The Science of Firearm Injury Prevention:
Charting the Path Forward with Data and Innovation
Mini-Symposia
Presented: September 23, 2020

12:10pm-1:00pm
Choice A: Linking Administrative Datasets to Support Firearm Injury Research
- Ali Rowhani-Rahbar, MD, PhD, MPH
- Kathleen Carlson, PhD, MS
- Elizabeth Alpern, MD, MSCE

Choice B: Child Access Prevention Laws and Extreme Risk Protection Orders: Two Laws to Reduce Firearm Violence
- Elinore Kaufman, MD, MSHP
- Michele Grim, MPH, LPD
- Jennifer Paruk, MPH

2:00pm-2:50pm
Choice A: Firearms and Rural Youth
- Nicholas Stange, BS
- Charles Jennissen, MD
- Cole Wymore, BS

Choice B: National Surveys on Firearm Safety and Behaviors: Results on COVID-19, Counseling, and Access
- Rebeccah Sokol, MSPH, PhD
- Carmel Salhi, BA, BS, MSc, ScD
- Andrew Conner, BS
- Patrick Carter, MD

3:50pm-4:30pm
Race, Policing & Firearms
- Trina Kumodzi, PhD, RN, CCRN
- Dylan Jackson, BS, MS, PhD
- Joseph Wertz, AB
- Daniel Webster, ScD, MPH
Mini-Symposia

Linking Administrative Datasets to Support Firearm Injury Research

Speaker 1: Ali Rowhani-Rahbar, MD, PhD, MPH
Bartley Dobb Professor, Study and Prevention of Violence
Associate Professor, Epidemiology, University of Washington
School of Public Health

“Linking of Administrative Datasets for Statewide Ascertainment of Arrest, Injury and Jail Time for Patients with Firearm Injuries”

Speaker 2: Kathleen Carlson, PhD, MS
Core Investigator, VA Portland Healthcare System Associate
Professor, Epidemiology, Oregon Health and Science University
Portland State University School of Public Health

“The Integration of Federal and State Databases to Capture More Complete Data on Firearm Injuries: A Demonstration Project”

Speaker 3: Elizabeth Alpern, MD, MSCE
Professor of Pediatrics Division Head, Division of Emergency
Medicine Ann & Robert H. Lurie Children’s Hospital
Northwestern University Feinberg School of Medicine

“Database Linkage Providing Hospital-based Information About Children and Teen Firearm Injuries”
Linking of administrative datasets for statewide ascertainment of arrest, injury and jail time for patients with firearm injuries

Vivian H. Lyons, PhD, MPH,1,2 Frederick Rivara, MD, MPH,2,3 Anthony S. Floyd, PhD,4 Jin Wang, PhD,2 Lauren Whiteside, MD, MS, FACEP,5 Kevin P. Haggerty, PhD, MSW, Kevin P. Haggerty, PhD, MSW,6,7 Ali Rowhani-Rahbar, MD, PhD, MPH,2,8

1Department of Health Behavior and Health Education, University of Michigan, 2Firearm Injury and Policy Research Program, Harborview Injury Prevention & Research Center, 3Department of Pediatrics, University of Washington, 4Alcohol and Drug Abuse Institute, University of Washington, 5Department of Emergency Medicine, University of Washington, 6Social Research Development Group, University of Washington, 7School of Social Work, University of Washington, 8Department of Epidemiology, University of Washington

Statement of Purpose: To conduct state-wide administrative data linkages that to support research which aims to improve health and well-being of patients with firearm injuries.

Methods/Approach: As part of a randomized controlled trial conducted among patients with firearm injuries, we conducted multiple administrative data record linkages for outcome ascertainment (arrest and subsequent injury) as well as to ascertain time at risk (excluding jail time). We linked a total of 11 administrative datasets including arrest data, court data, county and state jail data, and a combination of 6 different datasets to measure subsequent injury. Linking processes used varied on the data sources and included deterministic and probabilistic linkages.

Results: While many arrests were captured in both arrest data sources, some were captured in only one or the other. For injury data, linking between data sources not only identified additional subsequent injuries that received treatment in an Emergency Department or hospitalization, but the linking allowed more complete ascertainment of chief complaint, injury intent, mechanism and body region. Finally, for jail data, almost none of our county data was included in the state records due to a county level agreement which exempted this county from reporting to the state system, indicating the necessity of linking both to county and state jail data.

