

Philadelphia, PA
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#HealthInCities

**REIMAGINING
HEALTH IN CITIES:**
CHALLENGES and NEW DIRECTIONS

Poster Session

Evaluating Interventions

1. "Secondhand Smoke (SHS) Incursions in Two NYC Subsidized Housing Settings: New York City Housing Authority (NYCHA) and Private Sector Buildings"

Elle Anastasiou, BS, Albert Tovar, BS, Emily Gill, BS, Melanie Baker, MPH, Katarzyna "Kasia" Wyka, PhD, Terry Gordon, PhD, Lorna E. Thorpe, PhD

Presenting author's affiliation: New York University School of Medicine

Background: Tobacco remains the leading cause of preventable death in the United States, with 41,000 deaths attributable to secondhand smoke (SHS) exposure. As of July 30, 2018, the U.S. Department of Housing and Urban Development (HUD) passed a rule requiring all public housing authorities (PHAs) to implement smoke-free housing policies. Objectives: To examine SHS incursions in select public and private sector, high-rise developments in New York City prior to implementation of the nationwide, federal smoke-free housing policy targeting PHAs. Methods: We conducted a baseline telephone survey in ten selected NYCHA buildings in April-July 2018 and 11 selected private-sector buildings (herein Section-8) in August-November 2018. We invited residents from non-smoking households who completed the telephone survey to enroll their household into a longitudinal air monitoring study. Before implementation of the federal smoke-free housing policy, we measured SHS exposure for seven days in each building's common areas (hallways and stairwells) and in non-smoking households (NYCHA n=157, Section-8 n=118). Results: Most stairwells and hallways had detectable nicotine. Compared to hallways in Section-8 buildings, hallways in NYCHA buildings had significantly higher average nicotine concentrations (0.45 ug/m³ NYCHA, 0.09 ug/m³ Section-8, p=0.006) and percentages with detectable nicotine (89.5% NYCHA, 60.9% Section-8, p=0.036). Self-reported prevalence of seeing smoke in common areas was higher in NYCHA buildings compared to Section-8 buildings (77.3% NYCHA, 55.6% Section-8, p < 0.0001). Implications: Results indicate evidence of widespread cigarette smoking in indoor common areas. The implementation of smoke-free policies may help in successfully reducing SHS exposure in low-income, public housing.

2. Withdrawn

3. "Evaluation of a Newly Implemented Community Based Stroke Education and Outreach Program"

Justina Ferguson, DNP, MSN

Presenting author's affiliation: Penn State Scranton

Background: The American Stroke Association reports stroke as a steady occurring acute and chronic disease process (2016). Stroke program evaluation affords quality improvement

changes to existing and future stroke care related services. Purpose: The purpose of this project was to improve the continuum of stroke services of an existing stroke program through the development and implementation of a stroke support group, dissemination of community-based stroke prevention and recognition education, and program evaluation of newly integrated services. Methods: Pre-test, post-test surveys were administered at community-based sites to assess stroke knowledge gained and participant satisfaction. Post-discharge phone calls were conducted at the project site to those discharged after a stroke to assess barriers of attendance for stroke support group sessions. Results: Data analysis was completed. Results included little to no changes between pre-test and post-tests. Stroke knowledge was already high among the surveyed population, illustrating the ceiling effect in statistics. Interview results from support group attendees provided valuable information for future support group programming. Post-discharge surveys identified attendance barriers and future ways to increase support group participation. Conclusions and Implications for Practice: By evaluating stroke program products such as a stroke support group and community-based education, quality improvement initiatives may further grow a robust continuum of stroke related care for those affected by stroke.

4. "Evaluating the health effects of urban upgrading interventions in informal settlements: a systematic review (2012-2018)"

Rosie Mae Henson, MPH, PhD(c), Ana Ortigoza, MS, MD, PhD, Kevin Martinez, MD, Gina Lovasi, MPH, PhD

Presenting author's affiliation: Dornsife School of Public Health

Background: By 2030, two billion of the world's 8.1 billion people will live in slums. Reflected in Sustainable Development Goal 11, improvements to physical environments through slum upgrading are critical to improve health. Evidence for these interventions, however, remains limited. Objectives: The purpose of this review is to summarize evidence of health effects of these interventions, assess the quality of this evidence, and provide recommendations for future evaluation based on these findings. Methods: Databases and development stakeholder websites reviewed reflect the cross-disciplinary nature of the topic. Evaluations satisfied inclusion criteria related to publication date, study design, intervention type, setting, and health-relevant outcomes. Abstracts and full-texts were screened in duplicate. Data from evaluations were extracted and analyzed qualitatively. Evaluation quality was assessed using an adapted version of the Effective Public Health Practice Project tool. Results: Thirteen evaluations were published between 2012 and 2018. Of these, eight used randomized controlled or controlled before-after designs. Overall, evidence from evaluations suggests health promoting effects across various indicators of health. Specifically, improvements in quality of life, violence and safety, and infectious disease were reported. Consistent with a previous review, most evaluations were assessed as weak quality. However, the overall quality of evaluations improved. Implications: Understanding the effects of physical environment upgrading interventions can inform policy decisions to improve living conditions as rapid urban growth continues. Natural experiments provide opportunities for evaluating these interventions and their health effects. Evaluations should be carefully designed to limit risk of bias. Specific recommendations are provided to improve future evaluations.

Place-Based Research and Initiatives

5. “Blight Surveillance for Public Health: Using 311 Data to Target Interventions”

Jessica Athens, PhD, MS, Nupur Chaudhury, MUP, MPH, Mark Zezza, PhD, MA, David Sandman, PhD, MPA

Presenting author’s affiliation: New York State Health Foundation

Background Urban blight affects community health through its association with increased violent crime, drug use, and decreased physical activity. Blight also directly results in poor health: Experimental research on blight, disease biomarkers, and poor mental health has shown blight’s causal relationship with adverse health outcomes. However, low-cost strategies for measuring blight focus on abandoned/vacant properties, which does not allow for targeted public health interventions. Objective Create a low-cost geographically-refined measure of urban blight using NYC’s 311 complaint data that identifies blight’s dimensions across neighborhoods and facilitates targeted public health action. Methods We propose to use natural language processing on 311 data from 2010- 2018 to identify key-word clusters that align with grantee-informed search terms and represent concerns specific to the built environment, the social environment, and housing-specific decay. The algorithm will be validated using HUD and city vacancy data. Associations with census tract-level estimates of health indicators from CDC’s 500 Cities Project will evaluate its utility for targeting public health improvements. Results Preliminary analysis of blight-related 311 calls in two demographically-matched communities showed the volume of calls within 250 square feet of community parks could be classified into four categories: street/sidewalk conditions, sanitation, housing safety, and noise complaints. The communities differed notably in total volume and contribution of each category to total volume. Implications This is a novel approach to evaluating blight that can be applied to 311 systems across New York and nationally. The effort will city policy on where community interventions should be targeted to improve health outcomes.

6. “Population-Based Measures of Exposure to Violence Are Associated with Mental Health, While Proximal Violent Crime Incidents Are Not”

Amy Carroll-Scott, PhD, MPH, Samantha Rivera Joseph, MPH, Rennie Joshi, MPH

Presenting author’s affiliation: Dornsife School of Public Health

Background: Community-level counts of violent crime incidents are commonly used to describe violence inequities and their health consequences (e.g., depression, anxiety, substance use) in urban environments. However, police-reported violent crime incidents are known to be an under-representation of the level of community violence. Objectives: To evaluate whether self-reported exposure to violence (ETV) and violent crime counts are associated with the mental health subscale of the SF-12 (MCS) in a population-based sample of adults from six low-income neighborhoods in New Haven, Connecticut. Methods: ETV items, MCS, and covariates were obtained from the 2015 New Haven Health Survey. Violent crime incident data obtained from the New haven Police Department were geocoded; buffers (80m) were created around individuals’ home address to calculate violent crime counts. Multivariable linear regression was performed with MCS as the outcome and violence measures as predictors. Covariates included age, gender, race and income. Results: After adjusting for covariates, ETV items were significantly associated with MCS: whether their family/friends were hurt by neighborhood violence ($\beta=1.77$, 95% CI:-3.09,-0.46), or were killed by neighborhood violence ($\beta=-2.47$, 95% CI: -3.90,-0.46); they heard gunshots frequently ($\beta=-1.36$, 95% CI: -2.57,-0.16); and they were present when someone they knew was shot ($\beta=-3.54$, 95% CI: -5.25,-1.82). Violent crime counts

were not significantly associated with MCS in all models. Implications: Self-reported ETV, but not counts of violent crime, were associated with mental health status. Community-level violent crime statistics alone may not capture the experience of violence and the impact on mental health of adults in urban settings.

