under-powered, mainly candidate genes have been surveyed, and few positive associations have been replicated. In the current study, a meta-analysis of individual GWAS was performed to achieve good statistical power and to allow each individual study to serve as a replication set for the others.

Methods: The meta-analysis included four GWAS performed in men treated with radiotherapy for prostate cancer: the RAPPER study (N=646), RADIogen (N=517), the Gene-PARE study (N=298), and the Cross Cancer Institute study (N=153). Imputation was used to obtain a uniform set of SNPs across the individual studies. Toxicity was assessed at two years following radiotherapy, and changes in scores from baseline were calculated. Four individual endpoints were studied (daytime urinary frequency, decreased urine stream, nocturnal frequency, proctitis/rectal bleeding) as well as overall toxicity (measured using the scale-independent Standardized Total Average Toxicity score). In each GWAS, multivariable analysis was performed by first fitting linear regression models for toxicity with non-genetic variables, to obtain residuals, which estimate the toxicity not explained by available patient- and treatment-related factors. The residuals were then tested for association with each SNP (coded as 0, 1 or 2 minor alleles) using linear regression. The results of the SNP-residuals association tests were then meta-analyzed. SNPs were considered significant if they had meta-p-value ≤ 5x10^-8 and had p-value ≤ 0.05 in at least two individual GWAS.

Results: A total of 2.2 million SNPs were tested for association with late toxicity in 1,614 prostate cancer patients. Q-Q plots for each endpoint display deviation from the null distribution at the upper tail, providing evidence that common SNPs are associated with risk of radiotherapy toxicity. Using the significance criteria defined above, a locus on chr11q22 was found to be associated (meta-p-value=3.6x10^-8) with daytime urinary frequency and a locus on chr3p24 fell just short of significance (meta-p-value=7.5x10^-8) for association with overall toxicity. Several additional loci neared significance (meta-p-values=10^-7) for each of the endpoints studied.

Conclusion: This international study represents the largest effort to date to identify genetic predictors of radiotherapy adverse response. By increasing sample size and including multiple individual cohorts, this study was able to identify a genetic locus that reached genome-wide significance and showed agreement across cohorts. Further expansion of GWAS and meta-analysis is expected to uncover a sufficient number of associated SNPs to allow development of predictive models that could be used in the clinic to stratify cancer patients based on risk for developing adverse treatment effects.
Abstract #: O-06  

Ambient PM$_{2.5}$ and CVD Mortality in a Prospective Cohort Study using Ordinary Kriging and Land Use Regression

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Background: Fine particulate matter (PM$_{2.5}$) exposure and risk of cardiovascular disease (CVD) has been examined, but most studies are small and questions remain about the suitability of methods for exposure estimation. We assessed CVD mortality in the National Institutes of Health (NIH)-AARP Diet and Health Study cohort (NIH-AARP) in relation to PM$_{2.5}$, estimated by ordinary kriging and by land use regression. Kriging estimates ambient PM$_{2.5}$ exposure in the spatial plane by interpolation from measurements at discrete sites. Land use regression, as used here, is an interpolation technique from discrete measurement sites, using land use, roads, and traffic, to estimate ambient PM$_{2.5}$ exposure in the spatial plane. Our goal was to provide a range of risk estimates for CVD, based on these two techniques.

Methods: NIH-AARP is a prospective cohort based on members of the AARP (formerly known as American Association of Retired Persons), aged 50 to 71 years from six US states and two metropolitan areas who responded to a mailed questionnaire in 1995-1996. We considered 499,099 participants for whom PM$_{2.5}$ air pollution exposure data were available for the year 2000. Vital status was ascertained through a periodic linkage of the cohort to the National Death Index. PM$_{2.5}$ exposure was estimated for the year 2000 at the centroids of enrollment census tracts of residence of cohort members. Spatial interpolation of ambient PM$_{2.5}$ data from EPA Air Quality System (AQS) was performed through ordinary kriging using the ArcGIS Geospatial Analyst (ESRI, Redlands, CA, USA). Land use regression was developed by Beckerman et al. (Environ Sci Tech, 2013) from Bayesian regression models incorporating land use data and the AQS PM$_{2.5}$ data from ambient monitors. We estimated relative mortality risks (RRs and 95% confidence intervals, CIs) for cardiovascular disease (CVD; 15,322 deaths) and coronary heart disease (CHD; 9,010 deaths), per 10 µg/m$^3$ PM$_{2.5}$ for the NIH-AARP cohort for 2000 to 2006, by Cox proportional hazards modeling, with adjustment for personal and ecologic (census-based) covariates.

Results: Average PM$_{2.5}$ exposure for cohort members in 2000 was mean 14.3 µg/m$^3$ (IQ range 12.1—15.9) by spatial interpolation and mean 13.6 (IQ range 11.2—15.5) by land use regression ($r = 0.88$). Risks per 10µg/m$^3$ PM$_{2.5}$ by spatial interpolation were RR= 1.13 (95%CI: 1.05—1.20) for CVD and 1.20 (95%CI 1.10—1.31) for CHD. The respective risks by land use regression were RR= 1.09 (95%CI 1.03—1.16) for CVD and RR= 1.16 (95%CI 1.08—1.24) for CHD.

Conclusions: This study based on more than a half million participants in NIH-AARP found that increased PM$_{2.5}$ exposure is related robustly to increased risk of CVD and CHD mortality, identified by both spatial kriging and land use regression exposure assessment.
Abstract #: O-07

Excessive Gestational Weight Gain is Associated with Childhood Body Composition at Seven Years in African American and Dominican Children in the Bronx and Northern Manhattan

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Background: While a body of research has focused on short-term offspring anthropometric and body composition outcomes of gestational weight gain (GWG), few studies have evaluated whether these associations persist into childhood, particularly in diverse cohorts. We examined the association between GWG and offspring weight and body composition at 7 years of age in a cohort of African American and Dominican dyads in the Columbia Children’s Center for Environmental Health study in Northern Manhattan.

Methods: Mothers were enrolled in pregnancy and their children were followed up at 7 (n=299) years. GWG was calculated from self-reported pre-pregnancy maternal weight and last weight prior to delivery, abstracted from medical records. Childhood outcomes include weight, height, waist circumference (WC), body-mass-index Z-score (BMIZ) and bioelectrical impedance analysis (BIA model BC-418; Tanita Corporation of America, Arlington Heights, Illinois) estimates of fat mass (FM), fat-free mass (FFM) and percentage body fat (%fat). Linear regression models, stratified by sex, evaluated the association between total GWG or excessive GWG according to Institute of Medicine (IOM) 2009 GWG guidelines and outcomes, adjusting for pre-pregnancy BMI and covariates (maternal education, race, parity, receipt of public assistance, report of not being able to afford during pregnancy, child age at measurement). Birth weight and breastfeeding duration were added to the adjustment set in additional sets of models.

Results: Pre-pregnancy BMI (mean ± SD, all such values) and total GWG were 26.0 ± 6.8 kg/m^2 (44% overweight/obese, BMI ≥25 kg/m^2) and 16.3 ± 8.1 kg, respectively. 63% of mothers GWG were above IOM guidelines with 27% of these mothers gaining ≥200% of the IOM recommendations. Excessive GWG was associated with higher FM and %fat in boys [FM β: 1.5 kg, p=0.03; %fat β: 2.4 %, p=0.02] and higher FM, FFM, BMZ, weight and height in girls [FM β: 1.2 kg, p=0.02; FFM β: 1.2 kg, p=0.02; BMIZ β: 0.40, p=0.02, Weight β: 2.94 kg, p=0.002, Height β: 1.80 cm, p=0.04]. Further adjustment for birth weight and breastfeeding did not change the results. Total weight gain was associated with higher FM, FFM, %fat, WC, and weight in boys [FM β: 0.14 kg, p=0.003, FFM β: 0.11 kg, p=0.009; %fat β: 0.18 %, p=0.01; WC β: 0.22 cm, p=0.02; weight β: 0.21 kg, p=0.02] and higher FFM and weight in girls [FFM β: 0.07 kg, p=0.02; weight β: 0.15 kg, p=0.02]; further adjustment for birth weight and breastfeeding did not change these associations.

Conclusions: Excessive GWG was highly prevalent and was associated with several childhood weight and body composition outcomes in boys and girls. Associations between excessive GWG and childhood weight and body composition were not explained by birth weight or breastfeeding. Strategies to control weight gain in pregnancy are warranted.
Abstract #: O-08

The Relationship between Generational Status and Perinatal Depressive Symptom Trajectories among Adolescent Women in New York City

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Background: Perinatal depression is the most common complication of childbearing and is a significant public health issue that affects women, children and families. Studies have found a higher prevalence of perinatal depression among adolescent women under 21 years old compared to adult women (25-60% vs. 10-15%, respectively). Adolescent women who have migrated to the US often navigate the unfamiliar culture of the host country. They might experience pressure to socialize to US norms and pressure to maintain the norms and traditions of their parents and culture of origin. This constant balancing may produce high levels of stress and conflict, which may be particularly harmful during the transition to motherhood.

Methods: Using longitudinal depressive symptom data (Center for Epidemiologic Studies depression scale [CES-D]) from the Centering Pregnancy Plus Project, we conducted latent class growth mixture modeling to identify distinct trajectories of perinatal depressive symptomatology from early pregnancy to 1 year postpartum among 623 control participants ages 14-21 recruited from community health centers in NYC. We employed multinomial regression modeling to examine the association between generational status (immigrant/1st generation/2nd generation or greater) and trajectory group membership.

Results: We identified 3 distinct trajectory patterns of depressive symptoms: ‘stable no/low’ (58%), ‘moderate declining’ (32%), and ‘high stable’ (11%). In the ‘stable no/low’ group, the mean depressive scores were low with little variation across all time points. In the ‘moderate declining’ group, the mean score was above the cut-off score of 16 at baseline (1st/2nd trimester of pregnancy), hovered around the cut-off in the 3rd trimester, and declined below the cut off score in the postpartum period. In the ‘high stable’ group, the mean scores were well above the cut off score across all time points. Compared to 2nd or greater generation women, 1st generation women had a 69% lower odds of being classified in the ‘high stable’ group versus the ‘stable no/low’ group (aOR=0.31, 95% CI 0.17-0.57), while immigrant women had a slightly lower, though non-significant odds of being classified in the ‘high stable’ group versus the ‘stable no/low’ group than 2nd or greater generation women (aOR 0.77, 95% CI 0.53-1.13). Generational status was not associated with being classified in the ‘moderate declining’ group versus the ‘stable no/low’ group.

Conclusions: This study found heterogeneity in depressive symptom trajectories throughout the perinatal period and identified a group with chronically high symptomatology. These findings have important implications for screening and treatment, as women with chronically elevated depressive symptomatology might be identified during prenatal care and resources targeted to them. Routine screening and referral to culturally and age appropriate support/treatment might also be offered to immigrant and 2nd generation women, who are more likely to be in the chronically high symptom group compared to 1st generation women.
Abstract #: O-09

Measles Outbreak Among Members of the Orthodox Jewish Community — Brooklyn, New York, March-June 2013

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Background: On March 13, 2013, an intentionally unvaccinated 17 year-old returned to New York City (NYC) from London while infectious with measles. This importation led to the largest outbreak of measles in the U.S. since elimination.

Methods: The outbreak period was March 13 to June 30, 2013. Suspected case investigations included patient interview, medical record review, and immunization record ascertainment. Measles IgM, IgG, and Polymerase Chain Reaction (PCR) were performed. Cases were residents of NYC and classified according to the CSTE clinical case definition. Exposed contacts were identified and control measures were conducted.

Results: Fifty-eight cases were confirmed with 6 generations of spread in two Brooklyn neighborhoods; all cases were among the Orthodox Jewish community. No cases had documentation of measles vaccination at the time of exposure. The outbreak began in Borough Park where the median age of cases (n=28) was 10 years (range 0-32yrs), and 89% of cases were part of three extended families that declined measles vaccine. The outbreak spread to Williamsburg where the median age of cases (n=30) was 19 months (range 0-32yrs), and the primary reason for lack of vaccination was delay (47%). All cases met the case definition; 83% were confirmed by positive measles IgM or PCR and 17% by epidemiologic linkage. Complications included pediatric pneumonia and hospitalization of two pregnant women; one had a miscarriage and one delivered a baby with congenital measles. Over 3,500 contacts were identified. Control measures included administration of immunoglobulin or MMR post-exposure prophylaxis and home isolation of non-immune contacts. Expanded vaccination recommendations included an additional MMR dose for children 6 through 11 months of age and early administration of the second routine dose of MMR.

Conclusion: Importations of measles lead to continued risks of outbreaks in the U.S. and threaten elimination. This outbreak was propagated by a few extended families that declined measles vaccine and children with vaccine delays in densely populated neighborhoods. The insular nature of the affected community and high population-level immunization coverage prevented spread outside the community. High vaccination coverage within the Orthodox Jewish community likely limited the scope of the outbreak.
Abstract #: O-10

Personal Determinants of the Human Gut Microbiome

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Background: Previous studies have examined the relationship between various factors, most notably adiposity and short-term diet, and gut microbiome. As the relationships between the gut microbiome and usual long-term dietary intake and other demographic and lifestyle factors remain unclear, we conducted a comprehensive study.

Methods: We used freeze-dried fecal samples from 82 controls from a hospital-based case-control study of colorectal cancer conducted between 1985 and 1987. The participants provided information on age, sex, race, smoking status, body mass index (BMI), and usual diet intake. 16S rRNA genes in fecal bacterial DNA were amplified by universal primers, sequenced by 454 FLX technology and aligned to fully-sequenced microbial genomes using the QIIME pipeline. Microbiome overall diversity was assessed by Principal Coordinate Analysis (PCoA). By regression analyses, we also assessed the relationship of these diet and demographic factors to microbiome diversity and relative taxon abundances.

Results: We found that sex and smoking were associated with overall gut microbial diversity (PCoA: p=0.001 and p=0.02, respectively). Multivariate regression analyses further substantiated these findings (p=0.03 and p<0.006, respectively). Sex and smoking were also associated with specific taxa, including Bacteroidetes (p=0.02 and p=0.03) and Actinobacteria (p=0.07 and p=0.001). Fruit and vegetable fiber intake was associated with overall diversity (PCoA: p=0.04; multivariate regression: p=0.03) and with increased relative abundance of Clostridia (OR for high vs. low Clostridia abundance=1.24, p=0.009) and decreased Bacteroidetes (OR=0.87, p=0.06). Bean fiber intake was related to increased Actinobacteria (OR=2.24, p=0.006 and FDR controlled P=0.05). BMI was not associated with overall diversity or specific taxa.

Conclusion: Results from this first comprehensive study indicate that sex, smoking status and dietary fiber from certain food sources are determinants of gut microbiome. Gut microbiome structural differences by sex has been observed in some studies possibly through sex hormones or sex-specific effects on gut transit time. Gut microbiota ferment dietary fiber to short-chain fatty acids, which decreases the pH in the gut, possibly suppressing gram-negative Bacteroidetes phylum while promoting gram-positive Clostridia. Actinobacteria has been consistently shown to be positively associated with a variety of fiber forms in both in vitro studies and in human studies. Given the potential relationship of the gut microbiome with diseases of the gut, our findings may have implications for prevention of diseases related to dysbiosis through long-term dietary manipulation of the gut microbiome.
Abstract #: O-11

Added Sugars Intake, Diet Quality and All-Cause Mortality Among US Adults: Prospective Data from National Health and Nutrition Examination Survey III

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Background: To better understand the relationship between added sugars intake and diet quality, and to estimate associations between added sugars intake with all-cause mortality

Methods: National Health and Nutrition Examination Survey III data were linked to mortality data (1988-2006), among 13,902 US adults between ages 18-74 yr having energy intake within 500-3500 calories for women and 800-4000 calories for men, no history of a heart attack, stroke, or congestive heart failure. Usual intake of added sugars and energy were estimated using the NCI method and categorized into gender-specific quartiles. Diet quality was assessed using the Healthy Eating Index 2005 score (HEI-2005). Associations between added sugars intake and mortality were estimated using Cox proportional hazards regression adjusting for age, race/ethnicity, body mass index (BMI), and usual total energy intake after testing for multiplicative interaction by each of these covariates.

Results: Mean intake of added sugar was 17.2 (95% Confidence Interval (CI) 16.8, 17.6) teaspoons (tsp) in women and 25.0 (95% CI 24.4, 25.7) tsp in men. Higher usual intake of added sugars was associated with being younger, a current smoker, and having between 12 and 15 years of education among both men and women. Higher usual intake of added sugars was related to a lower HEI score in women versus a higher HEI score in men (Quartile (Q) 4 for HEI = 61.62 versus Q1 = 64.73 in women, p=0.0002; (Q4 = 62.71 vs. Q1 = 60.07 in men, p=0.0209). Higher HEI scores for the grain, fruit, vegetable, meat, and variety components were related to lower intake of added sugars; whereas, the fats, cholesterol, and sodium components of the HEI were related to higher intake of added sugars in men and women. During a median follow-up period of 14 years, a total of 1,889 deaths were recorded. After multivariable adjustment, higher added sugars intake was not associated with increased all-cause mortality (hazard ratio (HR) 95% CI of Q4 vs Q1, 1.08 (0.77, 1.52)).

Interpretation: Epidemiological studies suggested that higher sugars intake is associated with an increased risk of obesity and cardiovascular diseases (CVD). These findings indicate higher intake of added sugars is associated with lower diet quality in women, but not men. Added sugars intake was not significantly associated with all-cause mortality in this representative sample of the US population.
Abstract #: O-12

Exploring Bias due to Sample Selection in Propensity Score Matching for a Supportive Housing Program Evaluation in New York City

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Background: Propensity score (PS) matching has been widely used to control for confounding. Of the several PS matching mechanisms, optimal full (“full”) matching has been found to be more efficient in reducing bias due to confounding (i.e., increasing internal validity) than one-to-one greedy (“one-to-one”) matching. In addition, full matching can retain almost the entire sample unlike one-to-one matching that generates pairs of treatment and control individuals; those who are not paired are discarded. However, little is known about the influence of sample selection in PS matching mechanisms on estimation. The purpose of this methods evaluation was to assess potential bias due to sample selection in one-to-one matching compared to full matching. These matching strategies were assessed when evaluating whether a supportive housing program in New York City (NYC) reduced costs from various government services.

Methods: Data on usage of government services were obtained for applicants to a NYC supportive housing program between 2007 and 2009. Remaining in supportive housing for one year after placement was defined as a treatment variable. Focusing on two applicant groups, adults with chronic homelessness and an active substance use disorder (“SUD population”) and young adults aging out of foster care (“young adult population”), we evaluated the performance of full and one-to-one PS matching methods using two criteria: 1) balancing covariates according to absolute standardized difference measures (internal validity) and 2) representing the original population (external validity). Using PS-matched data, we also evaluated whether the estimated program impact on post-housing Medicaid use would be affected by choice of matching method.

Results: In the SUD population, only full matching performed well in establishing internal validity, whereas both matching methods successfully achieved internal validity in the young adult population. In the second criterion, both methods established external validity in the SUD population, but one-to-one matching in the young adult population generated a matched population characterized by better health conditions and independent living skills than the original one. Using one-to-one matching compared with full matching, Medicaid savings were greater for the SUD population, and smaller for the young adult population.

Conclusions: In the young adult population, since good internal validity was found for both PS methods, the attenuated program impacts suggested that one-to-one matching introduced selection bias, which was evidence of low external validity. In the SUD population, differences in program impacts between the two PS methods were more likely to be due to reduced internal validity in one-to-one PS matching. Using a practical diagnostic approach to assess internal and external validities, in this program evaluation we identified potential selection bias from PS matching as a threat to external validity, indicating that full matching produced unbiased findings for the whole program population being evaluated.
Abstract #: 1-01

The Epidemiology of Falls Among an Urban Population of Older Adults, New York City

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Background: Each year, one in three older adults, age ≥ 65 years, falls in the United States. Falls among this vulnerable population can cause injuries, lead to institutionalization, and increase the risk of early death. In New York City (NYC), the older adult population is expected to increase 44% from 2010 to 2030, portending a dramatic increase in falls and associated consequences. We describe incidence, outcomes, and risk of unintentional falls among older adults in NYC from multiple data sources.

Methods: Incidence and outcomes of falls among older adults were collected with passive and active surveillance using the following administrative data sources: NYC Department of Health and Mental Hygiene’s (DOHMH) Bureau of Vital Statistics’ death data and NY State Department of Health’s hospitalization and emergency department (ED) data. ED visits were limited to those treated and released and hospitalization data were limited to live discharges. DOHMH’s Injury Surveillance and Prevention Program surveyed a sample (n=96) of older adults recruited from two NYC senior centers on recent falls and falls risk during 2012–2013.

Results: Falls are the leading cause of injuries among older adults in NYC. Falls caused 291 deaths and 17,452 hospitalizations in 2011, and 28,527 ED visits in 2010 among older adults in NYC. Fall-related ED visits increased by 22% from 2006 to 2010 (2,316 to 2,833 per 100,000). From 2006 to 2011, the hospitalization rate decreased by 4%, and the death rate decreased by 3% (1,793 to 1,713 per 100,000 and from 30 to 29 per 100,000, respectively). In 2011, the highest falls-related hospitalization rates were located in Staten Island, east Manhattan, and northwest Bronx. The majority (78%, n=13,695) of older adults hospitalized for a fall in 2011 required further care upon discharge; 48% were diagnosed with bone fractures and 13% with traumatic brain injuries. Over one-third (38%, n=36) of surveyed older adults reported falling in the previous year, with the home being the most common (58%, n=21) location of reported falls. Among those surveyed, 69% (n=66) reported throw rugs or some clutter in the home, and 48% (n=46) regularly used four or more prescription medications. Fewer than half reported having grab bars in the shower (41%, n=39) or near the toilet (16%, n=15); over half (58%, n=57) reported exercising to improve balance and strength.

Conclusions: Falls among older adults are important causes of deaths, hospitalizations and ED visits in NYC. Survey results suggest known, modifiable risk factors for falls among older adults are prevalent. Older adults and their families should work with their caregivers and health care providers to assess their home for risks, have all prescription medications reviewed for side effects and interactions, and participate in exercise programs to improve balance and strength.
Abstract #: 1-02
Happiness and Satisfaction with Life in Older Patients

Authors:

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Background: Validated instruments to measure quality of life, such as the "Oxford Happiness Inventory" (Hills & Argyle, 2002), have explored mental and physical status in the general adult population. However, there has been a dearth of such studies in the elderly. Since the geriatric population is a major challenge, we evaluated factors that may affect happiness and quality of life in older adults.

Methods: An anonymous two page survey (modified “Oxford Happiness Inventory”) was distributed to non-demented (MMSE>25), non-institutionalized older adults (65+) attending a geriatric faculty practice from September to November 2013. Acute “sick calls” were excluded. Descriptive statistics and associations between mean happiness score and potential factors were assessed.

Results: Of the 88 subjects included, 35% were male, mean age was 83.4, 44% were married, 86% had family living within 25 miles, 51% were college graduates 33% were members of religious groups and 40% reported strong or very strong religious beliefs. Average happiness score was 4.2 out of 6 (range: 2.4-5.8). Factors reported as top “contributors to happiness” were health (71%); social relationships (69%); financial circumstances (41%); independence (36%); and psychological well-being (34%).

Using Mann-Whitney U-tests and Kruskal-Wallis tests, results showed that education level, transportation method, strength of religious beliefs and faith were significantly associated with mean happiness score (p=0.03, p=0.03, p=0.004, and p=0.02 respectively). Using Spearman correlation, the strongest correlate with happiness was religious belief \( r=0.43, p<0.001 \). Further, subjects who were active in faith-based groups had higher happiness scores compared with those who were not \( p=0.007 \). Compared with subjects who drive, subjects who depend on others for transportation had lower happiness scores \( p=0.005 \). High school graduates had lower happiness scores compared with college graduates \( p=0.008 \) and subjects aged 85-89 had lower happiness scores compared with those aged 65-69 \( p=0.04 \).

Conclusions: Increased awareness of factors that impact happiness and life satisfaction in geriatric patients may help health care practitioners to develop more relevant and realistic therapeutic plans of care for the overall functional, physical and emotional health of older adults.
Abstract #: 1-03

Increasing Cancer Deaths in a Well Characterized HIV+ Cohort is Associated with Poor Viral Suppression

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Background: HAART has lead to a reduction in many AIDS associated causes of morbidity and mortality. Despite a reduction in AIDS related deaths, several national registries show that many HIV+ patients are still dying at a younger age and from different causes than their HIV- peers. It is a challenge to translate national registry data to a provider’s particular clinic to help guide the most intelligent use of time and resources. It is also important for clinicians to understand whether clinical parameters, such as VL, CD4 count or HAART adherence, provide prognostic information relevant to an individual patient. This study provides information on mortality in a well-characterized cohort of HIV+ patients and addresses the relationship between individual patient characteristics and mortality risks.

Methodology: We analyzed de-identified mortality records from a major HIV clinic in the NY Metropolitan area where ~2,000 HIV+ patients are followed. We evaluated all deaths that occurred in this cohort during 2010-2012 and, on the basis of review of each case by multiple clinicians active in the care of these HIV patients, classified the cause of death into ten categories based on the WHO International Classification of Diseases diagnostic tool. The rates were compared to CDC national mortality data.

Results: Causes of death in this HIV+ cohort were characterized by high rates of Cancer 33% and liver disease 17% and a very low rate of CVD 3%. The rate of death due to cancer was seen to increase over this period of time from 25% to 27% to 50% of total deaths. The mean age of those that died in this population was 53 yo. The VL was elevated in 40% of the patients that died in this cohort. The mean CD4 count and CD4% of patients that died from any cause were 304 and 20.3%.

Conclusions: HIV+ individuals are at risk of premature death and do not all enjoy an average life expectancy. Different rates of various causes of mortality are seen in this population compared to HIV- individuals and the incidence of cancer is significant and increasing in the studied patient population while the rate of CVD is low. Individual patient characteristics may help predict which patients are most likely to suffer from premature death. Our data do show that the patients in this clinic who did die during the observation period were characterized by low CD4 counts and a high percentage that failed to suppress VL. Clinical and community resources as well as research efforts should focus on the diseases most prevalent in this population such as Cancer.
Abstract #: 1-04

Neutrophil-Lymphocyte Ratio and Breast Cancer Prognosis in African American Women

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Introduction: Breast Cancer (BC) is the most common cancer among women, and the 2nd leading cause of cancer-related deaths. Inexplicably, African American (AA) women have lower incidence and higher mortality rates compared to white women. The neutrophil to lymphocyte ratio (NLR), a marker of systemic inflammatory response, has been linked to BC outcomes, but remains unstudied among AA.

Methods: A random sample of charts (n=285) of AA women who received treatment at NSLIJ from 2004-2011 were identified from the Cancer Tumor Registry. Cases without pretreatment neutrophil and lymphocyte counts were excluded from analysis. NLR was studied in relation to prognostic factors associated with survival: extremes of age, tumor size >1cm, high tumor grade, metastases, recurrence, and triple negative disease (lack of estrogen, progesterone, or HER2 receptors). Poorly differentiated, undifferentiated, Scarff Bloom Richardson scores of 8 or 9 (grade 3) were defined as high tumor grade. Metastasis was confirmed via pathology or imaging.

NLR cutoff scores of 2.5 and 3.3 have been associated with mortality. As there is currently no consensus within the literature regarding choice of cut-off value, we explored potential associations using NLR greater than 2.5 and 3.3 as cutoffs. Fisher’s exact test (for cell samples less than 5) and chi-square tests were conducted to compare NLRs >2.5 and 3.3 to each prognostic factor. Kaplan-Meier curves with logrank tests were fit to estimate differences in survival by NLR scores. A p-value of <0.05 was considered statistically significant; analyses were conducted in Stata/SE 12.1.

Results: No statistically significant differences in NLR were observed for age, tumor size, high tumor grade, recurrence, and triple negative disease. Significant differences with both 2.5 and 3.3 pretreatment NLR scores were observed for metastasis (p=0.02). No statistically significant differences in survival by NLR were observed.

Conclusions: These preliminary findings suggest that NLRs >2.5 are associated with BC metastases in AA. This may indicate that patients with metastases have a greater systemic inflammatory response. This study provides some evidence that higher NLR scores may be linked to poor prognosis among AA women with BC.
Meta-Analysis of Public Microarray Databases for Prognostic Gene Signatures and Subtypes of Cancer

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Numerous gene signatures of patient prognosis for late-stage, high-grade ovarian cancer have been published, but diverse data and methods have made these difficult to compare objectively. However, the corresponding large volume of publicly available expression data creates an opportunity to validate previous findings and to develop more robust signatures. We thus built a database of uniformly processed and curated public ovarian cancer microarray data and clinical annotations, and re-implemented and validated 14 prognostic signatures published between 2007 and 2012. Of these, twelve published models performed better than 97.5\% of randomized risk scores, and six out-performed 97.5\% of random signatures of the same size trained on the same data. By meta-analysis and “leave-one-dataset-out cross-validation” of 1,622 samples we generated and tested an improved prognostic signature for impending validation with GOG218 clinical trial specimens, and a predictive signature for suboptimal surgical debulking which was validated at the protein level by immunohistochemistry. We used a similarly curated database of colorectal cancer microarray experiments for robust identification of colorectal cancer subtypes, leveraging heterogeneous experiments to avoid artifacts due to batch effects or specific microarray designs. This work provides new approaches that leverage public gene expression databases to predict patient prognosis and to reliably identify cancer subtypes for incorporation with epidemiological studies.
Abstract #: 1-06

Effect of Pharmacologic Androgen Deprivation Therapy on Cardiovascular Risk Factors in Men with Prostate Cancer

Authors:

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Background: Pharmacologic androgen deprivation therapy (ADT) is widely used in the treatment of disseminated prostate cancer, as well as an adjunct to radiotherapy in intermediate localized prostate cancer. Observational studies have shown that ADT may be associated with an increased risk for myocardial infarction and stroke. Furthermore, observational studies have found associations between cardiovascular risk factors, such as impaired insulin sensitivity, and ADT use. Given the inherent biases in the design of these studies, our objective was to evaluate the effect of ADT on cardiovascular risk factors using data from randomized controlled trials (RCTs).

Methods: We conducted a systematic review using PubMed.gov (1950-June 2013), EMBASE (1974-June 2013), and Web of Science (1900-June 2013) for all RCTs that enrolled men with prostate cancer that compared ADT with placebo, radiation therapy, or any other control group that did not receive ADT. We defined ADT as the use of any gonadotropin-releasing hormone agonist (e.g., goserelin) or antagonist (e.g., degarelix) for at least 4 weeks. We limited our search to include studies that reported the effect of ADT on cardiovascular risk factors of interest, including systolic and/or diastolic blood pressure, cholesterol (both low- and high-density lipoprotein), triglycerides, fibrinogen, biomarkers of insulin insensitivity (e.g., fasting plasma glucose, hemoglobin A1c), central and overall adiposity, and C-reactive protein. This study was registered at the PROSPERO International Prospective Register of Systematic Reviews (CRD42013005097).

Results: Out of the 3272 unique publications identified in our systematic review, we did not identify a single RCT enrolling men with prostate cancer that compared ADT to a group that did not receive ADT and reported cardiovascular risk factors of interest.

Conclusions: There is a lack of published high-quality evidence describing the effects of ADT on cardiovascular risk factors. RCTs have likely collected data on these risk factors as part of routine study monitoring; however, these data have not been published. In order to understand the effect of ADT on cardiovascular morbidity, these data must be made available to the scientific community.
Abstract #: 1-07

Oral Microbiome and Risk of Head and Neck Cancer, A Nested Case-Control Study

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Introduction: The oral microbiome is intimately involved in inflammatory processes in the oral cavity and may be involved in metabolism of carcinogens in tobacco smoke. Our hypothesis is that oral microbiota may promote head and neck carcinogenesis, possibly related to smoking. To test this hypothesis, we conducted a nested case-control study to prospectively examine the role of the oral microbiome in head and neck cancer, in the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial cohort.

Methods: Subjects in the PLCO Trial completed risk factor questionnaires and provided oral wash samples. Trial participants were followed for cancer incidence by annual follow-up, medical chart review and search of mortality databases. During follow-up, 87 histologically confirmed head and neck cancer cases occurred subsequent to oral wash sample collection. We matched these cases to 174 cohort-nested controls (matched by age, gender, and race). DNA was extracted from oral wash samples, 16S rRNA genes were amplified by universal primers, and product was bar-coded and sequenced by 454 FLX technology. 16S rRNA bacterial gene sequences were binned into operational taxonomic units (based on 97% identity) and further assigned to taxonomy in the QIIME pipeline. We performed nonparametric Wilcoxon signed-rank tests and conditional logistic regression to compare differences between head and neck cancer cases and controls, with respect to overall bacterial community structure and relative abundance of specific taxa.

Results: From 261 oral samples, we obtained 2,548,067 high quality 16S rRNA gene sequence reads.

Overall community structure, based on a weighted UniFrac phylogenetic distance index, did not differ significantly between cases and controls (p>0.05). The major phyla in controls were Firmicutes (59.5%), Actinobacteria (15.5%), Bacteroidetes (11.3%), Proteobacteria (10.3%), and Fusobacteria (2.8%). Decreased abundance of Proteobacteria was observed in cases (7.8%) compared to controls (Wilcoxon test, p = 0.008, FDR controlled p=0.041). After consideration of age, race and sex in conditional logistic regression analysis, an inverse association of Proteobacteria with head and neck cancer risk was observed in smokers (OR comparing extreme tertiles =0.34, 95% CI 0.15-0.79; \( p_{\text{trend}} = 0.009 \) [FDR controlled p=0.065]), but not in non-smokers (\( p_{\text{trend}}=0.62 \)). We also noted a relative increase in abundance of Bifidobacteriales order (multivariate p=0.002, FDR controlled p=0.045) and Lactobacillaceae family (multivariate p=0.005, FDR controlled p>0.05) in cases compared with controls.

Conclusion: This first prospective study of the oral microbiome and head and neck cancer suggests that Proteobacteria and Bifidobacteriales are related to risk of head and neck cancer. Replication of these first observations is needed.
Associations between Bilateral High-Frequency Hearing Loss and Coronary Heart Disease: the National Health and Nutrition Examination Survey

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Background: Some evidence suggests that noise exposure is associated with cardiovascular disease morbidity and mortality. However, previous findings are not consistent, and the noise exposure assessments in previous studies are subject to various limitations, especially in the occupational setting. Bilateral high-frequency hearing loss, an objective biomarker of chronic exposure to loud noise, may be used to assess noise-related health effects. This project aims to investigate the association between bilateral high-frequency hearing loss and coronary heart disease (CHD).

Methods: This project includes 5219 participants aged 20-69 years who participated in the audiometry examination of the National Health and Nutrition Examination Survey 1999-2004. Bilateral high-frequency hearing loss was defined as the average high-frequency (3, 4, and 6 kHz) hearing threshold >25 dB in both the left and right ears. The presence of CHD was defined as a self-reported diagnosis by a doctor or other health professional.

Results: 255 CHD cases were identified, with an overall prevalence of 4.3%; the prevalence was 1.8% for participants with normal high-frequency hearing, and 11.9% for those with bilateral high-frequency hearing loss. Compared with those with normal hearing, participants with bilateral hearing loss were more likely to have CHD (odds ratio [OR], 1.74; 95% confidence interval [CI], 1.16-2.61) after adjustment for age, sex, race/ethnicity, body mass index, education attainment, cigarette smoking, leisure time physical activity, and diabetes. This association was particularly striking for participants who were exposed to loud noise in the workplace (OR, 4.35; 95% CI, 1.26-15.09). Stratified analyses for participants exposed to loud noise in the workplace or at leisure time showed that the association between bilateral hearing loss and CHD was stronger for participants who were less than 50 years of age, less educated, and current or former smokers. This association was not observed for participants who were not exposed to loud noise in the workplace or at leisure time, and there was no significant association between unilateral high-frequency hearing loss and CHD.

