



**2022 NATIONAL
RESEARCH CONFERENCE**
FIREARM INJURY PREVENTION

Washington, D.C.
November 29-December 1

ABSTRACTS FOR FLASH SCIENCE PRESENTATIONS

TABLE OF CONTENTS

FLASH SCIENCE PRESENTATIONS

Click title for access to session abstracts

November 30, 4:45-5:15 PM – FLASH SCIENCE PRESENTATIONS

Flash Science 1–Firearm injury prevention among adolescent and pediatric populations

Flash Science 2–Examination of firearm policies and their effects on firearm injuries

Flash Science 3–Firearm access, carriage, and ownership

Session: Flash Science 1—*Firearm injury prevention among adolescent and pediatric populations*

Hampton Ballroom, November 30, 4:45-5:15 PM

[{Back to table of contents}](#)

1. Implementing Community-Based Youth Firearm Prevention: The True Reasons I Grabbed a Gun Evolved from Risks project (TRIGGER)

Ebunoluwa Odueso BS^{1,2}, Laney Rupp MPH¹, Tia Bell MA³, Marc Zimmerman PhD^{4,5}

¹Department of Health Behavior and Health Education, University of Michigan School of Public Health, ²Michigan Youth Violence Prevention Center, ³The TRIGGER Project, ⁴University of Michigan School of Public Health, ⁵Institute for Firearm Injury Prevention, University of Michigan

Statement of Purpose This paper describes an implementation study of the TRIGGER project in Washington DC that is part of the CDC-funded Michigan Youth Violence Prevention Center. The TRIGGER project includes a youth employment program that engages youth in building social-emotional skills, learning about root causes of gun violence, and planning gun violence prevention projects. The evaluation of TRIGGER involves two phases: implementation and outcome evaluation. This paper focuses on the implementation phase of our study to provide feedback to program leaders about program delivery and develop an implementation guide. Our project is a collaboration between academic researchers and a community-based organization. **Methods/Approach** Our data include: 16 semi-structured interviews with key community- and youth stakeholders, focus group discussions with participants, and observations of program sessions. The interviews will address topics regarding program capacity and sustainability, reach, and barriers to delivery. Focus groups will address participant satisfaction, feedback, and suggestions for improvement. Session observations will include ratings by research assistants on youth engagement, facilitator behavior, and overall quality. Qualitative data from interviews and focus groups will be coded using a deductive/inductive approach to analyze patterns and identify themes. The observational data will be integrated with these qualitative data to inform program improvement and develop the implementation guide. **Results/Conclusion** We do not have results to share because the deadline for abstracts was before commencement of data collection. We will have collected all data by August and will have analyzed it before the conference. **Innovation & Significance to the field** Our study is novel because we have little systematic information about grassroots youth gun violence prevention program implementation. It is vital for community firearm violence prevention to involve local stakeholders in program development and evaluation to ensure programs are locally relevant, acceptable, and sustainable.

2. Comparison of Pediatric Firearm Related Fatalities in Intimate Partner Violence Related Homicides, Familial Homicides, and Other Child Homicides

Kathryn J. Spearman MSN RN PhD Student¹, Hsiu-Fen Lin PhD LMSW², Karissa Pelletier PhD³, Jennifer Ross MD⁴, Millan AbiNader PhD LMSW⁵, Jesenia M. Pizarro PhD⁶, Jill T. Messing PhD MSW², Jacquelyn Campbell PhD RN FAAN¹

¹Department of Nursing, Johns Hopkins University, ²School of Social Work and Office of Gender Based Violence, University of Arizona, ³Firearm Safety Among Children and Teens (FACTS) Consortium, University of Michigan, ⁴Harris County Forensic Institute, ⁵School of Social Policy and Practice, University of Pennsylvania, ⁶School of Criminology and Criminal Justice, University of Arizona

Statement of Purpose: Child homicide is the fourth leading cause of pediatric mortality in the US, yet is understudied. Prior research has identified that up to 20% of child homicides can be attributed to parental intimate partner violence (IPV). This study seeks to answer: What are the differences in firearm-related and non-firearm related fatalities among children killed in IPV-Related Homicide (IPVRH), familial (non IPV-related) homicides, and other child homicides? **Methods/Approach:** We examined autopsy records and case narratives from medical examiner reports of all homicides in Harris County, Texas and Maricopa County, Arizona from 2016 to 2020. Based on the situational context provided in medical examiner case narratives, we classified child homicides as IPVRH, familial

homicide, or other. We examined child homicides in Maricopa County (n=165 child homicides; n=22 IPVRH of children) and in Harris County, Texas (n=130 child homicides; n=11 IPVRH of children). **Results/Conclusion:** Data analysis is underway. We will use multinomial regression to test the association of risk factors, and report chi-square and calculate relative risk. We hypothesize that children of IPVRH are more likely to be killed by a firearm, more likely to be part of a homicide-suicide, and have distinct risk factors. Analyses will examine individual and situational covariates of firearm and non-firearm homicides of children. In addition to demographic variables, we will also examine a number of situational variables including injury settings, cause of death, victim-offender relationship, perpetrator suicide, parental separation/divorce, number of victims, and witnesses. **Innovation & Significance to the field:** This study adds to the evidence of firearm-related homicides of children and in identifying risk factors preceding murders of children. The results of this study will provide additional information about firearms and other situational risk factors for child homicides that can be used to guide future intervention and policy work.

3. **Provider Perspectives on Trauma Recovery & Violence Prevention Resources for Assault Injured Youth in an Urban Level 1 Trauma Center**

Symphony Fletcher MD Candidate¹, Princy George MD¹

¹Pritzker School of Medicine, University of Chicago

Statement of Purpose Firearm homicide is the leading cause of mortality for adolescents. Further, youth who have experienced assault injury (AI) are nearly twice as likely to be reinjured. Evidence-based trauma recovery and violence prevention (TRVP) services have been shown to decrease youth reinjury as well as violent act rate, but provider utilization and awareness of these resources is understudied. **Methods/Approach** We surveyed 82 health providers working in a Level 1 pediatric emergency department (ED) over a 7-month period. All participants completed a 12-item Likert scale survey to measure awareness, usage, importance, and efficacy of TRVP resources. Qualitative free responses captured data on existing resources, resource barriers, and areas of improvement. **Results/Conclusion** Participants included 54 physicians, 19 nurses, 4 ED technicians, and 5 other staff. Most providers (90%) agreed that TRVP resources should be incorporated into standard care for AI youth. However, providers had limited awareness of resources and low confidence in utilizing resources. Eighty percent of providers scored ≤ 3 of 5 on awareness of existing resources, and roughly 41% of participants reported feeling slightly to not at all confident in activating existing resources. These findings suggest the need to develop educational interventions to train providers on TRVP resource utilization. Providers also reported low efficacy rating for existing resource: over 88% of participants identified existing resources as moderately to not at all effective at preventing reinjury. In their qualitative responses, participants identified resource insufficiency, systemic issues, communication barriers, patient interest, and lack of provider knowledge as barriers to TRVP uptake. These findings suggest the need to strengthen TRVP programs to address identified resource insufficiencies, beyond just investments in patient and provider education. **Innovation and Significance to the Field** With rising youth morbidity and mortality, pediatric EDs should consider improving TRVP resources to decrease firearm reinjury rate and decrease youth mortality.