7. “Feasibility of measuring adverse community experiences as indicators of community-level trauma: a systematic review”

Samantha Rivera Joseph, MPH, Randy Sell, ScD, Ana Martinez-Donate, PhD, Brent Langellier, PhD, MA, Amy Carroll-Scott, PhD, MPH, Yvonne Michael, ScD, SM

Presenting author’s affiliation: Dornsife School of Public Health

Background: Inequities in community violence are rooted in structural forces such as socioeconomic disadvantage and racial segregation, forces which, in turn, result in trauma at the individual and community levels. The Prevention Institute’s Adverse Community Environment and Resilience (ACE|R) framework was developed to understand the risk and protective factors in communities that lead to or prevent violence and community trauma. Methods: To assess the feasibility of creating a community-level trauma index, we conducted a systematic literature review to assess potential measures and learn from research conducted that explored the structural drivers of community violence and trauma (e.g. neighborhood disadvantage, residential racial segregation). This search was used to create an inventory of indicators that measure adverse community environments associated with community violence and other poor health outcomes. Results: Publications related to individual-level trauma and its contextual determinants has increased in the past decade, driven largely by the development of the adverse childhood experiences (ACEs) measures and the prevalence in the literature of studies examining the consequences of ACEs on health throughout the life course. What is lacking are clear definitions of and measures of community-level trauma. Implications: This study is the preliminary work in the development of an index of community trauma informed by the ACE|R framework. The development of population-level measures is essential to target community-level interventions and inform upstream violence prevention initiatives in urban environments. This can only be done by understanding the context of chronic adversity and its structural drivers that perpetuate harm.

8. “An Overview of the West Philly Promise Neighborhood Initiative”

Erikka Gilliam, MS, MPH, Amy Carroll-Scott, PhD, Félice Lê-Scherban, PhD, Kelley Traister, MSW, Maggie Beverly, MPH, Irene Headen, PhD, Matthew Jannetti, MSPPM, Andrew Stutzman, MS, Dai Meeks, Samantha Joseph, MPH, DrPH(c)

Presenting author’s affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: West Philly Promise Neighborhood (WPPN) is a place-based initiative to create a system of comprehensive, cradle-to-career supports for children living or attending school in designated neighborhoods, their families and communities. The role of the WPPN Data and Research Core is to build the infrastructure for research, evaluation, data access and dissemination for the initiative. Objectives: To provide an overview of the WPPN initiative and the activities and functions of the Data and Research Core. Methods: The aims of the WPPN Data & Research Core are to: 1) create an integrated longitudinal data system to support, inform, and evaluate the project, 2) create a provider-facing service coordination and tracking database, 3) collect a neighborhood level, population-based, longitudinal survey to measure impacts of WPPN, and 4) create summary reports to share with stakeholders. Results: A limited-scope demonstration project that identifies children with high social risk was the final consensus for testing processes with the School District and the City of Philadelphia before implementing

the full IDS. Results of the 2018 baseline neighborhood survey will be shared with the community and other stakeholder groups through a series of community conversations. Implications: Despite challenges, WPPN presents a unique opportunity to use data systems as a basis for multi-sectoral partnership to improve child and family well-being.

9. "Creating a comprehensive resource directory for children and families in West Philly Promise Neighborhood"

Maggie Beverly, MPH, Amy Carroll-Scott, PhD, Félice Lê-Scherban, PhD, Kelley Traister, MSW, Leah Lombardi, BS, Dai Meeks

Presenting author's affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: The West Philly Promise Neighborhood (WPPN) is a place-based initiative to create a system of comprehensive, cradle-to-career supports for children who live or attend school in designated neighborhoods in West Philadelphia, and their families and communities. Objectives: To create a comprehensive resource directory for children and families in the West Philly Promise Neighborhood. Methods: We will gather information on resources through utilizing current resource/referral guides, conducting online searches, and coordinating with partners conducting similar resource inventorying or asset mapping processes. We will then conduct interviews with each organization to gather detailed information on services offered including populations served, eligibility requirements, languages, documentation requirements, and costs. We will also conduct focus groups with "Referral Hubs" which we defined as organizations that provide a wide range of referral services and are most knowledgeable about resources in the community. These focus groups as well as interviews with topic or neighborhood experts will help us understand what types of resources are most commonly used and where gaps in resources exist. We will use GIS to map resources across the different neighborhoods and proximities to our schools. Results: This process will result in a resource directory available to residents in the WPPN footprint accessible through our website as well as directory available through our data portal for WPPN providers. Implications: We aim to create a useful process that our partners will want to sustain beyond the life of the grant to maintain a comprehensive placed-based resource directory.

10. "Map the Gap: Addressing Urban Trauma in Mantua, PA Via Human-Centered Design, Interdisciplinarity, and Mixed-Methods Translational Research"

Samantha Stein, Diana Nicholas, RA, AIA, NCARB, Yvonne Michael, ScD, SM, Kristin Giordano, MPH, Thanh My Nguyen

Presenting author's affiliation: University of Pennsylvania

The Robert Wood Johnson Foundation's Culture of Health program initiated a call to reimagine health as extending beyond physiological outcomes, and to redefine it as encompassing equity, justice, and other like cofounders. Such a call expands the burden of responsibility for health promotion to sectors traditionally seen as separate from healthcare (Lindau et al., 2016), and inaugurates a shared duty to address society's structural problems. We appreciate the criticality of redesigning healthcare strategy to address the complex, sometimes obscured, underlying social issues which determine the experience of health. Accordingly, we apply mixed-methods to derive data on the interplay between Mantua, PA's healthcare infrastructure and health need with regards to housing as a constituent of health. These methods themselves, and the data they yield inform the design of an mHealth urban trauma mitigation tool and the methods used to evaluate said tool's effectiveness. Thus far, we have translated our research into a user-centered design project, Map the Gap. Map the Gap is a digital, user-driven housing decision guidance tool that intends to dissolve historical tensions

between tenants and landlords by connecting users with existing resources in the community and providing a platform for communication between stakeholders. By leveraging the need for housing system navigation guidance, we promote equity, and thus address health as an experience constituted by a culture which exists beyond traditional healthcare. We frame housing, and more substantially equity as key components of reformed healthcare strategy and constituents of reimagined health. And, we demonstrate how design research can be integrated into technology and policy development for mixed-methods healthcare design projects.

11. "Surveillance of urban policy action related to social determinants of health at the city level"
Jennifer Kolker, MPH, Amy Confair, MPH, Katherine Castro, MPH(c), Amy Carroll-Scott, PhD, MPH

Presenting author's affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: Although much public health policy is enacted at the state or federal level, US cities play a critical role in implementing policies and programs that impact population health. Surveillance of policy trends can inform future research and policy action; yet no policy surveillance system exists. **Objectives:** This study piloted a surveillance system to document current urban policy trends that affect health. **Methods:** To begin this national surveillance, four cities were chosen (Philadelphia, New York City, Washington DC, and Los Angeles), and three issue areas that affect health (environmental, housing, and education). Policy monitoring included legislation, regulations, major programs and budget plans at the city level, longer than one year, and initiated after March 2017 or ongoing at that time. Data was collected from general news, social media and city government agency websites. **Results:** As of May 2019, over 90 education policy actions were found promoting equity among students and increasing college and career readiness. Over 100 environmental policy actions were found, many adopting Green New Deal concepts, lowering emissions, waste and energy use. Over 100 housing policy actions were found aiming to increase the amount of and access to affordable housing, provide shelter for residents and resources for homeowners. **Implications:** This work shows that cities are investing in improving urban health through policies and programs in education, environment and housing. Following trends and sharing best practices can help inform developing policy action. This project is garnering attention and will expand with partners from additional U.S. cities in 2019-2020.

12. "The role of school segregation in child obesity disparities"
Nuha Mahmood, BS, Brisa Sánchez, PhD, Emma Sanchez-Vaznaugh, ScD, Mika Matsuzaki

Presenting author's affiliation: University of Michigan

Background: Segregation creates differential exposures to environmental health factors and has been shown to impact health. Racial disparities computed based on individual-level race/ethnicity are often confounded by segregation, and recent research has shown that health disparities estimated within integrated communities are much smaller compared to those estimated from national datasets. Given that children spend much of their time in school, school segregation may be a salient factor that contributes to unequal rates of child obesity across racial/ethnic groups. **Objectives:** We sought to quantify the effects of school segregation on child obesity disparities. **Methods:** We utilized publicly available data collected on 5th, 7th, and 9th grade students from California public schools to determine child overweight and obesity rates and whether each school was integrated or segregated. We computed three measures of disparities by comparing obesity rates among children of color to white children: state-wide, within racially integrated schools, and between segregated schools. **Results:** We found that school segregation accounted for 50% of the disparity found between White children and

children of color in state-level data. In integrated schools, all racial/ethnic groups of children within the same school had similar rates of obesity. The disparity in childhood obesity arose between schools that had a majority of children of color compared to schools with a majority of White children. Asian children were an exception to the trend, as they had lower rates of obesity than their White peers in most scenarios. Implications: School segregation is an important factor contributing to childhood obesity disparities.

13. “Understanding Menstrual Hygiene Management Among Adolescents in Indian Urban Slums”

Tanya Dhingra, MPH, Heather Murphy, PhD, PEng

Presenting author’s affiliation: Temple University

Background: Menstruation is the most important change during a young girl's adolescence. In resource-poor countries like India, menstrual hygiene is heavily compromised and steeped in silence, myths, taboos, and stigma. Inadequate Menstrual Hygiene Management (MHM) can cause Reproductive Tract Infections (RTI) which are concurrent with the incidence of cervical cancer, HIV/AIDS, infertility, and ectopic. Heavily gendered experiences create and enforce a multitude of unaddressed menstrual concerns which are often silenced as a result of the inability to discuss and address them openly. Objectives: To investigate the range of social challenges faced by girls during menstruation, To identify points of intervention that may ameliorate the said challenges Methods: 12 focus group discussions (6 with girls and 6 with their mothers) and 15 in-depth individual interviews with girls only were conducted. The study took place in Goela Dairy, an urban slum in New Delhi, India. The questionnaires were guided by the socio-ecological framework. Results: The preliminary results from the coding show that lack of access to water and sanitation are not an important barrier to managing menstruation whereas factors such as shame/taboo, lack of awareness/knowledge and low self-efficacy/esteem are the most prevalent. Implications: The adverse effects of not being able to manage their period in a healthy manner are abundant for these girls; it interferes with their ability to attend school. In the face of social stigma and cultural restrictions, their MHM is restricted by a lack of access to functional toilet facilities, clean water, and a private secure safe-space.