Conclusions: This study confirms the previous finding that exposure to loud noise in the workplace, as indicated by bilateral high-frequency hearing loss, is associated with increased prevalence of CHD.
Abstract #: 1-09

Use of Regional Data to Validate and Recalibrate Self-Reported Hypertension: Highlighting Differences in Ethnically Diverse Immigrant Groups in New York City

Authors: Stella Yi, Michael Johns, Sung Woo Lim

Background: Population-level surveillance of high blood pressure is critical to monitor trends and for appropriate program planning and resource allocation. Self-reported hypertension has been validated in national data and with white, black, and Mexican-American populations. However, validation has not been performed using local data or in urban areas, particularly, in two Hispanic subgroups (Puerto Ricans, Dominicans) and Asian Americans. Given the diversity of the New York City (NYC) adult population and the potential roles of low access to care and low health literacy on one’s ability to accurately self-report hypertension, validation in these groups is of value.

Objective: To assess validity of self-reported hypertension in foreign born, Hispanic, and Asian American adults, and to recalibrate prevalence of self-reported hypertension with measured hypertension from a representative NYC sample.

Methods: Data were obtained from the NYC Health Department: the Community Health Survey (CHS) 2005-08 and the 2010 Heart Follow-Up Study (HFUS). Self-reported hypertension was available in the CHS, while the HFUS included both self-reported hypertension, and seated blood pressure measurements and self-report of anti-hypertension medication, variables needed to define clinical hypertension. Sensitivity and specificity were calculated in the HFUS data. The recalibration method previously described by Mentz and colleagues required use of local data to calculate the probability of clinical hypertension; these probabilities were then applied to the self-report data to generate recalibrated estimates of hypertension.

Results: The sensitivity and specificity for self-reported vs. clinical hypertension in the HFUS data were 80% and 91%. A higher sensitivity was observed in women vs. men. Sensitivity was lowest among Hispanics; the uninsured; in those who spoke Spanish at home and who had been in the U.S. <10 years. Specificity did not differ markedly across groups. The prevalence of hypertension in the CHS was 26.6%, while the recalibrated hypertension was 23.0%. The difference between the original and recalibrated prevalence was largest in U.S. born Hispanics (recalibrated: 20.8% vs. original: 27.8%). Recalibrated compared to original estimates in Puerto Rican and Dominican Hispanics were notably lower (28.6% vs. 36.1%; 28.0% vs. 34.1, respectively). No substantial changes occurred within Asian Americans.

Conclusions: Validity of self-reported hypertension was good to fair in this urban, ethnically diverse sample. Similar to prior validation work in national samples, self-reported hypertension was the least robust in Hispanics, but had similar validity in Asians as in white participants. Factors such as low health literacy, lack of health insurance or limited access to care, or cultural differences in the hypertension definition which may lead to overreporting are potential explanations for these differences. In the absence of annually recurring measured data, surveillance systems may consider recalibration as an option, potentially in areas with a high percentage of Hispanics.
Abstract #: 1-10

Pulmonary Function and QT Duration: the Multi Ethnic Study of Atherosclerosis

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Background: Chronic obstructive pulmonary disease is now the third leading cause of death in the US with approximately 24+ million adults affected. The risk for all cardiovascular diseases is higher in COPD patients than in age and gender matched controls. QT interval, a measure of the cardiovascular electrical cycle, has been linked to increased risk of mortality. Prior small studies have suggested an association between spirometry-defined COPD and heart rate corrected QT interval (QTc). We hypothesized that low lung function is associated with prolonged QT in the general population.

Methods: The Multi-Ethnic Study of Atherosclerosis (MESA) is a multicenter, prospective cohort study of the prevalence, correlates, and progression of subclinical cardiovascular disease in whites, blacks, Hispanics, and Asians without clinical cardiovascular disease. Between 2000 and 2002, MESA recruited 6,814 men and women 45 to 84 years of age from 6 U.S. communities. A subset of 3,521 participants underwent electrocardiogram (ECG), spirometry and full-lung computed tomography (CT) in 2010-12. Patients were excluded from the current analysis if they had atrial fibrillation, atrial flutter, a pacemaker, idioventricular rhythm, complete heart block or indication of antibiotic use in the 2-weeks prior to the ECG. Each participant underwent three 10-second resting ECGs in the supine or semi-recumbent position following an overnight fast. QT values of $\geq 460$ms in women and $\geq 450$ms in men were considered abnormal (prolonged QT). Spirometry was measured following ATS/ERS guidelines. Percent emphysema was defined at a -950 Hounsfield unit threshold on CT. Multivariate models were adjusted for: age, sex, race, education, low body mass index (BMI $\leq 21$), smoking status, cotinine corrected pack-years, hypertension, diabetes, waist circumference (cm), hip circumference (cm), weight (kg), height (cm), heart rate and medications.

Results: The mean age of the 2,781 included participants was 69 years and 49.6% were men. The prevalence of prolonged QT was 15%. A lower FEV1 was associated with a longer QT (adjusted $\beta$=-1.82, 95%CI:-3.56 to -0.08). There was no association between emphysema and QT or prolonged QT.

Conclusions: Our analysis revealed a significant association in the general population between lower FEV1 and longer QT. However, no association was seen with emphysema. Low lung function may be a risk factor for longer QT in the general population.

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Abstract #: 1-11

Fruit and Vegetable Consumption and Cardiovascular Risk in Older Chinese: The Guangzhou Biobank Cohort Study

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Purpose: Vegetable and fruit consumption is widely promoted as part of a healthy lifestyle largely based on observational evidence from Western contexts where vegetable consumption and health share social patterning. To clarify whether these observations are contextually specific or biologically based, we examined the associations of vegetable and fruit consumption with Framingham score in the non-Western setting of Southern China.

Methods: We used multivariable linear regression to examine cross-sectionally the adjusted associations of vegetable and fruit consumption separately, as portions per week, with Framingham score and its components among 19518 older Chinese (≥50 years) from the Guangzhou Biobank Cohort Study. We repeated the analysis among 12091 people without previous cardiovascular diseases or diabetes.

Results: Vegetable consumption (portions per week) was associated with higher Framingham score (0.01, 95% confidence interval (CI) 0.006 to 0.01), while fruit consumption (portions per week) was not clearly associated with Framingham score (-0.004, 95% CI -0.01 to 0.001), adjusted for age, sex, phase, socio-economic position and lifestyle. Among people without previous cardiovascular diseases or diabetes, vegetable consumption was associated with higher Framingham score (0.01, 95% CI 0.003 to 0.01), and fruit consumption was associated with higher Framingham score (0.01, 95% 0.007 to 0.02).

Conclusion: This large study from a non-western setting suggests observations concerning the benefits of vegetable and fruit consumption may be contextually specific. Investigation of the underlying factors driving potential health benefits of vegetables and fruit would be helpful.
Abstract #: 1-12

Prenatal Arsenic Exposure and Blood Pressure in a US Pregnancy Cohort

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Background: Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide and mounting evidence indicates that toxicant exposures can have a profound impact on CVD risk. Studies in adults suggest that high levels of arsenic (As) are positively related to blood pressure, systemic inflammation and CVD risk. Pregnancy is a period of particular vulnerability to environmental insults and a time when CVD risk is unmasked for the mother. For example, high blood pressure during pregnancy can signal later risk of coronary heart disease and stroke. However, little is known about the cardiovascular impacts of As exposure during pregnancy.

Methods: As part of the New Hampshire Birth Cohort Study, in which approximately 15% of participant household wells exceed the As maximum contaminant level established by the US EPA of 10 μg/L, we performed a preliminary analysis investigating the association between urinary As concentration and blood pressure in 332 pregnant women in our cohort. Using multivariate linear regression models, we examined maternal urinary As (U-As) measured at 24-28 weeks gestation in relation to the average of the last three maternal blood pressure measurements during pregnancy.

Results: Each µg/L in U-As was significantly related to a 0.22 (95% CI: 0.052, 0.357, p = 0.01) mmHg increase in systolic blood pressure and borderline significantly associated with a 0.09 (95% CI: -0.024, 0.204, p = 0.12) mmHg increase in diastolic blood pressure after adjustment for maternal age and BMI.

Conclusions: The data suggest that As exposure may increase blood pressure during pregnancy. Future studies are needed to assess the cardiovascular effects of As exposure during pregnancy, as even modest increases in blood pressure during pregnancy, a period particularly sensitive to environmental insults, may translate to increased CVD risk for both mother and child.
Abstract #: 1-13

An EHR for a Church? The Uses of Health Information Technology in Faith-Based Cardiovascular Health Promotion

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Background: Poor blood pressure (BP) control is major contributor to the racial disparity in hypertension (HTN) among Blacks as compared to Whites. Improving BP control leads to significant cardiovascular risk reduction in Blacks and can be achieved through evidence-based interventions targeting self-management behaviors. The challenge for local health departments is to redesign these evidence-based approaches to function sustainably at the level of resources and skills available in typical community-based organizations (CBO). Health IT could build the capacity of CBOs to implement evidence-based models, allowing for broader translation of life-saving interventions, and lay a foundation for coordination of care for people with HTN from the clinic to the community setting.

Methods: The objective of this ongoing study is to assess the feasibility of implementing a Personal Health Record (PHR) system customized to enable trained community health workers (CHW) in predominately Black churches to track individual and aggregate changes in BP and health behaviors (diet, physical activity, healthcare utilization) using a Congregational Dashboard. Ongoing process and outcome evaluation of the study is being conducted at the church- and individual-levels using the RE-AIM framework.

Results: Since March 2012, five churches have been enrolled in the Congregational Dashboard, and over this time 338 individuals have registered at his/her participating church. Analysis of usage data across the churches shows that an average of 17 individuals is registered per month (range: 1-34). A total of 1,074 BP readings have been entered into the 5 Dashboards, with an average of 3.18 BP readings per person recorded over a 20-month period (range: 1.59 to 8.34 readings). Among persons with multiple readings, the average change in systolic BP across the churches is -0.6 mmHg (range: -5 mmHg to +1 mmHg). Thus far, the process evaluation has identified the following challenges to implementation of the Dashboard at the participating churches: discomfort with sharing data (privacy and security) and frustration with the registration process. Facilitators to implementation have included: engaging younger members who are familiar with technology in the health ministry and using data as a means to develop church-level milestones. Through a user-centered cyclical design process, modifications have been made to layout and functionality of the Dashboard which have increased CHW satisfaction with the information technology tool.

Conclusions: Ongoing implementation and evaluation of the health IT system will provide insight into community-based models of health promotion that are sustainable and generalizable, with potential for significant impact at the individual, community and population level, in part by making it possible for lay individuals to practice chronic disease self-management with a view towards trends in the health of their community.
Abstract #: 1-14

WTC Heart: A Cohort Study of Cardiovascular Diseases Among World Trade Center Responders

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Background: The WTC-Heart cohort study primary objective is to examine whether the Framingham Heart Study (FHS) score for coronary heart disease (CHD) predicts the risk for primary and subsequent myocardial infarction (MI) and stroke among rescue workers and volunteers (responders) that survived the 9/11 World Trade Center (WTC) disaster. Extra risk factors not included in the FHS score are a) heavy exposure to the 9/11 dust cloud and b) PTSD and depression. The second objective is to compare the CHD risk of WTC responders aged over 55 to that of the INVEST cohort, comprised of Washington Heights, NYC residents who were not directly exposed to the air pollution and mental stress at Ground Zero.

Method: WTC-Heart (N=6,492) is a sub-cohort of responders enrolled in the World Trade Center Health Program (WTCHP), Mt. Sinai and North Shore sites. Participants were actively recruited at annual monitoring visits at the WTCHP. Determinants of cardiovascular disease, 9/11 exposure, depression, and probable PTSD were measured on the date of enrollment using clinical exams and supplemental questionnaires. An on-going follow-up for incident MI and stroke consists of annual screenings, secondary telephone interviews, and medical record review. The 2-year predicted risk of CHD and the observed risk will be calculated using baseline characteristics and the results of the follow-up, respectively. Comparisons with the INVEST cohort will be done at the end of the 2-year follow-up.

Preliminary Results: The average age of the WTC-Heart cohort is 45 years, 82% male and 18% female. The active follow-up of 50% of the cohort (N=3,300) conducted via online, mail and telephone questionnaire (50.9%, 41% and 24% return rates, respectively) and on 51% of all secondary interviews to investigate positive cardiac and/or neuro symptoms, has yielded 37 incident MI and strokes. At this stage it is too early to estimate a one-year risk. We are also unable to compute the corresponding FHS-2yr risks since we have not received yet the data for cholesterol and HDL.

Conclusion: In the event that the long-term cardiovascular health of 9/11 responders is impacted above and beyond the usual determinants of cardiovascular disease risk, we may propose a revised WTC-score to identify high-risk responders and guide treatment more effectively. This assessment tool will not only guide care for WTC responders, but also guide medical surveillance of civilians affected by future disasters. We propose a future, passive follow-up of the cohort based on a linkage with the New York State hospital discharge database, SPARCS, and the National Death Index as a sustainable method of tracking the CV health of this unique and young cohort.
Abstract #: 1-15

Parental Age and Autism Spectrum Disorders Among New York City Children 0-36 Months of Age

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Background: The prevalence of autism spectrum disorders (ASD) in the United States has increased in recent decades. In New York City (NYC), a similar trend has been observed in children younger than three years old who were referred and found eligible for Early Intervention (EI) services. Parental age has been examined as a possible risk factor for ASD with varied results. This is of concern since the proportion of births to older mothers has increased nationally. We examined trends in parental age and ASD and the association of ASD with parental age among NYC children.

Methods: Children born in NYC to resident mothers between 1994 and 2001 were identified through vital statistics records (N = 927,003). Data were linked to service data of the NYC Early Intervention Program (EIP) through 2004. The outcome of interest was having an ASD identified by the EIP before 36 months of age. Multiple logistic regression was used to estimate the independent parental age-specific odds of ASD controlling for other risk factors including maternal race/ethnicity, education, and metabolic risk factors and child’s sex and gestational age. The proportion of growth in ASD attributable to changes in parental age at birth was also examined.

Results: The proportion of births to mothers 35 years of age or older increased from 15% to 18% between 1994 and 2001 and the proportion to fathers 35 years or older increased from 30% to 33%. ASD prevalence in EI increased significantly from 1 in 3,300 children born in 1994 to 1 in 233 children born in 2001. Both maternal and paternal ages were independently associated with ASD after adjusting for covariates. Children born to mothers 25-29 years (OR=1.5), 30-34 years (OR=1.6) and 35 years of age or older (OR=1.9) were more likely to be diagnosed with an ASD in EI compared to children of mothers younger than 25 years of age. Additionally, children born to fathers 35 years of age or older (OR=1.4) had significantly higher odds of ASD compared to those born to fathers younger than 25 years of age. The change in parental age accounted for only 2.7% of the increase in ASD prevalence.

Conclusions: Older paternal age and older maternal age were both independently associated with increased risk of ASD. While parental age at birth increased between the 1994 and 2001 birth cohorts in NYC, it did not explain the increase in number of ASD cases.
Abstract #: 1-16

Adolescent Vaccine Administration, Coverage, and Missed Opportunities, New York City, 2006 – 2012

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Background: The Advisory Committee for Immunization Practices (ACIP) recommends that adolescents receive three immunizations at 11-12 years of age: meningococcal conjugate (MCV4, recommended 2005), tetanus/diphtheria/acellular pertussis (Tdap, recommended 2005), and human papillomavirus (HPV, recommended for females in 2006). In 2007, New York State mandated all students ≥11 years of age receive a Tdap dose for grade 6 entry. MCV4 and the first dose of HPV should be administered at the same visit as Tdap administration. The New York City (NYC) Bureau of Immunization (BOI) examined adolescent vaccine uptake since the Tdap mandate and assessed missed opportunities for simultaneous MCV4 and HPV vaccine administration with Tdap. Additionally, we examined catch-up vaccination over time by birth cohort.

Methods: Analyses used data from the Citywide Immunization Registry, a population-based Immunization Information System containing all vaccines administered to individuals <8 years of age since 1996 and expanded to individuals <19 years of age in 2005. Only first, valid doses of Tdap, MCV4, and HPV vaccine were included. Analyses included 11 year-olds born 1996 through 2000 and immunizations given through 2012. HPV vaccination was only analyzed among females.

Results: Administration of all adolescent vaccines has increased since the 2007 Tdap mandate, but coverage is consistently highest for Tdap and lowest for HPV. In 2012, coverage among 13-17 year-olds was 89% for Tdap, 76% for MCV4, and 60% for one dose of HPV among females. Peak vaccine administration among 11 year-olds occurs in the August-October back-to-school months, which is also when most missed opportunities for MCV4 and HPV vaccination occur. Although MCV4 doses administered increased each year, nearing Tdap doses administered, doses of HPV remained nearly the same from 2007-2013. From 2007-2012, missed opportunities for MCV4 administration decreased 50% among 11 year-olds while HPV missed opportunities decreased only 5%. Adolescents who miss the opportunity for MCV4 and HPV administration never fully catch-up to reach Tdap coverage levels. Among those born in 1996, 99% received ≥1 Tdap by 17 years of age, 95% received ≥1 MCV4, and 79% of females received ≥1 HPV vaccine. For adolescents born in 2000, by 13 years of age, ≥99% had received ≥1 Tdap, 85% received ≥1 MCV4; 56% of females received ≥1 HPV dose.

Conclusions: Among adolescents, Tdap coverage is high, and MCV4 uptake is improving. However, HPV uptake remains stagnant, missed opportunities remain high, and there is poor catch-up over time, leaving adolescents vulnerable to HPV infection. Efforts to increase adolescent vaccination reduced missed opportunities for MCV4 but did not do much to improve HPV vaccination coverage. Moving forward, BOI will stress the importance of reducing missed opportunities to providers and will promote HPV vaccine education among parents.
Abstract #: 1-17

Effects of an Integrated Pest Management Intervention on Asthma Health Outcomes for Children (0-17 Years) Enrolled in an Asthma Management Program

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Asthma remains a burden for NYC children with 14% of the population under the age of 12 reported to have ever have been diagnosed with asthma in 2009. Children living in the poorest NYC neighborhoods were almost twice as likely to be affected by asthma as were their wealthier counterparts (i). From 2008 to 2012, 635 families received IPM services and 163 families were also enrolled in the EHACE program.

Generalized estimating population (GEE) was used to analyze all study data by assuming a binomial distribution of day and night time symptoms in 14 days and 30 days respectively. Chi-square test for significance was conducted on families by environmental exposures, level of treatment provided, housing and demographic indicators.

Of all families receiving environmental interventions, enrollment in EHACE was significantly associated with visible mold exposure and having other building maintenance issues, as well as having a bedroom treatment provided. Public housing was significantly associated with having other maintenance issues, visible mold and bedroom treatment. Over time, visible mold exposure and living in public housing were significantly associated with probability of symptom free nights. Bedroom treatment significantly modified the time trend of probability of symptom free days and weakly modified the time trend of the probability of symptom free nights. Time trends for the probability of symptom free days and nights were marginally different among families that received IPM intervention and those that did not but significantly different between those that received mold remediation services and those that did not.

Targeted environmental interventions coupled with intensive case management can be effective for symptom control for children with persistent asthma. The EHACE asthma management program should address persistent environmental issues and provide IPM and mold remediation services to all families with environmental exposures especially clients living in public housing.

Abstract #: 1-18

Translation of Depression from Mother to Child via Epigenetic Modification of SLC6A4 in Cord Blood

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As a growing concern in healthcare, depression during pregnancy has been linked to suboptimal fetal development. Previous research has provided evidence that an adverse intrauterine environment, due to maternal stressful life events, has significant ramifications on childhood development and adult disease. This study set out to investigate a biological pathway through which maternal depression during pregnancy effects the neurobehavioral development of the fetus, focusing on the SLC6A4 gene which contains the genetic code for serotonin reuptake transporters in the brain. A sample of 44 pregnant women, who received prenatal care at Mount Sinai Medical Center in New York City from 2010-2012 were followed throughout pregnancy until 6 months postpartum, when neurobehavioral profiles of the children, as measured by infant temperament, were assessed. We observed hypomethylation of the SLC6A4 gene in cord blood, and increased levels of sadness in infants born to depressed mothers, compared with infants born to non-depressed mothers. The mechanistic implication illustrated by this study provides evidence to an approach that can help identify “at risk” patients. Utilizing these findings to design necessary early intervention strategies for these children, will play a key role in promoting their long term development. Further investigation is required to design intervention strategies to reverse the effects of epigenetic changes caused by an adverse intrauterine environment, while minimizing any risks for the mother and child.
Genetically Predicted Estradiol and Systemic Inflammation in Women: A Separate-Sample Mendelian Randomization Analysis in the Guangzhou Biobank Cohort Study

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Background: Many complex, chronic diseases are characterized by low-grade systemic inflammation. Estrogens may promote immune response; consistent with sex-specific patterns of diseases. In vitro culture and animal experiments suggest estrogens are anti-inflammatory and might thereby protect against low-grade systemic inflammation. Evidence from epidemiological studies is limited. Using a Mendelian randomization analysis with a separate-sample instrumental variable (SSIV) estimator, we examined the association of 17β-estradiol with well-established markers of systemic inflammation (total white blood cell, granulocyte and lymphocyte count).

Methods: A genetic score predicting 17β-estradiol was developed in 237 young Chinese women (university students) from Hong Kong based on a parsimonious set of genetic polymorphisms in ESR1 (rs2175898) and CYP19A1 (rs1008805). Multivariable linear regression was used to examine the association of genetically predicted 17β-estradiol with systemic inflammatory markers among 3,096 older (50+ years) Chinese women from the Guangzhou Biobank Cohort Study.

Results: Predicted 17β-estradiol was negatively associated with white blood cell count (-6.3 10³/mL, 95% confidence interval (CI) -11.4 to -1.3) and granulocyte count (-4.5 10³/mL, 95% CI -8.5 to -0.4) but not lymphocyte count (-1.5 10³/mL, 95% CI -3.4 to 0.4) adjusted for age only. Results were similar further adjusted for education, smoking status, use of alcohol, physical activity, body mass index, waist-hip ratio, age of menarche, age at first pregnancy and age at menopause.

Conclusion: Endogenous 17β-estradiol reduced markers of low-grade systemic inflammation (white blood cell and granulocyte count), consistent with experimental and ecological evidence of 17β-estradiol promoting immune response. Replication in a larger sample is required.
Abstract #: 1-20

Vulnerability to Diabetes in Asians: an Age-Period-Cohort Analysis

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Background: Asian populations often have high rates of diabetes mellitus despite a relatively non-obese population. Muscle mass is a sink for glucose disposal and potentially protective. Experimental evidence from randomized controlled trials indicates that muscle mass is environmentally driven and that increasing muscle mass improves glucose metabolism. Peak muscle mass is achieved in late adolescence. Given the rapid economic development in Asia most Asians grew up in very limited living conditions and tend to have low muscle mass. We assessed whether the first generation with late adolescence in a more economically developed environment had a lower risk of diabetes.

Methods: We used deaths from diabetes mellitus and population figures from 1976-2010 in an Asian setting (Hong Kong) with a well characterized population history and recent economic development. We fitted age-period-cohort models to decompose mortality rates into age, period and cohort effects.

Results: The risk of death from diabetes fell for the first generation (births in the early 1930s) with late adolescence in less limited living conditions, but the risk rose again for the first generation (birth 1960s) affected by the obesity epidemic. Notably the risk of diabetes was unchanged for the first generation born into less limited living conditions.

Conclusions: Adiposity undoubtedly contributes to diabetes in Asian settings, as elsewhere, however current vulnerability of many older Asians to diabetes in plentiful environments may be the result of very limited living conditions until early adulthood which precluded the growth of substantial muscle mass. Interventions that focus on muscle mass, throughout life, and particularly in adolescence, might be a useful adjunct to adiposity focused interventions for diabetes prevention in Asians.
Abstract #: 1-21
Understanding and Implementing Screening Programs in Low Resource Settings - International Collaboration on Establishing Lead Screening in Rural India

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Purpose: Lead is a toxic heavy metal with proven association with irreversible neurological damage in young children, resulting in reduced IQ, developmental disorders, even at very low levels in the blood. As per the 2004 data from the world health organization, blood lead levels (BLL) above the CDC reference level of 5 mcg/dl in children 15 years and less, is way more in low and middle income developing countries (74% in South East Asia) than only about 5% in high income countries.

Data/methods: A pilot study, based in north western India was conducted in the urban setup of Jaipur city. Health awareness camps were conducted, and blood samples of 61 children from 0-16 years, of which 37 were suffering from developmental delays, was collected to quantify for BLL, using the electrochemical sensor Lead Care II Test kit.

Results: Mean crude BLL of 8.1mcg/dl with a stratification of 7mcg/dl for the diseased and 10.4mcg/dl for the healthy kids was observed. Increased prevalence of hyperactivity and early reversal of milestones in children with elevated BLL suffering from Autism was observed.

Recommendations: Alarming prevalence of elevated BLL, in the post lead-free gasoline era, was congruent with other studies conducted in different parts of India. Hence, a meta-analysis of prevalence of elevated BLL in India is required. Policy recommendations are to put together a series of early lead screening program for children, to check for the toxic heavy metal.
**Abstract #: 1-22**

**For How Long is WTC Exposure Associated with Incident Airway Obstruction?**

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**Background:** Adverse respiratory effects of exposure to the WTC disaster site have been widely documented and have shown consistent dose-response relationships. This study compares the number and timing of new cases of chronic OAD in highly-exposed versus lesser-exposed firefighters.

**Methods:** Chronic OAD was diagnosed by Fire Department of the City of New York (FDNY) physicians at treatment visits, with onset considered to be the first date of diagnosis. Exposure was categorized by WTC arrival time: (High) Morning 9/11/2001 (n=1,451); (Moderate) Afternoon 9/11/2001 or 9/12/2001 (n=6,506); (Low) 9/13-24/2001 (n=1,083). We modeled relative rates of incidence with respect to exposure intensity over the first five years post-9/11/2001. We estimated the time(s) of changes in the relative rates using change point models using goodness of fit (profile likelihood). Models were adjusted for age on 9/11/01, smoking history, retirement status, and seasonality.

**Results:** A change point in the relative rate was observed at 15 months post-9/11/2001. The relative rate for the high versus low exposure group was 3.90 (95% CI 2.49-6.10) prior to the change point and 1.79 (1.28-2.48) after the change point. The test for trend of a change in relative rate over time and going from low to high exposure was significant at p≤0.0007. Similar results were found for sensitivity analyses on incident asthma and incident chronic bronchitis/COPD.

**Conclusions:** Incident OAD is associated with WTC exposure for at least five years post 9/11. Among rescue/recovery workers at WTC, there was higher rates of new-onset OAD among the most highly-exposed during the first 15-months, but continued to be higher among highly-exposed than among lesser-exposed firefighters throughout at least the first five post-9/11/2001 years. This difference in new OAD occurred despite full and free access to healthcare throughout this time period. These results demonstrate the persistence of WTC-associated risk of even late-emerging OAD.
Abstract #: 1-23

Sarcoid Arthritis In World Trade Center Exposed New York City Firefighters Presenting as a Unique Clinical Subset

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Background: Sarcoidosis is a multisystem disease characterized by the formation of non-caseating granulomas with lungs being predominantly affected and the joints in up to 40%. Acute joint manifestations occur in 25-40% of patients and are often self-limited with only 1-4% of patients developing a more chronic arthritis, requiring more aggressive therapy, due to persistence or progression. We previously reported an increased incidence of sarcoidosis among Fire Department of the City of New York (FDNY) firefighters prior to 9/11/01 and an even higher incidence after World Trade Center (WTC) exposure. We now describe a series of FDNY firefighters who developed sarcoidosis following WTC rescue/recovery work with severe chronic polyarthritis as a significant component of their disease.

Methods: All FDNY WTC-exposed firefighters with polyarticular sarcoidosis are followed jointly by the WTC Health Program at FDNY and the Rheumatology Division at the Hospital for Special Surgery (HSS). Patient demographics, WTC-exposure information, smoking status, date of diagnosis, and pulmonary findings were obtained from FDNY’s WTC database. Joint findings (symptoms, duration, distribution of joints involved, treatments, and response) were obtained from HSS chart review.

Results: 11 male firefighters developed polyarticular arthritis after WTC-exposure; 2 had been diagnosed with sarcoidosis pre-9/11/01. All were never smokers and arrived at the WTC-site within 2 weeks after 9/11/01. Their median age was 37.7 years (IQR = 31.6-40.8), with a median of 6.9 years (IQR=4.4-13.2) of FDNY firefighting service pre-9/11/01. All had biopsy-proven pulmonary sarcoidosis, 9 by transbronchial or mediastinal lymph node biopsy, 1 by liver and bone biopsy and 1 by Kveim testing. All had normal pulmonary function tests at presentation. Duration from WTC-exposure to diagnosis of pulmonary sarcoidosis was 7.7 years (IQR=5.8-9.5). Polyarticular arthritis was part of the initial presentation in 9 patients who developed sarcoidosis post-9/11/01. In 2 patients with pre-9/11/01 sarcoidosis, polyarticular arthritis occurred after WTC exposure, 5 and 10 years after their initial diagnosis. Polyarthritis was symmetrical, involving large joints (n=1), small and large joints (n=10) and ankles (n=10). All had normal ESR and CRP; negative anti-CCP and Quantiferon or PPD. Only one had a positive RF and all but two had normal ACE levels. All required additional disease modifying agents for steroid sparing (stepwise progression from hydroxychloroquine->methotrexate->TNF-blocking agent). Adequate disease control was obtained with hydroxychloroquine (n=1); methotrexate (n=3); and anti-TNF agents (n=6).

Conclusions: Chronic polyarthritis appears to be an important manifestation of sarcoidosis in FDNY firefighters with sarcoidosis and WTC-exposure. Their arthritis appears to be chronic and most have not responded adequately to oral DMARDs, generally necessitating the addition of anti-TNF agents. Further studies are needed in order to determine the generalizability of these findings to other groups with varying levels of WTC-exposure or with non-WTC environmental/occupational exposures.
Abstract #: 1-24

Inflammatory Myositis-Increased Incidence in Fire Department Of New York Firefighters After World Trade Center Exposure

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Background: Inflammatory myositis (IM) is extremely rare in white middle-aged males. Incidence rates in males ranging from 0.25 to 5 per million. We describe a series of Fire Department of the City of New York (FDNY) firefighters who developed IM following World Trade Center (WTC) exposures.

Methods: FDNY WTC-exposed firefighters with IM are followed jointly by the WTC Health Program at FDNY and the Rheumatology Division at the New York University, School of Medicine. Patient demographics, WTC-exposure information, smoking status, diagnoses (including date of diagnosis), and pulmonary findings were obtained from FDNY’s WTC database. Findings (symptoms, duration, muscles involved, treatments, and response) were obtained from chart review.

Results: Seven firefighters developed IM after WTC-exposure. Duration from WTC-exposure to IM diagnosis was 4.6 years (IQR=1.5-6.2). The average annual incidence rate was 9.2 per million. No cases had been reported at FDNY prior to 9/11/01 (15 year prior database search). All were white males who arrived at the WTC-site within two weeks after 9/11/01. Three cases are never smokers, while four cases are ever-smokers. None had a family history of IM or autoimmune disease. Their median age on 9/11/01 was 45.5 years (IQR 43.2-55.6), with a median of 20 years (IQR=15.8-31.0) of FDNY firefighting service pre-9/11/01. All presented with bilateral proximal muscle weakness and pain most noticeable in the pelvic girdle and quadriceps, and elevated creatine kinase. None had skin involvement; one patient developed interstitial lung disease (anti-Jo antibodies) and died two years after lung transplantation; and one patient had inclusion body myositis (IBM) on muscle biopsy. All but two patients responded to corticosteroids and methotrexate with dramatic improvement and one patient had complete resolution without need for maintenance medication. Two patients (one with anti-Jo antibodies and one with IBM) required monthly intravenous immunoglobulin.
Abstract #: 1-25

Characterizing Bicyclist Injuries and Helmet Utility Within A Congested Urban Setting

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Background: In 2012 alone, 15,882 bicyclists were injured in the United States. Although mortality remains low (0.8%), the frequency of non-fatal injuries in the bicyclist population persists as a significant public health concern. Over the last five years, bicycling in NYC has increased by nearly 60% and will continue to rise as the largest bicycle sharing system in North America was implemented in May, 2013. This study aims to better delineate the demographics, reason for cycling, injuries, hospital resource use, and outcomes of injured bicyclists in NYC. A secondary objective is to assess helmet use, behavior patterns, and outcomes based on helmeted status in injured bicyclists.

Methods: A prospective hospital-based observational study of injured bicyclists presenting to Bellevue Hospital – a Level I regional trauma center – was performed. All injured bicyclists presenting within 24h of injury, regardless of age, mechanism or admission, were included. Data were collected between 2/1/2012 and 8/31/2013 by interviewing patients, supplemented with imaging (e.g. computed tomography (CT)) and outcomes variables. Variables collected included patient demographics, behavior patterns, helmet use, vehicle-related data, Glasgow Coma Scale (GCS), Injury Severity Score (ISS), and outcomes data.

Results: 475 bicyclists met inclusion criteria. 378 (80%) were men and a majority (64.9%) were between the ages of 18 and 39 years. Most bicyclist injuries involved collision with a motor vehicle; the mechanisms of injury varied based on reason for cycling (e.g. working, commuting, or leisure-riding) (p=0.000). Of those injuries involving motor vehicles, yellow taxicabs were most commonly involved (34.3%), followed by compact cars (24.6%), and sport utility vehicles (12.7%). 39.4% of injured bicyclists wore helmets. Gender, age, and ethnic differences were identified based on helmet status; un-helmeted bicyclists were proportionally more likely to be men (p=0.013) and of Latino heritage (p=0.004). Un-helmeted bicyclists were more likely to be crossing against the traffic signal (p=0.017) or to have used alcohol at time of injury (p=0.010). Un-helmeted bicyclists were more likely to undergo CT head, CT c-spine (p=0.023), and CT abdomen/pelvis (p=0.022). Un-helmeted bicyclists had a lower mean GCS (p=0.003). Mean ISS did not differ based on helmet status (p=0.952), but un-helmeted bicyclists were more likely to sustain critical injuries (p=0.000) and more significant head injuries (p=0.030) based on ISS and head AIS respectively. There was no mortality difference based on helmet use.

Conclusions: Within a congested urban setting, most bicyclist injuries involve collisions with motor vehicles. Helmet use is an indicator of safer riding behaviors, although most injured bicyclists do not wear them. Helmets protect against severe traumatic brain injury even within low-speed environments such as NYC. Helmet use is associated with reduced resource utilization in the form of costly CT-imaging. Injured bicyclists who fail to wear helmets must be targeted for educational programs.
Abstract #: 1-26

Understanding Patterns of Pedestrian Traffic Fatalities in New York City, 2009-2011

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Background/Purpose: While traffic fatalities in New York City (NYC) have declined nearly 25% in the last decade, reaching an all-time low, they remain a public health threat, particularly for certain groups. Pedestrians are vulnerable road users in NYC, accounting for more than half of all traffic fatalities (55%). This figure stands in contrast to the national statistic – 20%. Further investigation and understanding of traffic fatalities in NYC is required to reduce injury risk among pedestrians. Active surveillance through file review at the Office of Chief Medical Examiner (OCME) allowed for the collection of information from toxicology reports, including alcohol and drugs, on the victims of fatal crashes. Such information is an essential supplement to administrative traffic crash reports that detail most other crash circumstances.