Conclusion: Linking across multiple data sources for outcome ascertainment is both feasible and is clearly beneficial.

Innovation & Significance to the field: While many studies conduct linkages for outcome ascertainment, few have linked to multiple data sources for the same outcome. Our study highlights the benefit of this approach as well as specific linking challenges.
The Integration of Federal and State Databases to Capture More Complete Data on Firearm Injuries: A Demonstration Project

Kathleen F. Carlson, MS, PhD1,2; Tess Gilbert, MHS1; Lawrence Cook, MStat, PhD3

1Center to Improve Veteran Involvement in Care, VA Portland Healthcare System, Portland, OR, 2Oregon Health and Science University-Portland State University School of Public Health, Portland, OR, 3Department of Pediatrics, School of Medicine, University of Utah

**Purpose:** Data on children’s firearm injuries, particularly nonfatal injuries, are often incomplete. Leveraging data from a well-defined cohort, the purpose of this project was to demonstrate the utility of linking data across federal and state agencies to identify firearm injuries, both fatal and nonfatal, and to examine potential upstream risk factors for these injuries.

**Methods:** In partnership with the Oregon Public Health Division, we probabilistically linked data for all post-9/11 military veterans (n=2.7 million) to four Oregon statewide databases: Vital Records, Violent Death Reporting System, Trauma Registry, and Hospital Discharge Index. Diagnosis and cause-of-injury codes were used to identify firearm events and to categorize intent. We compared rates and frequencies of fatal and nonfatal firearm injury events between veterans and non-veterans for the 10-year period between 2007 and 2016.

**Results:** We identified 104 and 7,087 firearm-related injury events among veterans and non-veterans, respectively (10-year rates: 21.4 and 18.0 per 10,000 veterans and non-veterans). Compared to non-veterans, larger proportions of veterans’ injuries were nonfatal (69% versus 43%) and, among nonfatal events, unintentional (54% versus 35%). Due to the relatively low number of veterans’ firearm injuries, there was insufficient statistical power to examine potential risk factors using upstream data available for this cohort.

**Conclusion:** This study demonstrates the utility of linking disparate data sources to examine the entire range of firearm injuries within a defined cohort. This approach may be used to examine firearm injuries among similarly defined cohorts of children. Our findings highlighted important differences in our target population; however, to examine injury risk with greater granularity, a larger cohort, and/or number of injury events, is needed.

**Innovation/Significance:** There is a need to compile more complete data on both fatal and nonfatal firearm injuries among children in the US. The systematic integration of data from across agencies can advance this endeavor.
Database Linkage Providing Hospital-based Information About Children and Teen Firearm Injuries

Elizabeth Alpern MD, MSCE¹, Peter Ehrlich MD, MSc², Jason Goldstick PhD³, Monika Goyal MD, MSCE⁴, Stephen Hargarten MD, MPH⁵, Lisa Prosser PhD⁶, Megan Ranney MD, MPH⁷, Ali Rowhani-Rahbar MD⁸, PhD, MPH, Jukka Savolainen PhD⁹, MA, Brooke Lerner PhD¹⁰, Matt Hall PhD¹¹, Larry Cook PhD¹²

¹Division of Emergency Medicine, Department of Pediatrics, Ann & Robert H. Lurie Children’s Hospital, Northwestern University Feinberg School of Medicine, ²Pediatric Surgery, University of Michigan, ³Emergency Medicine, University of Michigan, ⁴Pediatric Emergency Medicine, Research at Children’s National Hospital, ⁵Emergency Medicine, Medical College of Wisconsin, ⁶University of Michigan, School of Public Health, ⁷Emergency Medicine, Brown University, ⁸Department of Epidemiology, University of Washington, ⁹Wayne State University, ¹⁰Emergency Medicine, University of Buffalo, ¹¹Children’s Hospital Association, ¹²Family And Preventive Medicine, Pediatrics, University of Utah

Firearm-related injuries are a leading cause of morbidity and mortality among children and adolescent with over 5,000 deaths and 29,000 nonfatal injuries annually in the United States. Research examining child and adolescent firearm injury prevention is constrained by the availability of high-quality data on non-fatal firearm injuries across the spectrum of hospital care. This project addresses this challenge by linking existing multi-center clinical electronic health record and administrative databases to produce a rich patient-centric hospital-based database of pediatric firearm injuries across care settings (ED, inpatient, outpatient clinic) and also longitudinally across years.