Built environment

14. “A comparison of first-time Citi Bike members to New York City cyclists, 2013-2018”

Aldo Crossa, MSc, Kathleen H Reilly, PhD, Shu Meir Wang, PhD, Sze Yan Liu, PhD, Anne Krassner, MS, Sungwoo Lim, DrPH

Presenting author’s affiliation: NYC Department of Health and Mental Hygiene

Background: Citi Bike (CB) is the largest bike share system in New York City (NYC) with 150,000 subscribers and could have population-level health effects by promoting physical activity via active transportation. Since launching in 2013, the NYC Departments of Health and Mental Hygiene and Transportation have collaborated with CB to implement an opt-in survey to collect demographic and socioeconomic characteristics of first-time CB members. Objectives: To compare the demographic characteristics of first-time CB subscribers with those of NYC residents who report cycling at least once a month. Methods: We compared the sociodemographic characteristics of first-time CB subscribers who participated in the survey with NYC residents who reported cycling at least once a month (based on 2013-2017 NYC Community Health Survey data). Both data sources were limited to neighborhoods with at least one CB station. Results: Of the 275,610 first-time CB subscribers, 202,464 (73%) were >18 years old and lived in a ZIP code with a CB station. Compared to frequent cyclists, first-time CB

subscribers were more likely to be white (71.3% vs 55.5%, $p < 0.05$), college educated (90.1% vs 60.8%), and with a household income $> 200\%$ of the federal poverty line (94.1% vs 56.3%, $p < 0.05$). Women made up a similar percentage of CB subscribers and frequent cyclists (37.6% vs 33.4%, $p > 0.05$). Implications: The demographics of NYC cyclists and first-time CB subscribers differed, particularly by income and race. Recent efforts to expand the reach of reduced fee CB membership programs could help make CB more accessible to all New Yorkers.

15. “Determinants of residential preferences related to built and social environments and concordance between neighborhood characteristics and preferences”

Jingjing Li, PhD, Amy Auchincloss, PhD, Daniel Rodriguez, PhD, Kari Moore, MS, Ana Diez Roux, PhD, Brisa Sanchez, PhD

Presenting author's affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: The residential self-selection effects on the associations between built environment and health-related behaviors have drawn much attention. However, empirical evidence on the sociodemographic variations in residential preferences and the concordance between residential preferences and neighborhood characteristics remains scarce. Objectives: This study aimed to (1) explore associations between residential preferences and sociodemographic characteristics; and (2) investigate the concordance between current neighborhood characteristics and residential preferences and heterogeneity in concordance by income and race/ethnicity. Methods: Data came from a cross-sectional survey of 3668 residents of New York City, Baltimore, Chicago, Los Angeles, St. Paul, and Winston Salem in 2011-12. Principal component analysis was used to construct three scales for residential preferences and four scales for neighborhood characteristics. Multiple linear regression and logistic regression were used to examine the sociodemographic variations in residential preferences and explore the concordance between current neighborhood characteristics and residential preferences. Stratified analysis was employed to examine the heterogeneity in concordance by income and race/ethnicity. Results: Stronger preferences were associated with being older, female, non-White/non-Hispanic, and lower education. There was significant positive but weak concordance between current neighborhood characteristics and residential preferences (after controlling sociodemographic characteristics). Concordance was stronger for persons with higher income and for Whites. Implications: Our findings suggest that residential self-selection effects are stronger for populations that are more advantaged. They provide further evidence of racial and economic disparities in residential decision-making and highlight the need for neighborhood health effects research to carefully consider the role of residential local relative to socio-demographic characteristics.

16. “Field validation of two food outlet data sources used to characterize the food environments in New York City”

Aldo Crossa, MSc, Ryan Gardner-Cook, MA, Amarilis Cespedes, PhD, Sze Yan Liu, PhD, Sungwoo Lim, PhD, L. Hannah Gould, PhD

Presenting author's affiliation: New York City Department of Health and Mental Hygiene

Background: Food environments are an important determinant of health. Several data sets exist that characterize food environments but their validity is rarely examined. Objectives: To assess the potential for measurement error due to differential accuracy of two food retail data sets commonly used to describe food environments in New York City (InfoUSA and the New York State Department of Agriculture and Markets, NYSDAM). Methods: A team from the New York City Department of Health and Mental Hygiene conducted a field census of food retail stores in three ZIP codes (10027, 10451 and 11237) in September-November of 2018. Secondary

datasets were used to obtain a list of restaurants (from InfoUSA) and of other food stores (merged InfoUSA and NYSDAM). We calculated sensitivity for restaurants and all other food stores. Results: The field census identified 762 food outlets, including 297 restaurants and 465 non-restaurant outlets. For restaurants, the sensitivity for InfoUSA was 67.3% (200/297) with little variation between ZIP codes. For the 26 supermarkets identified in the field, sensitivity was 65.4% (17/26) for NYSDAM, 57.7% for InfoUSA and 73.1% for the combined. Of stores identified as bodegas 70.4% (143/203) were in NYSDAM and 36.9% (75/203) in InfoUSA and 75.9% for the combined. Implications: We found differential sensitivity by type of stores. InfoUSA had a particularly low sensitivity for bodegas, an important store type in New York City. In studies characterizing food environments, comparing and supplementing secondary data sources is crucial to improving accurate exposure assessment.

17. "Characterizing Smoking-related Litter in Public Parks in Philadelphia"

Russell McIntire, PhD MPH, Ashley Lipshaw, MPH(c)

Presenting author's affiliation: Thomas Jefferson University

Background: Cigarettes are the most littered item in the country. Cigarette do not biodegrade under normal circumstances, and leach dangerous chemicals into the environment. Communities have established smoke-free public spaces, including public parks, in part to mitigate this source of litter. In 2014, the Mayor of Philadelphia signed an executive order making all parks owned and administered by the city smoke-free. However, not all parks in Philadelphia have the same environment to deter smoking, as "No Smoking" signs are not posted in all smoke-free parks. Objectives: This study reports the results of systematic litter audits at four parks in Center City Philadelphia in order to describe major categories and the proportion of smoking-related litter at parks. Methods: Using an instrument developed in partnership with Smoke-Free Philly, three trained researchers categorized litter at parks (Independence Square, Washington Square, Louis Kahn, and Rittenhouse Square) in May and June 2018. Researchers audited an assigned area within each park twice over an eight week period. Descriptive statistics were used to summarize variables. Results: Researchers performed 24 total audits. Among the 295 pieces of litter categorized, 57.0% were smoking-related. Cigarettes represented the vast majority (87.5%) of smoking-litter identified, followed by packaging (8.3%) and mouthpieces (4.2%). The highest proportion of smoking-related litter was at Louis Kahn Park (64.6%) and the lowest was at Rittenhouse Square (43.1%). Implications: Results from this study can be used to monitor the relative amount of smoking-related litter found in parks, and inform interventions to reduce smoking and littering in Philadelphia parks.

18. "How do low-income ethnic families with young children use parks? Using latent class analysis to understand types of park use and family characteristics"

Jing-Huei Huang, Med, Myron Floyd, PhD, Oriol Marquet, PhD, Claudia Alberico, MS, Elizabeth Mazak, MS, J. Aaron Hipp, PhD

Presenting author's affiliation: North Carolina State University

Background: Parks provide a free resource for family physical activity. Objectives: This study identified types of park use by young children in low-income families of color and investigated associations of these types of park use with family and neighborhood characteristics. Methods: Cross-sectional data were obtained through a 2018 online survey of low-income racial/ethnic minority families located in the US with at least one child aged 5 to 10 years (n=1,583). Topics of the survey included park use behaviors and family and neighborhood characteristics (e.g., demographics and perceptions of neighborhood social cohesion). The latent class analysis was used to identify classes of park users. Multinomial logistic regression tested

for associations between classes and family and neighborhood characteristics. Results: Three classes were described: (1) infrequent family user, children being less active (31%); (2) frequent family user/children being active in playground and soft courts (33%); and (3) walk or bike to parks/children being active on hardcourts (36%). Results indicate, young parents, living within short walking distance to a park, and perceiving positive social cohesion are more likely to be in both class 2 and 3, compared to class 1. Families with a boy and perceiving good neighborhood walkability and safety are most likely to be in class 3, compared to classes 1 and 2. Implications: Access to parks and neighborhood environments that are perceived as walkable, safe, and socially-inclusive may encourage more park use for low-income families with children 5-10, and that park design and access should meet the needs of diverse residents.