4. **Asking Saves Kids: a firearm injury prevention campaign in a suburban Cook County pediatric Emergency Department (ED)**

Veena Hamill MS¹, Rachel Yang¹, Sameera Siddiqi¹, William Adams PhD², Clara Pavesi-Krieger¹, Mark Cichon DO FACEP/FACOEP³

¹Stritch School of Medicine, Loyola University, ²Biostatistics Core, Loyola University Medical Center, ³Department of Emergency Medicine, Loyola University Medical Center

Statement of Purpose: In the United States, 87 children are injured or killed by guns daily. Firearms are the second leading cause of death for American children; gun violence is a public health epidemic. Campaigns such as ASK (Asking Saves Kids) promote gun safety education and encourage conversations around these topics as a potential to keep kids safe from unintentional firearm injury due to a loaded or unsecured gun in the home. Our study seeks to evaluate if educating child caregivers about gun safety and the ASK campaign, while in the ED, increases their confidence in discussing these topics with other child caregivers. **Methods/Approach:** Caregivers of patients in Loyola University Medical Center's (LUMC) pediatric ED ("participants") completed a baseline questionnaire

regarding familiarity with the ASK campaign, and their practice of discussing at-home gun safety. Participants then received educational material from the ASK campaign (“ASK education”) about gun safety in homes with children. At two points after receiving ASK education, participants completed questionnaires regarding their familiarity with the ASK campaign and practice of asking about at-home gun safety. **Results/Conclusion:** In this small sample, participants were significantly more likely to be familiar with the ASK campaign at the immediate follow-up assessment (OR = 6.29; p = .02) and at the final assessment (OR = 14.67; p = .001). We believe this increased familiarity with the ASK campaign correlates with participants being able to correctly describe its mission. **Innovation & Significance To The Field:** Prior studies at LUMC have demonstrated that educating EM providers about ASK increased their comfort in discussing gun safety topics with patients. In this study, we sought to determine if teaching child caregivers’ about ASK while in the ED would increase their comfort in and practice of discussing these topics with other caregivers.

5. Care Management Needs Among Assault-Injured Youth Enrolled in a Hospital-Based Violence Intervention

Lynn S. Massey MSW^{1,2,3,4}, Laura Seewald MD^{1,2,3,4,5}, Claire Liu¹, Kyana Dixie MSW², Rebecca M. Cunningham MD^{1,2,3,4}, Jason Goldstick PhD^{1,2,3,4}, Maureen Walton MPH PhD^{1,2,3,7}, Ken Resnicow PhD^{1,2,3,6}, Patrick M. Carter MD^{1,2,3,4},

¹Injury Prevention Center, University of Michigan, ²Institute for Firearm Prevention, University of Michigan, ³Firearm Safety among Children and Teens Consortium, University of Michigan Medical School, ⁴Department of Emergency Medicine, University of Michigan Medical School, ⁵Department of Emergency Medicine, Hurley Medical Center, ⁶Department of Health Behavior/Health Education, University of Michigan School of Public Health, ⁷Addiction Center, Department of Psychiatry, University of Michigan Medical School

Statement-of-Purpose: Hospital-based violence interventions are increasingly employing strengths-based care management approaches to link assault-injured youth with community services to reduce the risk of repeat violent injury. Understanding key resource needs among this population can inform future intervention efforts.

Methods/Approach: We present baseline data from 50 assault-injured youth (age=14-24) enrolled in an on-going multi-site randomized control trial (RCT) evaluating the efficacy of two versions of a hospital-based violence intervention that combines behavioral therapy with care management. Enrolled youth were asked at baseline about key service needs and barriers to accessing services prior to their condition assignment. **Results:** Among assault-injured youth (age=19.6; 44.0%-male; 80.0%-Black; 68.0%-public assistance; 16.0% baseline firearm carriage; 80% non-partner (20% partner) violence; 28.0% firearm victimization), 86.0% self-identified one or more care management service needs (mean=4.64 requested services (SD=4.43)). Key areas identified by assault-injured youth included access to: (1) pro-social resources (58.0% requested positive free time activities; 30.0% positive peer/adult mentors); (2) mental health counseling/treatment (30.0%); (3) employment opportunities/training (28.0% requested access to job programs; 28.0% requested job training/skills); (4) school/GED resources (28.0%); and, (5) basic social service needs (44.0% financial assistance; 28.0% food assistance; 26.0% clothing/hygiene; 18.0% housing/shelter). Of note, while 18.0% reported alcohol and 60.0% reported marijuana misuse, only 2.0% of youth requested access to substance use services. Perceived barriers to accessing services among youth included: (1) not knowing what services were available or how/where to access services (32.0%); (2) potential cost of services (28.0%); (3) wait time to access services (28.0%); (4) belief that should be able to handle problems without help/assistance (20.0%); and, (5) distance to services (16.0%). **Innovation/Significance:** Given the increasing use of care management wrap-around services within violence prevention programs, understanding key service needs for assault-injured youth, as well as barriers to accessing those resources is essential for future prevention programming.

6. Trajectories of handgun carrying in rural communities from early adolescence to young adulthood and their association with bullying and physical violence

Alice M. Ellyson MS PhD¹, Emma Gause MS MA², Sabrina Oesterle PhD³, Margaret Kuklinski PhD⁴, Vivian H. Lyons MPH PhD⁴, Julia P. Schleimer MPH², Kimberly Dalve MA², Elizabeth Weybright PhD⁵, Ali Rowhani-Rahbar MPH MD PhD²

¹Department of Pediatrics, School of Medicine, University of Washington, ²Department of Epidemiology, School of Public Health, University of Washington, ³Southwest Interdisciplinary Research Center, School of Social Work, Arizona State University, ⁴Social Development Research Group, School of Social Work, University of Washington, ⁵Department of Human Development, Washington State University

Purpose: Most evidence on the patterns of handgun carrying and their overlap with interpersonal violence is based on findings from only urban communities. Characterizing patterns of handgun carrying among adolescents and young adults growing up in rural areas as well as their association with bullying and physical violence can inform prevention programs that reduce firearm-related harm. **Approach:** We used a longitudinal cohort study of 2,002 public school students from 12 rural communities across 7 states from ages 12-26 (2005-2019). We determined specific points of intervention by identifying patterns of handgun carrying using latent class growth analysis and quantified how initiation age, duration, and frequency of carrying differ across identified patterns. After determining trajectories, we studied the association of handgun carrying trajectories with both the uses and experiences of bullying and physical violence during adolescence and young adulthood using logistic regression. **Results:** Latent class growth analysis indicated six longitudinal trajectories: never/low probability carrying (n=1,590;79.4%), emerging adulthood carrying (n=166;8.3%), steadily increasing carrying (n=163;8.1%), adolescent carrying (n=53;2.6%), declining carrying (n=24;1.2%) and high probability and persistent carrying (n=6;0.3%). The earliest average age of initiation occurred in both the adolescent and declining carrying groups at age 12.5 and 12.6, respectively. Trajectories with a higher probability of handgun carrying also carried more frequently. Compared to youth with very low probabilities of carrying a handgun in adolescence and young adulthood, youth with high probabilities of handgun carrying during adolescence (declining carrying, adolescent carrying, steadily increasing carrying) had greater odds of bullying (OR=11.22, 95%CI=[2.63,47.89]; OR=3.89, 95%CI=[1.99,7.62]; OR=1.95;95%CI=[1.39,2.73], respectively) and of using physical violence (OR=15.85, 95%CI=[4.71,53.40]; OR=9.74;95%CI=[4.85,19.54]; OR=3.33, 95%CI=[2.39,4.63], respectively). **Innovation/Significance:** Experiencing and using bullying and physical violence were associated with specific patterns of handgun carrying among youth growing up in rural areas. Handgun carrying could be an important focus of violence prevention programs among those youth.