This proposal will:

1. Linkage two existing databases (PECARN Registry and Children’s Hospital Association Pediatric Health Information Systems database (CHA-PHIS)) including data from seven sites over 2012-2019
2. Validate ICD codes related to identification of pediatric firearm injury and documentation of intentionality and method of injury

Firearm injury epidemiology studies often rely on ICD codes from medical records. Prior studies evaluating the validity of ICD codes in other clinical conditions have demonstrated significant variability. The PECARN Registry is unique in that it captures clinical text along with ICD codes, laboratory data, radiologic data, and medications. We will measure the validity of ICD codes in comparison to free-text analysis of the electronic health record to identify children presenting to emergency departments with any type of firearm injury.

This study will lay the groundwork for identifying opportunities and limitations in the use of current administrative datasets to study firearm-related injuries in children. This proposal will deliver researchers a novel and unique database with the strengths of deep patient-centric emergency department clinical data linked to important continuation of inpatient care and outcomes data. This work will help inform and improve data collection and recording in large datasets, which is crucial for informing public health initiatives to prevent firearm-related morbidity and mortality.
Mini-Symposia

Child Access Prevention Laws and Extreme Risk Protection Orders: Two Laws to Reduce Firearm Violence

Speaker 1: Elinore Kaufman, MD, MSHP
Assistant Professor, Department of Surgery, University of Pennsylvania Perelman School of Medicine

“Linking of Administrative Datasets for Statewide Ascertainment of Arrest, Injury and Jail Time for Patients with Firearm Injuries”

Speaker 2: Michele Grim, MPH, LPD
Recent Graduate, Doctor of Law and Policy Program, Northeastern University


Speaker 3: Jennifer Paruk, MPH
Doctoral Student, Michigan State University School of Criminal Justice

“Characteristics of Extreme Risk Protection Order Respondents in Florida”

Elinore Kaufman, MD, MSHP¹, Jason Gravel PhD², Whitney Orji, BS³, M. Kit Delgado, MD, MS⁴, Therese S. Richmond, PhD, RN⁵, Douglas J. Wiebe, PhD⁶

¹Department of Surgery, Perelman School of Medicine, University of Pennsylvania, ²Department of Criminal Justice, Temple University, ³University of Pennsylvania, ⁴Emergency Medicine, Perelman School of Medicine, University of Pennsylvania, ⁵School of Nursing, University of Pennsylvania, ⁶Biostatistics and Epidemiology, Perelman School of Medicine, University of Pennsylvania

Purpose: Child access protection (CAP) laws have not been comprehensively evaluated yet hold promise for preventing child firearm injury deaths. This context brings methodologic challenges, with child deaths being statistically rare events, that may vary by mechanism in rural versus urban counties.

Methods: We investigate this issue using child firearm deaths (4-15 years) from CDC Multiple Cause of Death data from 1990-2017, and the firearm law database from the RAND Corporation to assess CAP laws in U.S. states. Each county in each state was classified per the USDA rural-urban continuum as urban (codes 1-3) or rural (codes 4-9).

Results: 23,077 child firearm deaths occurred over the study period. Mechanism and race varied by rurality. Whereas 83% of all deaths occurred in urban areas, urban areas accounted for 70% of unintentional deaths, 91% of assaults, 77% of suicides, and 80% of undetermined (Chi²3=P<0.001). Whereas African American children accounted for 51% of deaths overall, African American children accounted for 36% of unintentional deaths, 91% of assaults, 10% of suicides, and 48% of undetermined (Chi²6=P<0.001). 28 states implemented a CAP law over the study period. Modelling these states using conditional logistic regression, the percent of total deaths states experienced due to unintentional shootings was 16% lower (OR=0.84, 95%=0.73-0.97) in years after versus before a CAP law was enacted; the percent of total deaths due to assault was 24% higher (OR=1.24, 95%CI=1.01-1.54); the percent due to suicide and undermined mechanisms did not change. Results were similar in urban areas and attenuated in rural areas.