19. “Built environment and physical activity among youth: Findings from Mexico City”

Tahmeed Tureen, Elizabeth FS Roberts, Martha M Tellez-Rojo, Brisa N Sanchez, PhD
Presenting *author’s affiliation*: University of Michigan School of Public Health

A growing body of research has investigated the associations between built infrastructure and physical activity in high-income countries (HIC) like the United States (US). The research has shown that higher availability and quality of infrastructure is associated with higher physical activity among adults. Research conducted among adolescents is less conclusive in general, and little work in this area exists in Latin America (LA). Most countries in LA are low-to-middle income (LMIC), and have infrastructures that are markedly different from the US due to economic differences but also due to different histories of urban settlements and community building. Using data from a longitudinal cohort and objective measures of built infrastructure, this project investigates the association between features of the infrastructure and physical activity among adolescents in working class neighborhoods in Mexico City, Mexico (CDMX). Features of the built infrastructure investigated are: availability of sidewalks, green cover (trees on streets), public transportation, and informal business activity on streets (mobile vendors). Results: from this research bring to question whether associations found in HIC are transportable to LMIC. Given the expected population growth and rapid rate of urbanization in LA, it is pressing to identify features of built infrastructure that support and promote health-related behaviors in LA.

Climate, air pollution, and environmental exposures

20. “Solutions at the nexus of Climate Change and Health for Cities”

Debarati Majumdar Narayan, PhD

Presenting author’s affiliation: The Pew Charitable Trusts

Background: According to the recent National Climate Assessment, climate change impacts such as extreme heat, storms and flooding, increase and change in disease vectors, and disruption to food supply, have important implications for the public’s health in the U.S. Local leaders, particularly many U.S. mayors, committed to acting on climate change, are exploring data-driven, cross-sector strategies that ensure their communities are prepared, resilient, and sustainable. These strategies present a unique opportunity to address drivers of health that can simultaneously improve physical, social and economic well-being for all, while building resilience to climate change. Objectives: The focus of this initiative is to translate research into action with measurable impact on the social determinants of health, building on foundational or active initiatives related to climate change that have the potential for sustained investment in four municipalities in the U.S. By bringing health-related evidence to decision-making, including how decisions may disproportionately affect certain populations, the goal is to find solutions that

address both climate change and improve public health. Methods: The Health Impact Project (the Project), is leading an initiative to support four cities working across sectors to build resilient communities by simultaneously addressing climate change and promoting population health. In addition to grant funding, the Project will support peer learning, convene other jurisdictions interested in replicating solutions, and help disseminate the lessons learned. Results: This is an ongoing project for which we will have preliminary results by September. Implications: Lessons learned from these efforts will provide a replicable model for health evidence informed climate change solutions in other jurisdictions and provide metrics to track the efficacy of such solutions.

21. “Understanding Hurricane María’s Impact on Public Health in Puerto Rico”

Mislael Valentín-Cortés, BA, Dana Thomas, MPH

Presenting *author’s affiliation*: University of Michigan School of Public Health

Background: The importance of disaster research has become increasingly evident, with natural catastrophes increasing in frequency and populations becoming more vulnerable as they age rapidly and grow more unequal. Objectives: This presentation aims to explore the underlying social determinants associated with adverse health outcomes following Hurricane Maria’s landfall on Puerto Rico, the major health needs facing the island moving forward, and strengths of the preparedness and recovery efforts in the island. Methods: In-depth qualitative interviews were conducted with 12 community practitioners who worked in the preparation and recovery of the storm. Interviews were conducted in Spanish, audio recorded, transcribed, and analyzed thematically. Results: Respondents indicated that the social determinants associated with morbidity and mortality following the storm were largely the result of the pre-existing economic crisis and policies at the local and federal level which affected the local government’s ability to respond to the storm. These social conditions threaten long-term recovery efforts, with demographic trends suggesting the island’s population is expected to grow older and poorer, and migration patterns further intensifying following the storm. Participants also highlighted the ongoing need to address healthcare access, mental health services, and geriatric health as Puerto Rico recovers from the hurricane, as well as how communities demonstrated resilience and unity in the mitigation and recovery of the storm’s effect. Implications: Results can inform additional research that examines a community’s existing challenges that are exacerbated by natural events and compound recovery efforts.

22. “Social Susceptibility to Multiple Air Pollutants in Cardiovascular Disease”

Jane Clougherty, ScD, MSc, Jamie Humphrey, PhD, MPH, Ellen Kinnee, MS, Laura Kubzansky, PhD, MPH, Colleen Reid, PhD, MPH, Leslie McClure; PhD, MS, Lucy Robinson; PhD, MA

Presenting author’s affiliation: Environmental and Occupational Health, Drexel Dornsife School of Public Health

Background. Cardiovascular disease (CVD), the leading cause of death in the U.S., has been linked to chronic and acute air pollution exposures. Research has identified stronger effects of air pollution in lower-socioeconomic position (SEP) communities, where exposures are also often higher. While specific factors underlying this susceptibility are unknown, chronic psychosocial stress related to social adversity is hypothesized as a key component. Objectives. To characterize social susceptibility multiple air pollutants in CVD in New York City (NYC). Methods. We use data on 1.3 million NYC CVD emergency department visits, multiple air pollutants [fine particles (PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), summertime ozone (O₃)], and community-level social stressors (e.g., violence). We first examined associations between spatio-temporal pollution exposures and CVD events using case-crossover

models, across lag days 0-6. We then tested modification in these associations by community-level social stressors. Results. We found significant same-day associations between NO₂, PM_{2.5}, and SO₂ and risk of any CVD event, ischemic heart disease (for NO₂, SO₂), and heart failure (for NO₂, PM_{2.5}). We found evidence of significant effect modification by community stressors, with higher excess risks for NO₂, PM_{2.5}, and SO₂ in communities of greater violence, deprivation, and poverty. Implications. Results from case-crossover models suggest a dose-response relationship between exposure to air pollution and CVD with increasing levels of social stressors, including violent crime rates, and material and social deprivation. However, community stressor exposures are profoundly confounded by individual race/ethnicity and segregation in NYC. Future work will disentangle the simultaneous impacts of individual- and community-level modification.

23. “Disentangling impacts of multiple nitrogen dioxide sources across Philadelphia”

Sheila Tripathy, PhD, Paige Williams, MPH, Lucia Lavallo, Leah Schinasi, PhD, Shannon Capps, PhD, Jane E. Clougherty, ScD

Presenting author's affiliation: Dornsife School of Public Health

Background: Urban air pollution is linked to increased risk of morbidity and mortality. Air monitoring campaigns are an important tool in policy development and health effects research. However, there have been few such campaigns in Philadelphia, and none designed to monitor pollution levels across the entire city. As an industrial city with many pollutant sources (e.g., petroleum refinery, international airport), Philadelphia is an important setting for a targeted monitoring campaign. Objectives: We developed a spatio-temporal air monitoring campaign to identify sources of nitrogen dioxide (NO₂) in Philadelphia and developed a land use regression (LUR) model to predict NO₂ concentrations across the city. Methods: NO₂ was monitored at 49 sites across Philadelphia in January 2018 using site selection methods in a geographic information system (GIS) that maximized spatial variability in NO₂ concentrations. A subset of 13 sites were continuously monitored at two-week increments throughout 2018 to examine the pattern of NO₂ across seasons. GIS-based source covariates (e.g., traffic density, distance to port) were developed and tested in a LUR model using a manual forward stepwise process. Results: The mean NO₂ concentration across all sites was 22.8 parts per billion (ppb) (SD=3.78 ppb, Min=10.5 ppb, Max=30.1 ppb). The LUR model explained 70% of the variability in NO₂ concentrations and included percent impervious surface and summed road length within a 300-m buffer of monitoring locations. Implications: Results from the LUR model will be used in future epidemiological analyses assessing the impact of exposure to air pollution and other urban exposures on health outcomes.

24. “Effects of fine particulate matter on blood pressure and potential effect modifiers in Nepal”

Rennie Joshi, MPH, Yvonne Michael, ScD, SM

Presenting author's affiliation: Drexel University

Background: Nepal's air quality was ranked the worst out of 180 countries in 2018, with levels of fine particulate matter (PM_{2.5}) higher than the WHO standard in many areas throughout the year. Hypertension rates have been steadily increasing, with a prevalence of 26% in 2013. There is a consensus on the effect of particulate pollution on blood pressure, but there is inconsistent evidence of effect modification by factors like smoking status and urban residency, especially in this region. Objectives: This study aimed to investigate the association between cluster-level estimates of PM_{2.5} and systolic and diastolic blood pressure in Nepal. We also tested whether this association was moderated by socioeconomic status, urban residency and smoking status. Methods: Health outcomes, covariates and geolocation (cluster-level) data

were obtained from the Demographic Health Survey 2016, along with sample weights, clusters and strata to account for stratified two-stage cluster design. PM2.5 data was obtained at the cluster-level from geographically-weighted estimates of Aerosol Optical Depth data. Results: 14,747 individuals from 383 clusters from all over Nepal were included in the final model. Cluster-level fine particulate matter was significantly associated with systolic and diastolic blood pressure levels only for urban smokers, while adjusting for covariates including sex, age, BMI, and wealth index. Among urban smokers, a 10ug/m³ higher area-level PM2.5 was associated with 1.34mmHg higher SBP (95% CI:0.73-1.96) and 0.63mmHg higher DBP (95% CI: 0.17-1.08). Implications: Based on these findings, priority policies to mitigate air pollution could be targeted towards urban smokers.