Methods: Pedestrian fatalities for 2009-2011 were identified using the International Classification of Diseases, 10th revision (ICD-10) by the NYC Department of Health and Mental Hygiene (DOHMH), Bureau of Vital Statistics. Using a detailed abstraction form and following standardized coding practices, researchers reviewed OCME files for these pedestrian fatalities. Information was abstracted from the narrative reports and interviews conducted by the medico-legal officers at the OCME. Data from administrative police crash reports were also used to provide a more comprehensive summary of the circumstances surrounding these fatalities.

Results/Outcomes: Between 2009 and 2011, 457 pedestrian fatalities occurred in NYC. Data suggest gender, age, and racial differences among pedestrian fatalities. Although males account for 48% of NYC’s population, they accounted for 62% of all pedestrian fatalities. Similarly, although older adults (aged 65 years and older) make up 13% of the city’s population, seniors accounted for 35% of all pedestrian fatalities. Non-Hispanic blacks account for 23% of NYC, but 38% of all pedestrian fatalities. The most frequent crash situation was pedestrians crossing at a crosswalk against the signal (18%). Eighty-one percent of decedents had valid toxicology results. Among those, 20% tested positive for alcohol. Half of all alcohol-related pedestrian fatalities occurred between midnight and 6AM, and a quarter involved crossing against the signal.

Conclusions: Overall, this review noted significant age, gender, and racial differences among pedestrian fatalities in NYC. Supplementing death data with more detailed information from the OCME and police reports enabled identification of high nighttime risk of pedestrian fatalities and a possible role of alcohol use in the pedestrian victims. These findings warrant further investigation to understand the role of alcohol use by pedestrians.
Abstract #: 1-27

Effect of an Office Ergonomic Intervention among Workers with Neck and Upper Extremity Pain

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Background: Office workers using computer keyboards and mice are at increased risk for neck/upper extremity (UE) musculoskeletal pain.

Methods: A seven-month office ergonomic intervention study evaluated the effect of two engineering controls with training on neck/UE pain and ergonomic exposures among 109 workers employed in a state government. Participants were randomized to receive a “major” intervention (adjustable keyboard/mouse tray, touch pad pointing device for the non-dominant hand, training, and keyboard shortcuts), or a “minor” intervention (keyboard shortcuts). A traditional mouse continued to be used with the dominant hand. Outcome measures were a verbal pain severity scale obtained for proximal and distal upper extremities, a modified version of the Computer Rapid Limb Upper Assessment (RULA), and Hand Activity Level (HAL).

Results: Relative Risks (RR) of the intervention group relative to the control group were used to evaluate post-intervention effects. Small decreases in pain severity were observed in the dominant UE for the group who received the major intervention (proximal UE RR=0.8, 95% CI=0.3-1.8, distal UE RR=0.8, 95% CI=0.3-2.4), while pain severity increased in the non-dominant extremity (proximal RR=1.4, 95% CI=0.5-3.7, distal RR=1.9, 95% CI=0.4-8.0). The group who received the major intervention had significant reductions in RRs (40%-80%) for non-neutral postures in all modified RULA elements. Hand activity on the dominant side also decreased (RR=0.8, 95% CI=0.7-1.0), while there was a significant increase in hand activity on the non-dominant side (RR=1.6, 95% CI=1.2-2.1).

Conclusion: An adjustable keyboard/mouse tray combined with a touch pad for the non-dominant hand may reduce pain in the dominant extremity but increase hand activity and pain in the non-dominant extremity. To achieve reductions in pain in both extremities, limit the number of programmable features of a touch pad to three.
Abstract #: 1-28

Subtle Neurocognitive Effects Associated with Blood Concentrations of Common Volatile Organic Compounds in US Adults

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Background: While exposure to multiple volatile organic compounds (VOCs) is ubiquitous, the neurobehavioral health effects of VOCs among the general population are not well studied.

Objective: To test the hypothesis that environmental exposure to a mixture of common VOCs is associated with cognitive impairment.

Methods: The study cohort consisted of 497 participants (aged 20-59) from the third National Health and Nutrition Examination Survey (NHANES III, 1988-1994) who had valid blood concentrations of VOCs and neurocognitive health measures. Cognition outcomes were indicated by four scores from three neurocognitive tests: the simple reaction time test (SRTT, for visual motor speed), the symbol-digit substitution test (SDST, for attention/perception), and the serial digit learning test (SDLT, for learning recall and short-term memory), which had a total-error-score (SDLTts) and a trials-to-criterion score (SDLTcr). We grouped 12 common (detected in >50% of the valid samples) VOCs into 4 principal components (PCs), where PC1 included benzene, toluene, ethylbenzene, m-/p-xylene, o-xylene, and styrene (BTEXS); PC2 had 2-butanone and acetone; PC3 included chloroform and tetrachloroethene; and PC4 included 1,1,1-trichloroethane and 1,4-dichlorobenzene. Individual VOC species were summed within the component. Thus, there were a total of 16 indicators of VOC exposures. We fit quantile regression and logistic models to estimate VOC-cognition associations with and without adjusting for relevant covariates (e.g. demographics, chronic disease status, and personal behavioral factors). Models were fit with one VOC indicator at a time, and effects of multiple-VOC exposure were summarized with the DerSimonian and Laird’s random-effects model, a meta-analysis method.

Results: The most consistent significant (p<0.05) associations were between ketones and SDST, where a 1% increase in the VOC concentrations corresponded to a 0.02-0.04% (n=399-465) decrement in SDST performance. Other significant associations seen in both crude and adjusted models were 1) from meta-analytical results: increase in BTEXs exposure (PC1 compounds) was associated with improved SRTT performance, and increase in PC3 VOCs was associated with worse SRTT performance but with better SDLTts outcomes; and 2) from individual VOC-cognition pairs: positive associations (i.e. adverse effects of VOCs on neurocognitive performance) were seen in tetrachloroethene-SRTT; while negative associations were seen in o-xylene-SRTT, styrene-SRTT, tetrachloroethene-SDLTts, and 1,1,1-trichloroethane-SDLTcr. Meta-analytical findings from all sixteen VOC indicators showed that elevated blood VOC concentrations were associated with worse SDST performance ($\beta_{crude}=0.013$, 95% CI: 0.008,0.018), while associated with better SDLTcr outcome (odds ratio or OR$_{adjusted}=0.93$, 95%CI: 0.86,0.99).

Conclusions: The consistent associations between exposure to ketones and SDST performance suggested potential subtle adverse neurocognitive effects of ketones exposure at levels that were typical among the US general population. However, further research is needed to clarify the VOC-cognition associations as our analyses showed that VOC exposures were subtly associated with both reduced and increased neurocognitive performance depending on specific VOC species measured and cognitive tests performed.
Abstract #: 1-29


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Background: Data on New York City (NYC) fatal occupational injuries are collected through the Census of Fatal Occupational Injuries (CFOI). The program began in 1992 and is administered by the US Bureau of Labor Statistics in conjunction with participating state and local agencies, such as the NYC Department of Health and Mental Hygiene. The program collects, compiles, and analyzes fatal occupational injury data and produces annual summary reports. CFOI data provide a foundation for occupational fatality prevention. Stakeholders, such as OSHA, union and trade organizations, and safety equipment managers use CFOI data to identify fatal workplace conditions and enact policies to prevent occupational fatality. For example, as of 1994, the NYC Taxi and Limousine Commission has required all taxis to be equipped with safety partitions or, as of 2000, in-vehicle security cameras.1,2

Methods: A CFOI researcher reviewed death certificates, medical examiner reports, Occupational Safety and Health Administration reports, newspaper articles, and other media reports to identify fatal occupational injuries. Identified cases confirmed via two sources are included in the data set. Fatal occupational injuries are defined as fatal injuries that occur while on an employer’s premise or while a decedent is on work duty but off-premises. We evaluated the distribution of NYC fatal occupational injuries overall and by sex, event (i.e., homicide), and occupation using CFOI data from 1992 – 2011. We evaluated the distribution by race starting with 2000, the first year specific non-Hispanic white and non-Hispanic black categories were published. We restricted analyses to decedents who were injured in NYC.

Results: Of the 187 fatal occupational injuries in 1992, almost all decedents were male (94%, n=176). The most frequent occupations were taxi driver (20%, n=38) and grocery store worker (13%, n=25). The leading event was homicide (64%, n=119).

In 2000, decedents were Hispanic (35%, n=39), followed by non-Hispanic white (28%, n=31), non-Hispanic black (19%, n=21), and Asian/Pacific Islander (17%, n=19).

Fatal occupational injuries decreased to 72 in 2011, mainly due to a decrease in homicides, which fell to 22% (n=16), yet remained the leading event. Homicides declined 74% overall in NYC from 1991 – 2011.3 In 2011 decedents were mostly male (92%, n=66); 42% (n=30) were non-Hispanic white, 25% (n=18) were non-Hispanic black, 24% (n=17) were Hispanic, and 10% (n=7) were Asian/Pacific Islander. The leading occupation was construction worker (25%, n=18). Deaths of taxi drivers and grocery store workers declined to < 5 each. Due to small numbers, exact numbers are not published.

Conclusion: In NYC, fatal occupational injuries decreased since 1992, largely driven by a decline in homicides. Homicide remained the leading event in 2011, while construction workers had the highest risk of death. Further monitoring and action is needed to prevent fatal occupational injuries among construction workers.

References:

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Social Integration Buffers Stress in New York Police After the 9/11 Terrorist Attack

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Introduction: Being socially integrated is regarded as a protective factor enabling people to cope with adversity. The stress-buffering effect of social integration reflects an interaction between stress and a social coping resource factor on subsequent outcomes.

Methods: The present study examines whether such an effect is found among New York police officers who responded to the 9/11 terrorist attack on the World Trade Center (WTC). The WTC Health Registry is a large longitudinal database on the health of people affected by the attack and its aftermath, including 2,940 police officers that completed surveys in 2003-2004 (Wave 1) and 2006-2008 (Wave 2). The research aims at identifying social integration as a beneficial resource factor accounting for less severe stress responses in those more socially involved. A moderated mediation model was specified using the PROCESS macro by Hayes that uses event exposure as a distal predictor, earlier stress response as a mediator, and later stress response as an outcome, and social integration as a putative moderator of this mediating relationship.

Results: The mediation hypothesis was confirmed, and moderation occurred at two stages. First, there was a multiplicative relationship between exposure levels and social integration: the higher the exposure level, the more stress responses (main effect) occur, but this effect is buffered by a high level of social integration (interaction effect). Second, Wave 1 stress interacted with social integration on Wave 2 stress: the more the police officers were socially integrated at Wave 2, the lower the Wave 2 stress (main effect), in a synergistic manner (interaction effect).

Conclusion: This study showed that social integration among NY police officers who responded to 9/11 led to less severe stress responses. The findings contribute to the understanding of mediating and moderating mechanisms that result in health outcomes such as posttraumatic stress disorder or resilience.
Abstract #: 1-31

**Association Between Arsenic Exposure From Drinking Water or Urine and Blood Pressure Change: Result from the Health Effects of Arsenic Longitudinal Study**

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**Background:** Cross-sectional studies have shown associations of arsenic exposure and prevalence of hypertension. However, no study has examined the relationship of arsenic exposure and longitudinal change of blood pressure.

**Method:** We evaluated the association of arsenic exposure from drinking water or urine and longitudinal change of blood pressure in 10,853 participants in the Health Effects of Arsenic Longitudinal Study (HEALS), with a median of 6.7 years of follow-up. Arsenic exposure was measured in well water and in urine samples at baseline and every two years since baseline. Mixed effect models were used to estimate the association of baseline well and urinary arsenic with annual change in blood pressure over years of follow-up, as well as the association of visit-to-visit changes in well and urinary arsenic with visit-to-visit change of blood pressure.

**Result:** Every 100 µg/L difference in baseline water arsenic was significantly associated with a greater annual increase of 0.1 (95% CI 0.06-0.14) mmHg/year in SBP and 0.08 (95% CI 0.05-0.11) mmHg/year in DBP. Similarly, for every 200 µg/g difference of creatinine-adjusted urinary arsenic, SBP and DBP raised 0.05 (95% CI 0.02-0.08) mmHg/year and 0.06 (95% CI 0.04-0.08) mmHg/year greater, respectively. Stratified analyses showed that the positive association between baseline water arsenic and annual SBP or DBP change was stronger in never smokers than ever smokers (P for interaction =0.037 for DBP). However, there was no apparent association between visit-to-visit change of either water arsenic or urinary arsenic and visit-to-visit change in SBP or DBP.

**Conclusion:** The findings suggest that arsenic exposure at baseline plays a role in the elevation of blood pressure over time. The effect of arsenic on blood pressure may remain latent and effects of intervention efforts in an arsenic-exposed population may not be immediately apparent, particularly for blood pressure.
Abstract #: 1-32

Reporting and Case Management of Bloodborne Pathogen Exposures Among Health Care Workers in Tanzania

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Introduction: In sub-Saharan Africa, bloodborne pathogens exposure (BPE) is a serious risk to health care workers (HCW). Reporting BPE is necessary for effective post-exposure prophylaxis (PEP), an important element of workplace safety in health facilities. Limited data are available on factors associated with BPE reporting among HCW.

Methods: We conducted a cross-sectional study assessing experiences of occupational BPE, history of BPE reporting, and use of PEP among health care workers at three public hospitals in Tanzania. From August to November 2012, HCW were interviewed using Audio-Computer Assisted Self-Interview. All HCW at risk for BPE were invited to participate. Factors associated with reporting BPE were identified using logistic regression.

Results: Of the 1,102 eligible HCW, 973 (88%) completed the interview. Of these, 690 (71%) were female and 387 (40%) were nurses. Of 357 HCW who had a BPE in the past 6 months, 120 (34%) reported it. Among these 120 reported exposures, 93 (78%) HCW reported within 2 hours of exposure, 98 (82%) received pre- and post-HIV test counseling, and 70 (58%) were offered PEP; 68 (97%) of these 70 HCWs completed PEP. Independent risk factors associated with reporting BPE were being female (adjusted odds ratio (AOR)=2.0 [95% confidence interval (CI) 1.2-3.5), having ever-received BPE training (AOR=2.0, CI 1.2-3.5), knowledge that HCW receive PEP at another facility (AOR=2.6, CI 1.5-4.4) and HIV testing within the past year (AOR=2.3, CI 1.2-4.4).

Conclusion: Despite the significant proportion of HCW with a recent BPE, only one in three reported it. Our results highlight the importance of appropriate and continuous training on the prevention and reporting of occupational exposures to increase acceptance of HIV testing after BPE.
Abstract #: 1-33

Interaction Between Arsenic Exposure From Drinking Water and Genetic Susceptibility in Cardiovascular Disease Risk and Carotid Artery Intima-Media Thickness in Bangladesh

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Background: Epidemiologic data on genetic susceptibility to cardiovascular effects of arsenic exposure from drinking water are limited.

Methods: We conducted 1) a case-cohort study of 447 incident fatal and nonfatal cases of CVD, including 238 cases of coronary heart disease (CHD) and 165 stroke cases, and a subcohort of 1,375 subjects randomly selected from the Health Effects of Arsenic Longitudinal Study (HEALS) in Bangladesh, and 2) a cross-sectional study of 1,078 participants in the subcohort, to evaluate whether the association of arsenic exposure with CVD risk and carotid intima-media thickness (cIMT) differs by 360 single-nucleotide polymorphisms (SNPs) in 18 genes related to arsenic metabolism, oxidative stress, inflammation, and endothelial dysfunction.

Results: The multiplicative interactions between well-water arsenic and two SNPs, rs281432 in ICAM1 (P_adj = 0.0002) and rs3176867 in VCAM1 (P_adj = 0.035), in CVD risk, were significant after adjustment for multiple testing. The adjusted hazard ratio (HR) for CVD was 1.82 [95% confidence interval (CI): 1.31, 2.54] for the joint presence of a 1-standard-deviation (SD) increase in well-water arsenic (101.3 µg/L) and the GG genotype of rs281432, and was 1.34 (95% CI: 0.95, 1.87) for the joint presence of a 1-SD increase in well-water arsenic and the CC genotype of rs3176867. These associations were similar for stroke risk but weaker for CHD risk. We also found that the AA genotype of NOS3 rs2853792 and the GG genotype of SOD2 rs5746088 were significantly related to a reduced risk of CVD and CHD, and that the CC genotype of MTHFR rs1801133 was related to a significantly increased risk of stroke. On the other hand, whereas MTHFR rs1801133 was related to a significantly increased risk of stroke. On the other hand, although not significant after correcting for multiple testing, nine SNPs in APOE, AS3MT, PNP, and TNF genes had a nominally significant interaction with well-water arsenic in cIMT. For instance, the joint presence of a higher level of well-water arsenic (≥ 40.4 µg/L) and the GG genotype of AS3MT rs3740392 was associated with a difference of 40.9 µm (95% CI: 14.4, 67.5) in cIMT, much greater than the difference of cIMT associated with the genotype alone (β = -5.1 µm, 95% CI: -31.6, 21.3) or arsenic exposure alone (β = 7.2 µm, 95% CI: -3.1, 17.5). The pattern and magnitude of the interactions were similar when urinary arsenic was considered as the exposure variable. Additionally, the at-risk genotypes of the AS3MT SNPs were positively related to percentage of monomethylarsonic acid (MMA) in urine, which is indicative of arsenic methylation capacity.

Conclusions: The findings provide novel evidence that genetic variants related to endothelial dysfunction may modify the risk of CVD associated with arsenic exposure whereas genetic variants involved in arsenic metabolism may play a more important role in arsenic-induced subclinical atherosclerosis.
Abstract #: 1-34

Air Pollution and Cardiovascular Disease Early Markers and Mortality: Does Lifestyle Modify the Effect of Particulate Matter?

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Background: There is a growing body of evidence to support the association between exposure to outdoor particulate air pollution and cardiovascular disease (CVD). Systemic inflammation is thought to be a major mechanistic pathway by which exposure to particulate matter (PM) contributes to CVD, however the epidemiologic evidence is limited and not entirely consistent. We sought to determine whether outdoor PM is associated with mortality and early markers of CVD in the Third National Health and Nutrition Examination Survey (NHANES III). We additionally sought to determine whether lifestyle factors modify the association between PM and early CVD biomarkers.

Methods: This study was based on 20,050 men and women who participated in the NHANES III survey in 1988-1994 (age range 17-90 years). Subjects were followed for mortality through December 31, 2006 by linking with death certificate records from the National Death Index. Exposures to particulate matter smaller than 10 microns (PM₁₀) were derived from the US Environmental Protection Agency’s Air Quality System monitoring sites, using inverse distance weighting of annual average PM₁₀ based on participant residence. Systolic blood pressure (SBP) and serum levels of low (LDL) and high density lipoproteins (HDL) were measured at baseline. Multivariate cox proportional hazards modeling was used to determine the association of interquartile range (IQR) change of PM₁₀ and mortality. Multivariate linear regression was used to estimate the associations between IQR change of PM₁₀ and SBP, LDL, and HDL. CVD biomarker analyses were further stratified by intake level of total fat, saturated fat, and fruits and vegetables, as well as by BMI.

Results: We found a 6% increase in the risk of death per IQR increase in PM₁₀ (HR: 1.06; 95% CI: 1.00-1.14; 2,881 deaths). PM₁₀ was significantly associated with elevated SBP (0.33 mmHg SBP (p=0.007) per IQR increase in PM₁₀) and LDL (1.17 mg/dL LDL (p=0.006)), but not with HDL (p=0.410). For all three biomarkers, the effect of PM₁₀ differed according to BMI categories and intake levels of fruits and vegetables, total fat, and saturated fat (p for interaction <0.05 for all except LDL by fruit/vegetable intake).

Conclusions: Our study based on a large nationally representable US population suggests that air pollution is associated with mortality risk and elevated levels of early CVD biomarkers. Moreover, the effect of PM₁₀ on CVD biomarkers was modified by diet and BMI, indicating that lifestyle factors can confer greater susceptibility to PM-induced CVD.
Automated Processes for Prospectively Detecting Aberrations in Reportable Communicable Disease Data

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Background: The responsibilities of the Bureau of Communicable Disease (BCD) at the New York City Department of Health and Mental Hygiene (DOHMH) include data quality assurance and analysis of surveillance data for >70 reportable infectious diseases. To rapidly detect disease threats and prioritize investigations to prevent or control ongoing transmission given limited staff resources, signals indicating potential disease clusters must be timely and have high positive predictive value. We highlight three automated processes used to prospectively screen >250,000 disease reports received annually from a multitude of laboratories and providers, mostly via electronic reporting.

Methods: (1) To detect disease clusters weekly at citywide, borough, and neighborhood spatial resolutions, we use a modified version of the Historical Limits Method, comparing the number of diagnoses in the prior four weeks with comparable historical data from the prior five years, while accounting for secular trends and aberrations in historical data. When potential clusters are identified, a report is automatically generated and displays a case linelist and a map indicating cases’ residences. (2) To rapidly detect individual health events or clusters among vulnerable populations, we flag disease events where the patient residential address matches (using geocoding, keywords, or fuzzy matching) an address in a list of selected facilities (e.g., nursing homes). (3) To detect failures in electronic laboratory reporting, we identify laboratories with at least ten reports in the prior 0-60 days but zero reports in the prior 0-7 days; analogous approaches are used to identify laboratories with unusual declines in reports of tests for specific diseases.

Results: The output of these automated reports is manually reviewed and routinely prompts follow-up activities to support public health. For example: (1) Accounting for secular trends in historical data using the modified Historical Limits Method has resulted in fewer campylobacteriosis signals and more careful inspection of remaining signals. BCD does not routinely investigate individual campylobacteriosis reports but investigated a signal in June 2013 indicating a potential cluster of 11 campylobacteriosis cases residing in one neighborhood. The investigation identified links to live poultry markets and resulted in health education. (2) Reports screening for laboratory-confirmed influenza among nursing home residents have identified outbreaks that otherwise may have gone unreported to BCD. (3) DOHMH information technology liaisons collaborate with clinical laboratories to resolve technical issues underlying reporting problems.

Conclusions: Automated processes help BCD to monitor data quality and to screen a large volume of disease reports to prioritize investigations. Planned work includes characterizing variability in lags between the date of disease diagnosis and the date of reporting to BCD, applying the space-time permutation scan statistic to improve disease cluster detection across various temporal and geographic resolutions, and more formally evaluating the utility to BCD of screening for disease within individual buildings.
Abstract #: 1-36

Exam-Based Surveys for Evaluating Municipal Health Policy:
New York City Health and Nutrition Examination Survey, 2004 and 2013

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Purpose: Nearly a decade after the first local Health and Nutrition Examination Survey (HANES) was conducted in New York City (NYC), a second NYC HANES was launched in August 2013. Through a health survey, physical exam and biospecimen collection, the study will compare the health of NYC adults at two time periods to help evaluate municipal policy initiatives launched during the interim. It also will serve as a “gold standard” source to test the validity of using a distributed electronic health record (EHR) network for population health surveillance purposes.

Methods: We constructed a rigorous sampling frame of NYC housing employing address-based sampling and a three-stage cluster sample design. For survey questions and biospecimens, we prioritized consistency with 2004 NYC HANES in order to conduct trend analyses. Questions were added to ensure consistency for diagnoses of common chronic conditions such as hypertension and hypercholesterolemia between NYC HANES and the EHR network, including past 12-month use of medication and time since seeing a primary care provider. The PHQ-9 depression diagnostic and severity measure was added to compare depression prevalence in both populations. Physical exam measures height, weight, waist circumference, blood pressure and pulse. Blood, urine and oral rinse specimens are being collected.

Results: Using biomarkers from 2004 and 2013, we will measure the impact of municipal policies implemented since 2004. Cross-sectional findings from the first NYC HANES in 2004 contributed to the launch of several policies that have since been adopted in other jurisdictions in the U.S. and internationally. For example, we found a majority (56.7%) of non-smoking adults in NYC had elevated cotinine levels indicating increased exposure to second-hand smoke, compared with 44.9% of adults nationally (p<.05), despite lower smoking prevalence in NYC than nationally (23.3% vs. 29.7%, p<.05). This evidence helped support laws to make NYC parks, beaches and hospital grounds smoke-free (2006-2011). The high burden of diabetes and impaired fasting glucose (12.5% and 23.5%, respectively), with poor A1c control among those with diagnosed diabetes (45% >7), supported the launch of a Hemoglobin A1c Registry (2007). Cardiovascular results from NYC HANES helped justify structural and policy interventions to promote healthy eating and physical activity, including the decision to remove artificial trans-fatty acids from restaurants (2008). Using biomarker data, NYC trends will be compared to national data from NHANES to account for secular trends. In addition, estimates on key measures of behaviors, clinical services, and disease prevalence and management will be compared to estimates derived from a NYC-based EHR surveillance system being developed, known as the NYC Macroscope, using data from a distributed EHR network serving 1.2 million patients.
Abstract #: 1-37

Monitoring Drug Use and Associated Health Consequences in New York City: A Public Health Surveillance Model

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Objective: To describe the data sources and strategies used to create a surveillance system that detects emerging drug use trends and consequences.

Background: Drug overdose deaths have become the leading cause of injury deaths in the United States, due primarily to increasing rates of overdose deaths involving opioid analgesics. From 2005-2011, the rate of unintentional opioid analgesic overdose deaths increased 65%. Robust surveillance systems are needed to monitor this epidemic.

Methods: The New York City (NYC) system compiles data on the prevalence of opioid analgesic use, patterns of prescribing, morbidity, and mortality. Prevalence is derived from the NYC sample of National Survey on Drug Use and Health. Opioid analgesic prescription information is obtained from the New York State Health Department’s (NYSHD) Prescription Monitoring Program. Additional prescribing data is taken from the Drug Enforcement Administration Automation of Reports and Consolidated Orders System (ARCOS) for pharmacy orders. Data on emergency department visits and hospitalizations are obtained from the NYC Health Department’s (NYCHD) syndromic surveillance system and the NYSHD hospital discharge registry, respectively. Mortality data are taken from the NYCHD Bureau of Vital Statistics, with additional information obtained from the NYC Medical Examiner’s Office. An ongoing qualitative data collection system supplements the quantitative data. The timeliness, granularity, and limitations of each data source are described.

Conclusions: The New York City surveillance system for opioid analgesics is timely and comprehensive. It is useful in responding to the continuing evolution of this epidemic. Local health departments should create similar systems.
To Match or Not to Match: Control Selection Strategies in Cancer Biomarker Discovery Studies

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Background: Biomarker discovery studies commonly match controls to cases on disease risk factors (e.g. smoking status in lung cancer biomarker discovery study), yet ignore this design feature during data analysis to select top marker candidates. It has been proposed that such matching and improper data analysis increases the false positive detection rate in biomarker discovery studies and that anti-matching (e.g. matching an old case to a young control and a young case to an old control) decreases the false positive rate. However, the extent to which matching schemes impact discovery has not been broadly evaluated.

Methods: We assessed the impact of study design on biomarker discovery efficiency using prostate specific antigen (PSA) data (the ‘needle’) from a cohort study of 5,168 men followed up for prostate cancer incidence (n=780, 15.1%) to which we added 10,000 simulated weakly predictive biomarkers (the ‘haystack’). We performed nested case-control analyses (n=100 cases) within this cohort using three control selection strategies, 1000 times per design: controls matched on the risk factors of age and race, controls selected randomly, and controls anti-matched on age and race. We calculated area under the curve (AUC) for receiver operator characteristic (ROC) curves for each biomarker in each study and compared the proportion of studies in which PSA had the highest AUC across study designs (i.e. in which ROC analysis selected the needle as the most predictive marker in the haystack).

Results: In full cohort analyses PSA had the highest AUC, 0.66, while the largest AUC of any simulated marker was 0.57. The unmatched case-control design produced the highest percentage of studies (46%) in which PSA had the highest AUC, followed by the anti-matched (42%) and the matched (39%) designs. In studies for which PSA did not have the largest AUC, the median AUC rank for PSA across studies was significantly higher for non-matched designs than anti-matched and matched designs (median ranks: 9, 11 and 14, respectively). While in this simulation environment the anti-matched design outperformed only the matched design, we also demonstrate mathematically the circumstances (risk factor’s prevalence and association with disease) under which the anti-matched design would also outperform the non-matched design. We further show mathematically that matching of controls to cases on disease risk factors does not, on average, increase probability of selecting the most predictive biomarker across the cohort regardless of the risk factor’s prevalence and association with disease.

Conclusions: Our analyses show that for biomarker discovery studies non-matched designs outperform matched designs and that in some circumstances anti-matching on a risk factor may improve candidate selection performance. Optimally, study design features such as matching should be taken into account during biomarker discovery analyses.
Abstract #: 1-39

Electronic Health Record Surveillance Systems: A New Approach to Chronic Disease Surveillance

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Background: Chronic diseases are leading causes of morbidity and mortality worldwide. Traditional methods of chronic disease surveillance are often costly, implemented infrequently, and are rarely designed to provide local data. New surveillance systems based on data from office-based electronic health records (EHRs) have the potential to significantly increase knowledge of the prevalence and management of chronic conditions at the community level, and are becoming more feasible as EHR use becomes widespread. We seek to contribute to the field of electronic health record surveillance system (EHRSS) development by describing the challenges and design decisions encountered during the development of the NYC Macroscope EHRSS.

Methods: We reviewed the gray and published literature in this rapidly developing field; spoke with key informants from government, industry, and academia; and developed the indicators, procedures, analytic methods and evaluation criteria for the New York City Macroscope EHRSS. In July 2013 we released a 26-page report documenting lessons learned from these planning activities. This poster, which was presented at APHA, summarizes the important governance and methodological issues that must be addressed when developing an EHRSS, and presents the design of the NYC Macrooscope and the methods we will use to validate it.

Results: EHRSS development requires coordinated leadership and alignment of goals, attention to confidentiality, and technological readiness. Methodological considerations include: system design and interoperability among EHR systems; data quality and standardization of data elements; record selection and indicator definitions; and, data reliability, validity, and generalizability.

Discussion: EHRSSs have the potential to provide community level data on chronic disease prevalence and management, but EHRSS development is in its infancy. Our findings contribute to the EHRSS knowledge base and can be used to inform the development of EHRSSs in other jurisdictions.
Abstract #: 1-40

Evaluating the Capacity of New York City’s Syndromic Surveillance System to Track Injuries in Real-Time

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Background: Surveillance for injuries typically involves administrative data systems with an inherent lag-time in data delivery. Syndromic surveillance systems (SSS) provide timely data to identify temporal and geographic clusters to inform rapid response. While existing SSS’s are regularly used for communicable disease detection, there is limited experience with monitoring of non-communicable disease. New York City’s (NYC) SSS archives ED visit data from 49 of 52 qualifying NYC hospitals daily. We aim to evaluate SSS’s capacity to track injuries in near-real time.

Methods: Drawing on conventional injury outcome and mechanism language as well as common misspellings, we developed six injury syndromes in SSS reflecting NYC’s injury prevention priorities. Syndromes were based on injured persons – pedal cyclist, pedestrian, and motor vehicle occupant – and injury mechanisms – fall, firearm, and stabbing. Using the SAS index function, we scanned the free text of SSS’s chief complaint field for expected language constituting each injury syndrome. Syndromes were refined as necessary, then finalized. To evaluate the utility of the syndromes, we compared trends and patterns of the SSS cases to comparable cases in NYC’s administrative ED data from the Statewide Planning and Research Cooperative System (SPARCS). Injury visits in ED SPARCS were identified using International Classification of Diseases, 9th revision, Clinical Modification coding system. SSS and ED SPARCS data from 2008–2010 were used. Temporal injury trends were evaluated by calculating percent change in monthly volume (for 36 months), the Pearson correlation coefficient (r) of the percent change in monthly volume, and the average percent point difference in proportion of volume by time of day. Alignment in demographic patterns was evaluated by calculating the average percent point difference in the two data systems for sex, age, and borough of residence. Spatial patterns were evaluated by calculating injury volume by neighborhood, ranking neighborhoods from highest to lowest volume, and calculating the Spearman rank correlation coefficient (r) for the neighborhoods.

Results: Overall, the six syndromes tracked well with ED SPARCS in regards to temporal, demographic, and spatial trends and patterns. All correlation coefficients were greater than 0.65, indicating moderate-to-strong temporal and spatial correlations between SSS and SPARCS. Average percent point differences were less than 3 across temporal and demographic categories, suggesting similar results from the two data sources.

Conclusions: This evaluation demonstrates SSS’s potential utility for tracking injury in near real-time, ameliorating the lag in data delivery from usual surveillance systems. Applications of SSS injury syndromes might include: tracking falls during severe weather to inform the public about risks and prevention; tracking firearm and stabbing injuries for community-based youth violence prevention programming; and tracking pedal cyclist injuries to monitor injuries potentially related to trends in increased bicycle use.
Abstract #: 1-41

Agreement between Upper Respiratory Diagnoses from Self-Report Questionnaires and Medical Records in an Occupational Health Setting

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Background: The Fire Department of the City of New York (FDNY) World Trade Center (WTC) Health Program monitors the active and retired WTC-exposed workforce annually through physical exams and self-administered health questionnaires.

Methods: We measured sensitivity, specificity, and agreement between rhinosinusitis and GERD (gastroesophageal reflux disease) diagnoses from self-reported questionnaires and medical records during the same 12 month period. Using logistic models, we identified characteristics of those who self-report a diagnosis in the last 12 months that is also reported in the medical record.

Results: Self-reported GERD had good sensitivity (79.6%) and overall agreement (85.8%) between sources. Self-reported rhinosinusitis had lower sensitivity (57.0%), but similar agreement (83.9%) between sources. Results from multivariate analyses show that in those with a GERD or rhinosinusitis diagnosis from FDNY physicians, related symptoms, and medication use are all associated with self-reporting a diagnosis. The highest association was for GERD medication use (OR 9.0).

Conclusion: Sensitivity is good for self-reported GERD and moderate for self-reported rhinosinusitis. Self-reports are especially useful when disease prevalence, health literacy and access to care are high.
Abstract # 1-42

Improving Case Identification of Hepatitis B in Pregnancy through Active Surveillance

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Background: Preventing perinatal hepatitis B (HB) transmission is one of the top priorities in the strategy to eliminate HB infection. Identifying cases of HB in pregnant women through public health surveillance is made possible by mandated screening for HB during pregnancy and case reporting to the New York City (NYC) Department of Health and Mental Hygiene (DOHMH). Each year, the NYC DOHMH identifies 1800-2000 cases through this passive surveillance system.

Methods: A matching methodology and capture-recapture analysis were conducted to evaluate the completeness of reporting of HB in pregnant women to the NYC DOHMH. Cases were HB positive women residing in NYC who delivered live births. Maternal data from Vital Records (VR) for all women who gave birth in NYC between 10/1/2009 and 11/30/2010 was matched to demographic data in the NYC Electronic Clinical Laboratory Reporting System (ECLRS) for all HB laboratory reports with collection dates from 6/1/2006-12/31/2011. The matching algorithm included exact matches on maternal first, middle and last name separately or concatenated, date of birth and address. Probable cases of HB identified in this first match were then matched to confirmed cases in the Perinatal Hepatitis B Surveillance Database (PHBSD); matching was based on \(\geq 3\) corresponding fields for maternal name, date of birth or address and infant date of birth. All probable HB cases that were not found in the PHBSD were investigated through a hospital record review to confirm HB infection during the current pregnancy. The estimated total number of HB cases was calculated using Petersen’s estimate which accounts for cases potentially missed by both datasets.

Results: Matching between the VR and ECLRS datasets identified 745 probable HB cases, of which 609 (82%) were initially found in the PHBSD. Among the remaining 136 probable cases: 80 (59%) were HB negative, 23 (17%) were newly identified HB cases not previously in PHBSD, 15 (11%) were subsequently found in the PHBSD using additional identifiers from the hospital record, 10 (7%) were HB cases but not NYC residents, and for 8 (6%), the HB status could not be determined. The capture-recapture analysis estimated a total of 2120 HB-positive pregnant women, of which 75 (3.5%) cases were not identified by routine PHB surveillance.