7. Examining sleep problems as a mediator between adolescent firearm violence and depression in adulthood

Esther Lee MPH¹

¹Department of Health Behavior and Health Education, University of Michigan School of Public Health

Statement of Purpose: Firearm violence is the third leading cause of death for children and adolescents (ages 1-19). It is well-established that adolescents exposed to firearm violence have adverse mental health outcomes including depression and anxiety. Further, sleep plays a critical role in their well-being and mental health. Sleep loss and disruption are linked to multiple negative mental health outcomes (e.g., major depression, ADHD, anxiety) among adolescents. While there is prolific literature on the relationship between sleep and delinquency, fewer studies have examined the relationship among sleep problems, depression, and firearm victimization and perpetration. This research examined whether sleep problems (i.e., difficulty falling asleep and sleep duration) mediated the association between firearm-related victimization in adolescence and perpetration and depression in adulthood. **Methods:** The data was derived from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative sample of adolescents and young adults. Waves 1, 2, 3, and 4 were utilized (N=1,449) to examine the association between weapon (firearm and knives)-related victimization and perpetration (Wave 1) and depression (Wave 4) as well as sleep problems (Waves 2 and 3), controlling for age, grade, sex, race/ethnicity, and median household income. **Results:** Adolescents with exposure to firearm victimization and perpetration were more likely to have depression; sleep problems mediated this relationship (p-value= 0.01), even after controlling for age, grade, sex, race/ethnicity, and median household income. 12% of the total effect was mediated by insomnia. However, sleep length (number of hours) in Wave 3 not a significant mediator. The direct association between firearm victimization and perpetration and depression was statistically significant ($\beta = 0.35$, p-value=0.005).

Innovation & Significance: This study contributes to the literature elucidating the relationship among adolescent firearm victimization and perpetration, depression in adulthood, and sleep problems. Further, it provides a possible target for intervention among adolescents exposed to firearm violence.

8. Mental Health Comorbidities, Household Firearm Ownership, and Reported Firearm Access Among Children

Keith Hullenaar PhD^{1,2}, Ali Rowhani-Rahbar MD PhD MPH¹, Erin R. Morgan MS PhD^{1,2}, Chelsea D. Hicks PhD MPH^{2,3}, Frederick P. Rivara MD MPH³

¹Department of Epidemiology, University of Washington School of Public Health, ²Harborview Injury Prevention and Research Center, University of Washington, ³Department of Pediatrics University of Washington School of Medicine

Statement of Purpose: To estimate how youth and their caregivers' mental health risk factors for suicide are associated with youth reported access to firearms inside and outside the home. **Methods/Approach:** This cross-sectional study examined Adolescent Brain and Cognitive Development Social Development (ABCD-SD) data collected from 2016 to 2021. Participants included 2,277 children ages 10 to 15 years old from five study sites in the United States. We used generalized linear models to estimate household firearm ownership and child's reported firearm access. Child mental health risk factors for suicide included depression, anxiety, attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder, externalizing problems, and lifetime suicidality. Caregiver mental health risk factors for suicide included depression, anxiety, ADHD, antisocial behavior, and lifetime mental health histories. **Results/Conclusion:** Around 20% of children lived in a firearm-owning household, and 5% of children reported easy firearm access. Overall, children with mental health risk factors for suicide were just as likely or more likely to report firearm access as those without such risk factors. In firearm-owning households, children who indicated lifetime suicidality were 2.48 times more likely (95% CI = 1.50, 4.10) than their counterparts to report easy firearm access. In non-firearm households, children of caregivers who reported any mental health history or indicated externalizing problems were 1.67 times (95% CI = 1.10, 2.54) and 2.28 times (95% CI = 1.55, 3.37) more likely than their counterparts to report easy firearm access. **Innovation & Significance to the field:** Our study is the first to examine how youth and their caregivers' mental health risk factors for suicide are linked to children's access to firearms inside and outside the home using a novel dataset from the ABCD study. In addition to promoting safe firearm storage and screening for child mental health, youth suicide prevention efforts should address youths' access to firearms not in their homes and the effects of caregiver mental health.

9. It Doesn't Add Up: Performance of the Adverse Childhood Experiences (ACEs) Questionnaire with Black Male Firearm Violence Survivors in a Hospital-based Violence Intervention Program

Nazsa Baker PhD MA¹

¹New Jersey Gun Violence Research Center

Statement of Purpose: Black men experience worse health outcomes when compared to other race-gender groups because of structural racism and negative social determinants. Improving the health of Black males will require a comprehensive approach, including the examination of how social experiences and institutional forces influence the health of Black boys. Despite higher rates of morbidity related to firearm injuries, Black men are disregarded when creating health disparity screening questionnaires. **Methods:** A mixed methods study utilizing both in-depth interviews and Felitti's 1998 adverse childhood experiences tool. **Results:** In the population of interest, the ACEs questionnaire is not performing as expected. Black male firearm violence survivors in this study report an average ACE score between three and four, yet their narratives describe severe child and early adulthood trauma that is not captured on the ACEs questionnaire. **Conclusion:** This presentation will examine narratives of urban Black male firearm violence survivors who report significant trauma compared to trauma as described by the original ACEs questionnaire. Thus, exposing the incongruence and cultural ineptness of the ACEs questionnaire in communities of color, especially Black communities. I believe the ACEs questionnaire should be revised in order to address the lived experiences of the population of interest, in this case urban Black males specifically Black male firearm violence survivors.

Session: Flash Science 2—Examination of firearm policies and their effects on firearm injuries

Congressional Rooms, November 30, 4:45-5:15 PM

[{Back to table of contents}](#)

1. State regulation of public carry, 1980–2020: From bans to permitless carry and NYSRPA v. Bruen

Alexander D. McCourt JD PhD MPH¹

¹*Center for Gun Violence Solutions, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health*

Statement of Purpose: This study maps and categorizes state concealed carry policies from 1980 to 2022 and describes the implications of the Supreme Court’s decision in *New York State Rifle and Pistol Association v. Bruen* (NYSRPA) on state regulation of public carry. **Methods/Approach:** This study used public health law research methods to gather, categorize, and analyze concealed carry policies from 1980–2022 in all 50 states. Statutes, regulations, and legislative history documents were obtained from Thomson Reuters Westlaw, Nexis Uni, HeinOnline, and state government websites. Policies were categorized based on the overall permitting scheme and specific permitting requirements, including training courses and elements affording discretion to permitting agencies. Trends and common themes were identified from these longitudinal legal data. These elements were reassessed and analyzed in light of the Supreme Court’s opinion in NYSRPA. **Results/Conclusion:** From the 1980 to 2022, concealed carry was deregulated considerably. This occurred in two phases, with many states starting to adopt so-called “Right-to-Carry” laws in the 1990s and states rapidly adopting permitless carry laws in the 2010s. Alongside the first phase, states added new provisions, including training requirements, that provided opportunities to shape gun carrying behavior. The second deregulation, however, removed requirements like training by repealing the overall permit requirement. NYSRPA added another wrinkle to this analysis, reshaping the law in the handful of states with discretionary policies and threatening the status of other permitting provisions.** **Innovation & Significance to the field:** This study identifies themes and trends in the overall liberalization of concealed carry. Prior work has found associations between relaxed concealed carry policies and increases in violence. The specific findings in this study highlight the need for research into individual permitting requirements and for novel approaches to regulating carry and reducing gun violence, especially in light of the Supreme Court’s opinion in NYSRPA.