25. "Differential food, water and animal exposures reported by Pennsylvania Salmonella and Campylobacter case-patients in urban and rural areas, 2011-2016."

Erica Smith, PhD, MPH, Esther Chernak, MD, MPH, Alison Evans, ScD

Presenting author's affiliation: Dornsife School of Public Health

Background Non-typhoidal Salmonella spp. and Campylobacter spp. are major bacterial causes of acute gastroenteritis in the US. Pennsylvania has the 3rd largest rural population of any state, and prior studies showed salmonellosis and campylobacteriosis rates are higher in rural areas. We hypothesize food, water and animal exposures among cases differ by urbanicity. No US population-based study has previously characterized these exposures for both pathogens by urbanicity. Objective To characterize food, water and animal exposures reported by Salmonella and Campylobacter case-patients by urbanicity. Methods Sporadic, domestically-acquired non-Typhoidal Salmonellosis and Campylobacteriosis cases reported in Pennsylvania during 2011-2016 were included. Campylobacter exposures included ≥ 1 restaurant meal, eggs, meat/poultry/fish, unpasteurized dairy/juice, well water, recreational water, any animal(s), cat/dog(s), reptile(s), livestock. Salmonella exposures also included any poultry, beef, or fresh produce. Individual food, water and animal exposures and census tract disease rates were compared by census tract urbanicity (measured using rural-urban commuting area codes) using chi squared tests and negative binomial regression. Results A total of 6486 Salmonella and 8099 Campylobacter cases were included. Salmonellosis and Campylobacteriosis rates were higher in rural census tracts. Food exposures such as meat, poultry, seafood and eggs were more common among urban cases, while exposures such as unpasteurized milk, well water and animal contact were more common among rural cases. Implications Public health programs to reduce bacterial enteric disease should be tailored by urbanicity. In urban areas, programs should focus on reducing food contamination and in rural areas, on mitigating raw milk, well water and animal exposures.

Changing Cities

26. "Trends in transit use, walking to transit, and ridesharing between 2009 and 2017 in the US and its major metropolitan areas"

David Berrigan, PhD MPH, Calvin Tribby, PhD MPH

Presenting author's affiliation: National Cancer Institute

Background: Recent disruptions in the US transportation system, such as app-based ridesharing, have potential consequences for overall and travel-related physical activity (PA). Walking is a common form of PA and is the most frequent mode to access public transit. Thus,

increased use of ridesharing could result in decreased PA. Objectives: We examine the association between change in transit use, transit-related walking, and ridesharing prevalence nationally and for select US metropolitan areas using the 2009 and 2017 National Household Travel Surveys (NHTS). Methods: The NHTS reports travel by all modes based on a stratified random sample of households. We used complex survey methods to estimate prevalence and test differences in transit use, transit-related walking, and ridesharing between 2009 and 2017 unadjusted and adjusting for common covariates. Results: Nationally unadjusted prevalence of any transit use in the previous 30 days in 2009 was 14.4% (14.0%-14.8%) and in 2017 was 16.6% (16.1%-17.0%) ($p < 0.0001$). Unadjusted prevalence of transit-related walking on a given day in 2009 was 3.5% (3.3%-3.7%) and in 2017 was 3.9% (3.7%-4.1%) ($p = 0.003$). Unadjusted prevalence of taxi use on a given day in 2009 was 0.43% (0.35%-0.51%) and taxi/rideshare use in 2017 was 0.94% (0.82%-1.05%) ($p < 0.0001$). National unadjusted results suggest that transit, transit-related walking and taxi/rideshare use have increased slightly from 2009 to 2017, although after adjustment, only taxi/rideshare was significant. Implications: These results suggest that nationally, ridesharing may not be offsetting transit use although this may be occurring in specific metropolitan areas additionally individual-level substitution between the two modes may also be present with concomitant health and environmental consequences.

27. "Changes in physical activity supportive environments and changes in small-area sociodemographic composition in US urban areas: a bi-directional analysis"

Pedro Gullon, MD, PhD, Usama Bilal, MD, PhD, Jana Hirsch, PhD, Andrew Rundle, PhD, Julia Díez, MsC, Philip Hurvitz, PhD, Insu Koh, PhD, Gina S. Lovasi, PhD

Presenting author's affiliation: Dornsife School of Public Health

Background: Few research examines how neighborhoods change in both physical form and sociodemographic composition, and how these changes are inter-related. Objectives: To study how changes between physical activity (PA) supportive environments and changes in neighborhood sociodemographic composition have had mutual influence between 1990 and 2010 in US urban areas. Methods: PA supportive environments were measured as count of walkable destinations, count of PA facilities, and green land cover within the census tract. Sociodemographic composition was measured by a SES index (education, unemployment, poverty, household income and women-headed houses with children) and race (% non-Hispanic White). We divided the variables into percentiles and calculated the change of percentile between 1990-2000 and 2000-2010. Using linear regression, we modelled (1) how 1990-2000 changes in sociodemographic composition were associated with 2000-2010 changes in PA supportive environments, and (2) how changes in 1990-2000 PA supportive environments were associated with 2000-2010 changes in sociodemographic composition. Results: One percentile increase in SES was associated with a 0.08 (95% CI 0.07;0.09) and 0.13 (95% CI 0.12;0.14) percentile increases in walking destinations and PA facilities, respectively. One percentile increase in walking destinations had an association with a decrease in SES (-0.05, 95% CI -0.04;-0.06) and % non-Hispanic White residents (-0.02, 95% CI -0.02;-0.01). A percentile increase in green land cover was associated with a 0.10 percentile increase in SES (95% CI 0.08;0.11). Implications: The bi-directional association between changes in sociodemographic composition and changes in the built environment should be taken into account when designing areas that support physical activity.

28. "Aging in a Gentrifying Harlem"

Saakshi Kakar, BS, Mubarak Sanni, Isabella Greco, Justin McIntosh

Presenting author's affiliation: Wesleyan University

"Place-keeping" is the dynamic process through which a community preserves the physical environment of their neighborhood as well as the cultural memories and histories embedded in the space. Place-keeping is crucial to maintaining people's place attachment and sense of collective belonging and place identity, psychological constructs strongly associated with overall wellbeing over time. Through a thematic analysis of eight focus groups conducted in Harlem during the summer of 2017, this paper seeks to investigate how elderly residents of Harlem perceive gentrification as disruptive to the important place-keeping process of social memory sharing in their community. Four themes of the content of the focus groups were identified by the author: (1) erasure and manipulation of Harlem's identity, (2) visibility and belonging, (3) changes in social networks and institutions, and (4) the affordances of accessible communal space.

29. "Change in Prevalence of Metabolic Syndrome Among New York City Adults: New York City Health and Nutrition Examination Survey 2004 and 2013-14"

Rania Kanchi, MPH, Sharon Perlman, MPH, Bahman Tabaei, Adeiyewunmi Osinubi, Lorna Thorpe, PhD

Presenting author's affiliation: NYU Langone Health

Background: Metabolic syndrome (MetS) affects more than one-third of the US population and increases the risk of heart disease and premature death. Objectives: To estimate the change in MetS prevalence among NYC adults between 2004 and 2013-14, and compare findings to national estimates. Methods: Data from New York City (NYC) Health and Nutrition Examination Survey (HANES)—a population based cross-sectional survey of NYC adults 20 years and older—and National HANES were used in this analysis with measured blood pressure and bio-specimen collection. MetS was defined as the presence of at least 3 of the following: abdominal obesity, low HDL, high triglycerides, glucose dysregulation, and elevated blood pressure. Age-standardized prevalence of MetS was calculated according to demographic characteristics and a t-test was used to determine the significance of change over time. Results: In 2013-14 the prevalence of MetS among NYC adults was 24.5% (95% CI, 21.5-27.7); adults 65+ years and Asians had the highest prevalence (45.6% and 33.8%, respectively). Abdominal obesity was the most prevalent MetS component in 2004 and 2013-14 (50.7%). Between 2004 and 2013-14, MetS decreased by 13.1% ($p=0.088$) and the decrease was significant and larger in magnitude among women than men. Nationally, the prevalence of MetS increased 12% ($p=0.037$) from 30.9% to 34.6%, particularly among young and non-Hispanic black adults. Implications: Age and racial/ethnic disparities in MetS prevalence were found in 2004 and 2013-14. While prevalence of MetS was trending down among adults in NYC, it significantly increased nationally, specifically among young and non-Hispanic black adults.