Conclusion: Results suggest that NYC PHB surveillance system is highly sensitive. Optimization of the matching algorithm is being performed for future use. Feasibility of conducting ongoing VR-ECLRS matches going forward is being explored to identify cases of HB in pregnant women who may otherwise be missed.
Abstract #: 1-43

Evaluation of Non-response Bias in a Cohort Study of World Trade Center Terrorist Attack Survivors

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The World Trade Center Health Registry (WTCHR) is a longitudinal study that tracks 71,000 enrollees to understand the long term health effects of the September 11 2001 terrorist attack. In 2003-04, 2006-07, and 2011-12, the WTCHR conducted three waves of health surveys. Response rates to the two adult follow-up surveys were 68% and 63% respectively. Falling response rates in follow-up surveys, especially among particular 9/11 populations at risk, pose critical challenges for evaluating associations between 9/11 exposure and health outcomes as well as prevalence estimates of health outcomes.

The objectives of this study are to assess: 1) non-response bias in the prevalence estimates of health outcomes among enrollees at follow-ups, and 2) the extent to which non-response may have affected estimates of association. We focus on two prevalent 9/11-related outcomes of public health importance, recurrent lower respiratory symptoms (LRS) and probable posttraumatic stress disorder (PTSD) as well as self-assessed general health.

We found that individuals who participated in all three surveys were less likely to report poor or fair health, probable PTSD, or LRS at follow-ups than those who participated in only one follow-up survey. However, such differentials were not present for other health outcomes including asthma, chronic bronchitis, gastroesophageal reflux disease, high cholesterol, hypertension, and anxiety.

We also found that attrition was not a substantial source of bias in the association between 9/11 disaster exposure and key physical and mental health outcomes. Specifically, the association between disaster exposure and probable PTSD and LRS was similar in magnitude and did not differ statistically between individuals who completed all three Registry surveys and those who participated in only one follow-up survey.

The absence of non-response bias in the association of disaster exposure and health outcomes thus far, despite modestly biased health estimates, provides a level of confidence in overall Registry findings.
Abstract #: 1-44

Evaluation of Statistical Interactions for Binary Disease Traits

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Background: It is now increasingly evident that investigating interactions between risk factors in statistical models is crucial to our understanding of the disease process. Statisticians define interaction as a departure from an additive model on a certain scale of measurement of the outcome. Certain interactions, known as removable interactions, exhibit monotonicity properties. For binary disease traits, when interactions occurring under the logistic link function are removable, it means that the model is additive under an alternative link function. This would facilitate a parsimonious approach for modeling the data, would provide a more powerful approach to test for removable interactions, and would facilitate more precise and accurate estimation of parameters such as odds ratios. Removable interactions are likely to be biologically plausible and are, hence, more likely to be validated in follow-up studies.

Methods: We develop a novel one-degree of freedom statistic to test for removable interactions in a logistic regression model. We show that, when an interaction is removable under the logistic link function, the Guerrero and Johnson (GJ) family of link functions (which includes the logistic link as its member) is suitable for fitting a parsimonious additive model to the data. We show how to fit a model using the GJ link function, and how to interpret the results under the familiar odds ratio or risk framework.

Results: Simulation studies show that our proposed test statistic has appropriate type I error, and that it is more powerful than the standard likelihood ratio statistic to test for interactions. We apply the proposed method to reanalyze published data from case-control studies of endometrial cancer, and show that the interaction between body mass index and a polymorphism in the CYP19A1 gene and the interaction between body mass index and diabetes are removable, suggesting that the relationship between disease and these risk factors is additive under the GJ link function. Further investigation of these GJ link functions demonstrates that, as a function of these risk factors, the risk of endometrial cancer increases at a rate that is substantially higher than that postulated by an additive model under the logistic link function. We also show that the interaction between green tea intake and a polymorphism in the CYP19A1 gene is not removable – disease risk decreases monotonically with increasing number of T alleles in the high green tea intake group, while there is no monotonic pattern in the low green tea intake group. This may be an anomaly of the observed data or some unmeasured confounders may contribute to the substantially low disease risk observed among those not carrying a T allele in the low green tea intake group.

Conclusion: Our proposed test is a powerful approach to identify biologically plausible and practically interpretable interactions.
Investigating EHR Data Documentation in NYC Practices: Who Uses What, and How Do We Know?

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Background: Since 2001, the percent of office-based physicians using an Electronic Health Record (EHR) has risen from 18% to 78%. EHR data holds promise for quality improvement, surveillance and effectiveness research. Quantifying EHR data quality is an important first step in understanding the potential of EHRs and identifying data limitations. Using aggregate data, the NYC Health Department’s Primary Care Information Project (PCIP) explored systematic patterns in EHR documentation.

Methods: For each year from 2009 to 2012, we compared total patients seen to the subset of patients with: a valid BMI in vitals; standard race/ethnicity in demographics; one of the 2,000 most common LOINC codes in lab results; or any prescription in medication management. Practice documentation rates were reported for the first and final years and significance of change ascertained using Wilcoxon signed-rank tests. A total of 278 PCIP practices met the inclusion criteria (>=25 patients seen in 2009).

Results: On average, practices documented BMI for 44.1% of patients in 2009. By 2012, that number rose to 72.1%. In 2009, practices recorded race for 30.1% of patients, and ethnicity for 42.8%. Four years later, 47.5% had race and 69.2% had ethnicity. By 2012, an average of 45.0% of patients had >=1 electronic lab results, as compared to 16.1% in 2009. By 2012, practices had prescribed >=1 medication to 71.8% of patients on average, as compared to 52.1% in 2009. All changes were significant (p<0.001).

Conclusions: Data completion varies by area of the EHR and by practice. EHR use is improving over time, incentivized by Meaningful Use. Reimbursements should focus on improving documentation. Building indicators based on practices that document well in a given section of the record may improve data for research and surveillance.
A Longitudinal Assessment of the Dynamic Health-Relevant Retail Environment Using the National Establishment Time-Series (NETS) Database

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Background: Characteristics of the built environment have been linked to health, but a key criticism of the neighborhood effects literature has been its reliance on cross-sectional studies, which hinder studies examining the cumulative effects of exposure over the life course and limit causal claims. Overcoming these problems requires longitudinal data on the built environment, including the spatial distribution of commercial resources and retail access.

Objective: The purpose of this paper is to highlight methodological issues raised by a novel data source that can be used to characterize the built environment longitudinally: the National Establishment Time-Series (NETS). Our intent is to make future public health applications of this longitudinal database more transparent and efficient.

Methods and Results: NETS allows flexible address-level characterization of neighborhood environments over time; however, it has not been widely used in epidemiological studies. The NETS database provides annual microdata since 1990 for businesses and many nonprofit and government agency establishments. Over 300 variables (including company name, most recent location, relocation history, industrial classification codes, sales volume, and number of employees) enable the characterization of the dynamic business environment. We discuss decision points and challenges encountered, and describe how we identified and coded health-relevant businesses, using NETS data for the New York-New Jersey-Pennsylvania Core Based Statistical Area, 1990-2010, a total of 2,701,356 business records. The data were received as 13 tab-delimited ASCII format files that required additional processing to create a true relational database. We regeocoded all business addresses using local and national geocoding tools, and examined the match rates and spatial accuracy in comparison to the geocodes provided with the NETS data. Our own geocoding of historical business addresses purchased with NETS was able to improve on the spatial precision, particularly for earlier years in the database. The standard industrial classification (SIC) code, and/or a text search of the company or trade name, number of employees, and sales information were used to define each business category of interest. Businesses were grouped into 25 researcher-defined categories, representing medical facilities, alcohol outlets, food stores and restaurants, and physical activity venues, and other destinations of daily living.

Conclusions: Although NETS has some limitations and requires an initial investment of time for data management, development of category definitions, and geoprocessing, this longitudinal database is attractive for population health researchers, with potential applications in ecological, linkage, and natural experiment studies. Wider use of longitudinal databases like NETS can improve understanding of how retail environment dynamics affect population health.
Abstract #: 1-47

Underage Alcohol Consumption; Using Social Media for Syndromic Surveillance

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Background: Underage alcohol consumption is a significant public health problem, associated with increased trauma, risky sexual behavior, and long-term predispositions to criminal behavior, alcohol dependence, prescription drug misuse, and suicide. As American youths spend more time on social networks, it is reasonable to develop tools to use data from social media to (i) gain insight into the epidemiology of underage alcohol consumption and (ii) identify targets for behavioral modification. Social media have been analyzed to track the dynamics of viral syndromes. However, tools to track patterns of behavior in specific age groups have not been developed. Here, we present preliminary results on the development of a method that analyzes how similar two pieces of textual data are by combining semantic and syntactic information.

Methods: We queried the Twitter API to capture tweets related to alcohol consumption and clustered them based on their semantic similarity. We developed a support vector machine to estimate the age of Twitter users to within a decade, using data from the 0.45% of Twitter users that do report their age. To identify patterns in the discussion of underage alcohol usage we developed a novel measure of similarity between textual data. That measure, the semantic distance, quantifies the similarity between two pieces of text as the average path length on the WordNet semantic map between all pairs of keywords between those two pieces of text. We define keywords as the dictionary form of all unique words that remain after removing stopwords, high frequency words, such as “a”, “the”, or “of”, which are unlikely to contribute to the meaning of a piece of text.

Results: Our reconstruction of the geographic distribution of underage alcohol use from social media shows a high concordance with national survey data (r=0.91). We found that communications on social media that seriously discuss underage alcohol consumption are more semantically similar to each other than to those communications discussing (i) usage facetiously, or (ii) general topics. We also found that when a user changes the semantics of his comments, his network interactions change.

Conclusions: Our results demonstrate that an analysis of social media can provide insight into the epidemiology of underage alcohol use. It can identify the geographic distribution of underage alcohol use as accurately as more traditional means, but much more rapidly and less expensively. It can identify at-risk users and provide insight into what topics of discussion are most associated with underage alcohol use. More generally, our approach can identify differences in patterns of behavior that prior machine learning techniques may overlook.
Molecular Methods Reveal Extensive Subpatent Infections in Pilot Epidemiology Study in India

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Background: Malaria is a serious global public health problem and the cause of high morbidity and mortality in the Indian subcontinent. *Plasmodium vivax* and *Plasmodium falciparum* are the predominant human malaria species in India although there have been reports of *P. malariae* detection in some regions. Primary diagnosis of malaria in India is mainly through passive case detection (PCD) via standard microscopy examination of blood smears collected from febrile patients.

Methods: As part of the Center for the Study of Complex Malaria in India (a partnership between the National Institute of Malaria Research in India and New York University) we conducted a Pilot Epidemiological Survey via PCD at three study sites representing varied ecological niches to: (i) compare the sensitivity and specificity of three diagnostic tools [microscopy, rapid diagnostic test (RDT)] and species-specific diagnostic PCR), (ii) select the most suitable RDT device for use in the field, and (iii) examine any shifts in the epidemiologic profiles within these regions that could be used to inform future epidemiological studies at the three sites.

Results: Data from this study show significant shifts in species dominance and high rates of mixed-species infections. Moreover, PCR diagnosis revealed a high rate of *P. vivax* subpatent parasitemia, underlying the limited accuracy of both microscopy and RDT. Due to this, the overall prevalence rate throughout these different ecological niches is estimated to be 20-60% higher than reported.

Conclusion: Overall prevalence rate in two out of the three study sites is estimated to be higher than reported. Sub-patent reservoirs of non-dominant Plasmodium species at these sites may explain the underestimated burden. This pilot study paved the way for launching comprehensive epidemiological studies of the CSCMi project.

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Using Patient Data from Malaria Clinic Visits to Map the Spatial Distribution of Malaria and Inform Census Collection as Part of the Center for the Study of Complex Malaria in India

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Background: The Center for the Study of Complex Malaria in India (CSCMi) was established in 2010 as part of a global network of independent research centers in malaria-endemic settings through a program called the International Centers of Excellence for Malaria Research (Das et al., 2012). The CSCMi, a partnership between New York University in the USA and the National Institute of Malaria Research (NIMR) in India, aims to address major gaps in understanding of the complexity of malaria in India, which include changing patterns of epidemiology, vector biology and control, drug resistance, and parasite genomics. To capture the eco-epidemiological diversity in India, three NIMR field stations act as sentinel research sites for the CSCMi project.

Methods: We focused initial efforts at the Chennai NIMR field station, one of the three sentinel research sites for the CSCMi. Historical malaria prevalence data for January – December 2011 were collected from the National Vector Borne Disease Control Besant Nagar Malaria Clinic, and transcribed into an Excel worksheet. Field workers were sent to collect the GPS coordinates of 4,724 addresses on the worksheet. The address coordinates were mapped using Google Earth Pro and overlaid with patient information on gender, malaria positive/negative status, and malaria parasite species. Malarious blocks were defined and delineated as geographic clusters to facilitate census survey collection (convenience samples) of 5-10% of the population in each cluster. Census surveys covering basic demographics, health care access, malaria history, and malaria prevention measures were obtained from 1557 households in the catchment area.

Results: Census data collected from malarious areas defined by retrospective clinic data showed that 6% percent of the houses reported at least one person having malaria in the last 12 months. Mosquito repellants were the most commonly used method of personal protection and 63% of the households reported weekly or monthly larvicidal application by government agencies as a vector control measure. The data indicate that there is an equal distribution of households accessing public or private health care facilities for their health needs.

Conclusion: We were able to use retrospective clinic attendance data to generate a spatial map of malarious regions and define the catchment area for census. The census data provided information on the baseline demographics of our study population and defined geographical clusters to conduct the next steps of our community based epidemiological studies via active case detection.

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Abstract #: 1-50

Diabetes among Those with HIV, Hepatitis B, Hepatitis C and TB: Preliminary Results from Matched New York City Surveillance Data

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Background: Providers and laboratories are required to report cases of human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis virus C (HCV), and tuberculosis (TB) to the New York City (NYC) Department of Health and Mental Hygiene (DOHMH). Since 2006, laboratories have also been required to report hemoglobin A1C results to monitor the prevalence and control of diabetes. Persons with HIV, HBV, HCV, and TB may have diabetes, because diabetes predisposes them to infectious diseases or because their disease or its pharmacologic treatments lead to diabetes. To better understand and address the interaction between diabetes and infectious diseases in NYC, we matched HIV, HBV, HCV and TB surveillance data (2000-2010) with A1C surveillance data (2006-2012). This analysis is part of a larger initiative, Program Collaboration and Service Integration (PCSI) to increase collaboration and data sharing across infectious disease programs within DOHMH.

Objective: To assess the burden of diabetes in New York City residents with HIV, HBV, HCV, and/or TB diagnoses.

Methods: We conducted a retrospective, deterministic cross match of HIV, HBV, HCV and TB cases from 2000-2010 and of persons with diabetes, defined as having had at least two A1C results > 6.5%, from 2006-2012. We examined the proportion of persons with HIV, HBV, HCV, and TB who had diabetes.

Results: The percentage of people with diabetes was highest among individuals with HCV (11%), followed by TB (9%), HIV (6%), and HBV (5%). Given that there are an estimated 146,000 people living with HCV in NYC, we estimate that as many as 16,000 may have both diabetes and HCV.

Conclusions: Matching surveillance data across disease registries improves our understanding of how diseases impact the NYC residents, particular sub-populations that may be at risk of more than one disease. We are currently analyzing this data to identify demographic and neighborhood characteristics of persons with infectious disease and diabetes in New York City. DOHMH will use these to inform program planning, public health campaigns, and delivery of integrated services to improve population health.
Abstract #: 1-51

The Genetic Predisposition for Uterine Leiomyomas in Recently Admixed Populations: A Preliminary Study in Individuals from Electronic Medical Records

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Uterine leiomyomas (UL) are common benign tumors of the uterus and are the leading cause of hysterectomies. UL affects 25-77% of women and women of African descent have 2-3 fold-increased risk. In addition to African ancestry, risk factors for UL include increased age, obesity, endogenous hormonal factors, and family history. Heritability studies in Europeans suggest 26-79% of UL can be explained by genetic factors. Despite the high heritability, established common genetic variants have yet to be identified. Identifying common genetic risk factors for UL in particular has been a challenge. First, obtaining a large population of UL cases that have been clinically diagnosed has been difficult to achieve in survey based cohort studies. Furthermore, there are few genetic studies that have been performed in UL in minority populations. We aim to address these limitations by using a diverse clinical population to identify and characterize the genetic predisposition of UL in African Americans (AAs) and Hispanics (HAs). Here, we report preliminary findings from a association study using Illumina OmniExpress and Human Exome BeadChip arrays in AAs and HAs from BioMe Biobank Program at Icahn Medical School at Mount Sinai, a clinical care cohort of consented patients with genotype data linkable to their electronic medical records (EMR). Using medical billing codes as a broad preliminary definition of case status, we identified a total of 325 cases and 650 controls from BioMe that were self-reported AA and 306 cases and 606 controls that were self-reported HA. We tested 844,372 common SNPs for an association with UL. All analyses were adjusted for age, body mass index, and informative principle components. While no SNP reached genome-wide significance at the discovery stage, we identified four loci at p<5.0E-6: AASDHPPT on chr11 (OR=1.6, p=1.4E-6) and an intergenic region on chr4 (OR=1.7, p=4.1E-6) in AAs as well as GAB4 on chr22 (OR=1.9, p=3.0E-6) and an intergenic region on chr2 (OR=0.51, p=2.5E-6) in HAs. We then meta-analyzed the results of AAs and HAs and detected six associations at p<5.0E-6. Notably, one locus harbors a tumor suppressor gene, FOXP1 (p=2.9E-6) and trends towards significance in both AAs and HAs (p=1.2E-4 in AAs, p=2.4E-3 in HAs). To expand this limited study, we are expanding the BioMe cohort and developing a robust algorithm to extract UL cases and controls from the EMRs of BioMe participants.
Abstract #: 1-52

Predictors of Electronic Cigarette Use Among a Sample of New York City Adolescents

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Background: Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver vaporized nicotine that is often flavored. The product is designed to strongly resemble the look and feel of a traditional cigarette. The use of flavors in particular has raised concerns that these products will be especially attractive to youth, leading to nicotine addiction and subsequent use of traditional tobacco products. There is currently little research examining factors associated with e-cigarette use among youth. This study examines the relationship between e-cigarette experimentation, tobacco use behaviors and environmental, social, and demographic variables among a sample of adolescents in New York City (NYC).

Methods: In the May of 2013, 504 adolescents were surveyed as they were leaving small grocery stores or pharmacies in NYC. Surveys were conducted outside 50 stores—7 small grocery stores and 3 pharmacies in each NYC borough—that were randomly selected from among all licensed tobacco retailers in NYC. The survey included measures of ever use of e-cigarettes, ever and current use of tobacco cigarettes and current use of cigars. Measures capturing exposure to, and awareness of, retail tobacco marketing, having friends who smoke, living with a smoker, and perceived social norms about e-cigarette and tobacco cigarette use among peers and adults were also included.

Bivariate analyses were conducted to identify variables associated with e-cigarette experimentation. All of the associated variables were then simultaneously entered as predictors in multivariable logistic regression models of ever e-cigarette use. The data were weighted for probability of store selection and post-stratified to the sex, age, race/ethnicity and borough population totals of 13 to 17 year-olds in NYC.

Results: Overall, 13% (95% CI: 9-17) of respondents had tried e-cigarettes. Several variables were associated with e-cigarette use in bivariate analyses: ever smoking cigarettes; being a current cigarette or cigar smoker; living with a smoker; having at least one friend who smokes cigarettes; frequently noticing tobacco products in retail settings; perceptions of e-cigarette use among peers; and age. In logistic regression models, the odds of e-cigarette use were highest among ever smokers, 17 year-olds (compared to 14/13 year olds) and those having at least one friend who smokes cigarettes.

Conclusions: This study is one of the first to examine whether e-cigarette use shares common correlates with cigarette smoking in a diverse sample of adolescents. Ever having tried smoking tobacco cigarettes, being older, and having at least one friend who smokes were the factors most strongly associated with ever having used e-cigarettes. Experimenting with tobacco and exposure to peers who smoke appear to be important variables associated with openness to experimenting with e-cigarettes. This finding suggests that cigarette smoking and e-cigarette use might share common risk factors.
Abstract #: 1-53

Enhancing Unintentional Drug Poisoning Surveillance to Increase Drug Specific Classification

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Background: Drug poisoning deaths are the leading type of injury in the United States. Standard reporting of unintentional drug poisoning deaths is based on causes of death listed on death certificates, coded using International Classification of Diseases-10 (ICD-10). The specific type of drug associated with the fatality may not be specified on the death certificate, but is usually identifiable from medical examiner toxicology findings.

Objective: To determine the sensitivity of death certificates for identifying drug-specific poisoning deaths.

Methods: Unintentional drug poisoning deaths in New York City were reviewed using two linked sources: death certificates and medical examiner files for the year 2010. The death certificate literal text and assigned ICD-10 code were reviewed to determine drugs involved in those deaths. We calculated the sensitivity of the death certificate to detect drug-specific poisoning deaths, using the toxicology results as the gold-standard. We calculated separate sensitivities for cocaine, heroin, and opioid analgesic-related deaths. We calculated sensitivity of the death certificate as the number of drug-specific poisonings on the death certificate divided by the number of drug specific poisonings according to toxicology results.

Results: There were 516 unintentional drug poisoning deaths in New York City in 2010. Of the 297 cocaine-involved deaths, death certificates identified 215 (sensitivity = 81%). Of the 208 heroin-involved deaths, death certificates identified 86 (sensitivity = 38%). Of the 171 opioid analgesic-involved deaths, death certificates identified 170 deaths (sensitivity = 99%).

Implications and Recommendations: Death certificate sensitivity varies by drug type; it is least sensitive for heroin and most sensitive for opioid analgesics. Low sensitivities will produce underreporting of drug-specific mortality rates unless imputation methods are employed. Underestimation of drug-specific mortality can compromise effective targeting of resources and public health interventions. Medical examiner information on drug-related deaths should be systematically included in death certificate cause-of-death documentation.
Abstract #: 1-54

Using Prescription Drug Monitoring (PMP) Data to Identify Chronic Opioid Analgesic Use in New York City, 2008–2012

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Background: During the last decade, shifts in the management of chronic pain have led to a dramatic increase in opioid analgesic prescriptions (OAP). However, evidence to support the effectiveness of long-term prescription opioid analgesic use for treatment of non-cancer pain is lacking. Chronic opioid analgesic use often involves high doses, conferring greater risk of overdose. Identifying demographic and prescription characteristics associated with chronic OAP use can help identify at-risk populations.

Objective: To describe factors associated with chronic opioid use among New York City residents who filled OAPs.

Methods: We conducted a retrospective analysis of OAPs filled by New York City residents over a five year period (2008–2012) using New York State’s Prescription Monitoring Program (PMP) data. A period of chronic OAP use was defined as: three or more consecutive months of a 30-day supply opioid analgesic prescription, without evidence of opioid analgesic use in the 3 months preceding the chronic use period. Descriptive analyses of the number and proportion of New Yorkers who received OAPs, the number of prescriptions filled, and the cumulative morphine equivalent dose of prescriptions was calculated. Bivariate analyses were conducted to examine the association of demographic (gender, age, borough of residence) and prescription characteristics with chronic OAP use.

Results: Between 2008–2012, approximately 6.5 million OAPs were filled by 2.2 million New York City residents. 80% of residents received 1-2 prescriptions and 20% filled 3 or more prescriptions. Of New Yorkers who filled 3 or more prescriptions, 22% had at least one period of chronic OAP use. Chronic OAP users, compared to all other New Yorkers who filled at least one OAP in the period, were more likely to be male (OR = 1.4), aged 45 to 54 compared to all other age groups (OR = 1.6), and residents of the Bronx and Staten Island compared to residents of Manhattan (OR = 2.0 and OR = 2.3, respectively). Chronic OAP users were also nearly 16-times more likely to have filled a high dose OAP (OR = 15.5), with 39% of chronic OAP users filling a high dose OAP compared to only 4% of all other New Yorkers who filled at least one OAP in the period.

Conclusions: Chronic OAP users were more likely than non-chronic OAP users to receive high MED prescriptions. Furthermore, men, Bronx and Staten Island residents, and middle-aged New Yorkers are the groups most likely to receive chronic opioid therapy. Education and initiatives should target these groups. Analysis of prescription data can aid in the understanding of chronic opioid analgesic prescribing practice, risk of OAP-related complications, such as overdose, and guide public health efforts.
Abstract #: 1-55

Evaluating Changes in Flavored and Menthol Tobacco Product Sale Before and After the FDA and NYC Bans

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Background: In September of 2009, to reduce youth smoking, the U.S. Food and Drug Administration (FDA) prohibited the manufacture of cigarettes containing flavors such as fruit, candy, chocolate, cinnamon, or alcohol-flavored drinks like piña colada. Manufacturing of menthol cigarettes was not banned by FDA, however. The New York City (NYC) Council subsequently passed a law in October of 2009 that prohibited the sale of all flavored tobacco products, including flavored cigars, smokeless, and other tobacco products, but excluding any menthol tobacco products in most retail settings. NYC voluntarily stayed enforcement of the flavored ban until January of 2011. We evaluated the impact of both the Federal and the City law.

Methods: The NYC Health Department acquired five years of retail tobacco sales data (2008 to 2012) from stores with annual sales over $2 million in the five boroughs. Using this sample of stores, monthly unit sales of flavored and menthol tobacco products were compared using interrupted time series analysis, overall and by tobacco product (i.e., cigarettes, cigars, smokeless and other tobacco products). Negative binomial regression was used to estimate the percent change in the number of products sold per store each month before and after the FDA and NYC flavored tobacco bans.

Results: The FDA ban on flavored cigarette manufacture was associated with a 46% decrease in sales of these products. Enforcement of the NYC flavored ban in January 2011 was associated with a 91% decline in flavored cigar sales, a 100% decrease in smokeless product sales, and an 89% decline in sales of other tobacco products. Unexpectedly, menthol cigarette sales declined 12% and menthol cigar sales declined 85% after the NYC flavored ban was enforced, despite menthol cigarettes and cigars not being included in the ban. Smokeless menthol product sales increased after the FDA (24%) and NYC (25%) flavored bans were announced in 2009, while smokeless menthol sales declined 22% once the NYC flavored ban was enforced in 2011. Additionally, new products (e.g., pipe tobacco) with menthol began to be sold after the FDA flavored cigarette ban was implemented and the NYC flavored ban announced.

Conclusions: Prohibiting the sale of flavored cigarettes nationally, and prohibiting the sales of all flavored tobacco products in NYC has significantly reduced the legal sales of these products; however there are still low-level sales of flavored products occurring among some NYC tobacco retailers. More strategies are needed to continue to reduce sales of flavored tobacco products in NYC.
Abstract #: 1-56

Experiences with Drug Overdose Among a Population of NYC Drug Users Who Received Training on Naloxone Use

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Background: Up to two thirds of drug users experience overdose (Bennett, 1999; Darke, 1996; Dark, 2007). Eighty-five percent of overdoses are witnessed (Sporer, 2003), suggesting an opportunity for intervention. One prevention strategy is to train at-risk individuals to recognize overdose and administer naloxone to reverse opioid overdose. Little is known about characteristics and experiences of overdose prevention training (OPT) recipients. The objective of our study was to describe the characteristics and overdose experiences of OPT recipients.

Methods: A convenience sample of NYC individuals completing OPT was enrolled in a cohort study. Training consisted of risk factors for, physiology of, and effective responses to opioid overdose including naloxone administration. Following OPT, individuals completed interviewer-administered surveys. Outcomes of interest were witnessing and/or experiencing overdose and prior OPT. We describe OPT recipients’ demographics (gender, race, age); substance use and service history (substance used, methadone treatment enrollment, syringe exchange participation). We conducted bivariate analyses between demographics and substance use with three outcomes: experienced an overdose, witnessed an overdose, and prior receipt of OPT. Chi-square tests were used for all comparisons.

Results: Between June and September 2013, 355 OPT recipients were enrolled. Females made up 32% (n=105) of the sample, and 57% (n=201) were Hispanic. Median age was 47. Common substances used were alcohol (36%, n=131), heroin (33%, n=116), opioid analgesics (32%, n=113), and benzodiazepines (30%, n=108). Fifty-five percent (n=195) were enrolled in methadone programs and 49% (n=174) in syringe exchange programs (SEPs). One third (n=124) had overdosed. Three quarters (n=273) had witnessed an overdose. Thirty percent (n=208) had received OPT previously. SEP enrollees were 2.6 times more likely to have witnessed an overdose compared to individuals not enrolled in SEPs (p=.0004). Factors associated with having experienced an overdose included heroin (p=.00) and benzodiazepine use (p=.01), methadone program (p=.00) and SEP participation (p<.0001). Previous OPT was associated with SEP enrollment (<.0001).

Conclusions: Among this sample, experiencing and witnessing overdose is common, consistent with previous studies. Having been trained previously in overdose prevention, however, is less prevalent. SEP participants were more likely to have experienced situations in which OPT could be useful. Though this group was more likely to have been previously trained, it should continue to be targeted for OPT. Further expansion of OPT among individuals not accessing SEP is needed.

References:


Abstract #: 1-57

Does Drug Treatment Improve Patient Quality of Life?
A Pilot Study of the Outcomes of a Quality of Life Assessment in New York City Outpatient and Opioid Treatment Programs

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Background: Quality of life (QOL) measures are widely used in epidemiologic and clinical studies to assess the impact of medical interventions, but have been underutilized in the treatment of substance use disorders (SUD). The objective of this study was to determine how a validated QOL instrument in SUD treatment could serve as a patient outcome measure.

Methods: NYC outpatient drug treatment (DT) and opioid treatment programs (OTP) were invited to participate in a six-month cohort study. Newly admitted patients completed counselor-administered surveys in July 2013. Surveys included demographic and clinical questions and the WHOQOL-BREF, a 26-item validated questionnaire that measured QOL in four domains: physical, psychological, social relationships, and environment. Variables included gender, age, race, primary language, homelessness, criminal justice involvement, mandated or voluntary admission to treatment, presence of other medical conditions, substance of choice, and frequency of use. Domain-specific QOL scores were calculated and compared with healthy and chronically ill populations; scoring was on a scale of 0 to 100 for each domain. We also compared mean domain scores between DT and OTP patients and between demographic and clinical variables using ANOVA and t-tests.

Results: 34 programs participated. Counselors surveyed 482/557 (87%) newly admitted patients. In OTPs (n=211), heroin was the predominant substance of choice (n=195, 92%); in DT (n=282), alcohol (n=101, 36%) and marijuana (n=85, 30%) were the most common substances. Participants reported lower mean physical and psychological scores (63 on each) than healthy adults (77 and 75, respectively) and higher scores than chronically ill adults (54 and 61, respectively) in the literature (Bonomi, 2000). Participants reported lower mean social and environment scores (56 on each) than healthy (72 on each) and chronically ill adults (57 and 63, respectively). Physical, psychological and environmental scores significantly differed by primary substance (p=.000, .01, and .000, respectively) and frequency of use (p=.000, .001, .003, respectively). Marijuana users had the highest psychological score, while alcohol users had the highest physical and environment scores. Individuals who used substances more frequently had lower scores compared to individuals who used less frequently across domains. DT patients did not differ from OTP patients.

Conclusions: Our findings suggest that those entering NYC outpatient drug treatment have lower QOL scores than average healthy adults in all four domains of the WHOQOL-BREF, and lower scores than chronically ill adults in the domains of social relationships and environment. Change in QOL following three months of drug treatment will be available by the February Forum. Further analyses focusing on longitudinal tracking of QOL measures should be performed to determine the usefulness of this approach in measuring treatment effectiveness.

Comparing Measures of Segregation: Application to Understanding Smoking Prevalence in Asian Ethnic Enclaves in New York City

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Background: Asian make up 9.2% of the NYC population and are the fastest growing race group. Despite an increase in smoking cessation programming and policies in NYC, the smoking prevalence among Asians in NYC did not significantly change between 2002 and 2010. Ethnic enclaves with geographic and social segregation may explain why population-based tobacco control policies have been less effective among Asians. Ethnic enclaves provide social networks with social norms similar to the member’s native country. Because many Asian countries have high smoking prevalence and few smoking cessation and prevention services, identifying the impact of ethnic enclaves on smoking behavior can improve culturally-tailored smoking interventions. Prior literature lacks full exploration of measures of ethnic enclaves and which measure is ideal for a geographically dense but highly mixed urban area such as NYC. Further there is no known relevant cutpoints for identifying Asian ethnic enclave. The objective of this study is to quantify Asian ethnic enclaves by four commonly-used definitions, explore cutpoints, and link these definitions to smoking. We hypothesize that smoking prevalence in Asians will be higher for those living within ethnic enclaves vs. not and vary by segregation definition used.

Methods: Asian was defined by self-report of Asian race among Non-Hispanic New Yorkers. Ethnic enclave was defined in four ways: (1) >10% Asian in an area; (2) the isolation index based on Census 2010 data at the United Hospital Fund (UHF) level; (3) the dissimilarity index by UHF; and (4) anecdotally ‘known’ East Asian enclaves (e.g., Chinatown, Flushing, Sunset Park). Smoking will be defined as current (self-reports 100+ cig/life and currently smoking), former (self-reports 100+ cig/life and not currently smoking), and never smoker. Smoking prevalence by ethnic enclave definition will be assessed overall and by sex. Where sample size allows, specific Asian subgroups will be characterized.

Results (preliminary): The isolation index for Asians ranges from <0.01 to 0.57. Since no known relevant cutpoint of the isolation index for Asians is established, quantiles are presented. The highest quartile of the isolation index for Asians corresponds with anecdotally known East Asian enclaves. In Queens, the isolation index identified a broader distribution of Asian enclaves than anecdotally known Asian American enclaves.

Conclusions: Using the highest quartile of isolation index to define Asian enclaves may include more Asian American communities, and may more accurately capture segregation compared to anecdotally known Asian enclaves. Future analyses will describe other segregation measures, and assess smoking prevalence within Asian American enclaves. The distinction between South vs. East Asian will be expanded, given differences in smoking patterns and locations of ethnic enclaves. A limitation of the current analysis is that characteristics of Asians immigrating directly to suburban enclaves (i.e., in New Jersey) are not characterized. Figure 1:
Abstract 1-59

**Frequent Binge Drinking After Exposure to 9/11: Findings from the World Trade Center Health Registry**

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**Background:** Exposure to 9/11 may have significant long-term impact on health behaviors, including increased alcohol consumption. We examined the association between frequent binge drinking, 9/11-related posttraumatic stress disorder (PTSD), and number of 9/11-specific experiences among World Trade Center Health Registry (Registry) enrollees five-to-six years post-9/11.

**Methods:** Participants included 41,284 lower Manhattan residents, workers, passers-by and rescue/recovery workers aged 18 or older without a pre-9/11 PTSD diagnosis who completed Wave 1 (2003-04) and Wave 2 (2006-07) interviews. Frequent binge drinking was defined as consuming five or more drinks on five or more occasions in the prior 30 days at Wave 2. Probable PTSD was defined as scoring 44 or greater on the PTSD Checklist. 9/11 exposure was measured as the sum of 12 experiences and grouped as none/low (0-1), medium (2-3), high (4-5) and very high (6+).

**Results:** Frequent binge drinking was significantly associated with increasing number of 9/11 exposures and PTSD. Those with very high and high exposures had a higher prevalence of frequent binge drinking (13.7% and 9.8%, respectively) than those with medium and low exposures (7.5% and 4.4%, respectively). Upon stratification by PTSD status, the association was significant for those without PTSD and attenuated among enrollees with PTSD.