** At the time of submission, the NYSRPA decision has not been issued.

2. State by State Legislative Action to the Sandy Hook Mass Shooting and Analysis of Subsequent Legislative Reaction in the years from 2013-2020

Deirdre M. Bowen JD PhD^{1,2}, Frederick P. Rivara MD MPH^{3,4,5}, Alice Ellyson PhD^{3,5,6}, Ali Rowhani-Rahbar MD PhD MPH^{3,4,5}

¹*Seattle University School of Law*, ²*Firearm Injury Prevention Research and Policy Program*, ³*Department of Pediatrics, University of Washington School of Medicine*, ⁴*Department of Epidemiology University of Washington School of Public Health*, ⁵*Firearm Injury and Policy Research Program, University of Washington*, ⁶*Center for Child Health, Behavior, and Development, Seattle Children’s Research Institute*, ⁷*Harborview Injury Prevention & Research Center, School of Medicine, University of Washington*

Purpose: We developed a database of firearm-related laws enacted by states in the legislative session immediately after the Sandy Hook massacre and in the seven years that followed, analyzed subsequent state legislative reactions, and identified patterns in these reactions starting with the initial “Sandy Hook” laws through subsequent legislative activity in response to mass shootings through 2020. **Methods:** Using Thomson Reuters Westlaw, we developed a database of gun laws enacted or amended beginning in 2013. We tracked legislative response through 2020. We coded legislative response identifying four patterns: legislative action leading to firearm restrictive laws, firearm expansive laws, a mixed response, or consistent legislative inaction. **Results/Conclusion:** In the first legislative session after Sandy Hook, state responses varied. An almost equal number of states failed or chose not to pass legislation, passed a mix of legislation that both restricts and expands access or possession of firearms, or passed

restrictive legislation only. Trends in the subsequent years revealed a continuity in heterogeneity with twenty-nine states passed a mix of firearm restrictive and expansive laws, ten states consistently enacted firearm restrictive legislation, nine states were mostly inactive, and two states consistently firearm expansive. Legislation that passed fell into two categories: 1)firearm restrictive laws that involved domestic violence or mental health, and 2)firearm expansive laws that expanded concealed carry options. We conclude that inconsistent state legislative action from one year to the next with contracting and expanding access to firearms may contribute to an overall weakening of firearm policy. **Innovation:** This database and study provided two insights: it shows heterogeneity in longer term legislative response patterns to mass shootings beginning with Sandy Hook, and more broadly, it shows why state firearm policy might not be as effective even in states passing restrictive laws despite evidence that restrictive laws are associated with lower firearm deaths.

3. Improving causal inference in firearm policy research: A review of confounder selection

Julia Schleimer MPH¹, Camerin A. Rencken SCM¹, Matthew Miller MD ScD MPH², Soja A. Swanson ScD³, Ali Rowhani-Rahbar MD PhD, MPH¹

¹Department of Epidemiology, School of Public Health, University of Washington, ²Department of Health Sciences, Bouvé College of Health Sciences, Northeastern University, ³Department of Epidemiology, School of Public Health, University of Pittsburgh

Purpose: Estimating effects of firearm policies is an important research endeavor. Confounding is a pervasive threat to causal inference in these settings. To address this, most studies control for confounders in a multiple regression framework, making the choice of such variables an important consideration. This scoping review characterizes investigators' selection of confounders in non-randomized firearm policy research in the US. **Methods:** We identified empirical research articles indexed in PubMed from 1/1/2000-9/1/2021 that examined any of 18 pre-specified firearm policies which regulate: 1) who may own, purchase, or possess firearms, 2) firearm sales and transfers, and 3) the use, storage, or carrying of firearms. For the same policy-outcome combinations examined in two or more studies, we identified confounders used across studies and the reported method of confounder selection. **Results:** Of 7733 screened articles, 120 were included. We have extracted data from 33 articles thus far, 17 of which are pre-post studies, allowing comparison of change in the outcome with change in the policy. Although most studies reported selecting covariates based on prior evidence for their association with the policy and/or outcome, there was little overlap in covariates selected in studies of the same policy and outcome. For example, five pre-post studies examined the association between background check policies and firearm homicide. Of 22 total confounders included across these studies, only 9 were common to one or more studies. Four of these studies additionally controlled for other firearm policies (9 total policies included; 5 common to one or more studies). Across various policy-outcome combinations, common confounders included demographic and economic characteristics.

Innovation/Significance: Covariates selected for confounding control may reduce or induce bias. Wide variation in selected confounders might contribute to inconsistent results in firearm policy research. More rigorous and transparent confounder selection may improve the accuracy of evidence on firearm policy effectiveness.

4. The Effects of Firearm Concealed Carry Licensing Policies: Who do they affect and how?

Susan Parker MPP MS¹

¹Department of Health Management and Policy, School of Public Health, University of Michigan

Statement of Purpose: Firearm injury and mortality, excluding suicide, is most often caused by violent interpersonal assaults that occur in public spaces. While the majority of U.S. states have permitted gun owners to carry firearms in public for decades, in the last twenty years, the remaining states loosened restrictions on carrying concealed weapons in public. The effects of regulating concealed weapons in public have for decades remained unresolved (Morrall 2018), but recent advances find that permissive concealed carry licensing laws increase violent crime and homicide (Colmer and Doleac 2021; Donohue et al. 2019). Yet, less is known about the effects of concealed carry licensing on injury and death by victim race or the mechanisms that affect policy outcomes. **Methods/Approach:** This study examines the staggered state-level rollout of permissive concealed carry licensing laws by combining

state-level medical claims databases with detailed patient information to create a panel of firearm injuries treated in hospitals from 2000-2018 using a differences-in-differences framework to estimate the effects of concealed carry policy on firearm injuries. To assess whether policy effects are driven by changes in firearm prevalence among legal firearm possessors, demand for firearms measured by background check and concealed carry license volumes are assessed. Further, illegal firearm prevalence is assessed using data on stolen and recovered firearms. **Results/Conclusion:** The effects of loosening restrictions on concealed carry licenses differ by victim race and county residence urbanicity. Overall changes in firearm injury and mortality may be driven less by changes to household prevalence than increases in public firearms carrying. Firearm theft increases significantly after policy implementation. **Innovation & Significance to the field:** Identifying differential victim effects is important in understanding the burden of firearm injury and can inform targeted policy interventions to reduce harm.