30. "Changing Neighborhoods, Changing Health? An Ecological Analysis of Gentrification and Neighborhood Level Health - New York City, 2002-2018"

Karen Alroy, DVM, MPH, Sze Yan Liu, PhD, MPH, Michael Sanderson, MS, Aldo Crossa, MSc, L. Hannah Gould, PhD, MBA, Sungwoo Lim, DrPH, MS

Presenting author's affiliation: CDC and NYC DOHMH

Background: Gentrification, a process whereby persons of higher income move into historically disinvested communities, is transforming certain New York City (NYC) neighborhoods. Although economic revitalization might result, gentrification can contribute to negative health outcomes by displacement, disrupted community networks, and changes in affordable medical care and food access. **Objectives:** To describe overall community-level health trends in NYC by neighborhood gentrification classification, race and ethnicity, and income. **Methods:** We classified neighborhoods as gentrifying or nongentrifying using the Ross and Mirowsky disadvantage index, a framework only recently used in NYC. It was calculated based on 2000 decennial census data and 5-year American Community Survey estimates during 2007–2011 and 2012–2016. Neighborhood-level health was described using annual NYC Community Health Survey data from 2002–2017, including indicators of general health, mental health, chronic disease, nutrition, and physical activity. Using joinpoint time-series analysis, we examined health trends over time for gentrifying and nongentrifying neighborhoods. Data were stratified by race and ethnicity, and income to examine how populations are differentially affected by gentrification. **Results:** Analysis is ongoing. Nonstratified preliminary results show that prevalence of fair or poor general health increased in gentrifying and nongentrifying neighborhoods. Prevalence of serious psychological distress declined in nongentrifying neighborhoods; however, in gentrifying neighborhoods serious psychological distress remained constant and higher than nongentrifying neighborhoods. **Implications:** This study adds to a growing body of evidence on the relationships between gentrification and health. Ultimately, understanding how gentrification affects neighborhood health over time can help municipalities enact public health measures as communities change.

Special populations

31. “Housing Needs of Individuals with Autism Spectrum Disorder and their Families Living in Philadelphia”

Paul Turcotte, MPH, Lindsay Shea, MS, DrPH, Mimi Wong, LCSW, Kate Verstrete, MPH
Presenting author’s affiliation: AJ Drexel Autism Institute

Background: While housing continues to be a need across many communities in Philadelphia, there are specific challenges that individuals with ASD and their families face. Adults with autism is a fast-growing demographic, and it is critical to understand their living arrangement needs to inform policy, program and service development to support them living in Philadelphia. **Objectives:** The objectives of this project are to: 1) understand the current living situation and level of satisfaction from the perspective of individuals on the spectrum compared to caregivers, and 2) identify the long-term housing plans that caregivers have for their child, level of concern and adequacy of resources to prepare for these plans. **Methods:** Data from the 2017 PA Autism Needs Assessment will be used. The 2017 PA Autism Needs Assessment surveyed over 6,000 individuals with autism and their caregivers in PA. In Philadelphia, the PA Autism Needs Assessment captured 446 individuals with autism and their caregivers. **Results:** Most individuals with ASD are living with their parents or other relatives. A fifth of adults with ASD indicate being unhappy in their current arrangement. Less than a quarter (20%) of caregiver’s report having housing plans for their child when they are no longer able to care for them. **Implications:** Understanding of the current living arrangements and needs of individuals

with ASD and their caregivers in Philadelphia is critical to the development of policies to inform housing services and supports. Results from the PA Autism Needs Assessment identifies opportunities for cross-sector collaboration for addressing these needs.

32. “Community Needs of Individuals with Autism Spectrum Disorder and their Families Living in Philadelphia”

Mimi Wong, LCSW, Lindsay Shea, MS, DrPH, Paul Turcotte, MPH, Derek Green, JD

Presenting author’s affiliation: AJ Drexel Autism Institute

Background: As the prevalence of autism increases, so does the public health need to address inclusion and community involvement barriers that individuals on the spectrum and their caregivers face. By understanding the challenges of participating in community activities, entities and agencies in Philadelphia can plan for activities and programming to address this growing need and population. Objectives: The objectives of this project are to: 1) highlight the challenges to participating in activities in the community from the perspective of individuals on the spectrum compared to caregivers, and 2) identify current activities, level of participation and meaningfulness from the perspective of individuals on the spectrum compared to caregivers. Methods: Preliminary data from the 2017 PA Autism Needs Assessment will be used. The 2017 PA Autism Needs Assessment surveyed over 6,000 individuals with autism and their caregivers in PA. In Philadelphia, the PA Autism Needs Assessment captured 446 individuals with autism and their caregivers. Results: Adults living in Philadelphia noted emotional challenges (64%) as the primary barrier to participating in community events, with a third also reported having physical challenges. Caregivers reported emotional challenges (57%) as the leading barrier to community participation, with 44% also reporting behavioral challenges. Implications: Better understanding of the status of community involvement, its challenges and what it means to individuals on the spectrum and their caregivers, is critical to ensuring that public spaces and programming are inclusive to everyone.

33. “Scaling of drug fatalities in the United States”

Priscilla Mullachery, MPH PhD, Usama Bilal, MD MPH PhD

Presenting author’s affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: We use the concept of urban scaling, the behavior of outcomes relative to the population size of urban agglomerates, to hypothesize that urban networks can facilitate the “spread” of the drug epidemic. This hypothesis predicts disproportionately large number of drug fatalities in large urban agglomerates (behavior known as superlinear scaling) compared to less populated areas. Objective: To measure the scaling properties of drug fatalities in the 741 U.S. commuting zones (CZ) in 2005-2011 and 2012-2017. Methods: We examined crude mortality rates due to drug poisonings (per 100,000 population) in CZs aggregated into deciles of total CZ population per year. To describe the scaling behavior of drug fatalities, we regressed the log transformed death count on the log transformed population, stratified in two periods (2005-2011 and 2012-2017), adjusted for the age distribution in 5-year groups. Results: Between 2005 and 2017, mortality due to drug poisoning increased in CZs across all deciles of the population. CZs with 100,000 or more residents more than doubled the mortality rate due to drug poisoning by 2017 (22 vs. 10 deaths per 100,000 in 2005). Drug fatality scaled superlinearly ($\beta=1.18$, 95%CI [1.12-1.23] in 2005-2011 and $\beta=1.17$, 95%CI [1.12-1.22] in 2012-2017) which means that larger CZs have disproportionately more drug fatalities compared with smaller CZs. Implications: Our

results indicate that there is a role for increased levels of agglomeration in the geographic patterning of drug fatalities. Understanding the mechanisms underlying this relationship can help design policies to address the fatal drug epidemic.

34. "“Anything Could Happen” How Perceived HIV Risk Influences PrEP Initiation Among Women Who Inject Drugs in Philadelphia”

Eliza Ziegler, BA, Marisa Felsher, MPH, PhD(c), Jade McKnight, MPH, Alexis Roth, PhD, MPH
Presenting author’s affiliation: Dornsife School of Public Health

Background: Pre-Exposure Prophylaxis (PrEP) is a promising strategy to prevent HIV among women who inject drugs (WWID) but little is known about what guides their decisions about initiating PrEP. Methods: WWID were purposively sampled from an ongoing PrEP implementation study. Seventeen WWID who initiated PrEP and 5 WWID offered PrEP who chose not to initiate completed a qualitative interview exploring their perceived HIV risk and how it influenced their decision to initiate PrEP. Content analysis was used to explore participant narratives. Results: WWID described PrEP as an important HIV prevention tool and viewed their risk for HIV as dichotomized into risk within their control (consensual sex and drug use practices) and that beyond their control (sexual assault, partners removing condoms, and unintentional needlesticks). While participants mostly felt like they had low HIV risk related to what they can control, almost all expressed high concern for external risks. For some, these external risks were enough to motivate PrEP initiation. For others, perceived barriers such as side effects outweighed their perceived need for and benefits of PrEP preventing uptake. Conclusions: Despite viewing PrEP as an important HIV prevention tool, especially for sources of risk beyond their control, not all WWID who were offered PrEP initiated it. For these women, supports to buffer perceived barriers to initiation and access to post-exposure prophylaxis may be warranted. For women who initiate, it is possible that adherence will wane if perceived risk does not remain high. Research to assess this relationship over time is needed.

35. Withdrawn

36. “Ongoing Pilot Study on the Use of Doxycycline as Prophylaxis for Syphilis in HIV-Infected Men Who Have Sex With Men”

Heather Conway, BS, Zsofia Szep, MD, Shara Epstein, MD, Michele Kutzler, PhD, Edward Gracely, PhD, Margaret O'Connor, MS, MD/PhD student, Nguyen K. Tran, MPH, PhD(c), Seth Welles, ScD, PhD

Presenting author’s affiliation: Drexel University College of Medicine

Background: Reported cases of early syphilis in Philadelphia have nearly doubled from 622 to 1,089 between 2000 and 2016 and the majority of these cases have been in men who have sex with men (MSM). In 2017 the Philadelphia Health Commissioner recommended that health care practitioners should offer doxycycline prophylaxis to HIV-infected MSM who have had a prior episode of syphilis within the past 2 years. Objectives: Our study investigates the effectiveness, feasibility, and limitations of using doxycycline prophylaxis for syphilis prevention in an HIV-infected population at high risk for early infection. Methods: Enrolled participants are prescribed 100 mg of doxycycline daily and followed prospectively for 1 year. Every 3 months participants are screened for syphilis, gonorrhea, and chlamydia and complete a sexual behavior questionnaire. Results: The study has been open for enrollment since November 2018. There

are 6 male participants; the median age is 33.5 years; 83% are Black or African American; 50% had undetectable HIV viral load at enrollment (≤ 20 copies/mL). The mean number of syphilis infections in the 2 years prior to enrollment is 2.3. One participant was treated for syphilis 22 days after enrollment. No severe adverse events from doxycycline use have been reported. Implications: Syphilis in MSM and transgender persons is increasing nationwide and novel methods of prevention will be important to control this disease. Preliminary data from daily prophylaxis with doxycycline suggest this may be a useful control measure.