**Conclusions:** Our findings suggest that 9/11 exposure had an impact on frequent binge drinking five-to-six years post-event among Registry enrollees. Understanding the effects of traumatic exposure on alcohol use is important to identify risk factors for post-disaster alcohol misuse, inform policy, and improve post-disaster psychological and alcohol screening and counseling.
Abstract #: 1-60

Binge Drinking Patterns in New York City

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Background: In the United States, binge drinking accounts for over 40,000 deaths and 1.5 million years of potential life lost every year. Alcohol is also associated with significant morbidity, including injuries, and interpersonal harms, such as physical and verbal arguments. Nationally, 17% of Americans binge drink on average 4.4 times per month. No population-based studies have assessed the relationship between binge frequency or number of drinks and alcohol-related harms.

Methods: We telephonically surveyed a representative sample of non-institutionalized NYC adults aged 18 years and older to assess the prevalence of binge drinking (defined as four or more drinks for women and five or more for men on one occasion), binge frequency (number of binge episodes), and intensity (largest number of drinks on one occasion) during the past 30 days. Weighted estimates were calculated. Additionally, respondents were asked whether they experienced any of four harms from other’s drinking in the past 6 months: 1) serious argument, 2) insulted or humiliated, 3) pushed, hit, or assaulted, or 4) an unwanted sexual advance. Alcohol consumption patterns were compared between younger (aged 21-39) and older (aged 40-64) respondents; prevalence of harm experienced was compared by binge drinking frequency and intensity. Associations were tested using chi-square and t-tests.

Results: The prevalence of binge drinking was 14%, mean binge frequency was 3.4 episodes per month and mean maximum intensity among binge drinkers was 7.0 drinks (median 6). The largest number of drinks ranged from 4 to 30, and 19% had 9 or more. Younger adults aged 21-39 were more than twice as likely to report binge drinking compared with older adults aged 40-64 (24% vs. 10%, p<0.001). Younger binge drinkers binged 3.1 times per month with an intensity of 7.1 drinks, and older binge drinkers binged 4.1 times with an intensity of 6.5 drinks. The prevalence of harm reported was higher among binge drinkers than non-binge drinkers (26% vs. 11%, p<0.001). Moreover, 16% of binge drinkers with one binge episode reported any harm compared with 28% of those with two to five episodes, and 45% of binge drinkers with a binge frequency of six or more. Binge drinkers with an intensity of nine or more drinks compared to those with an intensity of less than nine drinks were nearly twice as likely to report any harm (41% vs. 22%).

Conclusions: Similar to national data, older adults had a lower prevalence of binge drinking but had a higher frequency of binge episodes than their younger counterparts. Binge drinking, frequency and intensity were associated with experiencing alcohol-related harms regardless of age. Intervention planning focusing on reducing the prevalence of binge drinking should consider frequency and intensity during these binge episodes as a measure to prevent alcohol-related harms.

References:
Abstract #: 2-01

**Recent Trends in Hospitalizations for Smoking-Related Illnesses among New York City Adults: Does Neighborhood Racial/Ethnic Isolation Matter?**

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**Background:** New York City (NYC) expanded the Smoke-Free Air Act to include all workplaces in 2003 as part of its comprehensive tobacco control plan. Previous research has documented declines in hospitalizations for acute myocardial infarction (AMI), stroke and other conditions associated with exposure to environmental tobacco smoke in New York State (NYS) and elsewhere following the implementation of smoke-free air laws. There is currently no research looking at NYC data; the distinctive, racially diverse ethnic enclaves in NYC provide settings in which to explore acculturation-related impact on smoking-related outcomes. Research has suggested that enclaves may have either a beneficial or negative impact on health outcomes, depending on the racial/ethnic group being studied.

**Methods:** We used NYS SPARCS hospitalization data to analyze trends in three acute smoking-related illnesses (AMI, stroke, angina) conditions from 2000 to 2010 among NYC residents. To account for hospitalization trends in general, we also analyzed three acute conditions not related to smoking (appendicitis, kidney stones, and acute cholecystitis) for comparison. Annualized rates and confidence intervals were computed per 100,000 adults ages 35 and older using SAS v9.2 and trends assessed using Joinpoint 4.0.

The isolation index is the minority-weighted average of the minority proportion for each spatial area, and scores range from 0 to 1. For this analysis, areas were United Hospital Fund (UHF) areas, comprised of contiguous zip codes. The isolation index was calculated for black, Hispanic and Asian isolation in each UHF neighborhood with high segregation set at >0.6 for blacks and Hispanics based on previous literature and >0.3 for Asians (no cutoff exists in the literature; this threshold yields similar counts of high segregation areas for the three racial/ethnic groups).

**Results:** Preliminary analysis shows that overall, smoking-related hospitalizations declined steadily from 2000 to 2010 (1,126 to 885 per 100,000, -21%) while non-smoking related hospitalizations increased over the same period (266 to 306 per 100,000, +15%). Smoking-related hospitalizations were consistently higher in low Asian segregation neighborhoods compared with high Asian segregation neighborhoods, though both declined over the period reviewed. In contrast, high black and Hispanic segregation neighborhoods appear to show elevated rates of smoking-related hospitalizations in recent years compared to low black and Hispanic segregation neighborhoods.

**Conclusions:** Declines in smoking-related hospitalizations have occurred consistently since 2000 while non-smoking related hospitalizations have not, suggesting ongoing success of NYC’s comprehensive smoking plan. Enclave-based disparities in smoking-related hospitalizations persisted over this period, however. Further examination of potential cultural influences on health-seeking behaviors and the influences of acculturation on other cardiovascular disease risk factors are needed.
Abstract #: 2-02


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Background: HCV is the most common blood-borne infectious disease in the U.S. causing more deaths annually than HIV or HBV. Significant disparities in HCV testing and prevalence exist among racial and ethnic minorities; especially within NYC. Previous studies have identified numerous factors associated with HCV testing and infection among minorities; however, many have not accounted for the inherent selection bias arising from variations in testing rates among minority groups when attempting to identify risk factors for infection specifically. This study therefore addresses issues of sample selection bias to identify factors associated with HCV infection among NYC’s minority communities.

Methods: Data from years 2009-2012 of the REACH U.S. community survey provided a sample of 2,903 Blacks, 4,426 Asians, and 4,493 Hispanics within NYC. Bivariate probit models, adjusted for sample selection, were used to analyze associations with HCV testing and infection among these groups. Models were also adjusted for well-known determinants of HCV testing and infection including: age, gender, socioeconomic status, health insurance coverage, and common HCV risk factors.

Results: 28, 19, and 27 percent of Blacks, Asians, and Hispanics respectively report being tested for HCV. Among those tested, 11 percent of Blacks, 7 percent of Asians, and 11 percent of Hispanics report being infected with HCV. Adjusting for other factors, Asians are significantly less likely than Blacks to be tested for HCV (β = -0.34; 95% CI -0.45 to -0.24). Asians are at increased risk of HCV infection when accounting for biases arising from differences in testing (β = 0.34; 95% CI 0.17 to 0.51). Hispanics are equally likely to be tested or infected when compared to Blacks. Subpopulation analyses reveal these differences arise solely in foreign born individuals with all U.S. born minority groups equally likely to be tested and infected with HCV.

Conclusions: Previous studies have determined factors associated with HCV infection among NYC’s minority groups but have not accounted for biases arising from differences in testing rates. The current study attempts to account for sample selection bias arising from these differences. It is found that Asians are significantly less likely to be tested for HCV but are at increased risk of being HCV positive. Interestingly, these differences arise solely among foreign born minorities. These results suggest additional preventive efforts should be particularly targeted at foreign born Asian communities within NYC to increase HCV testing rates and decrease the prevalence of infection.
Background: Certain female reproductive events, such as age at menarche and parity, are influenced by socioeconomic status and race/ethnicity, and are associated with weight and body size. However, the contribution of reproductive factors to social disparities in obesity in women is not fully understood. We examined the timing of key reproductive events (ages at menarche, first live birth and menopause) in relation to the risk of general and abdominal obesity in middle-aged women.

Methods: The study population consisted of 306 women, aged 40-61 years, who were recruited from a mammography screening facility in New York City (71% Hispanic, 16% African American, 64% foreign-born). We collected detailed information about menarche, history and outcome of each pregnancy, menstruation history and gynecological surgeries through in-person interviews in English and Spanish, and measured participants’ height, weight and waist circumference through standard techniques. General obesity was defined as body mass index (BMI) ≥ 30 in kg/m², and abdominal obesity as waist circumference ≥ 88 cm. We used logistic regression models to examine the extent to which timing of menarche, first live birth and menopause explained educational differences in the risk of obesity.

Results: The prevalence of general obesity and abdominal obesity were 42% and 70%, respectively. The average age at menarche was 13 (SD=1.9). The mean age of first live birth among parous women was 25 (SD=6.4), and of menopause among postmenopausal women was 45 (SD=7.0). Educational attainment was strongly positively associated with age at first live birth (p< 0.001, e.g., 81% of women with college degree had first live birth at age ≥ 35 vs. 8% in women with high school or less education), and to a lesser extent, associated with age at menopause (p=0.06). There were no educational differences in age at menarche. We observed marginally significant inverse associations between age at menarche and age at first live birth and risk of general obesity (OR=0.89, 95% CI: 0.78, 1.01 and OR=0.87, 95% CI: 0.95, 1.02, respectively). We observed similar associations with age at menarche and age at first live birth and risk of abdominal obesity (OR=0.91, 95% CI=0.80, 1.05 and OR=0.96, 95% CI=0.92, 1.00, respectively). Although postmenopausal women had higher general and abdominal obesity than pre- and peri-menopausal women, the age at menopause was not associated with obesity.

Conclusions: In our study sample of predominantly racial minority and immigrant women, female reproductive factors were not strong determinants of general and abdominal obesity in midlife, and thus, are unlikely to explain social disparities in obesity.
Abstract #: 2-04

Diabetes Prevalence and Management Among Minority Populations in New York City

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Background: Disparities in diabetes prevalence exist, especially in ethnic minority communities. Information on diabetes prevalence and risk factors was collected using 4 years of the REACH U.S. Risk Factor Survey, which oversampled 3 ethnic minority populations living in predominately ethnic enclaves in New York City (NYC).

Methods: Survey data targeting minority subgroups from 2009-2012 yielded approximately 4,403 Asian Americans, 2,978 non-Hispanic African Americans, and 4,943 Hispanics. Demographic and health variables were run by subgroup, including self-reported diabetes prevalence rates (excluding gestational). Bivariate analyses determined factors related to a diabetes diagnosis by subgroup, and logistic regression predicted factors related to a diabetes outcome, while adjusting for all other variables. Additional analyses examined diabetes management among individuals with diabetes in each subgroup, including self-management (checking blood sugar and feet) and management through a health professional (doctor visits, checking HbA1c, and eye exams).

Results: Age-adjusted diabetes prevalence was 14.3% among African Americans, 16.5% among Hispanics, and 10.7% among Asians overall. Asian Indians had the highest diabetes prevalence (19.0%), followed by “other” Asians (14.2%). Older age, unemployment, fair/poor self-reported health, higher BMI, and diagnoses of high cholesterol and high blood pressure were significantly associated with a diabetes diagnosis among all groups in logistic regression. Among Asians overall, individuals with an income of < $25,000 were 1.7 times more likely to have been diagnosed with diabetes compared to individuals with an income of ≥ $50,000 (p<0.05) when adjusting for all other factors; income was not significant among the other subgroups. Additionally, compared to Chinese, Asian Indians were 3.7 times more likely and “other” Asians were 2.3 times more likely to have been diagnosed with diabetes (p<0.01) when adjusting for all other factors. Among Hispanics, individuals with less than a high school education were 1.6 times more likely to have been diagnosed with diabetes compared to individuals with at least a college degree (p<0.05) when adjusting for all other factors; education was not significant among the other subgroups. Males were significantly more likely than females to have been diagnosed with diabetes among Asians and Hispanics when adjusting for all other factors; gender was not significant among African Americans. Among individuals with diabetes, Asians displayed the poorest diabetes management; they were less likely to do weekly blood checks and feet checks and saw a doctor less often for their diabetes.

Conclusions: Our diabetes rates were higher than age-adjusted rates from the 2012 NYC Community Health Survey (13.7% Blacks, 15.4% Hispanics, and 10.4% Asians and Pacific Islanders), and the highest rate was seen among Asian Indians. Diabetes management among Asian Americans was poor, and should be further examined by Asian subgroup. This information will inform researchers addressing health disparities faced by minority groups living in ethnic enclaves.
Prevalence and Social Determinants of Multiple Chronic Disease Behavioral Factors Among Asian Americans in New York City

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Background: Behavioral risk factors (BRFs) are among the most preventable risk factors for many chronic diseases. Evidence suggests a growing concentration of many BRFs in socioeconomically disadvantaged and minority populations, but less research has focused on the prevalence and distribution of the co-occurrence of multiple BRFs, particularly among Asian American populations.

Methods: We examined the patterns of multiple BRFs (current smoking, overweight/obesity, low physical activity level, low fruit and vegetable intake) in Asian Americans residents in New York City, aged ≥ 18 years, and identified social factors that were significantly associated with the number of BRFs in this population. We used data from surveys administered in 2009-2011 as part of the New York University site of the Racial and Ethnic Approaches to Community Health across the US (REACH US) program (n=3,215; 50% females, 70% Chinese, 13% Koreans, 9% Asian Indian, 9% other Asians).

Results: Only 6% and 24% of participants had respectively 0 and 1 BRF, while 41% and over 28% respectively had 2 BRFs and 3 or 4 BRFs. Low physical activity and fruit/vegetable intake were the most common single BRFs (prevalence of 59.2x% and x78.2% respectively), and the most frequently co-occurring BRFs (e.g., 92.6% of those with 3 or 4 BRFs reported low physical activity and fruit/vegetable intake). Results of multivariable ordinal logistic regression models showed positive associations between increasing number of BRFs and lower family income (POR=1.42, 95% CI: 1.01, 1.72 for lowest vs. highest income group) and educational attainment (POR=1.36, 95% CI: 1.07, 1.73 for less than high school vs. college graduate). Measures of acculturation (nativity status, home language), healthcare access (health insurance, ability to afford healthcare), and food insecurity (worries about money for meals) were not significantly associated with the number of BRFs. We observed minimal differences in the prevalence and associations of multiple BRFs across ethnic subgroups.

Conclusion: Our overall results suggest that multiple BRFs are highly prevalent among Asian Americans residing in New York City, particularly among those with low socioeconomic status. Given these patterns and the potential additive and/or synergistic health effects of multiple BRFs, prevention programs that address multiple BRFs in socially disadvantaged and minority populations may have substantial public health impact.
The Einstein-Montefiore Center for AIDS Research HIV Integrated Clinical Database: Cohort Development and Description

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Background: Current paradigms of HIV treatment and prevention emphasize associations among clinical management of those who are HIV-positive, population-based prevention strategies, and epidemiologic trends in the disease. To better address questions of disease processes and outcomes among its HIV-positive population and examine associated epidemiologic trends in the context of prevention efforts, the Einstein-Montefiore Center for AIDS Research developed a clinical cohort comprising both HIV-positive and HIV-negative patients cared for in the largest healthcare system in the Bronx.

Methods: We identified HIV-positive and HIV-negative patients who received care in the Montefiore Medical Center (MMC) network from 1997-2012 by querying the electronic health record shared across inpatient and outpatient sites. HIV-positive patients were identified by a positive HIV Western blot, detectable HIV viral load, or >=3 undetectable HIV viral loads checked concurrently with a CD4 count. HIV-negative patients were identified by a negative HIV antibody test and not being in the HIV-positive cohort. Routinely collected electronic clinical, prescription, and ICD-9 diagnosis data for these patients were merged with HIV risk factor data from the New York State AIDS Institute Reporting System (AIRS), collected through MMC’s Ryan White programs. We compared characteristics of the cohort with U.S. Census and HIV surveillance data from the same catchment area.

Results: Over two million unique patients received care in the MMC network from 1997-2012, and 232,687 of these patients are included in the cohort. Among them, 217,751 (94%) are HIV-negative and 14,936 (6%) are HIV-positive. The HIV-negative patients are 68% female, median age 35 (IQR 26-47), 34% black and 45% Hispanic. The HIV-positive patients are 42% female, median age 46 (IQR 39-53), 40% black and 42% Hispanic. Risk factor data were available for 59% of HIV-positive patients: among men, 28% men who have sex with men and 28% current/former injection drug users; among women, 67% heterosexual contact. Median duration of follow-up for the HIV-positive cohort was 4 years (IQR 1-9) and median number of CD4 and viral load records is 7 (IQR 2-19) and 8 (IQR 2-22), respectively. The racial/ethnic composition of the HIV-negative cohort is similar to the overall population in the Bronx, and compared to HIV surveillance data for the Bronx, the HIV-positive cohort has a comparable demographic composition and risk factor distribution. Quality measures for additional clinical, prescription, and ICD-9 diagnosis data for the entire cohort are underway, and matching with the National Death Index is planned.

Conclusions: We developed a clinical cohort of HIV-positive and negative patients spanning a period that included important developments in HIV treatment and prevention. Both the HIV-positive and -negative cohorts are similar to their respective populations in the Bronx. This large, clinically rich database is a potentially useful resource for HIV clinical and epidemiologic research.
Abstract #: 2-07

Data Quality and Electronic Death Certificate Reporting: An Evaluation of the Pneumonia and Influenza Mortality Surveillance System in New York City

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Background: Pneumonia and influenza (P&I) mortality reporting is a long-established component of influenza surveillance at the New York City Department of Health and Mental Hygiene (NYC DOHMH). The quality of reporting is important locally for monitoring weekly counts and case identification during pandemics. P&I mortality surveillance uses cause-of-death (COD) reported on death certificates by clinicians through NYC’s general electronic death registration system (EDRS). In response to questions about the accuracy of COD documentation, NYC DOHMH evaluated the P&I mortality surveillance system to better understand system data quality and accuracy.

Methods: We assessed surveillance system performance and attributes per Centers for Disease Control and Prevention (CDC) guidelines. We conducted semistructured interviews of informants and stakeholders. For surveillance, NYC DOHMH defines a P&I death as one with P&I as the underlying COD. To evaluate sensitivity and predictive value positive (PVP), we compared 2010 NYC DOHMH death certificate data from inpatients (ICD-10 codes: J09–J18) with matched New York State hospital discharge data as the gold standard (ICD-9 CM codes: 480–488).

Results: Overall, 93% of deaths are reported electronically with clinicians reporting deaths and COD information within 24 hours. NYC DOHMH then assigns ICD-10 codes to COD information and creates a statistical file that is analyzed specifically for P&I deaths. System stakeholders include NYC DOHMH Bureau of Communicable Diseases and CDC. Regarding flexibility, system alerts have been used to remind providers to document influenza as the COD when appropriate. Regarding timeliness, median time from death to certification is <1 day. Overall, time from death to stakeholder reporting is 1–12 days, but time could be shortened to <48 hours if needed. System stability is good, with data collection spanning >100 years. Stakeholder interviews revealed that the NYC P&I death case definition (underlying cause only) differed from the CDC-recommended definition (any mention of P&I in COD) because any-mention COD data were not timely before EDRS implementation. Of 52,575 NYC deaths during 2010, 31,952 (61%) were inpatient, of which 25,165 (79%) matched a hospital discharge record. System sensitivity for P&I death was 18%; PVP was 67%. Defining a P&I death using the CDC-recommended definition of any mention of P&I death on the death certificate increased sensitivity to 36%; PVP remained 67%.

Conclusions: EDRS permits timely P&I mortality data availability. Sensitivity of the NYC P&I mortality surveillance system appears to be low. Confirmation using a medical chart review as the gold standard is needed. Expanding the P&I death case definition would likely increase system sensitivity, but a change might influence other attributes (e.g., stability). NYC DOHMH should engage stakeholders regarding usefulness of changing the NYC P&I case definition.
Abstract #: 2-08


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**Background:** Nationally and in New York City (NYC) the greatest number of new HIV diagnoses are among men who have sex with men (MSM). The U.S. Centers for Disease Control and Prevention (CDC) developed the National HIV Behavioral Surveillance (NHBS) System to monitor HIV risk behaviors among groups at high risk for HIV in U.S. cities with high levels of AIDS to better target and evaluate HIV prevention efforts.

**Methods:** In NYC, MSM were venue-sampled, interviewed, and offered HIV testing in serial cross-sectional studies as part of NHBS. Significant differences in overall time trends were determined using the Kruskal-Wallis test and the Cochran-Armitage trend test. Analyses of risk behaviors were restricted to those who did not self-report being HIV positive. Variables that were significantly associated with both study year and the outcome of interest (p<0.05) were adjusted for in logistic regression models.

**Results:** There were 457 (2004-2005), 550 (2008), and 510 (2011) participants in each study round. Over time, the median age in years varied (29 years (IQR: 23, 37), 32 years (IQR: 25, 42), 29 years (IQR: 23, 40) (p<0.0001)) and the proportion of white participants decreased (41.0%, 31.1%, 29.4% (p=0.04)). Smaller proportions of participants had completed college (49.2%, 40.4%, 26.1%, p<0.0001) and greater proportions were recruited from parks (0.7%, 8.7%, 16.5%, (p<0.0001)). There was no significant linear trend in HIV prevalence over time (18.7%, 28.6%, 19.2% (p=0.76)). Among those who did not self-report being HIV positive (n=410, n=479, n=448), the percentage who tested for HIV in the past 12 months increased (62.4%, 64.7%, 76.1% (p<0.0001)), the proportion of participants reporting more than 3 male sex partners in the past 12 months decreased (62.0%, 48.0%, 52.2%, (p=0.0006), and past 12 month unprotected anal intercourse (UAI) remained steady (50.2%, 49.9%, 52.9% (p=0.43)). Past 12 month non-injection drug use (excluding marijuana) decreased (46.8%, 33.4%, 32.4%, p<0.0001), with non-injection methamphetamine use also declining (13.0%, 5.4%, 4.2% (p<0.0001)). Among those who tested HIV positive, the frequency of those who did not disclose or were unaware of their HIV infection decreased modestly (not significant) (51.7%, 52.7%, 39.6% (p=0.10)). Significant trends persisted in adjusted analyses.

**Conclusions:** The results from this study suggest that from 2004-2011, more MSM in New York City are being tested for HIV, report declining drug use, and have fewer sex partners. Stable rates of UAI, however, are of concern, indicating that innovative strategies are needed to promote consistent condom use among MSM in NYC.
HEAT: HIV Prevention and Treatment Program for Youth, in Brooklyn, 2011-2012

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**Background:** Youth ages 13-24 comprise 25% of incident HIV infections. Approximately 72% of new youth HIV infections are in men who have sex with men (MSM) and transgender youth. This study compares the characteristics of youth tested for HIV in 2011 versus 2012, as well as those who tested positive.

**Methods:** The Health & Education Alternatives for Teens (HEAT) is a clinical care and community outreach program for HIV-infected and high-risk adolescents in Brooklyn, NY. Youth participants are offered HIV testing. In 2011, youth were reached through 13 venues, including ballroom events, an LGBT youth support agency, college campuses, public libraries, and the HEAT clinic. In 2012, HEAT program expanded to 3 additional venues and more frequent outreaches at existing venues.

**Results:** In 2011, HEAT performed 575 HIV tests, of whom 5 unique individuals (0.87%) tested positive. In 2012, HEAT performed 1326 HIV tests, of whom 30 unique individuals (2.3%) tested positive: 21 MSM, three bisexual men, four heterosexual men, and two with undisclosed sexual orientation. The median age of HIV-positive was 21 (inter-quartile range: [17.5, 24.5]). Most (70%) positive results were identified through direct HEAT related events.

More participants reporting addresses in the Bronx and Manhattan tested positive for HIV than participants reporting addresses in Brooklyn: 2.75% and 3.26% versus 1.88%. A majority (56.7%) of HIV-positive individuals entered HIV treatment.

**Conclusions:** Expanding an HIV screening program risks diluting the proportion of positives by contacting low-risk youth. HEAT’s expansion increased the proportion of positive tests by six-fold in 2012, compared to 2011, and helped them enter care. Higher HIV seropositive rates from Bronx and Manhattan likely reflect higher volume of young MSMs attending LGBT friendly HEAT events and engagement at an LGBT youth program. The program expansion was effective in reaching more youth at highest risk for HIV.
Abstract #: 2-10

Use of Interferon Gamma Release Assays (IGRA) for the Detection of Tuberculosis (TB) Infection in the New York City (NYC) Health Department Clinic Population

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Background: Interferon gamma release assays (IGRA) are more specific tests for TB infection compared to the tuberculin skin test (TST). From 2002-2004, NYC health department TB clinics, with over 60,000 patient visits annually, had an estimated positive TST prevalence of 8.8% among United States (US)-born and 39.5% among foreign-born. The clinics began using QuantiFERON®-Gold (QFT-G) as the diagnostic test for TB infection in October 2006. In November 2009, the clinics switched to the QuantiFERON®-Gold In-Tube (QFT-GIT) test.

Methods: We evaluated all QFT-G and QFT-GIT tests conducted at NYC clinics from October 2006-December 2011. The study population included individuals tested for work, school, or contact investigation, and others at high risk for TB infection. In 2009, testing was limited to those covered by the NYC Health Code (e.g., health care workers, contacts to TB cases). The proportions of positive, negative, and indeterminate results were calculated for all tests conducted during the study period. QFT-GIT test results were stratified by demographic, social, and clinical characteristics of tested patients.

Results: From October 2006-December 2011, 69,425 IGRA tests (48,549 using QFT-G, 20,876 using QFT-GIT) were conducted at NYC clinics. Overall, 9% tested positive (7% QFT-G, 16% QFT-GIT); 89% tested negative (91% QFT-G, 83% QFT-GIT); and 2% had an indeterminate result (2% QFT-G, 1% QFT-GIT). Of 20,154 patients who received QFT-GIT testing, 9% of US-born patients (775/8,672) tested positive compared to 22% of foreign-born patients (2,506/11,482). The proportion of positive QFT-GIT results increased with age ranging from 7% of 0-4 year olds testing positive to 44% among patients 65 years of age and older. Among countries of birth with more than 100 individuals tested, the Philippines had the highest proportion (40%) of positive test results.

Conclusions: This is the largest clinical sample of IGRA results presented to date. The lower prevalence of TB infection among foreign-born using IGRA compared with historical TST data suggests that IGRA use reduced false-positive results and unnecessary medical evaluations. The percentage of individuals testing positive increased after the introduction of QFT-GIT. Further evaluation is needed to determine whether this reflected policy changes that decreased testing of low-risk individuals, a changing population, or differential performance of the test.
Abstract #: 2-11

Malaria in NYC Residents: Examining the Determinants of Chemoprophylaxis Use and Adherence Among Immigrants Who Travel Abroad to Visit Friends and Relatives

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Background: Malaria is transmitted by the bite of a female Anopheles mosquito carrying the Plasmodium parasite. Though rarely transmitted in the United States, approximately 200 cases of malaria are reported annually among New York City (NYC) residents, with 77.9% of cases requiring hospitalization. NYC residents who are native to other countries, travel home to visit friends and relatives (VFR), and return with malaria infection represent missed opportunities for disease prevention. We aimed to understand reasons why travelers do not take malaria preventive measures and to examine the associations between 1) reason for travel and taking chemoprophylaxis, and 2) type of chemoprophylaxis used and medication adherence.

Methods: We conducted secondary data analysis of NYC malaria surveillance data from 2004-2010 (n=1335) and also performed open-ended interviews of a sample (n=32) of cases from 2011. Descriptive statistics were calculated for selected characteristics. Multivariable logistic regression was used to estimate the association between reason for travel and chemoprophylaxis use, and the association between type of drug taken and adherence, adjusting for age, gender, race, borough of residence, and travel region. SAS 9.2 was used for statistical analysis.

Results: NYC residents with malaria were predominantly men (67.0%), non-Hispanic black (86.7%), ages 40 to 59 years (38.5%), and VFR (68.9%). Over one third resided in the Bronx (35.2%), followed by Brooklyn (25.2%), and most (77.1%) traveled to West Africa. Chemoprophylaxis was taken by only 16.0%, and of those who took any chemoprophylaxis, 31.5% adhered to the complete regimen. In multivariable models, there was no significant association between chemoprophylaxis use and reason for travel (VFRs versus those who traveled for another reason), nor between adherence and type of drug taken (daily versus weekly dose). Among the sample of cases from 2011, only 40.6% took any chemoprophylaxis, and of those who took any chemoprophylaxis, 69.2% adhered to the full regimen. Knowledge, attitudes, and beliefs were more important in influencing chemoprophylaxis use than health insurance status, as 25.0% of the sample did not know about the risk of acquiring malaria, nor of its health impact, and 34.4% knew about it but still did not take chemoprophylaxis; among those who did not take chemoprophylaxis, most (84.4%) had health insurance.

Conclusion: Travelers and immigrant communities need outreach to increase awareness of malaria and the need for pre-travel medical advice to receive appropriate chemoprophylaxis; this advice should emphasize the need to adhere to the complete regimen. To improve chemoprophylaxis use and adherence, malaria prevention programs must target individuals’ knowledge, attitudes, and beliefs regarding their risk for a severe malaria infection. Qualitative research is recommended to identify barriers to chemoprophylaxis use and adherence. Providers also need training to give appropriate travel advice regarding malaria prevention.
Abstract #: 2-12

Provider Awareness and Altered Practice Following a 2011-2012 Bordetella Pertussis Outbreak, New York City

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Background: In January 2013, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) surveyed providers to assess if increased awareness and changes in clinical practices contributed to an elevated Bordetella pertussis incidence 270% over baseline following a 2011-2012 outbreak.

Methods: A twenty-question web-based survey was designed in FeedbackServer 5. The survey was distributed to NYC medical providers via multiple e-mail list-serves created and maintained by DOHMH, which were chosen for rapid survey distribution. The list-serves were not mutually exclusive and included non-medical providers. Analysis was limited to unique respondents who completed all survey questions and indicated current practice in a hospital or outpatient facility located in NYC. Analyses were conducted using SAS v9.2.

Results: A total of 1,316 responses were received, of which 429 (33%) met the inclusion criteria. Respondents provided care for pediatric (54%) and/or adult (69%) populations and worked in hospital (37%) and/or outpatient (80%) settings. Eighty-four percent of respondents were aware of the pertussis outbreak. Seventy-three percent reported that after the outbreak, they were more likely to consider pertussis in a patient with prolonged cough illness. Twenty-two percent reported an increased frequency of diagnostic testing. Twelve percent changed the type of diagnostic test ordered for pertussis, of which 33% and 64% were more likely to test with bacterial culture and/or polymerase chain reaction (PCR), respectively. Health advisory alerts and media reports were the most frequent reasons for awareness of the outbreak and altered clinical practices. Limitations of this survey include: 1) respondents may not be representative of the broader provider community; and 2) the survey response rate cannot be determined due to the nature of list-serves used.

Conclusions: High awareness of the outbreak, increased clinical suspicion of pertussis, and increased frequency of diagnostic testing likely contributed to the elevated incidence of pertussis cases reported following an outbreak in NYC. Advisory alerts and media reports were successful methods for providing information to providers.
Abstract #: 2-13

Differential Incidence and Patient Characteristics of Tuberculosis (TB) by Country of Birth in New York City (NYC), 2001-2008

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Background: The decline in TB rates in the United States (US) has taken place disproportionately among the US-born, resulting in a dramatic increase in the proportion of non-US born cases over the same time period. While numerous studies have presented differences in patient characteristics between US-born and non-US born TB patients, few have evaluated these differences by country of birth.

Methods: We conducted a retrospective population-based cohort analysis of incident TB cases diagnosed in NYC from 2001-2008. Socio-demographic and clinical characteristics were abstracted from NYC TB case registry. Average annual incidence rates were calculated by country of birth using population estimates from the US Census American Community Survey.

Results: The 8,171 TB cases diagnosed during the study period hailed from 143 countries, with 20 countries of birth representing 80% of cases. Overall NYC TB incidence was 11 per 100,000 but there was a disparity when stratified by US-born (6 per 100,000) vs. non-US born (24 per 100,000). Countries with the highest NYC incidence rates per 100,000 population (Indonesia: 115, Liberia: 79, Cambodia: 77, Ethiopia: 74) were not necessarily those with the largest populations in NYC (Dominican Republic, China, Jamaica, Guyana). Among 5,688 non-US born cases, 82% were born in a high TB incidence country, 13% in a medium incidence country and 5% in a low incidence country. Patient characteristics differed dramatically by country. Non-US born patients overall had lower proportions of HIV infection, homelessness and substance use compared to US-born patients.

Conclusion: While non-US-born TB patients in NYC share certain characteristics, our data show that they are largely a heterogeneous group. Nationally, the proportion of non-US-born TB cases is increasing. In order to work toward reducing this disparity, analysis of population-based data by country of birth can help focus interventions to reduce TB incidence.
HIV and HCV Sero-Prevalence and Associated Risk Factors in Sex Partners of People who Inject Drugs (PWID) in Kazakhstan and Kyrgyzstan: Findings from the Integrated Behavioral-Biological Survey (IBBS)

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Background: People who inject drugs (PWID) are considered the main drivers of HIV transmission in Central Asia’s concentrated epidemic where ≥50% of HIV infections occur in PWID. However, recent evidence suggests an increasing role of heterosexual transmission with increases in sexually acquired HIV from 20% in 2006 to 38% in 2010 in Kazakhstan. Further, sex partners of people living with HIV (PLWH) now constitute one of the largest groups of newly detected HIV cases (12% in 2011 in Kazakhstan). Since at least half of PLWH are PWID, sex partners of PWID are likely at increased risk for HIV infection. Little is known about this group that is excluded from routinely conducted integrated behavioral and biological surveys (IBBS) used to monitor the epidemic among key populations such as PWID. We conducted a modified IBBS survey among sex partners of PWID in Kazakhstan and Kyrgyzstan to determine HIV and HCV seroprevalence and identify associated risk factors in this population.

Methods: A cross-sectional survey was conducted among non-injecting sex partners of PWID from 8 sites across Kazakhstan and Kyrgyzstan. A convenience sample of sex partners was obtained by recruiting partners of PWID enrolled in IBBS through respondent-driven sampling. Partners were at least 18 years of age and had a history of sex (oral, anal or vaginal) with the index PWID. From June to August 2013, socio-demographic, behavioral, and other data (including drug use, sexual behavior, access to HIV/STI services, knowledge and perceptions of HIV/AIDS, willingness to participate in HIV prevention) were collected through semi-structured individual interviews. Dried-blood spots obtained through finger pricks were collected and tested for HIV and HCV using ELISA. Local stakeholders were interviewed to gather qualitative information on HIV prevention programming for partners of PWID. HIV and HCV prevalence estimates will be determined. Statistical tests including Chi-square and Wilcoxon rank-sum tests will be used to conduct bivariate analyses. Multivariate modeling will be used to identify factors independently associated with HIV and HCV prevalence. Analyses will be conducted in R and SPSS. Approval to conduct this study was received from the Ministries of Health and IRBs of Columbia University and CDC.

Results: 33 stakeholders were interviewed to gather qualitative information on involving partners of PWID in HIV prevention programming. 2044 partners were recruited and consented to participate; 29 were excluded due to ineligibility. 2015 partners were interviewed and provided blood samples. Data from interviews and laboratory analysis of blood samples were entered into a database. Data cleaning is currently underway in preparation for analysis.

Conclusion: The study will generate HIV and HCV prevalence estimates and associated risk factors in sex partners of PWID. These data will help identify unmet needs among partners of PWID and priorities for HIV-related programming for this population.
Abstract #: 2-15

Multilevel Analysis of Individual, Neighborhood, and Health Care Facility Characteristics Associated with Achievement of HIV Viral Suppression Among Persons Newly Diagnosed with HIV in New York City

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Background: More than 3,000 persons in New York City (NYC) are newly diagnosed with HIV each year. Viral suppression – the control of HIV viral load (VL) to a sufficiently low blood concentration – can reduce morbidity and mortality in persons with HIV and decrease the probability of onward transmission. The few population-based analyses that have examined factors associated with time from HIV diagnosis to suppressed VL have not examined the influence of neighborhood of residence and of health care facility characteristics. Such social and structural factors have been shown to influence other health outcomes among persons with HIV. We will investigate the effect of individual, neighborhood, and health care facility characteristics on time (days) from new HIV diagnosis to first achievement of HIV viral suppression (≤400 copies/mL), among adults and adolescents in NYC who were newly diagnosed between 2006 and 2010.