Conclusions: CAP law implementation may be protective against child unintentional firearm deaths. Death rates will be evaluated in next analyses.

Significance: With CAP laws being generally socially acceptable, they have great potential to prevent additional deaths through enactment in all states.

Funding: The Arnold Foundation.
A Policy Analysis of the Illinois Firearms Restraining Order Act: A Multiple Streams Approach to Extreme Risk Protection Orders
Michele Grim, MPH (LP.D. expected at the end of June 2020) ¹

¹Northeastern University Doctor of Law and Policy

After the Parkland, Florida shooting in 2018, a number of states passed Extreme Risk Protection Orders (ERPOs) that would temporarily remove firearms from those who are at risk of causing harm to themselves or others. Illinois was one of these states and passed the Firearms Restraining Order Act (FRO) in the spring of 2018. Because these laws are in their infancy, there is limited research on ERPOs and little is known about the process and implementation of the current iteration of ERPOs passed after Parkland. The purpose of this qualitative case study was to explore the passage and implementation of the FRO by conducting a critical policy analysis using John Kingdon’s Multiple Streams Framework. This research consisted of 13 key informant semi-structured interviews of individuals and organizations involved in the passage and implementation of the FRO. Results from the study found that although the catalyst for passing the FRO was mass shootings, they will be used for suicide prevention and a tool for domestic violence victims. It also found that stakeholder education and training are important parts to FRO implementation, the importance of bipartisan support, and Second Amendment sanctuary counties are perceived as a threat to FRO implementation. Policy recommendations include adopting ongoing statewide education and training, secure funds for education and training, hold sanctuary counties accountable for not following the law, and ensure accurate data collection. Outcomes of this study will help other states guide their legislation and implementation efforts for their ERPOs.
Characteristics of extreme risk protection order respondents in Florida

Jennifer Paruk, MPH1; April M. Zeoli, PhD, MPH1; Charlie Branas, PhD2; Rebecca Cunningham, MD3; Justin Heinze, PhD4; Daniel Webster, ScD, MPH5

1 School of Criminal Justice, Michigan State University; 2 Mailman School of Public Health, Columbia University; 3 Emergency Medicine, University of Michigan; 4 School of Public Health, University of Michigan, 5 Johns Hopkins Bloomberg School of Public Health

Statement of Purpose: Extreme risk protection order (ERPO) laws allow states, through a civil order, to prohibit individuals who are at high risk of injuring themselves or others from possessing or purchasing firearms. Due to the relatively recent passage of the majority of the nation’s ERPO laws, very little is known about the reasons and frequency with which they are petitioned for and granted or denied. This study explores these questions using ERPO petitions and orders from Florida, a state in which only law enforcement officers may petition for ERPOs.

Methods/Approach: We made public records requests to gather ERPO petitions and orders from Florida, for the first fifteen months after the ERPO law was enacted. Florida ERPO petitions include a checklist of factors deemed in the law to be relevant to risk, such as unlawful or reckless use of a firearm. Documents attached to the petition form that support the claims made on the petition were included in the public records request. Using the petitions, supporting documents, and court decisions, trained research assistants coded for which factors were present, details surrounding those factors, whether the petitions were granted, and reasons for denial. Each case was double-coded, with discrepancies resolved through discussion with the coding team and PI. Data from 386 petitions from 20 counties will be presented.

Results: Results presented include aggregated demographic characteristics and frequency of risk factors listed in ERPO petitions. Fifty-three percent of respondents had a history of suicide threats, attempts, or ideation and 78% of respondents had a history of using or threatening violence against another person. Thirty-six percent of respondents had histories of both suicidality and interpersonal violence.