5. The association of permit-to-purchase laws with intimate partner homicide

Stephen Oliphant MPP¹, April M. Zeoli PhD MPH², Mitchell Doucette PhD MS³, Cassandra K. Crifasi PhD³, Daniel W. Webster ScD MPH³

¹School of Criminal Justice, Michigan State University, ²Department of Health Management & Policy, School of Public Health, University of Michigan, ³Center for Gun Violence Solutions, Johns Hopkins Bloomberg School of Public Health

Statement of Purpose: Firearm intimate partner homicide rates have been rising since 2015. While research suggests that some firearm restriction laws are associated with population-level intimate partner homicide reduction, it is unknown if permit-to-purchase laws, which provide a strict mechanism for implementation of the firearm purchase restriction, are also associated with intimate partner homicide rates. **Methods/Approach:** Data on intimate partner homicides come from the multiply-imputed and weighted Supplementary Homicide Reports, state-and-year indexed from 1990-2019. We utilized two methodological approaches to assess the association of permit-to-purchase laws with state-level intimate partner homicide rates. We will conduct a longitudinal panel analysis using generalized estimating equations, modeling homicide counts using a negative binomial distribution, robust standard errors, and controlling for additional firearm safety laws and state-level characteristics. Then, we will use the augmented synthetic control method with fixed effects to estimate the impact of single-state permit-to-purchase policy changes on intimate partner homicide. For both modeling approaches, outcomes will be stratified by race/ethnicity (Non-Hispanic, White vs. Non-Hispanic, Black) and weapons (firearm vs. non-firearm). **Results/Conclusion:** The results of each approach will be presented and compared, drawing conclusions regarding the association of permit-to-purchase with intimate partner homicide and differences in results by model-type. Results from the stratified analyses will also be discussed. **Innovation and Significance to the Field:** This is the first study to directly test permit-to-purchase laws on intimate partner homicide using two different statistical techniques. Our longitudinal panel analysis will provide the population average effect of permit-to-purchase laws on intimate partner homicides and our augmented synthetic control approach will provide the average treatment effect on the treated for law adopting states. Implications of these two approaches will be discussed.

6. Effect of Second Amendment Sanctuary Ordinances on Firearm Homicide and Suicide Rates

Alexandra Filindra PhD¹, Burcu Kolcak PhD Candidate²

¹University of Illinois Chicago, ²Rutgers University

Statement of Purpose: In recent years, local governments have begun adopting resolutions declaring themselves as “Second Amendment Sanctuaries”, or “gun sanctuaries” in their effort to defy statewide gun-control measures they deem unconstitutional (Field 2020; Su 2021). Based on our original data collection, in the past year, around 1,000 counties have adopted Second Amendment sanctuary ordinances, non-binding resolutions largely adopted by boards of county commissioners. In this paper, we examine whether the adoption of second amendment sanctuaries affects firearm homicide and suicide rates. **Methods/Approach:** This paper uses a difference-in-differences design (DID) that looks at the effect of adoption of second amendment sanctuary ordinances on firearm suicide and homicide rates in order to minimize potential unobserved heterogeneity among counties in a certain time period, or among periods in a certain county. We compare differences in firearm suicide and homicide rates post-2018 period, the year marked by the adoption of Second Amendment sanctuary ordinances, relative to the pre-2018 period between Second

Amendment sanctuary counties and non-Second Amendment sanctuary counties. We use an original dataset that identifies all counties based on their adoption of Second Amendment sanctuary ordinances across the United States. For our dependent variable, we use county-level rates of homicide and suicide from the US Centers for Disease Control and Prevention (CDC). Our analysis also includes a set of geographic and demographic control variables. **Results / Conclusion:** We hypothesize that suicide and homicide rates will be higher after the adoption of sanctuary ordinances than before and also higher in counties that have adopted such ordinances than those that have not. **Innovation and Significance to the Field:** This paper investigates the effect of a new policy that has spread quickly across many counties. We use an original dataset on county-level Second Amendment sanctuary ordinances combined with data on crime, and other secondary source data.

7. An evaluation of community-based gun buyback programs: informing communities and political leadership about people's reasons for turning in firearms

Pina Mendillo Violano PhD MSPH RN PMGT-BC CCRN¹

¹Quinnipiac University, School of Nursing

Statement of Purpose: Death by firearm is a serious public health concern backed by decades of evidence showing a direct and robust correlation between the rate of gun ownership and the rate of gun deaths in any given community. Over the last 30 years gun buyback (GBB) programs have steadily grown to gain the support of both community and government officials yet their efficacy varies widely from state to state making it difficult to assess outcomes on a nationwide basis. **Methods:** A 21-question self-administered voluntary and anonymous paper survey was administered to willing GBB participants in Connecticut, Massachusetts, and California from 2011-2020. The following information was elicited: Military or formal weapons training; Gun storage safety practices; Importance of healthcare provider asking families about gun safe storage practices; Types and quantity of firearms turned in; Firearms remaining in the home; Access to firearms with children <18 yr. living in the home; Veteran status; Home with history of mental illness & suicide; Home with history of domestic violence; Home with history of dementia or Alzheimer's; Demographics- age, race, ethnicity, gender; Distance traveled to turn in firearm. **Results/Conclusion:** A total of 711 people (280 from CT) completed the survey (N=711/768;92.5%) yielding 2,234 guns (1,400 from CT). Participants were predominantly male (73.5%), white (80.9%), and older than 55 years (59.0%). They lived an average of 19.0 miles from the event and had an average median household income of \$65,731. More than half (54.5%) did not purchase the firearm, acquiring it through inheritance, gift, or random find. CT GBB found a correlation between the demographics of people turning in firearms and those most likely to commit or attempt suicide by gun. **Innovation and Significance to the Field:** Even though beliefs and attitudes towards firearms differ among communities, the reasoning behind turning in firearms may be very similar. Understanding why people participate in GBBs can provide useful insight to help advance public health initiatives in communities where the prevalence of undesired guns in the home is unknown and unsafe and/or further inform first responders and health providers who care for such populations.

8. Gun Violence in the US Territories

Alex Nguyen MPH MA¹

¹Giffords Law Center to Prevent Gun Violence

Statement of Purpose: Two US territories, the US Virgin Islands (USVI) and Puerto Rico, see some of the highest rates of gun violence in the US. We describe the trends in gun violence and the driving factors behind the alarming rates. **Methods:** We compiled publicly available data from a variety of federal and territorial sources to calculate the rates of gun violence and gun trafficking in the territories. We also conducted in-depth interviews with key stakeholders to better understand what factors contribute to the high rates of gun violence. **Results/Conclusion:** Based on the latest available data, firearm homicide rates in the USVI and Puerto Rico are seven and four times higher, respectively, than the firearm homicide rate in the 50 states. Unlike in the states, firearm homicides comprised the vast majority of gun deaths in both territories. Most of the firearms trafficked into the USVI and Puerto Rico that were used in crimes and recovered by law enforcement were originally sold in southeastern states like Florida, Georgia, and Texas. In 2016, 85% of firearms recovered and traced by law enforcement in the USVI were sold outside the territory. Similarly in

2018, 76% of firearms recovered and traced were sold outside of Puerto Rico. Additionally in Puerto Rico, the lack of trust in law enforcement and problems with policing contributed to the high rates of gun violence. Issues of data availability and data quality limited our findings. **Innovation & Significance to the Field:** Gun violence in the USVI and Puerto Rico has received little attention for policymakers, researchers, and advocates. This is the first consolidated report on gun violence in US territories and hopefully will inform how researchers and policymakers prevent gun violence in the future.