Methods: We will use individual and health care facility data through 2012 from the NYC HIV surveillance registry and publicly available neighborhood data at the Census tract level from Census 2010 (e.g., proportion of residents who are black) and American Community Survey 2011 5-year estimates (e.g., proportion of residents with incomes below the Federal poverty level). The registry includes demographic (e.g., sex at birth, age, race/ethnicity) and clinical (e.g., baseline CD4 count) information, address of residence geocoded to the 2010 Census tract, and HIV-related laboratory test results (e.g., VL) since 2000 for all New Yorkers diagnosed AIDS since 1981 and with HIV since 2000. Data on individual characteristics will be linked to cases by the unique patient identifier assigned by surveillance to all HIV cases, data on neighborhood characteristics will be linked by the Census tract of patient residence, and data on health care facility characteristics will be linked by the facility diagnosing HIV. Cox proportional hazards regression will be used, accounting for the clustering of individual outcomes by neighborhood or health care facility characteristic.

Preliminary Results: Between 2006 and 2010, 14,718 persons were newly diagnosed with HIV and had their address geocoded to the Census tract level (91% of all diagnoses). Of these, 10,403 (70.7%) achieved suppression by the end of the follow-up period. Additional results will be available at the time of the Forum.

Conclusions: Our results will elucidate factors associated with viral suppression, providing data that can be used by policymakers to scale up health promotion for people with HIV and target services to persons, neighborhoods, or facilities with characteristics associated with lower achievement of suppression. This study’s findings will contribute valuable information about the types of neighborhoods and facilities that both promote health among persons with HIV and, by supporting viral suppression, prevent ongoing transmission of the virus.
Reportable Bacterial Infections in Infants Born in New York City, 2001-2009

Abstract #: 2.16

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Background: Bacterial infections are an important source of infant morbidity and mortality; however, the rates, trends, and risk factors for these infections in New York City (NYC) infants have not recently been described. The NYC Department of Health and Mental Hygiene’s (DOHMH) Bureau of Communicable Disease (BCD) collects surveillance data on 73 notifiable infections, of which 52% are bacterial in origin. We analyzed 9 years of reportable disease data to determine the most common bacterial causes of infant infection and describe their epidemiology.

Methods: All cases of reportable bacterial infections received by BCD for infants (age ≤ 364 days) born in NYC from January 1, 2001 through December 31, 2009 were matched to the Office of Vital Statistics (OVS) live birth registry. Only diseases reportable to the DOHMH for every year of the study period were included (19 diseases). Incidence was calculated cumulatively as all cases of reportable bacterial infections per 1000 live NYC births from 2001 through 2009, annually compared to live births per year of birth, and as a percent of total reported infant bacterial infections. The proportion of all infections, Salmonella, and group B Streptococcus infection that occurred in early neonatal (< 7 days), late neonatal (7-27 days), and post-neonatal (≥ 28 days) periods were evaluated using a chi-square test, assuming that all infants survived their first year of life. Data on borough of residence were compared to NYC live birth data using chi-squared tests.

Results: There were 4597 infants born from 2001-2009 reported with a notifiable bacterial infection, resulting in a cumulative incidence of 4.1 cases per 1000 live births. Salmonella infection was the most frequent infection both cumulatively (46% of all infections reported) and annually. Disease incidence differed by age category, with significantly more infant infections reported in early and late neonatal infants (p<0.0001). Group B Streptococcus was the most common infection both in early and late neonatal infants (71% and 35% of infections per age group respectively), and Salmonella was most frequent in post-neonatal infants (53%). There were 65 infants with 2 reportable bacterial infections during their first year of life, of whom 20 had co-infections. The distribution of infants with infections by borough was statistically different than total NYC live births (p<0.0001), with disproportionately more infants with infections residing in Queens (5.7 per 1000 Queens live births) and the Bronx (5.1 per 1000 Bronx live births).

Conclusions: Infants with notifiable infections were disproportionately neonates and residents of Queens and the Bronx. The incidence of disease types varied by infant age category. Future work will use birth certificate information to compare infants with a reportable disease to cohorts by birth year in order to identify risk factors for infection and infection-associated mortality.
Abstract #: 2-17

Provider-Initiated HIV Testing & Counseling (PITC) in Children: Tackling the P of PITC

Authors: Khameer Kidia, Katharina Kranzer, Ethel Dauya, Stanley Mungofa, Karin Hatzold, Joanna Busza, Geraldine Ncube, Tsitsi Bandason, Rashida Ferrand

Background: Provider-initiated testing and counseling (PITC) in high HIV prevalence settings is recommended, but the extent to which this is routinely implemented in children is not clear. We investigated the barriers to PITC for children at 6 primary care clinics in Harare, Zimbabwe, and present the outcome of an intervention that sought to address these barriers.

Methods: Children aged 6-15 years with no previous documented HIV test result and who attended with a caregiver, were eligible for PITC. The proportion of children offered HIV testing, the uptake of testing, and reasons why PITC did not occur were systematically recorded over a four-month period. In-depth interviews with two healthcare providers at each of the 6 clinics were conducted to qualitatively explore barriers to offering PITC. We implemented an intervention to address these barriers and re-evaluated the implementation of PITC over three months.

Results: From January to May 2013, 2761 children were eligible for PITC, of whom 1472 (53%) underwent HIV testing with caregiver consent. 43 (5%) children and 64 (19%) of the 344 accompanying caregivers who also tested with the child were HIV-positive. PITC did not occur because 691 (25%) of eligible children were not offered testing and 598 (29%) of the 2070 who were offered testing declined. Providers did not offer testing due to uncertainty about consent procedures and the type of caregiver qualified to give consent; concerns about the negative psychosocial impact of a positive HIV test on a child and lack of services to address this; and shortages of staff and testing kits. Based on these findings, we: i) engaged clinic managers to address logistical issues, ii) provided training to providers on communication with guardians and ethical/legal issues of consent and iii) established a mentorship program to train nurses in pediatric HIV care. Post-intervention, the proportion of children offered testing increased to 93% and client refusal decreased to 8% (Fig 1). HIV detection rates increased from 1% to 5% as a result of this intervention.

Conclusions: PITC in primary care is an effective strategy for timely identification of HIV in children and caregivers. Providers require training to address the legal and ethical issues associated with HIV testing in children and to be able to counsel families appropriately for successful implementation of PITC.
Abstract #: 2-18

Differing Asthma Prevalence by Gross National Index (GNI) of Country of Birth Among New York City Residents

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Background: The hygiene hypothesis suggests that higher exposure to infectious agents may be one reason for regional differences in asthma. This would suggest that immigrants from less developed countries, where infections are more common, to highly developed countries will have lower risk for asthma compared to natives, as has been found in a number of studies. We expand the research on immigrants to look at the level of development in country of origin as a predictor of asthma in New York City residents.

Methods: Data came from the 2009 cross-sectional Community Health Survey. We used logistic regression to assess the relationship of country of birth and the gross national income (GNI), an indicator of the level of development, of country of birth with asthma among immigrants and US-born New York City residents.

Results: Those who were foreign born had lower odds of having asthma compared to those U.S. born (OR=0.43, p<0.001). There was a dose relationship between GNI and asthma with decreasing odds of having asthma associated with lower GNI in country of birth (low GNI country: OR=0.26, p=0.014; middle GNI country: OR=0.36, p<0.001; high GNI country=reference).

Conclusions: These findings lend support to the hygiene hypothesis in that the odds of having asthma among New York City residents was lowest among people born in the least developed countries, as indicated by GNI, where infections are likely the most common.
Elevated Risk for Invasive Haemophilus Influenzae, and Group A and B Streptococcus Infection in Persons Living with HIV/AIDS, New York City, 2000-2012

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Background: Invasive Haemophilus influenzae (Hi), Group A Streptococcus (GAS, Streptococcus pyogenes), and Group B Streptococcus (GBS, Streptococcus agalactiae) are reportable diseases in New York City (NYC). DOHMH also maintains a name-based registry of all HIV-related events. Hi and GBS infection have been a concern primarily in children and infants, but invasive disease in adults has become more common. Epidemiologic analyses of disease in adults have identified risk factors such as diabetes mellitus, malignancies, and older age. Immunosuppression from HIV infection has been explored as a risk factor, but the relationship between HIV in adults and disease risk has not been thoroughly quantified.

Methods: Surveillance data for Hi, GAS, and GBS cases ages 15 to 64 years from 2000-2012 were matched to the NYC death and HIV registries. Incidence rates were computed for the 13-year period among both people living with HIV/AIDS (PLWHA) and HIV-uninfected persons using intercensal population estimates. The number of PLWHA was estimated using age-specific HIV prevalence rates. Descriptive statistics and chi square tests were used to compare PLWHA to HIV-uninfected cases. The relative risk (RR) for each invasive bacterial disease in PLWHA was calculated as the ratio of the incidence of disease in PLWHA divided by the incidence in HIV-uninfected. Age-adjusted case fatality rates (CFR) for Hi were compared between PLWHA and HIV-uninfected. Information on death for GAS and GBS cases is pending completion of registry matches.

Preliminary Results: There were 1229 GAS cases (11.7% PLWHA), 4354 GBS cases (7.9% PLWHA), and 395 Hi cases (23.5% PLWHA) that met the inclusion criteria. Cases in PLWHA were found to differ from those in HIV-uninfected persons in the proportion of men for both GAS (62% vs. 51%, p=0.0009) and GBS (70% vs. 53%, p=0.0001). The RR among PLWHA was 17.3 (95% CI 13.7-21.9) for Hi, 7.8 (95% CI 6.5-9.3) for GAS, and 5.1 (95% CI 4.3-5.9) for GBS. For all three diseases the RRs declined across the three age groups (see table). The overall age-standardized CFR for Hi was 11.9% and the age-adjusted, odds ratio of death in PLWHA compared to HIV-uninfected was 0.68 (95%CI 0.30-1.52).

Table: PLWHA Relative Risks for Hi, GAS and GBS by Age Category

<table>
<thead>
<tr>
<th>Disease</th>
<th>15-24</th>
<th>25-44</th>
<th>45-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi</td>
<td>75.2</td>
<td>20.8</td>
<td>10.8</td>
</tr>
<tr>
<td></td>
<td>(33.1, 171.0)</td>
<td>(14.1, 30.6)</td>
<td>(7.9, 14.8)</td>
</tr>
<tr>
<td>GAS</td>
<td>14.5</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.3, 39.5)</td>
<td>(3.1, 5.1)</td>
<td></td>
</tr>
<tr>
<td>GBS</td>
<td>15.7</td>
<td>6.4</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>(6.9, 35.7)</td>
<td>(4.9, 8.2)</td>
<td>(2.3, 3.4)</td>
</tr>
</tbody>
</table>

Conclusions:
Hi, GAS, and GBS infection are significantly associated with HIV infection. The unexpected finding of decreasing RRs with age across all three diseases will be explored in case control studies accounting for CD4+ count and viral load. The findings may underscore the importance of early HIV diagnosis and linkage to care.
Abstract #: 2-20

**Perinatal Hepatitis B Prevention - Hospital Policy and Practices Survey**

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**Background:** Post-exposure prophylaxis (PEP) consisting of hepatitis B immunoglobulin and the first dose of hepatitis B virus (HBV) vaccine within 12 hours of birth is the most effective measure to prevent perinatal transmission from infected mothers. New York State mandates prenatal screening for hepatitis B surface antigen (HBsAg) as well as screening at the time of delivery for women of unknown HBsAg status; positive results are required to be reported to the health department. The Advisory Committee on Immunization Practices recommends that women at high risk for HBV infection during pregnancy are screened at Labor & Delivery (L&D) and advocates for a universal HBV vaccine birth dose policy for all newborns. We evaluated policies and procedures utilized by New York City (NYC) birthing facilities for perinatal HBV prevention.

**Methods:** A 50 question web-based survey was developed by the NYC Department of Health and Mental Hygiene and distributed to 41 NYC birthing facilities in 2012. Questions focused on perinatal HBV prevention policies and practices used in 2011, including maternal HBsAg testing and documentation, maternal risk assessment, PEP practices, birth dose coverage, policies and standing orders. It consisted of two different sections to be completed separately by the directors of Obstetrics/Gynecology departments (OBD) and Pediatrics/Neonatology departments (PND).

**Results:** Ninety percent (37/41) of birthing facilities returned ≥1 survey. Among surveys returned, 78% were completed by OBD and 83% by PND. Among OBD, 94% reported reviewing HBsAg test results for all women admitted to L&D. Eighty-eight percent test women with unknown HBsAg status admitted to L&D; 9% test all women regardless of previous testing. Sixty-six percent assess all women for HBV risk factors and 56% test women identified as high risk upon admission to L&D. Seventy-two percent of OBD have a written policy and 28% have a standing order for perinatal HBV prevention. Of PND, 91% offer HBV vaccine to all infants and 88% administer the vaccine between delivery and discharge. If HBV vaccine is withheld, 97% require the mother’s negative HBsAg status documented in the infant medical record and 59% require a physician’s order. Among PND, 91% have written policies and 59% have standing orders to provide HBV vaccine to all newborns. Median and mean reported birth dose coverage was 98% and 78%, respectively (range <5% to 100%).

**Conclusions:** Most of the responding facilities follow the legal requirements for HBsAg testing. Median reported HBV vaccine birth dose coverage is high, but varies widely between facilities. The difference between the median (98%) and mean (78%) birth dose coverage suggests there are outlying facilities with very low coverage. The identification of facilities with low birth dose coverage and/or without a perinatal hepatitis B prevention policy will allow for targeted outreach to increase prevention efforts.
Abstract #: 2-21

Depressive Symptoms are Associated with Excess Weight and Unhealthier Lifestyle Behaviors Among Urban Adolescents

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Background: Previous studies suggest that depression increases the risk of obesity in adolescents. This study examined the association of depressive symptoms with standardized body mass index (BMIz), weight-related lifestyle behaviors in urban adolescents, and additionally, with self-efficacy measures.

Methods: The study was conducted with a sample of 1,508 adolescents (mean age 13.9 years) from 11 public schools in the Bronx, N.Y. The sample was 53% female, 75% Latino, and 82% US born. 22% were overweight and 23% were obese. Depressive symptoms were measured using the Kandel et al. 6-item scale for adolescents (α= 0.78). Dietary intake, sedentary behavior and physical activity (PA) were obtained by self-report using validated questionnaires. Self-efficacy measures included separate scales for healthy eating and being physically active. Height and weight were directly measured. Gender- and age-specific BMIz were calculated according to CDC growth curves.

Results: After using mixed effects models to account for clustering at school level and to adjust for confounders, higher levels of depressive symptoms were associated with higher BMI z-score (β = .02, p < .02), intake of energy-dense foods (β= .42, p < .001), sedentary behavior (β= .48, p < .001), but lower PA (β= -.03, p < .001). The inverse association between depressive symptoms and PA was observed in boys but not girls, and it appeared to be mediated by self-efficacy (higher depression, lower self-efficacy, lower PA).

Conclusions: Findings indicate that higher levels of depressive symptoms among adolescents are associated with higher BMI and unhealthier lifestyle behaviors. Obesity prevention programs and health professionals should consider addressing the role of negative emotions as part of their preventive and therapeutic strategies.
Abstract #: 2-22

Repeat Psychiatric Hospitalizations in Children and Youth in New York City

Authors: Caroline Mills, Myla Harrison, Lily Tom, Cynthia Driver

**Background:** Repeat psychiatric hospitalizations after an initial admission potentially indicates lack of access or engagement to appropriate community-based mental health services. Understanding factors related to multiple admissions and identifying those at risk could lead to preventive interventions.

**Objective:** Describe the frequency and characteristics of youth with multiple psychiatric hospitalizations among NYC residents <18 years old. Examine variation in the association between ten psychiatric disorders and repeated hospitalization.

**Methods:** Data from the Statewide Planning and Research Cooperative System for 1999-2011 were used. The study sample was children and youth ages 17 and younger whose first hospitalization with a principal diagnosis of a psychiatric condition was in 2009, and who experienced multiple hospitalizations with a principal diagnosis of a psychiatric condition in the subsequent two years. Descriptive analyses of the sample included the distribution of ten ICD-9 diagnoses, demographic information, and characteristics of the first hospitalization. Analyses of the relation between diagnoses and hospitalization were stratified by age categories. Logistic regression was used to model variation in the relation between the ten diagnoses at first hospitalization and a subsequent hospitalization, adjusting for demographic characteristics, length of stay and insurance.

**Results:** Twenty-two percent (628/2844) with a first hospitalization in 2009 had a repeat hospitalization within two years. Among those with a repeat hospitalization, one quarter had a re-hospitalization within the first month, half within four months, and 81% within the first year. One-third (34%) had two or more re-hospitalizations within two years (range 1 to 8). Three percent were 0-5 years at initial hospitalization, 29% were 6-11 years, and 68% were 12-17 years old. The most common principal diagnoses at first hospitalization were mood disorder not otherwise specified (20%), depressive disorders (16%), bipolar disorders (14%), attention-deficit/hyperactivity disorder (14%), and schizophrenia (12%). Seventy-one percent had public insurance. Nineteen percent had a first hospitalization of three or fewer days; 32% had 16 or more days.

Among youth ages 6-11, all diagnoses had the same risk for subsequent hospitalization except for depressive disorders, which had a decreased likelihood of subsequent hospitalization (odds ratio [OR] = 0.37; P<.05). Youth ages 12-17 with adjustment disorders (OR=0.56; P<.05) were less likely to have a subsequent hospitalization whereas those with bipolar disorders (OR=1.96; P<.0001) and schizophrenia (OR=1.55; P<.01) were more likely to have a repeat hospitalization.

**Conclusions:** Most youth who had multiple hospitalizations were adolescents, on public insurance, and had their subsequent hospitalization within a year. Schizophrenia and bipolar disorders conferred increased risk of multiple admissions in adolescents. Efforts to reduce repeat hospitalizations should focus on these groups.
Background: Hurricane Sandy struck the northeast coastline on Oct. 29th, 2012 and had a devastating impact in New York City. Exposure to disasters like Hurricane Sandy is associated with mental health effects, including psychological distress and post-traumatic stress disorder (PTSD). PTSD may occur in 30-40% of direct victims of disasters.

Methods: The Hurricane Sandy Mental Health Needs Assessment was a cross-sectional survey conducted by the NYC Department of Health and Mental Hygiene in December 2012 to estimate the mental health impact of Hurricane Sandy among residents of severely impacted areas of NYC. Adults aged 18 and over were invited to participate. Surveys were administered by in-person interview. The Primary Care PTSD Screen and the Kessler-6 scale, a measure of psychological distress, were administered. Subjects were asked about psychological/behavioral symptoms in their children. Two geographic strata were defined: South Brooklyn/Rockaways and Staten Island. Sampling followed the Center for Disease Control’s Community Assessment for Public Health Emergency Response methodology. Responses were weighted to reflect the populations of the two strata.

Results: A total of 420 interviews were completed. The majority of respondents were in the impact area when the storm hit (79%). Half evacuated at some point before, during, or after the storm (49%). Participants experienced numerous sources of trauma exposure, including concern about being hurt or killed (37%), witnessing something terrible happen to another person (25%), knowing someone who was badly hurt or killed (18%), and being physically injured (8%). Almost all participants experienced some form of stressor such as lost electricity (94%) or heat (86%). A quarter (26%) of respondents screened positive for PTSD symptoms, and 39% showed moderate to severe levels of psychological distress. Prevalence of PTSD symptoms was higher among subjects reporting 3 or more trauma exposures (57%) than those reporting no trauma exposure (20%). Increased drug or alcohol use was not uncommon (14%). In addition, 40% of participants indicated that a child in the household experienced an increase in at least one psychological/behavioral symptom after the storm, such as sadness or clingy behavior.

Conclusions: NYC residents living in areas severely impacted by Hurricane Sandy experienced a substantial mental health burden. Greater number of traumatic exposures was associated with more substantial psychological effects. Health care providers should be aware of and seek to identify mental illness in adults and children exposed to Hurricane Sandy.


Abstract #: 2-24

Accumulation of Risk Factors for Psychotic Disorders Predicts Lower Fractional Anisotropy in the Superior Longitudinal Fasciculus in Healthy Adults

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Background: Although epidemiological studies provide strong support for demographic and environmental risk factors for psychotic disorders, few data examine how these risk factors relate to the putative aberrant neurodevelopment associated with illness. The present study examined how the accumulation of risk factors including low IQ, low parental socioeconomic status, history of adolescent cannabis use and childhood trauma, and high levels of subclinical psychotic-like experiences might contribute to aberrant neurodevelopmental outcomes in otherwise healthy adults.

Method: Healthy volunteers (N=112; 60 males, 52 females; M_age=36.07±13.23) were recruited from the community as part of an ongoing study of subclinical psychosis. Participants received a diffusion tensor imaging exam and voxel-wise statistical analysis of fractional anisotropy (FA) using tract-based spatial statistics was used to examine the relation between putative psychosis “risk load” and white matter (WM) integrity across the whole brain. Local association between participants’ “risk load” and FA was performed using permutation-based testing with age and sex as covariates.

Results: Analyses revealed that higher “risk load” was significantly predictive of lower FA in a cluster in the left superior longitudinal fasciculus (SLF) (p=0.04, corrected).

Conclusion: These results suggest that the accumulation of risk factors for psychotic disorders have a significant impact on WM integrity even in otherwise healthy adults. These findings may provide insight into the mechanism by which previously identified risk factors contribute to the structural brain abnormalities presumed to underlie psychotic illness. Prospective longitudinal studies examining the developmental trajectory of brain WM in relation to individual risk factors are warranted.
Abstract #: 2-25

Unmet Needs for Mental Health Treatment and Barriers to Treatment
Among NYC Adults with Probable Serious Mental Illness

Authors: Brigid Staley, MPH, Christina Norman, PhD

Background: A large proportion of adults with mental health problems delay or don’t receive mental health treatment. Barriers to treatment are common, including cost, which is a barrier for approximately half of U.S. adults who perceive an unmet need for treatment.

Methods: The Community Mental Health survey (CMHS) was a telephone survey on mental health needs and services conducted by the New York City (NYC) Department of Health and Mental Hygiene in 2012, supplementary to the Department’s Community Health Survey (CHS). The CHS is an annual telephone survey of non-institutionalized NYC adults aged 18 and older assessing various health indicators, using a stratified random sample. CHS participants were invited to participate in the CMHS if they: 1) scored 13 or greater on the Kessler-6 (K6) scale of psychological distress, or 2) endorsed a lifetime diagnosis of bipolar disorder, mania, psychosis, schizophrenia, or schizoaffective disorder. Probable serious mental illness with impairment (SMI) was defined using criteria developed by the Substance Abuse and Mental Health Services Administration, using the K6 and World Health Organization Disability Assessment Schedule scales. CHS data were weighted to reflect the NYC adult population, and an additional weight was created for the CMHS to adjust for non-response. The aim of this study was to determine the prevalence of SMI, unmet needs for treatment and services among NYC adults with SMI, and to assess barriers to treatment.

Results: Of the 8,797 CHS participants, 846 were eligible for the CMHS, and 590 participated. Incomplete CMHS surveys (N = 7) were excluded. The final sample consisted of 583 participants. The weighted prevalence of SMI was 4.7%, representing approximately 300,000 NYC adults.

Overall, 59% of adults with SMI received mental health treatment in the past year, of which 30% also perceived having an unmet need for treatment. Among the 41% who didn’t receive treatment in the past year, 46% perceived an unmet need. Among all adults with SMI, 41% perceived an unmet need for treatment.

Among adults with SMI reporting an unmet need for treatment, reported barriers included perceiving accessing treatment as too difficult/overwhelming (65%), cost (64%), not having enough time (53%), and difficulty finding a provider (34%).

Other perceived unmet needs reported by adults with SMI included assistance applying for benefits/entitlements (20%), employment services (15%), housing assistance services (15%), and substance use treatment (11%).

Conclusions: A substantial proportion of adults with SMI didn’t receive treatment and/or perceived an unmet need for treatment in the past year. Multiple barriers to treatment were frequently reported. These findings suggest a need for interventions targeting barriers to treatment among adults with SMI in NYC.
Abstract #: 2-26

Depression and Distress in Blacks and Whites in the U.S.: Results of a Systematic Review

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Background: The literature frequently notes, based on cursory reviews, inconsistent findings on Black and White mental health in the U.S.: a lower prevalence of psychiatric disorder, particularly major depression, in Blacks compared with Whites, coupled with higher levels of psychological distress. From the vantage point of social stress theory, these patterns suggest a double paradox. Social stress theory, the dominant framework for interpreting associations between social status and mental health, predicts worse mental health in disadvantaged versus advantaged groups. Given the stark socioeconomic divide between Blacks and Whites in the U.S., Black-White mental health comparisons are a strong test of the theory. Blacks' reliably lower prevalence of psychiatric disorder in general and depression in particular poses a critical challenge to social stress theory and represents the first paradox. The apparent divergence of depression-distress findings between Blacks and Whites is a second paradox, given that depression and distress are correlated.

These paradoxes have emerged only from anecdotal impressions of the findings, however, signaling the need for a systematic literature review. Systematic mapping of Black-White depression and distress findings could provide the empirical foundation for developing artifactual and substantive hypotheses to explain both paradoxes, ultimately reinforcing or diminishing our confidence in social stress theory. The goal of this study is to systematically review, for the first time, literature documenting Black-White comparisons of major depression prevalence and distress in nationally representative household samples of the adult U.S. population.

Methods: Following Cochrane guidelines, a search of PubMed and PsycInfo yielded 17,892 unique articles for potential inclusion. Title and abstract reviews resulted in 88 articles for full review. To date, 46 have been fully reviewed; these were selected first because they contain distress data, the outcome for which knowledge of the Black-White pattern is more tentative. A secondary review of reference lists of articles selected for inclusion will also be conducted. Results from included papers will be divided by outcome (major depression or distress), and then subdivided by measure used, outcome timeframe, and ordered by effect size.

Results: In the 18 articles satisfying inclusion criteria of the first 46 reviewed, Blacks had higher distress than Whites in 15, and 5 of these were statistically significantly. Whites had higher distress than Blacks in 2 studies and 1 of these was statistically significant. One study did not provide numbers but only reported no statistically significant difference in distress between Blacks and Whites.

Conclusions: Preliminary results from this systematic review support anecdotal impressions in the literature that Blacks have a lower prevalence of major depression but higher levels of distress compared with Whites. This systematically documented pattern could provide insights for novel hypotheses to account for both paradoxes described above.
Abstract #: 2-27

Testosterone and Cognitive Function in Men: A Separate-Sample Mendelian Randomization Analysis in the Guangzhou Biobank Cohort Study

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Early life exposures may be associated with cognitive function in older adulthood. Whether testosterone exerts a protective effect on cognitive function in men remains unclear. We examined the association of peak endogenous testosterone with cognitive function, assessed from the delayed 10-word recall score and Mini-Mental State Examination (MMSE) score, using a Mendelian randomization analysis with a separate-sample instrumental variable (SSIV) estimator to minimize reverse causality. A genetic score predicting testosterone was developed in 289 young Chinese men, university students, from Hong Kong based on three selected testosterone-related single nuclear polymorphisms (rs10046, rs1008805 and rs1256031). Multivariable linear regression was used to examine the association of genetically predicted testosterone with delayed 10-word recall and MMSE score among 4212 older Chinese men from the Guangzhou Biobank Cohort Study. Predicted testosterone was not associated with the delayed 10-word recall score (-0.006, 95% confidence interval (CI) -0.05 to 0.04) or MMSE score (0.05, 95% CI -0.05 to 0.16) after adjustment for potential covariates (age, education, smoking status, use of alcohol and body mass index). Our findings among men do not corroborate protective effects of testosterone on cognitive function seen in observational studies. Replication in a larger sample is needed.
Comorbidity of 9/11-Related Posttraumatic Stress Disorder and Depression in the World Trade Center Health Registry

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Background: Elevated prevalence of posttraumatic stress disorder (PTSD) and depression have been consistently reported among adult rescue and recovery workers, New York City residents, area workers and passersby exposed to the September 11, 2001 (9/11) disaster. However, few studies have evaluated long-term levels of PTSD and depression, and these mental health conditions are often comorbid with other psychiatric disorders. As such, this study examined long-term prevalence of PTSD, depression, and comorbid PTSD and depression among adult World Trade Center (WTC) Health Registry (Registry) enrollees 10 to 11 years after the WTC disaster. In addition, this study identified risk factors associated with having PTSD, depression, or both and examined quality of life, health care utilization and need, and cognitive functioning measures.

Methods: The study sample consisted of 29,486 adult enrollees from the Registry who completed the initial baseline interview (Wave 1, 2003-4) and both follow-up surveys (Wave 2, 2006-7; Wave 3, 2011-12); enrollees with a self-reported physician diagnosis of PTSD or depression before 9/11 were excluded. Probable PTSD was defined as a score of 44 or greater on the PTSD Checklist-Civilian Version (PCL-17) and depression was defined as a score of 10 or greater on the Patient Health Questionnaire (PHQ-8). A four-level categorical variable was created based on enrollees responses to the PCL and PHQ-8 at Wave 3: comorbid PTSD and depression, PTSD only, depression only, and neither.

Results: Over 15% of enrollees screened positive for probable PTSD 10 to 11 years post-9/11, 14.9% met criteria for depression, and 10.1% experienced comorbid PTSD and depression. The odds of comorbid PTSD and depression at Wave 3 were significantly elevated among individuals with high 9/11 exposures, low social integration, who were unemployed for health reasons, and who had experienced more than one traumatic life event since 9/11. Unemployment at Wave 3 was more strongly associated with depression status than PTSD status, while 9/11 exposure and being a rescue and recovery worker or lower Manhattan area worker was associated more strongly with PTSD than depression. Lastly, enrollees with comorbid PTSD and depression experienced poorer outcomes on all measures of PTSD-related impairment and symptom duration, life satisfaction, overall health, mental health care utilization and need, and cognitive functioning when compared to those with PTSD or depression only.

Conclusions: The prevalence of comorbid PTSD and depression in this study indicates a high burden of mental illness more than a decade post-event. These findings highlight the importance of ongoing screening and treatment for both PTSD and depression, particularly among those at increased risk for mental health comorbidity.
Abstract #: 2-29

Posttraumatic Stress Disorder and New-Onset Diabetes Among Adult Survivors of the World Trade Center Disaster

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Background: While posttraumatic stress disorder (PTSD) has been associated with diabetes in numerous cross-sectional studies, few longitudinal studies have explored this relationship. World Trade Center disaster survivors, a population with an elevated risk of PTSD, may be at an increased risk of diabetes. We explored the temporal relationship between 9/11-related PTSD and new-onset diabetes up to 11 years after 9/11.

Methods: Three waves of surveys (conducted in 2003-2004, 2006-2008, and 2011-2012) from the World Trade Center Health Registry cohort collected data on physical and mental health symptoms and diagnoses, sociodemographic characteristics, and 9/11-related exposures. Diabetes was defined as self-reported, physician-diagnosed diabetes reported after enrollment. After excluding those with diabetes at baseline, there were 36,899 eligible adult Registry enrollees. Logistic regression and generalized multilevel growth models were used to assess the association between PTSD measured at enrollment and subsequent new-onset diabetes.

Results: We identified 2,143 cases of diabetes. After adjustment for age, sex, race/ethnicity, high cholesterol, hypertension, and BMI, we observed a significant association between PTSD and diabetes in the logistic model [adjusted odds ratio (AOR) 1.28, 95% confidence interval (CI) 1.14-1.44]. Results from the growth model were similar (AOR 1.37, 95% CI 1.23-1.52).

Conclusions: PTSD, one of the most common 9/11-related health outcomes, was a risk factor for diabetes in a large population of individuals exposed to the traumatic experiences of the World Trade Center terrorist attack. Clinicians treating survivors of both natural and terrorist disasters should be aware that long-term consequences may include diabetes.
Abstract #: 2-30

Posttraumatic Stress Disorder After Hurricane Sandy Among World Trade Center Health Registry Enrollees

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Background: Traumatic exposure during a hurricane or other natural disaster has been shown to be associated with mental health conditions post-event. The World Trade Center (WTC) Health Registry (the Registry) - a cohort study of 71,434 survivors of the September 11, 2001 disaster - provided a sampling pool for a rapid survey of the experiences and physical and mental health status of persons directly affected by Hurricane Sandy in the New York City (NYC) metropolitan area in late October 2012. This study evaluated the relationship between Hurricane Sandy experiences and Hurricane Sandy-related posttraumatic stress disorder (PTSD) among individuals previously exposed to the 9/11 disaster who resided in inundation zones and non-inundation areas.

Methods: Registry enrollees in the tri-state NYC metropolitan area residing in inundation zones as defined by FEMA (n=4,435) and non-inundation areas (n=4,435) were surveyed. The study sample includes the first 2,517 web-based surveys completed between April 10 and October 31, 2013; 1,348 surveys (54%) were from inundation zones, and 1,169 (46%) were from non-inundation areas. PTSD was defined as a score of 44 or greater on the Sandy-specific PTSD Checklist-Civilian Version (PCL-17); the same threshold on a 9/11-specific PCL-17 at any of 3 waves of data collection was used to define 9/11-related PTSD. Hurricane Sandy exposures included being stranded, fearing for life or safety of others, witnessing terrible events, being threatened/assaulted/robbed, evacuation from home, living in a home that was flooded, home damage, property loss, financial cost for repair, and Hurricane Sandy-related injury.

Results: Overall, 9.1% of respondents screened positive for Hurricane Sandy-related PTSD. PTSD was higher in the inundation zones (12.4%) and lower in the non-inundation areas (5.3%). Furthermore, respondents residing in the inundation zones had a greater prevalence of adverse Hurricane Sandy exposures compared to those in the non-inundation areas. Persons residing in the inundation zones who had a history of 9/11-related PTSD had the highest prevalence (31.6%) of Hurricane Sandy-related PTSD. Persons who lived in the inundation zone with a prior history of 9/11-related PTSD were seven (adjusted Odds ratio=6.9,95%CI,4.5,10.8) times more likely to screen for Hurricane Sandy related PTSD than those without prior PTSD and those with the greatest number of aggregate Hurricane Sandy exposures were 16 (aOR=16.4,95%CI,8.3,32.5) times more likely than those with minimal Hurricane Sandy exposure.

Conclusions: These findings provide insight into the impact of Hurricane Sandy, 6-9 months after the disaster on persons vulnerable to post Hurricane probable PTSD. Public health preparation for events such as Hurricane Sandy ought to take into account the vulnerability of persons who have had prior disaster-related trauma. Further studies using these data will assess the association between storm-related experiences and environmental exposures on both physical and mental health.
Abstract #: 2-31

Minor Error or Fatal Flaw in Tracking Progress Towards Healthy People 2020 Physical Activity Objectives due to the Inclusion of Light-Intensity Activity

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Background: The National Health Interview Survey (NHIS) questions on leisure-time physical activity are used to measure progress in achieving two U.S. Department of Health and Human Services Healthy People 2020 (HP2020) objectives for physical activity: 1) increasing the prevalence of adults who get the equivalent of at least 150 moderate-intensity minutes of aerobic physical activity each week from 43.5% to 47.9% and 2) increasing the prevalence of those who get at least 300 minutes from 28.4% to 31.3%. The NHIS questions include light intensity activity, while the HP2020 guidelines do not. How much error does the inclusion of light activity in the questions contribute to overestimation of the number of adults meeting national physical activity objectives?