Conclusions & Significance: In some Florida counties, ERPOs are frequently used to temporarily prohibit dangerous individuals from having access to guns. This research lays the groundwork for future empirical studies of the effectiveness of ERPOs in reducing the likelihood of gun violence.
Mini-Symposia

Firearms and Rural Youth

Speaker 1: Nicholas Stange, BS
Medical Student, St Louis University School of Medicine
Department of Emergency Medicine, University of Iowa

“Firearm Presence and Storage in Rural Youth Homes”

Speaker 2: Charles Jennissen, MD
Clinical Professor, Departments of Pediatrics and Emergency Medicine, University of Iowa

“Firearm Exposure and Safety Training of Rural Youth”

Speaker 3: Cole Wymore, BS
Research Coordinator, Department of Emergency Medicine, University of Iowa

“Rural Youth’s Exposure to Firearm-Related Injury and Death and Their Attitudes Regarding Firearms”
Firearm Presence and Storage in Rural Youth Homes
Charles Jennissen, MD,1,2 Cole Wymore, BS,1 Nicholas Stange, BS,1 Kristel Wetjen, BSN,3 Pam Hoogerwerf, BA,4 Kelly Wood, MD,2 Lauren Mulford, BA,4 Mitchell Hooyer, BS,5 Joel Shilyansky, MD6

1Department of Emergency Medicine, University of Iowa Carver College of Medicine, 2Department of Pediatrics, University of Iowa Carver College of Medicine 3Division of Pediatric Surgery, University of Iowa Stead Family Children’s Hospital 4Injury Prevention and Community Outreach, University of Iowa Stead Family Children’s Hospital 5University of Iowa Carver College of Medicine 6Division of Pediatric Surgery, Department of Surgery, University of Iowa Carver College of Medicine

Statement of Purpose: To determine firearm presence and storage practices in rural youth homes.

Methods/Approach: Attendees of the Iowa FFA Leadership Conference were surveyed in 2019. Descriptive and comparative analyses were performed.

Results: 1,382 adolescents (13-18 years) participated. Over one-half (53%) lived on a farm, nearly one-fifth (18%) lived in the country but not on a farm, and 29% lived in town. Over four-fifths (84%) had at least one rifle/shotgun in their home, while nearly three-fifths (58%) had at least one handgun. Over one-half (56%) had both rifles/shotguns and handguns. The proportion of homes with firearms varied by where members lived (p<0.001): farm > country/not farm > town. Caucasians had higher percentages with rifles/shotguns in the home (95%) than those of other races (66%, p<0.001). Of homes with rifles/shotguns, at least one was stored at least part of the time unlocked (51%), loaded (29%) or both unlocked and loaded (17%). Of homes with unlocked rifles/shotguns (51%), almost one-half (46%) also had unlocked ammunition. Higher proportions living on a farm > country/not farm > town reported having rifles/shotguns not properly stored (p=0.019). Of homes with handguns, at least one was stored at least part of the time unlocked (43%), loaded (40%) or both unlocked and loaded (24%). Of those aware of how firearms were stored in the home, 82% reported that at least one firearm was stored either unlocked or loaded at least some of the time.

Conclusion: The vast majority of Iowa FFA members have firearms in their home. A large proportion are not stored safely, putting these adolescents at increased risk for firearm-related suicide. Education of rural families regarding the importance of proper firearm and ammunition storage is greatly needed.

Innovation & Significance: This study provides unique epidemiology on the presence and storage of firearms in rural youth homes.
Firearm Exposure and Safety Training of Rural Youth

Charles Jennissen, MD,1,2 Cole Wymore, BS,1 Nicholas Stange, BS,1 Kristel Wetjen, BSN,3 Pam Hoogerwerf, BA,4 Kelly Wood, MD,2 Lauren Mulford, BA,4 Mitchell Hooyer, BS,5 Joel Shilyansky, MD6

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Statement of Purpose: To investigate rural youth’s use of firearms and whether they had received firearm training.

Methods/Approach: Attendees of the Iowa FFA Leadership Conference were surveyed in 2019. Descriptive and comparative analyses were performed.

Results: 1,382 adolescents (13-18 years) participated. The vast majority (85%) had fired a rifle/shotgun; of these, nearly one-third (32%) did so before 9 years old, and nearly four-fifths (79%) before 13 years. Most had also fired a handgun (62%); of these, one-third (34%) did so before 11 years of age and four-fifths (80%) before 15 years. Males as compared to females, those 16-18 years as compared to 13-15 year olds, and those living on farms or in the country as compared to those living in town had significantly greater percentages that had fired a rifle/shotgun or a handgun. Males had higher proportions that had fired a rifle/shotgun or a handgun >20 times and had started firing them at a younger age as compared to females (p<0.001 for all comparisons). Over one-half (55%) reported having gone hunting. Nearly a quarter (24%) of those that went hunting stated they first did so before 9 years old, about one-half (48%) before 11 years, and nearly three-quarters (72%) before 13 years of age. Of those that had fired any firearm, three-fifths (60%) had completed a safety training course. Of those that had gone hunting, four-fifths (80%) had participated in training.