Session: Flash Science 3—Firearm access, carriage, and ownership

Capitol Room, November 30, 4:45-5:15 PM

[{Back to table of contents}](#)

1. Reducing Firearm Access for Youth At-Risk for Suicide in a Pediatric Emergency Department

Sofia S. Chaudhary MD^{1,2}, Emilie Morris MD³, Caroline Chivily BA¹, Shante Washington LCSW CCTP², Kiesha Fraser MD^{1,2}, Sarah Lazarus DO⁴, Angela Costa DO⁴, Amanda Artis MS MPH⁵, Nathan Call PhD², Johnathan Rupp PhD¹, Harold Simon MD MBA^{1,2}

¹Emory University School of Medicine, ²Children's Healthcare of Atlanta, ³University of Utah School of Medicine, ⁴Emergency Medicine Associates, Children's Healthcare of Atlanta, ⁵Emory University

Statement of Purpose: To evaluate feasibility and acceptability of behavioral health (BH) specialists providing lethal means counseling (LMC) and firearm safe-storage devices to caregivers of youth presenting with BH complaints in the pediatric ED. **Methods:** Prospective feasibility study of ED caregivers of youth presenting with BH complaints. Caregivers self-administered e-surveys on demographics and firearm safe-storage knowledge/practices. BH specialists provided LMC and gun-owners were offered free lockbox and/or trigger lock. 1-week follow-up e-surveys gathered self-reported data on gun-safety practices and intervention acceptability. Primary outcomes include proportion of gun-owning participants, follow-up response, and acceptability of LMC. Secondary outcomes include reported change in firearm-safety practices. Descriptive statistics used for univariate and paired data responses. Likert-scale acceptability responses dichotomized to strongly agree/agree vs. neutral/disagree/strongly disagree. **Results:** 58 subjects were approached with 37 enrolling (97% female, 51% Black, mean age 40 years (SD± 8.8)). 57% had no prior gun-safety counseling/education; 46% with gun at home. Among gun-owners (n=17), 82% had handguns and 53% had shotguns. 71% always used safe-storage device. 41% used gun-safe, 29% used lock box, and 24% used trigger lock. 65% of gun-owners requested safe-storage devices. 70% (n=26/37) of participants completed follow-up where 77% of participants asked about household guns prior to child visiting other homes compared to 46% pre-intervention (+30.8%). 88% affirmed at intake and follow-up that ED gun-safety education was useful and 81% affirmed at intake and follow-up that ED is an appropriate place for gun safety discussions. Among gun-owners that completed follow-up (n=14): 100% stored all guns locked at 1-week compared to 71% pre-intervention (+28.6%). **Conclusions:** Preliminary results show ED-based LMC via BH specialists as feasible. Caregivers report intervention useful, acceptable, and appropriate. LMC/device distribution led to reported changes in safe-storage practices. **Innovation/Significance to the field:** ED-based approach for LMC provides timely resources that improve caregiver firearm-safety practices.

2. Rates and factors associated with firearm carrying among young adults presenting to four urban emergency departments

Philip Stallworth JD^{1,2}, Amanda Ballesteros MPH¹, Patrick M. Carter MD^{1,2,5}, M. Kit Delgado MD³, Lauren Whiteside MD⁴, Rebecca M. Cunningham MD^{5,6}, Jason E. Goldstick PhD^{1,2}

¹Injury Prevention Center, University of Michigan, ²Institute for Firearm Injury Prevention, University of Michigan, ³Department of Emergency Medicine, Department of Epidemiology and Biostatistics, University of Pennsylvania, ⁴Department of Emergency Medicine, University of Washington, ⁵Department of Emergency Medicine, University of Michigan, ⁶Office of the Vice President for Research, University of Michigan

Statement of Purpose: The Screening to Predict Young Adults at Risk for Firearm Violence (SPARK) project is a multisite prospective longitudinal study proposing to use machine learning methods to predict future firearm violence risk. Here, we use partial baseline data from SPARK to study rates, and factors associated with, firearm carrying. **Methods/Approach:** Research assistants in four emergency departments (EDs) in three cities (Flint, Seattle, Philadelphia) approached youth aged 18-24 to participate in SPARK. Consenting youth completed a baseline assessment including validated measurements of firearm-related behaviors (possession/carrying/use), violence exposure (peer/partner; childhood violence exposure), peer behaviors, and neighborhood-level factors. We calculated rates of past-six-month firearm carrying and rates of carrying in several high-risk scenarios (e.g., while using drugs), and analyzed associations between covariates and firearm carrying using logistic regression. **Results:** To

date, 815 participants are enrolled in SPARK across four sites (36.3% male, 59.9% female, 3.8% non-conforming; 41.1% Black, 32.5% White, 9.6% Multi-racial, 14.6% Other race) and 94 (11.5%) reported firearm carrying outside the home. Among those, 44.1% report carrying in ≥ 1 high-risk scenario (e.g., while drinking/using drugs; while committing a crime) and 25.5% report firearm discharge in ≥ 1 high-risk scenario (e.g., to scare/threaten someone). Relative to the rest of the sample, those reporting firearm carrying had higher rates of peer (73.1%-vs-39.4%) and partner violence (35.1%-vs-18.5%), had higher rates of violence-related childhood experiences (57.6%-vs-30.4%), and reported higher scores on scales measuring community violence exposure, peer delinquency, and attitudes favoring retaliation (all $p < 0.001$). Logistic regression models, adjusted for site, race, age, and gender, were largely consistent with the unadjusted results. **Significance:** Nearly 12% of youth presenting to urban EDs carry firearms, and almost half of those report carrying/discharging a firearm in high-risk scenarios. Firearm safety interventions should prioritize youth with several sources of violence exposure, exposure to delinquent peers, and attitudes favoring retaliation.

3. Exploring Personal Crises Observed in Mass Shooters for Third-Party Detection and Intervention Using Psychometric Network Analysis

Samuel West PhD¹, Nicholas D. Thomson PhD¹

¹Department of Surgery, Virginia Commonwealth University

Purpose: Mass shootings in the United States have received significant attention from the media and scholars alike. Recent work indicates that mass shootings are becoming more deadly in the US, making the identification of critical warning signs among would-be mass shooters of paramount importance. In the present work we utilized a public database containing information on mass shooters to identify personal crisis indicators that may serve as critical warning signs to third parties prior to mass shooting events. **Methods:** To this end we applied a regimen of psychometric network analyses to a dataset of crises observed among mass shooters from the US prior to their attacks. We also conducted a regression and subsequent dominance analysis using these crisis indicators as predictors of shooting severity to identify which accounted for the most variance of shooting severity. **Results:** First, our exploratory graph analysis identified two specific groupings of crises: Distressed Isolation and Disturbed Affect. Next, our network analysis revealed that agitation was a highly important node due to the strong links it shared with mood instability and abusive behaviors. However, isolation yielded the greatest community cross-loading and the most edges in the network. We also found that depression and mood instability were the most important predictors of shooting severity, as they explained the greatest amount of variability. **Innovation & Significance:** This work marks a novel application of psychometric network analysis to the study of mass shooters and the prevention of such events. Our findings are discussed within the framework of the path to intended violence model and in terms of practical implications for interventions. We ultimately argue that social isolation is an ideal candidate for the acquaintances and communities of would-be shooters to intervene on and that a community-based model of intervention may be an important future direction.