37. "Qualitative Assessment to Understand the Knowledge Associated with Hepatitis B Among Vietnamese Nail Salon Workers in Southern New Jersey and Philadelphia, PA"

Catherine Freeland, MPH, Nga Vu, Tracy Nguyen, Nancy Nguyen, Chari Cohen, DrPH, MPH, Tran Huynh, PhD, MPH, CIH

Presenting author's affiliation: Hepatitis B Foundation

Background: In the United States (US), up to 2.2 million individuals have been chronically infected with hepatitis B (HBV). HBV disproportionately impacts Asian Americans and Pacific Islanders (AAPI). Over 20,000 individuals and 8-12% of local Vietnamese residents are estimated to be living with hepatitis B in Philadelphia. Objectives: To understand barriers and disparities associated with hepatitis B in Greater Philadelphia Vietnamese nail salons, this study aims to assess health needs for the prevention of HBV through focus groups and interviews. Methods: Information on knowledge of hepatitis B and screening practices was collected through focus groups and individual interviews with participating Vietnamese nail salons in Philadelphia and Southern New Jersey. Brief demographic surveys were administered. Interviews were transcribed, translated into English, and coded for analysis. Results: Qualitative research methods found emerging themes from interviews including misconceptions associated with transmission and symptoms of HBV, knowledge of vaccine, and risk factors associated with HBV. Findings also show that within training for nail salon workers, HBV is not specifically mentioned. Participants also provided valuable feedback on how to best create more awareness of HBV within the Vietnamese nail salon community. Implications: This study utilizes qualitative data collection to understand the impact and awareness of HBV within the Vietnamese nail salon community. This study can provide direction for future HBV public health awareness messaging campaigns to promote prevention and testing for HBV. It also makes a case for additional educational interventions within the nail salon workforce related to HBV and other infectious disease prevention.

38. "Prevalence and Awareness of Chronic Kidney Disease New York City Adults, 2013-14"

Sharon Perlman, MPH, Linda Wong, MD, MPH, Claudia Chernov, MPH, Sumit Mohan, MD, MPH, Lorna Thorpe, PhD

Presenting author's affiliation: New York City Department of Health and Mental Hygiene

Background: Chronic kidney disease (CKD) increases risk for kidney failure, cardiovascular disease, and premature death. Urban population-representative CKD estimates are rarely available, yet they are essential to the development of public health interventions to lower the high burden of CKD and its complications. Objectives: To assess CKD prevalence and awareness, and risk factors among non-institutionalized New York City (NYC) adults ages 20 and older. Methods: We used data from the 2013-14 NYC Health and Nutrition Examination Survey, a population-representative survey with biospecimens ($n = 1,089$). Estimated glomerular filtration rates (eGFR) were calculated using the CKD Epidemiology Collaboration formula. We

defined CKD stages 1-5 per eGFR and urine albumin-to-creatinine ratios using the 2012 KDIGO guidelines. We employed multivariable logistic regression models to examine the relationship between CKD and demographic and health characteristics using prevalence ratios. Results: CKD prevalence among NYC adults was 12.0%, including 4.8% of NYC adults with CKD stages 3-5. Most (77.6%) adults with CKD stages 3-5 were unaware of having CKD. Prevalence was significantly greater among those earning \leq \$50,000 annually (15.1%), adults who had ever smoked (16.3%), those with hypertension (20.7%), and those with diabetes (29.6%). In multivariable models, older age, lower income, ever-smoking, hypertension, and diabetes were each independently associated with CKD (adjusted prevalence ratios: 3.5, 1.7, 1.5, 1.7, and 2.0, respectively). Implications: One in eight NYC adults has CKD, yet awareness is very low. Public health officials need to increase awareness and testing of CKD, and continue efforts to control hypertension and diabetes.

39. Ruwais UN-Planned: A Public Health and Territorial Intervention”

Faris Abuzeid, BArch / MSc

Presenting author's affiliation: Faris Abuzeid + Associates (FA+A)

Background: Rapid expansion of Jeddah during 60's and 70's resulted in the creation of urban sprawl, with some neighborhoods becoming unplanned, or slum, districts within the urban fabric. With over 53 unplanned neighborhoods across Jeddah, poor public works is a common factor. This leads to the proliferation of infectious diseases such as dengue fever, typhoid and cholera amongst inhabitants. Objectives: The neighborhood of Al Ruwais is one example; with over 35,000 inhabitants and spanning an area of over 4 square kilometers; approximately half in slum conditions. Under the umbrella of Ruwais UN-Planned, the neighborhood was used as the case study for mitigation research. Methods: Results from investigating the current neighborhood situation, including discussions with residents, suggest that successful alignment of inhabitants is key in achieving the main objective. Thus, categorizing our intervention approach into following actions: • Public awareness campaign to educate residents how to reduce public health illnesses associated with poor hygiene practices, • Sanitation control through an incentive-based waste management program and non-intrusive pest control scheme, • Economical infrastructure intervention temporarily improving the quality of roads in between slums. Results and Implications: Through this platform, inhabitants are expected be empowered and help eradicate any spreading of infectious diseases, by being the driving force behind the revitalization process, and transform the area into an urban core for the city. This in retrospect will bring necessary economic development to the neighborhood and its community through the initial widespread of knowledge, disease prevention actions and community integration, which can be implemented in similar areas.

Innovative Research Methodology

40. “City-level measures of health, health determinants, and equity to foster population health improvement: the City Health Dashboard”

Miriam Gofine, MPH, Shoshanna Levine, DrPH, Lorna Thorpe, PhD, Benjamin Spoer, PhD, Marc Gourevitch, MD, MPH

Presenting author's affiliation: City Health Dashboard, NYU School of Medicine, Department of Population Health

Background: Most US cities lack actionable data, specific to their jurisdictions, on population health status, health determinants and health equity. While such data is often accessible at the county and state level, it is not readily available for many cities. This hinders local efforts to understand gaps in opportunity and target programs and policy changes to address them. Objectives: To develop a resource to increase access to granular local data relevant to health and well-being. Methods: We compiled data from 12 national data sources to provide local stakeholders with data on population health and its drivers. We included data for all 500 U.S. cities of population $\geq 66,000$, covering approximately 1/3 of the U.S. population. Data were analyzed at the city and, where possible, census tract level. City data were stratified by sociodemographic factors, as available. Results: The City Health Dashboard launched in May 2018 and presents 37 measures across five domains of health and its drivers. A “Take Action” page provides evidence-informed resources to support local stakeholders in moving from data to action. Between May 2018 and April 2019, the site hosted over 52,035 unique visitors in 77,248 sessions. Feedback from early adopter cities demonstrate the Dashboard’s utility in bringing together local stakeholders to measure, understand, and take action to address issues in their communities. Implications: As cities’ adoption of the City Health Dashboard becomes more widespread, it promises to augment local surveillance efforts and support urban population health improvement at a national scale, fostering healthier, more equitable communities.

41. “Comparing Health and Social Outcomes Among US Peer Cities Using Cluster Analysis”

Justin Feldman, ScD, Lorna Thorpe, PhD, Benjamin Spoer, PhD, Shoshanna Levine, DrPH, Marc Gourevitch, MD, MPH

Presenting author’s affiliation: NYU School of Medicine

Background: Identifying groups of peer cities can help urban leaders draw comparisons and understand the potentially attainable range of health and social outcomes for their city. Objectives: To identify clusters of US cities similar to each other regarding socio-demographic and geographic characteristics important to well-being, yet relatively unmodifiable through local policy. We sought to compare key health and social outcomes within and between clusters. Methods: We calculated 11 census-derived standardized variables to characterize cities by socio-demographic composition (racial/ethnic, age, and income distribution) and geography (city population and population density; metropolitan population). We used k-means cluster analysis to classify the cities into clusters. We then compared 4 outcomes (cardiovascular disease-related mortality, interpersonal violence, % uninsured, entropy index of racial segregation) within and between clusters. Results: We identified 10 clusters (range = 22 to 91 cities/cluster). Across all 4 indicators, there was considerable variation within and between clusters. Cluster 1 (high-income suburbs within large metro areas; N=55) had relatively low levels of racial segregation, and its mean outcomes were the best across the 4 other indicators. Cluster 7 (small cities with high-poverty, high % black populations; N = 54) experienced the poorest outcomes for racial segregation, violence, and cardiovascular disease-related mortality. Illustrating within-cluster variation, cardiovascular disease-related mortality within Cluster 7 had an interquartile range of 161–284 deaths/100,000. Implications: Using our analyses, urban leaders can explore whether there are specific policies or programs accounting for the relatively better health and social outcomes for cities that are similar to their own.