Methods: We used data from a 2012 telephone survey representative of adults living in New York City (NYC) households (n=7401). Respondents were asked the four NHIS items on leisure-time physical activity (frequency and duration of episodes of vigorous activity and of "light or moderate" activity) and a follow-up question asking how many of their light or moderate hours and minutes were of moderate intensity. We calculated mean weekly minutes of leisure-time physical activity by level of intensity, the share of light-/moderate-intensity activity that is actually light-intensity, and the prevalence of adults meeting the two HP2020 objectives with and without including light-intensity activity. Two-tailed statistical tests were used to identify subgroups for which overestimation of the prevalence of physical activity from the inclusion of light activity was largest.

Results: Almost half (46%) of individuals reported minutes of leisure-time physical activity that were of "vigorous" intensity (mean=145mins), followed by moderate- (29%; mean=93mins) and light-intensity activity (25%; mean=80mins). Most "light or moderate"-intensity minutes were of moderate, rather than of light intensity. Excluding light-intensity activity significantly reduced both the prevalence of NYC adults getting 150 moderate-equivalent minutes in the past week (from 53% to 46%, P <0.01) and the prevalence of those getting at least 300 moderate-equivalent minutes per week (from 38% to 32%, P <0.01). There were significant subgroup differences in the proportion of "light or moderate" intensity minutes that was of light intensity (e.g., by gender, household income, and self-reported health status), but no consistent differences in the change in prevalence of meeting either objective.

Conclusions: The inclusion of light-intensity activity in the wording of the NHIS questions resulted in a modest but statistically significant overestimation of the prevalence of NYC adults meeting HP2020 objectives, and one that was larger than the national improvement goal. However, this is not necessarily a fatal flaw since the error appears to be homogenous and it is likely modest compared to inaccuracies related to the self-reporting of physical activity.
Abstract #: 2-32

Validity of Bioelectrical Impedance Analysis for Measuring Changes in Total Body Water and Percent Body Fat Following Bariatric Surgery

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Background: Few studies have validated bioelectrical impedance analysis (BIA) following bariatric surgery.

Methods: We examined agreement of BIA (Tanita 310) measures of total body water (TBW) and percent body fat (%fat) before (T0) and 12 months (T12) after bariatric surgery, and change between T0 and T12 with reference measures: deuterium oxide dilution for TBW and three-compartment model (3C) for %fat in a subset of participants (n=50) of the Longitudinal Assessment of Bariatric Surgery-2.

Results: T0 to T12 median (IQR) change in deuterium TBW and 3C %fat were -6.4 (6.4) L, and -14.8 (13.4) %, respectively. There were no statistically significant differences between deuterium and BIA determined TBW [median (IQR) difference: T0: -0.1 (7.1) L, p=0.75; T12: 0.2 (5.7) L, p=0.35; Δ: 0.35 (6.3) L, p=1.0]. Compared to 3C, BIA underestimated %fat at T0 and T12 [T0: -3.3 (5.6), p<0.001; T12: -1.7 (5.2), p=0.04], but not change [0.7 (8.2), p=0.38]. Except for %fat change, Bland-Altman plots indicated no proportional bias. However, 95% limits of agreement were wide (TBW: 15-22 L, %fat: 19-20 %).

Conclusions: BIA may be appropriate for evaluating group level response among severely obese adults. However, clinically meaningful differences in the accuracy of BIA between individuals exist.
Abstract #: 2-33

**Dietary Sources of Sugar and Drink-Specific Calorie Intake in New York City Adults, 2013**

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**Background:** Excess calorie and sugar consumption contributes to multiple adverse health effects, such as weight gain and reduced intake of other important nutrients. Sugar-sweetened beverages (SSBs) have been identified as a key contributor to both excess calories and sugars in American diets. We analyzed the amount of calories and sugar contributed by SSBs, other beverages, and food among New York City (NYC) adults using a representative, population-based 24-hour dietary recall. We also compared the calorie and sugar intake between SSB and non-SSB consumers.

**Methods:** The 2013 NYC 24-Hour Dietary Recall was a cross-sectional study conducted among a representative sample of adult NYC residents. Respondents were recruited from a random digit dial telephone survey of 2,172 participants. From these, 488 dietary recalls were completed. From reported food and beverage intake, we analyzed calorie and sugar contributions from SSBs, other beverages, and food. Beverages were categorized as either SSBs or non-SSBs, and food was grouped together as one category. SSBs were defined as beverages with added caloric sweeteners and over 25 calories per 8-ounce serving, including carbonated soft drinks, non-carbonated fruit drinks, sweetened coffee/tea, and sports/energy drinks. Non-SSBs included 100% juice, unsweetened or low-calorie coffee/tea, plain milk, supplement drinks and smoothies, flavored milk and shakes, water/seltzer, and other low-calorie drinks. Participants were classified as whether or not they consumed any SSBs, and comparisons were made to determine if total calorie, sugar, and added sugar intake differed between these groups.

**Results:** 182 people were found to consume any SSBs (SSB drinkers), while 306 did not (non-drinkers). SSB drinkers consumed significantly more total calories than non-drinkers (2181 vs. 1609, p<.0001), more total grams of sugar (126 vs. 65, p<.0001), and more total teaspoons of added sugar (18 vs. 6, p<.0001). In addition to consuming significantly more sugar from non-alcoholic beverages (58 g vs. 13 g, p<.0001), SSB-drinkers consumed significantly more sugar from food (68g vs. 51g, p<.0001).

**Conclusions:** In this analysis, total sugar and added sugar intake were significantly higher among those who consumed SSBs. These differences were not solely attributable to the sugar obtained through SSBs, but through food choices as well. The Institute of Medicine has indicated that diets high in added sugars are lower in essential nutrients, implying that excess sugary food and beverage intake may displace consumption of healthier items. Several studies have shown that both total and added sugar intake in the United States are related to the development of chronic diseases such as obesity and type-II diabetes. Further examination of dietary sources of sugar is warranted, due to their potential impact on obesity and related chronic conditions.
Abstract #: 2-34

Physical Activity and Active Transportation in New York City and the Nation

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Background: The following paper compares physical activity from New York City and the United States. The study presents both survey data and accelerometer data to show differences in (1) overall level and (2) the type of physical activity that people receive.

Methods: Both the NYC Physical Activity and Transit (PAT) survey 2010-2011 and the National Health and Nutrition Examination Survey (NHANES) Physical Activity Questionnaire (PAQ) 2009-2010 survey are based on the Global Physical Activity Questionnaire (GPAQ) and thus both surveys ask identical questions on physical activity in three domains (work, recreation, and transit). NHANES conducted an accelerometer component to objectively measure physical activity in 2003-2004 and 2005-2006 and the PAT conducted a similar accelerometer component in 2011.

Results: Based on the self-reported GPAQ data, individuals nationwide get 831 minutes of exercise per week compared to 755 minutes of exercise in NYC. Accelerometer data show a different story, with mean values (in 10 minute bouts) of 50 minutes a week nationwide verses 118 minutes in New York City. While GPAQ values appear fairly comparable, accelerometer data in two population representative samples show New Yorkers to receive more than twice the amount of exercise as individuals nationwide. A further examination of the sub-domain level reveals a number of large distinctions between the way type of activity New Yorkers report and the type of activity individual’s nationwide report (see Table 1). For instance, of the weekly activity minutes individuals report, individuals in New York City report an average of 330 transit minutes of activity (walking and biking) in contrast individuals nationwide report only 76 minutes of transit activity in a given week. In contrast individuals nationwide reported 549

| Table 1. GPAQ Domain Overview (weekly minutes of exercise), by domain US verses NYC |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                 | US (N=6527)     | NYC (N=3806)    |                 |                 |
| Minutes Work                    | 549 (66%)       | 276 (37%)       |                 |                 |
| Minutes Transit                 | 76 (9%)         | 330 (44%)       |                 |                 |
| Minutes Recreation              | 206 (25%)       | 149 (20%)       |                 |                 |
| Total                           | 831 (100%)      | 755 (100%)      |                 |                 |

Data sources:
1) Physical Activity and Transit Survey (Wave 1 & Wave) NYC Department of Health 2010-2011
2) National Health and Nutrition Examination Survey (NHANES) Physical Activity Questionnaire (PAQ) 2009-2010

Conclusions: Differences in both the accelerometer measurement between physical activity in NYC and the US and the sub-domain analyses for ‘work’ and ‘transit’, indicate substantial differences in the level and type of physical activity engaged in by individuals in New York City compared to the nation as a whole. Neither accelerometer measurements, nor survey measurements are perfect in their estimate of physical activity, yet in combination we can achieve a greater understanding of both the accuracy of survey reporting and how environmental context affect physical activity.
Abstract #: 2-35

Resident Shopping Behavior in New York City Bodegas: The Role of Availability, Placement, and Promotion on Food Choice

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Background: Obesogenic environments are those that promote weight gain or are otherwise non-conducive to weight loss. Limited availabilities of nutritious foods coupled with low prices and advertising for unhealthy foods are all mechanisms through which the food environment can negatively influence obesity. Community-focused interventions designed to improve obesogenic food environments can lead to the adoption of a healthier diet. This study sought to explore the relationship between the bodega food environment, a common food source in New York City, and resident shopping behavior.

Methods: Conducted in 2012, the Bodega Consumer Study (BCS) randomly sampled 170 bodegas from a United Hospital Fund (UHF)-stratified list of the New York City retailer population. Store audits recorded data on store layout, product promotion, and food availability. Exiting customers were asked to participate in a survey assessing shopping behavior, typical dietary intake, and demographic information. All food purchases made by each participant were recorded, including brand descriptions, nutritional content, portion size, price, and store location where purchased. Generalized multilevel models were used to test for the effects of food availability, product placement, and advertising. Food availability was defined as the total number of different varieties of fresh fruits and vegetables. Product placement considered the location of water at eye level in refrigerator cases. Advertising was defined as the ratio of outward facing sugar-sweetened beverage ads to those for water and diet beverages. Outcomes included customer purchases (e.g., water, sugar-sweetened beverages, fruits and vegetables); calorie density of purchased foods; and customer perceptions of health and diet. For the multilevel analysis, shoppers were nested within bodegas.

Results: Overall, 38% of sampled bodegas had fresh produce displayed and 57% had water visible at eye level in refrigerator cases. The average number of outward-facing SSB advertisements per bodega was 3.88, compared to .23 outward-facing advertisements for water and diet beverages. A majority of the sample was male, had a high school education or less (53%), and was predominantly Hispanic or African American (75%). Preliminary model results indicate that participants were less likely to have purchased SSBs and bought more fruits and vegetables at stores with a wide variety of available produce (≥11 types), compared to stores with no produce or those with a small selection.

Conclusions: Retail characteristics such as availability, placement, and advertising may influence consumer purchases, and may be leveraged to create a healthier food environment. Given the preliminary associations between the level of produce availability, reduced SSB purchases, and greater produce purchases, it is possible that bodegas offering a wide variety of fresh fruits and vegetables are viewed as a good source of nutritious foods in the community.
The Impact of Implementing Self-Calibrating, Digital Scales that Include Stadio-Meters on Childhood Obesity Estimates in NYC Public Schools, Grades K-8

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Background: Annual height and weight measurements have been collected for all New York City (NYC) public school children since 2005. In 2011, self-calibrating, standardized scales with stadio-meters were installed and this analysis quantifies the impact of the new scales on data quality and obesity estimates.

Methods: Obesity prevalences were estimated for NYC public school children, grades K-8, ages 5-14 from 2006 to 2011. Age- and sex-specific percentiles, z-scores, and Biologically Implausible Values (BIVs) were created using the 2000 CDC growth charts (obesity defined as BMI≥95th percentile). We identified 3 mechanisms by which the new scales may have impacted obesity estimates: improved height measurements, reduction in BIVs, and reduction in the number of entries ending in 0 or 5, indicating rounding. We compared the proportion of students with decreasing height for all pairs of consecutive years and estimated the reduction in BIVs and rounded values. We then estimated the impact of these changes on obesity estimates. Additionally, we constructed a repeated cross-sectional trend model that quantified the impact of the new scales while controlling for a number of demographic characteristics.

Results: The direct estimate of obesity increased by 0.4 percentage points from 20.7% in 2010 to 21.1% in 2011. Improved height measurements resulted in 0.2% more students shrinking from 2010 to 2011 than in previous years, which accounted for 0.3 percentage points (~75%) of the obesity increase. The percent of BIVs decreased from 1.6% to 1.4%. This accounted for ~10% (0.04 percentage points) of the obesity increase. Rounding also decreased in 2011, especially in grades 6-8. In 6-8th grades, this accounted for an estimated 60% of the increase in obesity (0.5 of 0.8 percentage point increase). Based on model estimates, 0.12 percentage points (~15%) of the obesity increase in K-8 was due to being measured on a new scale.

Conclusions: Use of self-calibrating, standardized scales improved obesity estimates. However, their implementation had an effect on the ability to evaluate obesity trends. The observed increase in obesity may be all or mostly due to the new scales. Our analysis suggests that estimates from previous years may have been slightly low, especially for middle school.
Identifying Measurement Error in Body Mass Index (BMI) Data for Children: Alternative Approaches to the Biologically Implausible Centers for Disease Control and Prevention (CDC) Sex-and-Age-Specific Growth Charts Flags

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Background: The CDC’s sex-and-age-specific growth charts, which are the most common reference for defining childhood obesity, include an indicator for a biologically implausible value (BIV) for height, weight, or BMI. Although most analyses exclude entries that have a BIV flag, many measurements may be accurate. We evaluated the accuracy of CDC-defined BIVs and examined alternative methods for future development in defining implausibility.

Methods: The CDC’s macro was applied to NYC FITNESSGRAM data from 2006 to 2010 to obtain BMIs and BIVs. For each year, we classified BIV records as BIV-high (having a BMI≥1.2*95th percentile cut-off by age- and sex-, which is the definition for severe obesity) and BIV-other (not high) and found annual proportions of BIVs out of all measured students. Prevalence estimates of severe obesity were calculated using 1) valid BMI measurements and 2) valid and BIV-high measurements to quantify the potential impact on estimates of misclassifying BIV-highs. We quantified issues of cross-sectional flags by looking at individual growth curves using longitudinal student information. Lastly, we investigated alternative flags that more fully take into account the nature of longitudinal records clustered by student within school.

Results: During the 5-year period, 947,765 students had 1-5 observations and 2-3% of these students were identified as BIV (BIV-highs ranged from 38-48%). As the data quality improved across years, the proportion of BIV-others decreased while BIV-highs increased. Including BIV-highs increased prevalence of severe obesity from 5.7% to 6.6% in 2010. Using longitudinal records we observed that majority of BIV-highs were identified as BIVs for multiple years. Using individual BMI trajectories, many of these BIVs are plausible for their individual growth despite being above BIV cut-offs. The set of flags that we have implemented thus far including cross-sectional (using CDC-defined BIV cut-offs with empirical means and standard deviations), longitudinal (height change, BMI z-score change), and group (instructor and school flags for high proportions of measurement error) would increase our official estimates of obesity and severe obesity.

Conclusions: The use of large administrative datasets to estimate childhood obesity is increasing, which generally have low quality data. Current practices for identifying measurement error in childhood BMI data systematically exclude observations as BIV that are severely obese. Current practices also fail to use the full information available in these datasets (such as longitudinal records or measurements taken in groups). We explored some alternative flags to identify BIVs but also to assess problems with our data collection system and identify schools and instructors to target for improvement. Further, our analysis emphasizes the value of longitudinal records to understand the dynamics of BMI growth and to accurately characterize trends.
Abstract #: 2-38

Social Network Members and Group Physical Activity are Related to Meeting 2008 Physical Activity Guidelines for Americans Among New York City Adults

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Background: Physically active people have lower rates of chronic diseases and experience higher levels of general well-being. The World Health Organization recognizes physical inactivity as the fourth leading risk factor for mortality, globally. The attitudes and behaviors of members in a social network can influence physical activity (PA) via social support and group activity. To date, the influence of these factors has not been characterized among NYC adults.

Objective: To assess the influence of social networks on levels of PA, as measured by the percent meeting national PA guidelines.

Methods: In 2011, the NYC Department of Health and Mental Hygiene conducted the Physical Activity and Transit (PAT) Survey using random-digit dial (cell and telephones) methods (n=3801). Self-reported PA was assessed using the Global Physical Activity Questionnaire (GPAQ), which categorizes moderate and vigorous PA in bouts of 10 minutes or more. Data were analyzed and weighted to represent NYC adults using SUDAAN 10.

Physical activity within social networks was assessed using three questions that separately asked if the respondent had friends, family, or neighbors who “exercise, play sports, or do other physical activities.” Respondents were dichotomized as having some minutes/week of moderate and/or vigorous (MVPA) physical activity (active) or no MVPA minutes/week (inactive). Those reporting some activity were asked whether it was usually alone, with a partner, or in a group. Active respondents were further categorized as meeting the 2008 Physical Activity Guidelines for Americans (PAGA) if they reported > 150 minutes of MVPA/week. Prevalence estimates of active and inactive respondents were compared using t-tests. To assess the association between PA in a group vs. alone and meeting guidelines, adjusted odds ratio (AOR) were computed using logistic regression.

Results: Among respondents, 68.3% (66.0% - 70.6%) reported having a friend, 63.3% (60.9% - 65.6%) an adult family member, and 36.3% (34.0 – 38.6%) a neighbor who is physically active. Active respondents were more likely than non-active respondents to report having active friends, family, and/or neighbors (p-values<0.001 for all). Of the 89.6% reporting some minutes of moderate and/or vigorous physical activity, 73.6% met PAGA. The AOR of meeting guidelines was significantly higher among those who were usually active with a group compared to those who were active alone (AOR:2.67, 95% CI:1.55-4.61). Having an activity partner was not significantly associated with meeting guidelines (AOR: 0.99, 95% CI:0.64-1.52).

Conclusions: Physical activity among NYC adults is associated with having a friend, adult family member, and/or neighbor, who is active. Those who reported that they usually engaged in physical activity with a group showed increased odds of meeting the 2008 Physical Activity Guidelines for Americans. Interventions to increase physical activity among the inactive and insufficiently active should consider the influence of social networks and encourage group activity.

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Abstract #: 2-39

Associations Between Parenting Strategies and the Home Environment Among Overweight and Obese Children

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Background: Children’s health behaviors and variability in body mass index appear to be influenced by the family environment, which includes parenting strategies and the home environment. However, the mechanisms by which parenting strategies and the home environment interrelate to influence youth health behaviors and outcomes remains poorly understood. The purpose of this investigation was to examine the associations between parenting strategies and multiple factors of the home environment among an ethnic minority population of overweight and obese children.

Methods: This was a cross-sectional analysis that included 318 children 7 to 12 years of age and their parent or primary caregiver (93% female; 73% Hispanic/Latino), enrolled at baseline in the Family Weight Management Study, Jacobi Medical Center, Bronx, New York. To measure the family environment, parents completed several validated and widely used surveys. Parenting strategies were assessed using the Parenting Strategies for Eating and Activity Scale (PEAS). The home environment was assessed using modified questions from the Project Eat-III survey that assessed access to healthy/unhealthy foods and physical/sedentary activities in the home. Household food security was measured using the 6-item household food security short form. Correlation analysis and multivariable logistic regression were used to examine associations among parenting strategies and home environment factors.

Results: Correlation analysis revealed several statistically significant relationships of moderate strength between parenting strategies and the home environment that remained statistically significant when adjusted for potential confounders (child’s age, child’s gender, parent education, parent BMI, and parent race) in logistic regression models. The odds of families eating dinner in front of the TV >2-3 times per month significantly decreased with higher parental limit setting (OR 0.67; 95% CI 0.53, 0.84; P < 0.001) and higher monitoring (OR 0.55; 95% CI 0.42, 0.72; P < 0.001). The odds of the frequency of soda being served at meals significantly decreased with higher parental limit setting (OR 0.50; 95% CI 0.35, 0.72; P < 0.001), and the odds of the frequency of other sugary beverages excluding fruit juices (sports drinks, sweetened teas, etc.) being served at meals decreased by 38% with higher parental monitoring (OR 0.62; 95% CI 0.46, 0.83; P < 0.01).

Conclusions: Parenting strategies appear to be associated with home environment factors related to availability of foods and family meal structure. Results of this study will be used to further investigate how parenting strategies and home environment factors are associated with children’s weight status and individual health behaviors (dietary intake, physical activity), and to identify family-level determinants of variability in children’s body mass index and cardiometabolic risk factors. In addition, the effects of the Family Weight Management Study on changes in the family environment and associated changes in children’s health behaviors and outcomes will be explored.
**Abstract #: 2-40**

**Evaluating a Farmers’ Market-Based Nutrition Education Program**

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**Background:** Most New Yorkers do not consume the United States Department of Agriculture’s recommended five or more servings of fruits or vegetables daily, and people in low income households consume even fewer servings than the national average. In order to increase fruit and vegetable consumption among low-income New Yorkers, the NYC Department of Health and Mental Hygiene (DOHMH) developed the Stellar Farmers Market (SFM) program. SFM provides free nutrition and cooking workshops at farmers’ markets in low-income neighborhoods. We conducted an evaluation to explore the impact of the program on behaviors, attitudes, and self-efficacy related to produce preparation and consumption. We conducted surveys with participants who had taken 1 or more classes and compared their responses to a control group of market shoppers who had not completed any classes.

**Methods:** Data were collected in August 2012 at participating markets. Surveys were administered to a control group of market shoppers who had never attended an SFM class, a “one class” group, comprised of SFM participants who attended their first class right before they took the survey, and a group of participants who attended two or more classes. Measures covered fruit and vegetable consumption, attitudes about the importance of eating fruits and vegetables, difficulty of eating fruits and vegetables, and willingness to try new fruits and vegetables. Measures of self-efficacy assessed whether respondents felt they could prepare recipes with fresh produce, serve vegetables with meals and consume vegetables regularly, and eat different types of fruits and vegetables regularly. Bivariate analyses were used to examine differences in outcomes as a function of number of classes. We then conducted a series of regression analyses to determine whether there was a dose-response relationship between SFM class attendance and each outcome that differed by class attendance at the bivariate level, while controlling for age, race/ethnicity, education and gender.

**Results:** In bivariate analyses, attending SFM classes was associated with greater consumption of fruits and vegetables, more positive attitudes towards consuming fruits and vegetables, and higher self-efficacy around produce preparation and consumption compared to not attending any classes. These associations remained significant even after controlling for age, race/ethnicity, education and gender. There was also evidence of a dose-response effect, with the outcome increasing linearly as the number of classes taken increased from 0 to 6 or more.

**Conclusions:** This evaluation demonstrates that offering nutrition education and cooking classes at farmers’ markets is a successful approach to improving attitudes, self-efficacy and behaviors with respect to fruit and vegetable preparation and consumption. Other jurisdictions may consider exploring introducing similar programs in low-income areas to impact fruit and vegetable consumption.
Abstract #: 2-41

Associations Between Change in DASH Dietary Scores and CVD Risk Factors in the PREMIER Trial

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Objective: To measure associations between changes in the Dietary Approaches to Stop Hypertension (DASH) dietary indices and changes in blood pressure (BP), weight, and waist circumference (CVD risk factors) in PREMIER, a randomized, controlled trial of behavioral intervention for hypertension with and without the DASH dietary pattern.

Methods: DASH diet scores were derived based upon nutrient (9 nutrients, DASH_Nutrient) and food-based (8 food groups, DASH_Food) targets using two 24-h recalls administered at baseline, 6 months, and 18 months. Generalized estimating equations (GEE) were used to assess associations between CVD risk factors per SD change in the two DASH indices after accounting for confounders and randomization group.

Results: At baseline (n=807), lower DASH scores were associated with higher BMI, African-American race, and younger age for both indices. Spearman correlations between the indices were 0.36. Mean DASH scores at baseline and 18 months were 2.7 (SD=1.4) and 3.7 (SD 1.4) for DASH_Nutrient (range 0 to 9) and 36.2 (SD=10.5) and 40.0 (SD 11.8) for DASH_Food (range 0-80). Each SD increase in DASH_Nutrient was associated with a -1.26 (95% CI: -1.91 to -0.61) mmHg decrease in systolic BP versus a -0.87 (95% CI: -1.44 to -0.30) mmHg per SD change in DASH_Food. Each SD increase in DASH_Nutrient score was associated with a -0.50 (-0.95 to -0.06) unit decrease in diastolic BP. Changes in the DASH_Food score were not significantly associated with changes in diastolic BP.

Interpretation: The DASH dietary pattern defined by nutrient, rather than food, intake is more closely associated with reduction in CVD risk factors.

Table. Longitudinal associations (Mean (95% CI)) between changes from baseline in DASH Diet Scores and CVD risk factors

<table>
<thead>
<tr>
<th>CVD Risk Factor</th>
<th>DASH_Nutrient (derived based on Mellen’s DASH Index), per SD</th>
<th>DASH_Food (derived based on Gunther’s DASH Index), per SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood Pressure, mmHg</td>
<td>-1.26 (-1.91 to -0.61)</td>
<td>-0.87 (-1.44 to -0.30)</td>
</tr>
<tr>
<td>Diastolic Blood Pressure, mmHg</td>
<td>-0.50 (-0.95 to -0.06)</td>
<td>-0.32 (-0.75 to 0.11)</td>
</tr>
<tr>
<td>Weight, lb</td>
<td>-1.94 (-2.80 to -1.17)</td>
<td>-1.10 (-1.71 to -0.49)</td>
</tr>
<tr>
<td>Waist Circumference, cm</td>
<td>-0.89 (-1.29 to -0.48)</td>
<td>-0.75 (-1.10 to -0.40)</td>
</tr>
</tbody>
</table>

GEE models with unstructured correlation matrix adjusted for baseline CVD risk factor, baseline DASH score, sex, race, age, education, smoking (current, former, never), physical activity, energy intake, BMI, and randomization assignment.
Abstract 2-42

Diet Quality in Mid-Childhood and Incident Early Menarche in a Biracial Sample of US Girls

Authors: Noel T. Mueller PhD, Richard F. MacLehose PhD, David R. Jacobs PhD, Ellen W. Demerath PhD, Jill G. Dreyfus PhD, Mark A. Pereira PhD.

**Background:** Early menarche, a marker of pubertal timing in girls, has been linked to increased risk of obesity and several adult chronic diseases. Studies have linked intake of single nutrients in childhood to pubertal timing, but whether overall diet quality is prospectively related to menarcheal timing independent of pre-menarcheal body fat is unknown.

**Methods:** The National Heart, Lung, and Blood Institute Growth and Health Study recruited girls aged 9-10 years from Richmond, California, Cincinnati, Ohio, and Washington, DC. There were 2,379 (1213 African-American, 1166 Caucasian) girls enrolled in the study. We excluded those who were post-menarcheal at baseline (n=96), did not report age at menarche during follow-up (n=22), had baseline diabetes (n=5), or were missing diet (n=210) or percent body fat from skinfolds (n=17), yielding a final analytic sample of 1988 girls. Exposure variables, including diet, physical activity and anthropometry were collected at baseline, prior to menarche. We created a diet quality score (DQS) by summing standard deviation scores (SDS) for nutrients indicative of western diet (negative SDS; cholesterol, caffeine, and aspartame) and prudent diet (positive SDS; fiber, folate, magnesium, potassium, α-tocopherol, vitamin C, and polyunsaturated-to-saturated fat ratio). Girls were seen annually for 10 visits to ascertain incident age at menarche.

**Results:** Mean (±SD) age at menarche in the sample was 12.4±1.1 years. A better diet quality, as indicated by higher nutrient-element based DQS, was associated with lower risk of early menarche (RR for incident menarche <11 years per 1 SD increment in DQS = 0.77; 95% CI: 0.66, 0.90) after adjustment for confounders and pre-menarcheal % body fat measured at baseline. Of the individual components included in the DQS, early menarche was positively associated with intake of caffeine (RR for ≥50mg/day vs. <25 mg/day caffeine = 1.72; 95% CI: 1.04, 2.85) and aspartame (RR for ≥50 mg/day vs. 0 mg/day aspartame = 2.43; 95% CI: 1.51, 3.90), and negatively associated with dietary α-tocopherol (RR for highest vs. lowest tertile of α-tocopherol = 0.70; 95% CI: 0.49, 0.99) after full multivariable adjustment.

**Conclusion:** A diet rich in nutrients typically found in vegetables, fruits, and nuts, and poor in nutrients found in red meat and chemical elements found in soft drinks is associated with lower risk of early menarche, independent of fatness. These results suggest that diet, independent of adiposity, contributes to the timing of puberty.
Assessing Architect Knowledge, Confidence, and Behaviors Related to Non-Communicable Diseases and Risk Factors, and the Related Impact of the Active Design Guidelines

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Background: Non-Communicable Diseases (NCDs) account for thirty-six million annual deaths globally, and cardiovascular diseases (CVD) has been the leading cause of death in the United States since the mid-20th century. Leading risk factors for CVD include tobacco use, obesity, high blood pressure, high blood glucose and physical inactivity. There is ample evidence on the associations between the built environment--the buildings, streets, neighborhoods and their amenities--and NCD risk factors, particularly physical inactivity. To properly leverage the built environment to increase physical activity, New York City has created a unique partnership among the Departments of Health, Design and Construction, Transportation, and City Planning, the American Institute of Architects, and academics to translate scientific evidence into policies and practices to improve the built environment. These partners have developed and distributed the Active Design Guidelines (ADGs) to architects, urban designers, planners, and other built environment professionals who present and promote evidence-based strategies to improve physical activity and health through urban, site, and building design.

Methods: Data for analysis was derived from web-based pre-post surveys given to design professionals to assess their confidence and knowledge of physical activity, obesity, diabetes, and other chronic conditions, as well as understand their related self-reported practices in current and future projects. Over 2000 completed surveys were received from design staff, consultants, and architects from the Department of Design and Construction (DDC) and the American Institute of Architects (AIANY) in New York City. Surveys were analyzed using Fischer’s exact test for proportions and independent samples t-tests for mean comparisons.

Results: We found a significant increase in self-reported exposure to active design options, as well as participation in projects promoting physical activity. Following the release of the ADGs, there was a significant increase in the proportion of participants who reported attending AIANY and Department of Health events related to active design (p<0.0001), reading publications related to active design (p<0.0001), and implementing guidelines in professional practice (p<0.001). 19% of respondents reported using the guidelines, and 27% reported using the Street Design Manual. There was a significant increase in the proportion of participants reporting consciously incorporating design elements into projects for the purpose of increasing physical activity (p<0.01). This increase was significant amongst males (p<0.05) and AIANY members (p<0.05). Finally, there was a significant increase in the proportion of respondents participating in the building of parks (p<0.05).

Conclusions: Behaviors and practices of architects can rapidly change in a positive direction, which can be influenced by the promotion of reference documentation and scientific evidence in the form of Active Design Guidelines. Improvements in the design of buildings and public spaces that can increase physical activity are anticipated in New York City, and further research on impact is expected.
Abstract 2-44

Compliance to Healthful Behaviors Consistent with World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) Guidelines, and Associations with Obesity-Related Cancer Risk: Results from the Framingham Heart Study Offspring Cohort (1991-2008)

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Background: Accumulating evidence has shown that healthful behaviors, with regards to diet and physical activity, are modifiable risk factors for cancer via obesity-related mechanisms. We assessed the compliance to healthful behaviors consistent with the WCRF/AICR guidelines and their associations with obesity-related cancer risk in the predominantly Caucasian Framingham Offspring (FOS) cohort (n=3,710).

Methods: Data on diet, anthropometric measures and physical activity, collected in 1991 was used to construct a 6-component score consisting of body fatness, physical activity, foods and drinks that promote weight gain, plant foods, animal foods and alcohol. Cancers were identified from medical records (1991-2008). Descriptive statistics were generated to assess compliance to the score for the overall population and by presence of cancer risk factors including body fatness, physical inactivity, consumption of energy-dense foods, refined grains, animal foods and alcohol. Next, Cox regression models were used to estimate associations between the computed score and its components in relation to obesity-related cancer risk.

Results: We noted that 50-58% of the participants who met the requirements of limiting energy dense foods, refined grains, red meat intake, processed meat intake and who had lower body fatness, had an overall score that was 5 or higher (maximum attainable score is 6). The majority of the participants meeting the recommendations for physical activity, sugary drink consumption, adequate fruit and vegetable intake, consumption of starchy vegetables and alcohol had a score ranging from 3-4. Furthermore, the overall score was not associated with obesity-related cancer risk after adjusting for age, sex, smoking, menopausal status and hormone use. When score components were evaluated separately, lower alcohol consumption was associated with 70% reduced risk of obesity-related cancers. Increased intake of starchy vegetables was associated with a 66% higher risk of obesity-related cancers.

Conclusions: Healthful behaviors were generally seen to cluster in this study population. Lower consumption of starchy vegetables and alcohol intakes were associated with reduced risk of obesity-related cancers combined in this prospective study.
Abstract 2-45

Long-Term Obesity and Physical Functioning in Older Americans

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Background: Many Americans are becoming obese earlier in their lives, increasing the average number of years lived with obesity. The implications of long-term obesity will be important for anticipating functioning and disability trends among aging cohorts and forecasting the corresponding morbidity and economic burdens to individuals and society. Despite the importance of understanding these associations, the impact of long-term obesity on physical functioning of older adults is not well known. The objective of this paper is to determine the impact of long-term obesity apart from current attained weight for older adult functional limitations.

Methods: We analyzed data from 7487 adults aged 60-79 from the U.S. 1999-2010 National Health and Nutrition Examination Survey (NHANES). Respondents were considered functionally limited if they reported difficulty or much difficulty with any of the following 6 tasks: walking one-fourth mile, walking up 10 steps without resting, stooping/crouching/kneeling, lifting or carrying 10 lb, walking between rooms on the same floor, and standing from an armchair. Logistic regression models predicted the odds any functional limitation as well as each limitation separately (separately for men and women) based on weight at age 25 and current weight, controlling for age, race, education level, and smoking status.

Results: Men and women who were obese in both periods had higher odds of functional limitations (Male OR 2.20, 95% CI [1.34-3.62], Female OR 1.91, 95%CI [1.09-3.34]) compared to those currently obese but not obese at age 25. Importantly, after adjustment for the severity of current obesity, the odds of functional limitations associated with current obesity were similar for those who were obese at 25 compared to normal weight at 25 (Male OR 1.40, 95% CI [0.83-2.35], Female OR 1.17, 95% CI [0.66-2.09]). Results were largely consistent for individual limitations, with the association of long-term obesity on functioning being eliminated or greatly reduced after adjustment for current level of obesity.

Conclusions: The elevated risk of functional limitations associated with longer-term obesity are primarily due to the risk of more severe obesity later in life among those obese earlier in life, rather than the duration of obesity. Current attained weight rather than duration may be the best reflection of current physiological risk, and prevention of additional weight gain among those already overweight or obese at an early age should be prioritized.
Association Analyses of 100720 Individuals Reveal 8 New Loci Associated with Body Fat Mass

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Background: Insufficient physical activity and a poor diet are the major causes of the obesity epidemic. Nevertheless, 40-70% of the inter-individual variation in obesity risk is due to genetic differences. Large-scale meta-analyses of genome-wide association studies (GWAS) for readily-available adiposity measures, such as body mass index (BMI), waist-to-hip ratio (WHR) and obesity risk have identified at least 75 loci that contribute to body weight and fat distribution in adults and children of diverse ancestry. While these commonly studied adiposity traits are easily measured in large populations and thus allow statistically well-powered meta-analyses, they represent heterogeneous phenotypes. To increase our understanding of the genetic basis of adiposity and its links to cardiometabolic disease risk, we conducted a genome-wide association meta-analysis of body fat percentage (BF%), which more accurately assesses adiposity.