4. The Firearm Implicit Association Test: A Validation Study

Claire Houtsma PhD^{1,2}, Eric Sah BS⁵, Joseph Constans PhD^{3,4}

¹Southeast Louisiana Veterans Health Care System, ²South Central Mental Illness Research, Education and Clinical Center, Department of Psychiatry, School of Medicine, Tulane University, ³Office of Research and Development, Tulane University, ⁴Veterans Health Administration, Department of Social, Behavioral and Population Sciences, School of Public Health and Tropical Medicine, Tulane University, ⁵Sydney Kimmel Medical College, Thomas Jefferson University

Statement of Purpose: Currently, only self-report measures have been used to study firearm attitudes. Like all self-report measures, firearm questionnaires are susceptible to under- or over-reporting biases, particularly due to the emotional and controversial nature of the topic. Given research suggesting that firearm owners are generally unwilling to engage in open conversation about their firearms, measurement of firearm attitudes may be prone to such biases. To address limitations of self-report measures in other areas of study, investigators have employed the Implicit Association Tests (IAT) which utilizes reaction time data to assess the relative accessibility of certain attitudes

and beliefs. The purpose of this presentation is to describe the development and validation of a Firearm IAT. **Methods/Approach:** The IAT measures participant reaction times in associating target and attribute words/images to assess the strength of association under investigation. IAT procedures were adapted to examine the relationship between firearms and positively/negatively valenced words. Specifically, participants were exposed to neutral images (furniture) or target (firearm) images and words reflecting positive or negative valence (e.g., happy, awful). A total of 274 undergraduates completed the Firearm IAT, the Gun Behavior and Belief Scale, the Attitudes Toward Guns Scale (ATGS), and demographic questions. **Results/Conclusion:** Results revealed that participants had a mean (*M*) *D* score of -0.31 that significantly differed from 0 [$t(247) = -10.75$; 95% CI (-0.36, -0.25); $p < 0.0001$; Cohen's $D = 0.68$], indicating that, on average, there was a slight association between firearm images and words reflecting negative valence among participants. To demonstrate construct validity, the relationship between IAT *D* scores and explicit measures of firearm beliefs were examined. As expected, there was a significant positive association between the Firearm IAT and both the GBBS and ATGS total score, as well as between the Firearm IAT and the ATG total score, indicating that the IAT can serve as an indirect measure of firearm attitudes. **Innovation & Significance to the field:** This study shows that the IAT can be used as an indirect measure of firearm attitudes. This assessment strategy could be helpful in testing situations that might lead to deception on self-report measures.

5. What to do when the person at risk is you: A qualitative study of firearm owning individuals

Christopher Knoepke PhD MSW^{1,2}, Arielle Thomas MD MPH^{3,4}, Leslie M. Barnard MPH^{5,6}, Marian E. Betz MD MPH^{6,7,8}

¹*Division of Cardiology, University of Colorado School of Medicine*, ²*Adult and Child Consortium for Outcomes Research and Delivery Science, University of Colorado School of Medicine*, ³*Medical College of Wisconsin*, ⁴*American College of Surgeons*, ⁵*Department of Epidemiology Colorado School of Public Health*, ⁶*Department of Emergency Medicine, University of Colorado School of Medicine*, ⁷*Injury and Violence Prevention Center, School of Public Health, University of Colorado Anschutz Medical Campus*, ⁸*Adult and Child Center for Outcomes Research and Delivery Science, School of Medicine, University of Colorado Anschutz Medical Campus*

Statement of Purpose: Suicide is a leading cause of death in the US; 53% of suicides are by firearm. Reducing firearm access for those at risk of suicide is recommended; what is not well known is how firearm owners perceive themselves – versus others – to be at risk. In this qualitative analysis, we sought to explore the views of individuals who live in homes with firearms and their perceived personal risk of suicide. **Methods/Approach:** Semi-structured interviews were conducted with English-speaking adults who owned firearms or lived in homes with firearms in Colorado or Washington State. We recruited participants through email, telephone calls, social media, listserv, and snowball sampling. We used a mixed deductive and inductive approach in coding of transcripts to identify dominant themes. **Results/Conclusion:** This analysis included all interviews conducted for the larger study ($n=38$). Half of the participants were male (53%) and aged 35-54 years (40%). Most identified as non-Hispanic (95%) and white (92%). Dominant themes were (1) perceived risk of suicide initially focused on other members of the household. (2) most participants utilized the characteristics of the perceived at-risk individuals to guide their decision-making process and involved limiting physical access to the firearm and temporary out-of-home storage, (3) participants found it difficult to assess their own risk of a mental health crisis and struggled to conceptualize mitigation strategies for themselves, and (4) individuals who had experience with personal risk were more comfortable in navigating potential options. **Innovation & Significance:** Results show that firearm owners are generally able to conceptualize risk mitigation strategies to reduce potential harm for other household members. However, they struggle with personal risk assessment and mitigation strategies. Lethal means counseling should focus on developing strategies to reduce the risk of suicide for all members of the household.

6. Understanding Illicit Firearm Ownership among Black Individuals

Esprene Liddell-Quintyn PhD¹

¹*New Jersey Gun Violence Research Center, Rutgers School of Public Health*

Introduction: New Jersey is ranked as having some of the most restrictive gun laws in the country (Wood 2019). Despite these efforts, the illicit firearm market contributes to significant gun violence experienced in communities of

color. Illicit guns are trafficked through the Iron Pipeline via I-95 from lesser regulated states into more regulated states in the Northeast (Braga et al., 2020). With this in mind, there has been growing attention to better understand the illicit firearm market in the US. Yet, in depth research into the illicit firearm market is lacking for most US states. **Purpose:** To address this gap, the New Jersey Gun Violence Research Center has partnered with the Newark Community Street Team to launch a community based participatory research (CBPR) study focused on examining the lived experiences of illicit firearm owners in New Jersey. **Method:** The Newark Community Street Team is currently assisting the New Jersey Gun Violence Research Center with recruiting a purposive sample of 25 illicit firearm owners residing in New Jersey. Eligible participants will self-identify as having owned an illicit firearm in the past 5 years. In this qualitative study, we are conducting semi-structured interviews with participants to better understand their lived experiences owning an illicit firearm. **Preliminary Results:** In our preliminary analysis, we are noticing that safety and protection drives individuals to possess illicit firearms. Participants expressed needing a firearm to guard against potential threats and disagreements and to protect their families from danger. This presentation will provide insights that will help attendees better understand illicit firearm ownership in Black communities. **Significance to the field:** Through a series of qualitative interviews with community members, we aim to develop preliminary understandings about illicitly acquired firearms, thereby providing an opportunity to develop data-driven solutions.