42. “Improving Sampling Probability Definitions with Predictive Algorithms”

Matthew Jannetti, MSPPM, Amy Caroll-Scott, PhD, MPH, Erikka Gilliam, MS, MPH, Irene Headen, PhD, MS, Félice Lê-Scherban, PhD, MPH, Maggie Beverly, MPH, Samantha Joseph, MPH
Presenting author’s affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: The West Philadelphia Promise Neighborhood (WPPN) conducted the first wave of its neighborhood survey, representative of households with children. The sampling frame included a list of addresses that matched with addresses from City lead testing and immunizations, and school records. **Objectives:** To create a well-calibrated probabilistic model to predict households with children (“child-likely”) using Wave 1 data. A probabilistic model will provide a more granular definition of child-likely status that can improve survey sampling and planning. **Methods:** The performance of several predictive models (including logistic regression, linear discriminant analysis (LDA), random forest classification) were tested and compared using Receiver Operating Characteristic (ROC) and Calibration Curves. The variables in the models included counts of each time an address appears in each list, the average year each address appears in each list, type of match, and other interactions. **Results:** The best performing models were the logistic regression and the LDA; both were extremely well calibrated. Also, they performed better than the default model used in Wave 1, where every matched record was assumed to be child-likely. The logistic regression ROC had an area under the curve of 0.71. **Implications:** Applying this model to a sampling frame can help population-based survey efforts refine eligibility criteria and use the resulting probabilities, false positive rates, and true positive rates to set sample sizes with respect to how many eligible respondents can be expected, and to inform sampling methods. This model can also be evaluated post-survey more scientifically than the Wave 1 methodology.

43. “Spatial Statistical Methods to Assess the Relationship Between Water Violations and Poverty at the County Level: In America, Who has Access to Clean Water?”

Ruby Bayliss, BS, Loni Tabb, PhD

Presenting author’s affiliation: Dornsife School of Public Health

Background: The Flint, Michigan water crisis that occurred in 2014, has brought national attention to the importance of safe drinking water. The existence of water violations within community water systems since 2014 has been thoroughly documented throughout the United States, but the relationship between people who are socioeconomically disadvantaged, and the occurrence of water violations is unclear. **Objectives:** The goals were to: 1.) determine the county level spatial patterning of neighborhood characteristics related to socioeconomic status and the distribution of the occurrence of water violations throughout the state. 2.) investigate if the spatial patterning persisted in states with different proportions of water violations.

Methods: We used data from the County Health Rankings database supported by the Robert Wood Johnson Foundation to achieve our objectives. We identified three states that represented varying proportions of counties that had at least one community water violation. Utilizing both exploratory and inferential spatial statistical methods, we examined the spatial patterning of the community water violations as well as the neighborhood characteristics within each state. **Results:** We found that two of the three states had significant spatial patterning for the occurrence of at least one water violation. We also found that there was variation among the three different states for the spatial patterning of the socioeconomic variables. **Implications:** Policies regulating drinking water violations that occur within community water systems should

consider that neighborhood characteristics could influence the spatial patterning of the occurrence of water violations within the community.

44. “Spatiotemporal analysis of overall health in the united states between 2010-2018 using bayesian methods”

Binod Acharya, MS, Loni Tabb, PhD

Presenting author's affiliation: Urban Health Collaborative, Dornsife School of Public Health

Background: Many previous studies have documented the presence of spatial heterogeneity in health outcomes across the US in different geographic scales but the spatiotemporal analyses to understand overall health are conspicuously lacking. County Health Rankings (CHR) has been providing a database for several health outcomes and health factors in US counties since 2010. Objectives: This study quantifies the spatiotemporal variability in the mortality, quality of life, and overall health outcomes across the US between 2010 and 2018 and assesses whether this variability can be explained by county-level demographic and socio-economic characteristics. Methods: We used CHR data to analyze overall health, length of life, and quality of life for 2010-2018 in the contiguous US via a variety of exploratory analyses and formal analysis employing hierarchical Bayesian methods. Composite scores were created to proxy these outcomes utilizing pre-defined weights of several variables as recommended by CHR. Our methods assumed a convolution of spatially structured and unstructured errors to model the overall spatial error. Results: Substantial disparity in these health outcomes were evident, with counties with poorer health outcomes mostly concentrating in Southeastern US. Models that incorporated county level demographic and socio-economic characteristics partially explained the observed spatial heterogeneity in health outcomes. Interestingly, there was no time effect in any of the outcomes suggesting a perpetuation of health disparity over the years. Implications: County-specific interventions that take into account not just the individual characteristics, but also contextual factors might be beneficial in improving population health and breaking the perpetuation of health disparity.

45. “Split and combine SIMEX algorithm to correct geocoding coarsening of built environment exposures”

Jung Yeon Won, MS, Brisa N. Sánchez, PhD

Presenting author's affiliation: University of Michigan

One of the major challenges in spatial epidemiologic studies is uncertainty in exposure measurement due to geocoding errors. Faulty geocodes in built environment data introduce errors to exposure assessments and induce bias in the inference about corresponding health effect estimates. In this study, we focus on the estimation of the health effect associated with individuals' exposure to the food environment, represented by the number of specific food outlets within a buffer area around the subject. We show, algebraically and through simulation studies, that coarsening of food outlets' coordinates results in exposure measurement error that has heterogeneous variance and has non-zero mean. In turn, the bias in the health effect can be away from the null in many circumstances. We extend the simulation extrapolation (SIMEX) method to correct the bias in the health effect to accommodate the non-standard measurement error distribution, without requiring external data. We illustrate the procedure with our motivating example about adult BMI in an elderly cohort and proximity to healthy food outlets near their home.

46. "A causal model to estimate the effect of distance-weighted built environment exposures from longitudinal data"

Adam Peterson, M.S., Brisa Sanchez, PhD

Presenting author's affiliation: University of Michigan

Identifying health effects causally conferred by built environment exposures is challenging due to uncertainty about the spatial scale that is relevant for exposure assessment and confounding due to unmeasured person-level factors. We propose a difference-in-differences parameterization for the spatial temporal aggregated predictor (STAP) model to address the question of spatial scale and condition on unmeasured, time-invariant person-level confounders. As with STAP, the model uses the distances between study participants' locations and environmental features (e.g., supermarkets) to define a weighted exposure count, where weights are a function of distance with parameters interpretable as the spatial scale. In addition, the predictor is written as the difference in exposure during the current visit from the person-level average exposure, such that the effect of interest is interpreted as the change in the outcome associated with person-level change in exposure, causal interpretation. Implemented using a custom No U-Turn Hamiltonian Monte Carlo Sampler in C++, the model is used to estimate the causal effect of healthy food availability and body mass index within an ageing cohort.

47. "Understanding geographic disparities in cancer mortality: Does selection of neighborhood deprivation index matter?"

Daniel Wiese, PSM, Shannon Lynch, PhD, Kevin Henry, PhD, Kari Moore, MS, Yuzhe Zhao, Ana Diez Roux, MD, PhD, MPH

Presenting author's affiliation: Temple University, Geography Department

Background: Neighborhood socioeconomic conditions (nSES; i.e. poverty, employment, etc.) can contribute to disparities or differential cancer rates across geographies. However, many nSES measures have been developed, and effects of measure selection on disease associations remains unclear. Objectives: We explored the geographic variation of cancer mortality rates in Pennsylvania (PA) and systematically evaluated effects of nSES measure selection on explaining geographic disparities. Methods: Eight nSES measures were selected from a systematic review and derived from U.S. Census data. Cancer deaths were obtained from the PA National Death Index (2007-2014; n=226,115), aggregated by census tract (CT), and joined to nSES quartiles (low-to-high). Percent agreement across nSES quartiles were compared; Bayesian geospatial modeling (BayesX) estimated smoothed relative risks (RR) at each CT, adjusted for individual-level sex, age, race/ethnicity (baseline model), and identified locations with higher than expected cancer mortality ($p < 0.05$). Model fit and change in RR range across CTs were evaluated and compared after adding each nSES measure independently to the baseline model. Results: CTs with significantly higher mortality rates were identified; CTs defined by low nSES varied by measure. Inclusion of any nSES measure significantly impacted disease variation (attenuating RR ranges) and improved model fit compared to the baseline model. While associations with cancer mortality appeared similar across nSES measures, geospatially, some nSES measures explained disparities in urban areas, while others explained disparities in rural PA. Implications: Selection of nSES matters, particularly when findings are used to understand

disparities and/or to identify areas for cancer interventions. Systematic methods with geospatial considerations should be applied in future studies to support nSES variable selection.

48. “Network Analysis of Latino-Serving Organizations in Philadelphia to Promote Immigrant Health in Urban Settings”

Nishita Dsouza, MPH, Elizabeth Hassrick, PhD, Kristin Giordano, MPH, Chris Friedman, BA
Presenting author’s affiliation: Dornsife School of Public Health

Background: Latino immigrants experience significant health disparities. Assessing the organizational landscape of Latino-serving health and social service institutions can inform community-level efforts to reduce Latino immigrant health disparities in urban settings. Objective: To identify and map the ties between Latino-serving organizations in Philadelphia, including referrals, administrative, and planning collaborations. Methods: Latino-serving organizations (N=43) identified through existing resource directories and key informants were asked to complete a cross-sectional survey. Preliminary network analysis (N=22) identified the nature and extent of collaborative ties and how collaborations vary by type of service provided and between North and South Philadelphia. Results: Network density scores (rates of all possible ties) revealed more referral ties (45%) than administrative (23%) or planning collaborations (16%). Location-specific analysis found that North Philadelphia organizations had a higher density of referrals (60% vs. 49%) but perceptions of organizational value were greater among organizations in South Philadelphia (63% vs. 50%). Service-specific analysis identified fewer ties between domestic violence and mental health providers (47%), compared with ties within domestic violence (68%) and mental health providers (55%). Implications: Network analysis has significant utility to characterize interorganizational collaborations. The results will be presented in future community workshops to promote community-level dialogues about strengthening organizational coordination to improve urban Latino immigrant health.