Methods: In our primary meta-analysis, we combined the results of genetic associations with BF% for up to 100,720 individuals from 47 GWAS (n up to 76,138) and 15 MetaboChip studies (n up to 24,582), which were predominantly of European ancestry (n up to 89,301), but also included non-European ancestry (n up to 11,419) populations. In secondary analyses, we stratified by sex and/or by ancestry. For loci that reached genome-wide significance (P < 5x10^-8), we examined their association with a number of cardiometabolic traits available from other GWAS consortia. Using information of nearby coding variants, eQTL, functional regulatory data from Encode and Roadmap projects, known biology of nearby genes, and also Drosophila RNAi knockdown experiments, we aimed to narrow down the loci to identify potential candidate gene that might be underlying the observed associations.

Results: SNPs in 12 loci reached genome-wide significance. Two (near IRS1, SPRY2) of the 12 loci had been identified in previous GWAS for BF%, and six (in or near FTO, MC4R, TMEM18, TOMM40, TUFM/SH2B1, and SEC16B) have previously been reported for BMI. Four of the 12 loci, near GRB14/COBLL1, IGF2BP1, PLA2L6, and CRTC1, were novel. SNPs in the 12 established loci increase body fat percentage by 0.24 to 0.51 SD/allele, explaining 0.58% of the BF% variance (between 0.03- 0.13% per locus). Cross-metabolic trait analysis showed that association signatures that were not always consistent with phenotypic correlations. E.g. the BF% increasing allele of the COBLL1/GRB14 locus was associated with reduced WHRadjBMI, an improved lipid profile and increased insulin sensitivity. The BF%-increasing allele of the PLA2G6 locus was associated with an improved lipid profile and that of the TOMM40/APOE locus with reduced risk of Alzheimer’s disease.

Conclusion: Our meta-analysis for BF% identifies loci that were not previously identified by other larger-scale association studies for readily-available adiposity measures. These new loci reveal pathways that suggest a role of peripheral mechanisms involved in adipocyte and lipid metabolism and insulin sensitivity, complementing the central nervous pathways that are highlighted in GWAS for BMI and obesity risk.
Educational Attainment and Measures of Obesity: A Sex-Specific Genotypic Based Approach to Investigating Causality and Pathways

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Background: Measures of obesity and educational attainment have both been associated with important health outcomes. There are several reports demonstrating lower educational attainment in obese compared to normal-weight women in high-income countries. Among men, however, the evidence is less consistent. The co-occurrence of lower levels of education and obesity may have many possible explanations, some of which may impact men and women differently. These include education protecting against current and future obesity, or obesity impairing cognitive ability (for example via potential negative effects on brain volume). However, observed associations may not imply causal relationships and may be due to confounding factors. Previously conducted genome-wide association studies (GWAS) indicate that both educational attainment and obesity-related traits are partly heritable, highly polygenic traits. Some of the identified implicated loci display sex-heterogeneous effects. Using a Mendelian Randomization approach, genotypes associated with measures of educational attainment and obesity can be used to investigate causal relationships between these two sets of traits.

Methods: The genetic association data on educational attainment is obtained from publically available, previously conducted GWAS on the number of years' schooling and College completion (from the Social Science Genetic Association Consortium, n=126,559). Genetic association data on body mass index (BMI), body fat percentage (BF%) and BMI-adjusted waist-hip ratio (WHR_{adjBMI}) are obtained from previously conducted GWAS by the GIANT and BF% Consortia (n=89,296-322,154). Using the summary statistics results from the GWAS on the number of years’ schooling and College completion, we construct allelic scores to index each educational attainment trait in men and women. We then test the associations with these allelic scores in the sex-specific GWAS results of BMI, WHR_{adjBMI} and BF% to examine evidence for causal effects of educational attainment on measures of obesity. Next, allelic scores are constructed to index the measures of obesity which are then tested using the GWAS results for educational attainment in men and women to examine evidence for reverse causality. Finally, using all available genotypes, a sex-specific assessment of the overlap of the significant genetic loci in each anthropometric-educational attainment pair is conducted.

Results: Analyses are ongoing. Preliminary results indicate that genotypes associated with an increased number of years’ schooling are associated with lower BMI, as well as the presence of a higher than expected number of loci implicated in both.

Conclusions: We believe this work will provide evidence on whether the observed associations between educational attainment and measures of obesity reflect causal relationships, as well as shed light on the observed differences between men and women. In addition, an assessment of loci that overlap in the GWAS for educational attainment and measures of obesity may reveal important common pathways and may therefore improve our understanding of these sets of traits.

The work has not been previously published or presented.
Abstract #: 2-48

Associations of Acculturation, Parental Nativity, and Obesity in a Nassau County, New York WIC Population

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Background: While recent studies suggest that the several major cities have experienced a decline in the prevalence of childhood obesity over the last few years, racial/ethnic disparities in childhood obesity continue to persist. A higher prevalence of childhood obesity has reported among Hispanics and non-Hispanic blacks, compared to non-Hispanic whites and recent estimates have observed that nearly 40% of Hispanic children are overweight or obese by the time they are eligible for pre-school. Among Hispanics, significant heterogeneity has also been observed between ethnic subgroups and by nativity, with a lower prevalence of overweight and obesity documented among foreign born Hispanics, compared to US-born counterparts. Literature exploring the associations between acculturative factors and obesity in early childhood is sparse and informed the objectives of our study.

Objectives: To examine the associations between parental length of stay, nativity status, and acculturation and overweight and obesity among a diverse sample of children enrolled in the WIC program.

Methods: A cross-sectional study design was used to survey parents of 314 children enrolled in a WIC program across 5 sites within Nassau County, Long Island, New York. Parental self-reported race/ethnicity, country of origin, socioeconomic status, and acculturation (measured using the Stephenson Multigroup Acculturation Scale) were collected via an interviewer-administered questionnaire. Sex and age-specific body mass index (BMI) percentiles and BMI z-scores for children were obtained from the Pediatric and Pregnancy Nutritional Surveillance System (PedNSS). Additional covariates obtained from PedNSS included child’s birth weight and television viewing behavior, as well as maternal breastfeeding history. The effects of nativity and acculturation measures on overweight and obesity status were analyzed using multivariate Poisson regression models with robust variance estimation.

Results: Thirty-four percent of children within the sample were overweight or obese and 50% of parents were foreign-born. In the multivariable model, compared to children of foreign-born parents, children of US-born parents were more than twice as likely to be overweight or obese child [adjusted risk ratio (ARR) = 2.14; 95% confidence interval (CI) 1.03-4.47]. Children of parents with some college education or more were statistically significantly less likely to be overweight or obese compared to children of parents with less than a high school education [ARR= 0.44; 95% CI (0.21-0.92)]. No statistically significant associations between parental acculturation, television viewing, breastfeeding and overweight or obesity were observed.

Conclusions: This study provides further support for a nativity advantage with respect to childhood overweight and obesity. Future childhood obesity researchers should examine both nativity and acculturation, in order to differentiate the environmental and social conditions of the parent’s native countries from the changes to dietary patterns and behaviors that occur within the US, as they both may play a role in childhood obesity disparities.
Abstract #: 2-49

**FTO Genetic Variants, Dietary Intakes, and Adiposity in Childhood and Adolescence: Results from Over 16,000 Children and Adolescents**


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**Background:** Genome-wide association studies (GWAS) have established that FTO is the strongest known genetic susceptibility locus for adiposity. Experimental studies in animals also suggest potential roles of FTO in regulating food intake. The interactive relation among FTO variants, dietary intake of total energy and macronutrients, and body mass index (BMI) are complex and results from previous often small-scale studies in humans are highly inconsistent. Also, the interactive relation may differ along the life course but large-scale studies in children and adolescents are scare.

**Methods:** We performed meta-analyses based on data from 16,264 boys and girls aged 3-18 years from 15 studies to examine: 1) the association between the FTO-rs9939609 variant (or a proxy SNP) and total energy and macronutrient intake; and 2) the interaction between FTO variant and dietary intake on BMI. BMI was transformed to age- and sex-specific z-score in each study before analysis. Dietary intakes were assessed by food frequency questionnaires, dietary records, or 24-hour recalls, and macronutrient intake was expressed as the percentage of total energy intake. Dietary variables were dichotomized based on the median intake (low vs high dietary intakes) in each study for the interaction analysis.

**Results:** We confirmed that the minor allele (A-allele) of the FTO-rs9939609 variant (or its proxy) was robustly associated with higher BMI (effect per allele = 0.07 [95% CI 0.05, 0.09] z-score, $P=6.0×10^{-10}$) in children and adolescents. The BMI-increasing allele of the FTO variant was significantly associated with higher total energy intake (effect per allele =14.3 [5.9, 22.7] kcal/day, $P=0.0008$), but not associated with dietary protein ($P=0.12$), carbohydrate ($P=0.99$) or fat intake ($P=0.40$). The association between FTO variant and total energy intake persisted after further adjustment for BMI (effect per allele =14.5 [6.1, 22.9] kcal/day, $P=0.0007$). We also found a significant interaction between FTO variant and protein intake on BMI (interactive effect per allele =0.08 [95% CI 0.03, 0.12] z-score, $P$ for interaction =0.0007). The association between FTO variant and BMI was much stronger in participants with higher protein intake (effect per allele =0.10 [0.07, 0.13] z-score, $P=8.8×10^{-10}$) than that in those with low protein intake (effect per allele =0.04 [0.01, 0.07] z-score, $P=0.02$).

**Conclusions:** The FTO variant that confers a predisposition to higher BMI seems to be associated with higher total energy intake. Dietary protein intake may interact with FTO variants by accentuating the association between FTO variants and adiposity in children and adolescents with high protein intake.
Abstract #: 2-50

Evaluating Environmental Tobacco Smoke Exposure by Housing Type

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Background: Exposure to environmental tobacco smoke (ETS) has declined significantly over the past decade due to reductions in smoking prevalence and uptake of smoke-free air laws in workplaces and public places like bars and restaurants. This phenomenon has been validated in national population-based studies with observations of declines in measured cotinine levels among the general non-smoking population. However, ETS perseveres as a significant health concern and a small body of literature suggests this may be a particular concern in urban settings. One study documented a higher prevalence of elevated cotinine levels among non-smoking adults in New York City (NYC) than among adults nationally, despite the fact that NYC had a lower smoking prevalence. Another national study found that children of non-smoking parents residing in multiunit housing had higher mean serum cotinine levels than children of non-smoking parents living in detached houses. The high prevalence of multiunit housing in NYC may explain the persistently elevated cotinine levels among non-smokers, but associations between type of housing and cotinine levels have not been evaluated among adults.

Methods: Using 2004 NYC Health and Nutrition Examination Survey (NYC HANES) data, we examined the association between living in a multiunit housing structure (versus detached and attached single family homes) and having an elevated cotinine level among 1324 adult non-smokers, adjusting for socioeconomic status (education and income) and demographics (gender, age, or race/ethnicity). Elevated cotinine was defined as a serum cotinine level of ≥0.05 ng/ml.

Results: Residents living in apartments were more likely to have elevated cotinine compared with residents of single-family homes (58.7% vs. 51.5%, p=0.005). In unadjusted logistic regression, elevated cotinine was positively associated with living in an apartment compared to living in a single family home (Odds Ratio [OR]=1.54 (95% confidence interval [CI], 1.14, 2.09)). In multivariable regression, adjusting for socio-demographics, elevated cotinine was marginally associated with living in an apartment compared to living in a single family home (OR=1.33 (0.96, 1.86)), and positively associated with younger ages (20-24 versus age 65 and older), being male, having Asian ethnicity (compared with white), having a lower income and fewer years of education.

Conclusions: Living in multi-unit housing in NYC may increase the risk of exposure to environmental tobacco smoke. Housing policies and programmatic interventions may play a role in reducing ETS exposure in urban settings.
Affordable Housing: Can Your Home Make You Healthy?

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Background: Few health statistics for residents of low-income affordable housing exist. Lower socioeconomic status is correlated with higher rates of obesity and other chronic health conditions. As of 2013, all buildings funded by New York City government must follow Active Design guidelines. This study assesses the impact on physical activity and eating habits of tenants in an affordable housing building that is an early adopter of Active Design.

Methods: Cross-sectional baseline study of participants in a 2-year prospective cohort study of Active Design. Interviewer-administered, validated Block Physical Activity Survey, Block Brief Food Questionnaire, stair usage survey, and biometrics were conducted by trained research assistants for 63 tenants of two Leadership in Energy and Environmental Design certified affordable housing in the South Bronx, one featuring Active Design. Tenants demonstrate income less than 60% of area median.

Results: 74.6% of participants were female with median age 28 years. Median BMI was 29.2 with bimodal distribution (9.1% target, 33.3% overweight, 20.6% obese, 27.0% morbidly obese). Waist-to-hip ratios suggest low (52.4%), moderate (23.8%) and high health risk (23.8%). 39.7% of subjects met CDC-suggested minimum moderate to vigorous physical activity levels at home; 33% meet minimum requirements through work activity. Fruit and vegetable intake were less than one cup daily for 42.9% and 50.8% of participants, respectively.

Conclusions: Obesity rates in the South Bronx are among the highest in New York City (25%); the sample rate (47.6%) is substantially higher. Few participants meet minimum recommended physical activity in the home, or fruit and vegetable intake, suggesting opportunity for design interventions. Data may reflect the impact of built environment and socioeconomic status, and contribute to understanding health characteristics of populations living in New York City affordable housing.
Abstract #: 2-52

Superstorm Sandy Exposure and PTSD Among Pregnant Women

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Previous research has shown that living through a natural disaster is correlated with prenatal posttraumatic stress disorder (PTSD) in expecting mothers (Zhiyong et al., 2012). The present study compared a cohort of 142 pregnant women with/without PTSD receiving prenatal care at Mount Sinai Medical Hospital during “Superstorm Sandy,” which made landfall in the New York Region in 2012. The presence or absence of PTSD was determined with the Structural Clinical Interview for DSM-IV Axis I Diagnoses (SCID-I) by trained clinical interviewers. The expecting mothers were also given a survey in their second or third trimester to assess their personal experience of “Superstorm Sandy.” An analysis of variance (ANOVA) was conducted to compare the rate of PTSD in women exposed to Sandy during their first, second, and third trimester. Results showed that there was an exposure timing-specific increase in rates of PTSD. Relative to unexposed controls, those exposed during their 1st trimester had an over 5-fold (OR=5.4, p=.001), 2nd trimester exposed had an over 4-fold (OR=4.3, p=.001), and 3rd trimester exposed had a two-fold increased risk of PTSD due to Sandy (OR=2.1, p=0.24). Furthermore, women with PTSD had a two-fold increased risk for preterm birth (OR=2.0, p=.03) and a three-fold increased risk for low birth weight (OR=3.12, p=.001). These results suggest that investigating PTSD is particularly urgent, since climate change is ongoing and the rise of natural disasters such as “Superstorm Sandy” may indicate similar disasters occurring in the future (Yuval et al., 2012). Further study on the risks associated with PTSD may assist in implementing disaster-relief programs that improve the well being of expecting mothers who experience major natural disasters like “Superstorm Sandy” in the future.
Targeted Next Generation Sequencing and Functional Genomics in Alopecia Areata Identifies ULBP6 as a Critical Node in Its Genetic Architecture

Abstract #: 2-53

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\textbf{Background}: Alopecia areata (AA) is a highly prevalent and poorly understood autoimmune disease which targets the hair follicle causing disfiguring hair loss. There is an enormous unmet medical need for the 5.3 million patients in the US who suffer from AA, arising primarily from a lack of understanding of disease pathogenesis. Our initial GWAS in AA revealed the first disease association to ULBP3/6 genes in any human disease. These genes are ligands for the NKG2D activating receptors for a repertoire of leukocytes. We biologically validated our statistical evidence by showing a marked upregulation of ULBP3/6 in lesional hair follicles and the presence of CD8+NKG2D+ T cells within the immune infiltrate. These findings, together with the previous demonstration of MICA overexpression in AA hair follicles, placed the NKG2D axis squarely at the center of AA pathogenesis, and invited a functional genomics approach to uncover causal variants predisposing to disease.

\textbf{Methods}: In order to better understand the genetic variation driving the tagSNP associations identified in our GWAS, we selected a subset of 124 cases from our GWAS cohort for targeted deep resequencing with RainDance technology, amplifying 72Kb of sequence encompassing the entire region of association.

\textbf{Results}: As preliminary analysis of this dataset, we looked at the distribution of rare variants (p<0.01 in EVS and 1000G) across this region. We identified two rare missense variants, one of which is highly overrepresented in our cohort (p=0.005) and is located within ULBP6. Of the 127 rare or novel variants located within intergenic regions we identified 34 that fall within transcription factor binding sites, 7 of which are overrepresented in our cases, which cluster into two regions. One of these regions is a CTCF binding site, which is known to influence chromosome structure providing a mechanism for the regulation of gene expression.

\textbf{Conclusions}: The distribution of rare variants that are overrepresented in our cohort of unrelated alopecia areata cases suggest two novel disease mechanisms, one of which disrupts protein sequence and a second which interferes with the regulation of gene expression. In future work, these findings will be biologically validated by developing cellular assays to characterize the effects of coding and regulatory variants. This work will clarify how GWAS identified genetic variation influences NKG2D-mediated cytotoxicity in the pathogenesis of autoimmune disease.
Abstract #: 2-54

Aldehyde Dehydrogenase 2 - A Potential Genetic Risk Factor for Lung Function Among Southern Chinese from the Guangzhou Biobank Cohort Study

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Background: In East Asia moderate alcohol use is associated with better lung function, but non-alcohol users are also more likely to have inactive alleles (G) of aldehyde dehydrogenase 2 (ALDH2) potentially generating confounding, because inactive ALDH2 alleles increase exposure to acetaldehyde which may be detrimental to lung function.

Methods: We examined the association of ALDH2 genetic variants with percentage predicted lung function for age, sex and height, assessed from forced expiratory volume in 1 second (FEV1), forced vital capacity (FVC), and (FEV1/FVC), among 5,653 older Southern Chinese in the Guangzhou Biobank Cohort Study using multivariable linear regression.

Results: ALDH2 genetic variants were associated with alcohol use and height but not with age, socioeconomic position or smoking. Inactive ALDH2 alleles (A) had a graded inverse association with % predicted lung function (% predicted FEV1 -1.53%, 95% confidence interval (CI) -2.53 to -0.52 for one inactive allele and -2.02%, 95% CI -3.81 to -0.23 for two inactive alleles compared to two active alleles; and for % predicted FVC -1.28%, 95% CI -2.18 to -0.38 and -1.64%, 95%CI -3.24 to -0.04) but no association with % predicted FEV1/FVC. Additional adjustment for alcohol use, recruitment phase, socio-economic position, smoking and physical activity did not fully explain the associations.

Conclusion: Studies among East Asians showing moderate alcohol use positively associated with lung function may be confounded by ALDH2. The high frequency of inactive ALDH2 alleles in East Asia may exacerbate the effect of environmental exposure to acetaldehyde on the burden of chronic obstructive pulmonary disease.
Background: Over the last decade, New York City residents have become healthier. Life expectancy has risen to an all-time high, outpacing national trends, and there have been decreases in HIV/AIDS and cardiovascular disease deaths and in smoking and teen pregnancy rates. The New York City (NYC) Department of Health and Mental Hygiene developed Take Care New York (TCNY) nearly a decade ago as a citywide agenda to meet NYC’s greatest public health challenges and the updated 2016 agenda continues that tradition.

Methods: In developing TCNY 2016, the Department evaluated trends and developed citywide indicators in ten health areas with corresponding five-year targets using data from a variety of sources. The health areas were tobacco-free living, healthy eating, active living, heart health, HIV prevention, mental health promotion, alcohol and substance abuse reduction, cancer prevention, healthy indoor and outdoor air and quality preventive care. Recognizing that New Yorkers living in high-poverty neighborhoods experience higher rates of preventable disease and death, the Department also began tracking indicators in populations living in these neighborhoods. A set of ten indicators were also developed to track the health of children. Data sources used to develop the new agenda include the New York City Community Health Survey, Vital Statistics, Youth Risk Behavior Survey, the New York State Department of Health Statewide Planning and Research Cooperative System, the Citywide Immunization Registry, The New York City Housing and Vacancy Survey, New York State Medicaid claims data, the New York City HIV/AIDS Surveillance Registry, the Department of Health and Mental Hygiene’s Primary Care Information Project Hub, the United States Environmental Protection Agency Air Quality System and the New York City FITNESSGRAM.

Results: Internal workgroups were formed within the Department to provide recommendations on the development of the agenda’s framework, priority areas and indicators. Upon finalization of the priority areas and indicators, additional workgroups within the Department, comprised of programmatic staff, were created to discuss strategies and collaborations needed to meet these goals. In addition, listening sessions were held in each of the city’s five boroughs to solicit feedback on proposed strategies and interventions.

Conclusion: Through assessment of trends and alignment with current and planned programmatic priorities, the Department developed 35 indicators in the ten priority health areas. Feedback on the priorities and indicators was compiled from a range of stakeholders, including representatives from over 140 organizations working on public health priorities across the city. The development of internal working groups and engagement of stakeholders was instrumental in raising awareness of the Department’s population health metrics and in securing input and commitment on the new Take Care New York agenda.
Abstract #: 2-56

Global Non-Communicable Disease: Where Do Public Health Schools Stand?

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Introduction: The burden of non-communicable diseases (NCDs) is a major public health challenge for emerging economies. The World Health Organization projects global deaths from NCDs, including cardiovascular disease (CVD), cancer, chronic respiratory disease, and diabetes, will increase to 55 million by 2030. Addressing these will require a larger, better informed workforce with focused, relevant academic preparation. Though MPH students are aware of and interested in global health, the emphasis, historically, has been on infectious and acute childhood diseases. The objective of this study is to assess the availability of global NCD courses in MPH curricula.

Methods: We searched the online websites of the 50 schools of public health accredited by the Council on Education for Public Health (CEPH) in the Association of Schools and Programs of Public Health as of July 1, 2013. A questionnaire was developed to query the websites. Variables recorded included: availability of a global or international health department or track as well as requirements, availability of chronic disease or NCD track, and whether or not the school offered courses on NCDs, NCD risk factors, CVD, or global NCDs as well as global health infrastructure.

Results: All 50 CEPH-accredited schools of public health had coursework available for viewing online. Thirty one (62%) schools offered a global/international health track or certificate; 38 (76%) offered a chronic disease course, domestic or global, and 25 (50%) offered a CVD course. Only 4 (8%) schools offered a global NCD or CVD course. Of the 31 schools with a global health track or certificate, none required a course on NCDs but all schools offered courses on global health economics or infrastructure.

Conclusion: Although more than half of CEPH-accredited schools offer a global health focus for MPH students, very few have a global NCD course available. For public health education to be aligned with global public health realities, curricular initiatives that highlight the chronic disease epidemic and their complex cultural and societal risk factors will need to be emphasized.
Abstract #: 2-57

Is Tight Blood Pressure Control in Hypertensive Long-Term Care Patients Associated with Adverse Events (AEs)?

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Background: The association between blood pressure (BP), cardiovascular and cerebrovascular morbidity and mortality had been the focus of multiple studies in the older population, supporting the evidence for diagnosing and treating hypertension (HTN), regardless of age. The aim of this study is to explore potential adverse events (AEs) of “tight” BP control in residents of long-term care facilities.

Methods: The study utilized a 3-month retrospective electronic chart review of hypertensive subjects, 65 years and older, residing in a long-term care facility. The primary outcome variables were AEs, namely falls, syncopes, hypotensive episodes (systolic BP <90 mm/Hg), hospital readmissions and mortality. Subjects were categorized into four BP groups, based on average systolic BP (SBP): 1) <100 mm/Hg, 2) 100 - 119 mm/Hg, 3) 120 - 139 mm/Hg and 4) >140 mm/Hg. The chi-square or Fisher’s Exact test, when appropriate, was used to compare outcomes between groups of interest.

Results: Of the 60 subjects who fit inclusion criteria, 25% were male and average age was 76.5 ± 6.9. Fifteen subjects (25%) experienced AEs: 11 falls, 1 syncope, 1 hypotensive episode and 2 readmissions.

There were no significant differences in AEs when comparing subject age (76.9 years ± 7.1 and 76.4 years ± 6.9, respectively) and SBP (127.8 and 128.6). There was also no significant association between BP groups and AEs (p <0.3989); AEs were seen in 37.5% of subjects with SBP 100-119, in 22.5% of subjects with SBP 120-139, and in 33.3% of subjects with SBP 140 or greater.

However, there was a significant difference in the average number of BP medications between groups, with 2.47 in the AE group vs 1.28 in the non-AE group: subjects receiving more than one BP medication were more likely to have an AE (50%) compared to subjects on only one BP medication (5.9%) (p <0.0001). There was also a significant association between comorbidities and the presence of AEs: AEs were reported in 39.4% of subjects with at least one comorbidity but, only in 7.41% of subjects with no comorbidities (p <0.0044).

Conclusions: AEs in hypertensive long-term care residents appear to be associated with the use of multiple anti-hypertensive medications and the presence of comorbidities, rather than with a “tight” control of their blood pressure.
Embarking on a Hospitalist Career: Residents’ Views and Perspectives

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Background: The number of hospitalists in the US grew from 1000 in 1996 to 30,000 in 2010. In 2013, 70% of hospitals with over 200 beds are served by hospitalists. Driving forces behind hospital medicine’s increasing popularity remain uncertain, opening unique prospects for collaborative research at the intersection of geriatrics and hospital medicine. This study examines decision pathways of residents leading to hospitalist careers in our aging society.

Methodology: An anonymous survey of Internal Medicine Residents was distributed at Grand Rounds in five NY academic hospitals from September to November 2013. Descriptive statistics were calculated and associations between potential factors and hospitalist career choices were assessed using chi square or Fisher’s exact test.

Results: There were 149 respondents: 49% male, 71% US citizens, 56% US trained. Half (57%) were less than 30 years old. Residency level was equally divided between PGY-1 (31%), PGY-2 (36%), and PGY-3 (32%). Almost all (92%) reported working over 50 hours/week. Half (48%) would consider a hospitalist career, while 8% would pursue a geriatric hospitalist future.

When asked about most influential factors for career choice, 29% selected workload schedule, 16% professional environment, 16% reward incentives, and 15% personal autonomy.

Significant factors associated with decision to pursue a hospitalist career included: PGY level (p=0.008), age (p=0.02), enjoyment of interaction with older patients’ family members (p=0.03) and timing of career decision during either medical school or residency (p<0.001). Older respondents, those at higher residency training level, those who enjoy interacting with family members, and those who finalized career decisions during residency, were more likely to embark on a hospitalist career.

Conclusions: Although a hospitalist career has become a popular choice among internal medicine residents, few are open to becoming geriatric hospitalists. In view of aging demographics challenges in the US, this study underlines pressing needs for educational initiatives, particularly during early residency, to better prepare young physicians to the realities of caring for the older population in hospital settings and to explore opportunities for geriatric innovations within hospital medicine.
Abstract #: 2-59

Pre-Diabetes and Transition to Type 2 Diabetes Among Veterans at the VA New York Harbor
A Retrospective Cohort Study

Authors: Jordan Davis*, MPH\(^1\,^3\); Katelyn Bennett, MPH\(^2\); Matthew Beyrouty, MPA\(^2\); Ashley Jensen, MPA\(^2\); Mark D. Schwartz, MD\(^{1,2}\); Scott E. Sherman MD, MPH\(^{1,2}\); Nicole Skursky, BA\(^2\); Richard B. Hayes, DDS, PhD, MPH\(^1\).

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**Background:** Nearly 1 million patients using the Veterans Health Administration (VA) currently suffer from Type 2 Diabetes Mellitus (DM). 79 million Americans (35% of adults) have pre-diabetes (pre-DM), half of whom are likely to develop DM in the next decade. However, only 11% are aware of having pre-DM. Without routine screenings, little is known about pre-DM among veterans, a population with even higher rates of DM. Interventions have reduced the risk of incident DM by 40-70% among those with pre-DM. We seek to determine the prevalence of pre-DM, and the incidence and predictors of DM among veterans with pre-DM, at the VA New York Harbor Healthcare System (VA NYHHS) between 2004-2012.

**Methods:** We will conduct a retrospective cohort study of veterans with pre-DM enrolled in primary care at VA NYHHS. Prevalent pre-DM is defined as having \(\geq2\) glycosylated hemoglobin (HbA1c) results between 5.7% and 6.5%. Type 2 DM is defined as evidence of hyperglycemia (\(\geq2\) serum glucose readings \(>200\) or HbA1c \(>7.0\%\)), the prescription of DM medications other than metformin, or ICD 9 code of DM from \(\geq2\) inpatient or outpatient visits. All clinical data will be accessed from the VA’s national Corporate Data Warehouse. Patients will enter the cohort when they meet criteria for pre-DM and will be assessed over time by specific demographic and clinical characteristics until they meet the criteria for developing DM, exit the cohort, or to the end of the study in 2012, whichever comes first. Risks for conversion to DM in pre-DM cohort members will be assessed by Cox proportional hazard models. We will examine the validity of pre-DM and DM diagnoses, completeness of follow-up time, and availability of covariate and clinical data. The overall suitability of the dataset for the assessment of diabetic risk in the pre-DM VA population will be examined in a validation sub-analysis of a random sample of patients identified via electronic medical records.

**Results:** Preliminary analysis of 16,037 veterans (having \(\geq1\) A1c screening between 2008-2010), indicates that 61.9% (n=9,925) of patients were screened for DM. Among those screened, 18.2% (n=1809) had evidence of pre-DM between 2008 and 2012. For patients diagnosed with pre-DM between 2008 and 2010, approximately 15% subsequently developed DM during 2010-2012. Screening rates were similar for both males (62%, n= 9,396/15,158) and females (60.2%, n= 529/879).

**Conclusions:** The proposed study will identify risk and patterns of progression to DM among veterans by improving understanding of pre-DM at VA NYHHS. We anticipate that this will help develop and target strategies to prevent DM among those most at risk.
Abstract #: 2-60

Tranexamic Acid Use and Postoperative Outcomes in Patients Undergoing Total Hip or Knee Arthroplasty: A Study of Efficacy and Complications

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Background: Blood loss and the need for blood transfusion during the course of major orthopedic surgery remains a major concern. More recently, the use of pharmacologic agents, in particular tranexamic acid (TXA), has gained attention amongst surgeons as a means to reduce perioperative blood loss. Although trials indeed have shown benefit in terms of blood loss, populations studied were small. As such, conclusions regarding the safety of this practice cannot be drawn from these trials. Utilizing a large national database, we therefore sought to 1) compare demographics and outcomes between patients receiving or not receiving TXA and 2) determine its efficacy to reduce blood transfusions and its association with complications, in particular thromboembolic complications and acute renal failure.

Methods: Data on patients undergoing either total hip or knee arthroplasty (THA and TKA) from the Premier Perspective database (Premier inc., Charlotte, NC, January 2006-October 2012) were accessed after IRB approval. Patient characteristics and health care related characteristics including the use of TXA were determined. The main outcomes were: transfusion, thromboembolic complications (pulmonary embolism, deep venous thrombosis), and acute renal failure. Also, a combined complication variable was considered which included the latter two complications as well as cerebrovascular events, myocardial infarction, and in-hospital mortality. Multilevel multivariable logistic regression models were built to measure the association between TXA use and both transfusion receipt and complications.

Results: We included 872,416 cases from 510 hospitals in our final analysis. Utilization of TXA increased from close to 0% in 2006 to 12% in 2012. There was no difference in patients receiving TXA or not in respect to average age (65.79 [SD 10.64] vs. 65.77 [SD 11.00] years, P=0.86) or comorbidity burden (mean Deyo comorbidity index 0.72 (SD 1.05) vs. 0.74 (SD 1.05), P=0.068). Patients receiving TXA showed lower rates of transfusion (6.92% vs. 17.54%, P<0.0001), thromboembolic complications (0.63% vs. 0.78%, P=0.009), acute renal failure (1.26% vs. 1.57%, P=0.0002), and combined complications (1.97% vs. 2.59%, P<0.0001).

The multilevel models showed TXA to be independently associated with a 66% decreased need for blood transfusions (OR 0.34 [95% CI 0.32-0.36], P<0.0001), a 30% reduced risk of acute renal failure (OR 0.70 [95% CI 0.61-0.81], P<0.0001), and a 26% reduced risk of combined complications (OR 0.74 [95% CI 0.66-0.83], P<0.0001). There was no significant difference in odds for thromboembolic complications in the TXA versus the no TXA group (OR 0.93 [95% CI 0.75-1.16], P=0.51).

Conclusions: This is the first large-scale population based study investigating complication rates potentially related to the use of TXA in the perioperative setting. We found that the use of TXA was associated with a reduction in the need for blood transfusions. Moreover, the use of TXA was not associated with increased risk of complications including thromboembolic events and acute renal failure. In fact, our results show a decreased risk for acute renal failure and combined complications in patients receiving TXA, which in part may be explained by avoidance of blood loss and transfusion need.
Abstract #: 2-61

Use and Safety of Hydroxyethyl Starch versus Albumin in the Perioperative Setting

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Background: In the perioperative period colloids are used to obtain circulatory stabilization. Distinction is made between Albumin, a natural colloid, and artificial colloids (e.g., Hydroxyethyl Starch, HES). Recently, HES has come under scrutiny after several trials were published suggesting its use to be associated with increased risk of mortality and acute renal injury in critically ill patients. While both major trials and large-scale observational ‘real life’ data are lacking in the perioperative setting, the debate continues regarding the safety of perioperative HES use. Using a large national database we aimed to study the use and safety of HES versus Albumin in elective surgery.

Methods: After IRB approval, data on patients undergoing elective total hip or knee arthroplasty were accessed from the Premier Perspective database (Premier inc., Charlotte, NC, 2006-2012). Use of HES and Albumin was determined for the day of surgery and the day after surgery creating four different mutually exclusive intervention groups: HES use only (group 1), Albumin use only (group 2), HES/Albumin both used (group 3), no HES or Albumin used (group 4). Outcomes of interest were acute renal failure, need for blood transfusion, 30-day mortality, costs of hospitalization (COH) and length of hospital stay (LOHS). These were assessed in the four intervention groups, overall, and by patient subgroups based on intensive care unit (ICU) admission, old age (75+ years), and cardiovascular compromise (i.e., complicated hypertension and congestive heart failure).

Results: Our analysis included 903,619 patients from >500 hospitals. HES use (without Albumin) was around 4-5% in the study period; this was <1% for Albumin only use. Patients were youngest in group 1 (HES only); similarly, patients from this group had a lower comorbidity burden compared to group 2 and 3, but not group 4 (mean Deyo index 0.7 [SD 1.0] versus 0.9 [SD 1.1], 0.8 [SD 1.1], and 0.6 [SD 1.0], respectively, P<0.001). Complications were lower in group 1 (HES only) compared to group 2 (Albumin only) and 3 (HES/Albumin), with group 4 (no HES or Albumin) having the lowest complication rates: acute renal failure 2.1% versus 8.8%, 12.0% and 1.0% / blood transfusion 29.4% versus 44.9%, 43.2% and 13.4% / 30-day mortality 0.08% versus 0.51%, 0.0% and 0.03%, respectively (all P<0.001). For the same comparison, COH and LOHS were $18,725 versus $25,046, $32,720 and $16,729; 4.1 days versus 5.5 days, 9.6 days and 3.4 days, respectively. The same patterns were observed when looking in the patient subgroups.

Conclusions: While there have been safety concerns on HES use in critically ill patients, we did not find increased risk of adverse outcome in these elective surgical patients who were given HES compared to those given Albumin or HES/Albumin. In fact, compared to the latter two groups, the HES group had lower complication rates, COH and LOHS. This pattern remained when looking at patient subgroups, including those admitted to an ICU. Taking into account the retrospective nature of our data and the multivariable analyses to be conducted, these preliminary data do not coincide with the recent safety concerns.
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