7. Gender differences in weapon types used in fatal interpersonal violence-related homicides in Chicago, IL from 2015 to 2020

Regina Royan MD MPH¹, Sucharitha Bose PA-C², Evelyn Huang MD¹, Maryann Mason PhD¹

¹Department of Emergency Medicine, Feinberg School of Medicine, Northwestern University, ²Marian University College of Osteopathic Medicine

Purpose: More than 25% of women and 14% of men in the US experienced intimate partner violence, with more than half of all intimate partner violence (IPV)-associated homicides involving a firearm. Further characterization of gender differences remains sparse. **Methods:** The CDC's National Violent Death Reporting System (NVDRS) links data from death certificates, and coroner/medical examiner and law enforcement reports. We examined Illinois 2015-2019 NVDRS data for deaths of Chicago residents where IPV was endorsed and/or Jealousy contributed to death. We selected firearm cases and examined the distribution of these cases by sex, weapon type, and whether the incident was a homicide-suicide. **Results:** During 2015-2019 there were 329 deaths among 318 unique incidents; 139(42.2%) with fatal injuries caused by a firearm. Of the firearm deaths, most were suicides 56.1% (78); 42.4% (59) homicides. 71.2% (99) deaths were among males; 28.8% (40) were female. 30%(12) of firearm IPV-associated deaths among women were in the context of a homicide-suicide event, only 15%(15) of male FA IPV associated deaths were in the context of a homicide-suicide event. **Conclusion:** Firearms were the predominant weapon used in IPV-associated deaths in Chicago from 2015- -2019 with men more likely to die by suicide and women more likely to die by homicide. **Significance:** The high portion of males represented among firearm IPV-associated deaths may be due to a high percentage of suicides among these IPV-associated cases as males have higher suicide rates compared to females. The large proportion of IPV-associated firearm deaths among males suggests a role for IPV prevention in suicide in addition to other violence prevention initiatives.

8. The Association Between Community Violence Exposure and Parental Firearm Ownership

Karissa R. Pelletier PhD¹, Jesenia M. Pizarro PhD², Marc A. Zimmerman PhD^{1,3}, Rebecca Cunningham MD^{1,3}, Patrick M. Carter MD^{1,3}

¹FACTS Consortium, University of Michigan, ²School of Criminology and Criminal Justice, Arizona State University, ³School of Public Health, University of Michigan

Statement of Purpose: The purpose of this study is to determine the association between community violence exposure and parental firearm ownership. In order to examine this association, the research question examined in this study is: *What role does exposure to community violence play on parental firearm ownership?* We hypothesize that *the greater the exposure to community violence, the greater the likelihood of parental firearm ownership.* **Methods/Approach:** Nationally representative data from the Firearm Safety Among Children and Teens Consortium's National Survey (6/24/2020-7/24/2020) was examined. Parents (n=2,380) of high-school age teens (age 14-18) were

asked a series of validated measures assessing firearm ownership, community violence exposure, as well as socio-demographic characteristics. We constructed a stepwise logistic regression model examining the association of community violence exposure and parental firearm ownership. This modeling was chosen as we seek to understand what factors are driving parental firearm ownership. **Results/Conclusion:** The stepwise logistic regression models demonstrate that exposure to certain kinds of violence that are associated with an increased likelihood of firearm ownership among parents. The results of the models suggested that both partner and non-partner victimization for parents does not affect their likelihood of owning firearms, but their community violence exposure does increase the likelihood of firearm ownership (OR=1.08, $p < 0.05$). Other significant predictors of firearm ownership among parents sampled includes sex, age, marital status, and education. Sensitivity analyses also suggest that overall parental community violence exposure was more predictive of firearm ownership than their child's exposure to community violence and victimization. **Innovation & Significance to the Field:** This analysis adds new insight for the field surrounding the importance of community violence exposure and the likelihood of parental firearm ownership. This study contributes to our understanding of what drives parents to own firearms and can guide prevention strategies about the importance of reducing community violence.

9. Development of a Veteran Led Out-of-Home Firearm Storage Network: The Armory Project

Joseph Constans PhD¹, Amanda M. Raines PhD², Matthew Bailey JD², Claire Houtsma PhD², Gala True PhD^{2,3}

¹Office of Research and Development, Veterans Health Administration, Department of Social, Behavioral, and Populations Sciences, School of Public Health and Tropical Medicine, Tulane University, ²Southeast Louisiana Veterans Health Care System, ³South Central Mental Illness Research, Education and Clinical Center, Louisiana State University Health Science Center

Statement of Purpose: Because of potential resistance to in-home storage devices, safety advocates and investigators have promoted voluntary out-of-home storage options as an additional safe storage offering. However, the acceptability and effectiveness of out-of-home storage programs have not been tested. The purpose of this presentation is to describe our efforts to develop a regional, Veteran-led out-of-home firearm storage network and to present pilot data demonstrating its feasibility, acceptability, and effectiveness. **Methods/Approach:** The investigators developed an out-of-home storage program, known as The Armory Project (TAP), that consisted of a network of three Veteran-owned firearm retailers who agreed to provide temporary and free out-of-home storage for customers in need of this resource. The investigators provided support to the retailers in several ways including providing financial support for storage cabinets, developing educational booklets, banners, and adverts for TAP, assisting in development of transaction documents, providing staff training on suicide prevention, and leading monthly meetings to discuss success and barriers. A four-month pilot was conducted to assess retailer, staff, and customer acceptability, retailer compliance, and program effectiveness. **Results/Conclusion:** Suicide and LMS knowledge. Training was provided to all retail staff and a pre/post assessment showed that the training increased knowledge about the relationship between firearms/suicide and increased staff confidence in ability to discuss out-of-home firearm storage options with customers. Feasibility and Acceptability. Multiple process measures showed that the retailers were actively engaged in the program, collected requested information from customers/staff, actively promoted the program with our program/educational materials, and robustly disbursed promotional/educational materials. Program Effectiveness. A total of 10 weapons for 8 customers were stored during the pilot. Additionally, retailers reported having 28 out-of-home storage conversations with customers. **Innovation & Significance to the field.** This study represents the first assessment of the feasibility and effectiveness of an out-of-home firearm storage program led by Veteran retailers.

10. Violent injury prevention across the lifespan: a single institution analysis of firearm related injuries in the elderly

Courtney Meyer MD^{1,2,3}, Lauren Hudak MD MPH^{1,2,3}, Catherine McGeoch², Vignesh Majaraman Muralidharan MS ME², Randi N Smith MD MPH^{1,2,3}

¹Grady Health System, Atlanta GA, ²Emory University School of Medicine, ³Rollins School of Public Health, Emory University

Statement of Purpose: Firearm related violence (FRV) is a public health crisis in the United States. While most research and outreach initiatives are focused on youth, this study sought to investigate patterns of injury and clinical outcomes of firearm related injury (FRI) in elderly patients. **Methods:** A retrospective review of the institutional trauma registry at a large, academic Level I center was performed from 2016-2021. A descriptive analysis of patterns of penetrating injury was conducted and comparisons were made in a subgroup analysis between elderly (age > 65 years) and adult (age 18-65 years) victims using propensity score matching. **Results:** There were 23,975 patients with admission for traumatic injury and 4,133 (5.8%) were elderly. Of these, 134 (3.0%) had penetrating injuries and 72 (54%) of those were FRI. The mean age of elderly patients with FRI was 70.6y and they were predominantly black (50%) males (85%). Their presence of pre-existing comorbidities was higher and 73.6% were on government insurance (vs 17.3% in adult cohort, $p<0.001$). 42% of elderly FRIs were self-inflicted compared to only 3% in the adult cohort. Their overall mortality rate was 25% versus 15% in adults with FRI ($p<0.001$). When controlling for gender, race, existing comorbidities and ISS in a propensity-matched model, the difference in mortality remained significant (OR = 3.89, CI [1.83,6.02] $p<0.001$). **Conclusion, Innovation & Significance:** While the target demographic of most violence prevention efforts is young people, it is important to recognize FRV affects individuals across a lifespan and culminates in significant healthcare and rehabilitation costs. This study further demonstrates an alarming rate of self-inflicted FRI in elderly patients, making this a crucial area for continued research and directed prevention efforts.