Conclusion: Most Iowa FFA members have used firearms; often starting at very young ages. Although taking a firearm safety course is common, many have not received official instruction. Rural families should be advised when it is developmentally appropriate to consider introducing youth to firearms, and all should have formal training before using them.

Innovation & Significance: Study provides unique epidemiology on rural youth’s use of firearms and safety training.
Rural Youth’s Exposure to Firearm-Related Injury and Death and Their Attitudes Regarding Firearms

Charles Jennissen, MD,1,2 Ryan King, DO,1 Cole Wymore, BS,1 Nicholas Stange, BS,1 Kristel Wetjen, BSN,3 Pam Hoogerwerf, BA,4 Kelly Wood, MD,2 Lauren Mulford, BA,4 Mitchell Hooyer, BS,5 Joel Shilyansky, MD6

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Statement of Purpose: To investigate rural youth’s personal experience with firearm-related death and injury, and their attitudes about firearms.

Methods/Approach: Iowa FFA Leadership Conference attendees were surveyed in 2019. Descriptive and comparative analyses were performed.

Results: 1,382 FFA members (13-18 years) participated. Over one-third (36%) personally knew someone killed or injured by gunfire. Of these, over two-thirds (69%) knew someone that died or was injured by firearms accidentally and 30% knew someone killed/injured on purpose (e.g. suicide). Nearly 5% (n=64) had personally seen someone or been threatened with a firearm. Nearly all (94%) agreed or strongly agreed that hunting and sports shooting should be kept legal. The vast majority (89%) agreed or strongly agreed that firearm safety courses be required to get a hunting license. Three-fifths (60%) strongly agreed, and the vast majority (89%) agreed background checks should be required by law before someone buys firearms. Those that hunted had lower percentages that agreed background checks should be required (p=0.034). Over three-fifths (61%) agreed or strongly agreed there should be laws requiring safe firearm storage (locked and unloaded) in homes. Males (p<0.001), those living on farms or in the country (p<0.0001), those with firearms in their home (p<0.0001), those with unsafe firearm storage (p<0.0001) and those that had hunted (p<0.001) all had lower proportions that agreed there should be safe storage laws.

Conclusion: Most study youth favored firearm safety measures such as required training, background checks, and safe storage in homes. Over one-third knew someone killed or injured by firearms, and about 5% had seen someone threatened with a firearm. Screening may help identify youth with negative firearm-related experiences who might benefit from mental health intervention.

Innovation & Significance: This study provides unique epidemiology on rural youth’s experience with firearm-related death and injury, and their personal beliefs regarding firearms.
Mini-Symposia

National Surveys on Firearm Safety and Behaviors: Results on COVID-19, Counseling, and Access

Speaker 1: **Rebeccah Sokol, MSPH, PhD**
Assistant Professor, School of Social Work, Wayne State University

“Firearm-Related Injuries Deaths Among Children and Adolescents in St. Kitts and Nevis, 2000-2018”

Speaker 2: **Carmel Salhi, BA, BS, MSc, ScD**
Assistant Professor, Northeastern University, Bouvé College of Health Sciences

“Parent and Child Report of Adolescent Access to Loaded Firearms: Results from a Nationally Representative Survey”

Speaker 3: **Andrew Conner, BS**
Medical Student, Frank H. Netter MD School of Medicine, Quinnipiac University

“Discussions Regarding Firearm Safety Between Clinicians and U.S. Adults Living in Households with Firearms: Results from a National Survey”

Speaker 4: **Patrick Carter, MD**
Associate Professor, University of Michigan
Director, Injury Prevention Center, University of Michigan

“Health Care Counseling about Firearm Safety”
Firearm Possession during the COVID-19 Pandemic
Rebeccah Sokol, PhD

1School of Social Work, Wayne State University

Objectives. To: 1) Describe how the landscape of firearm ownership and storage has changed following the onset of the COVID-19 pandemic; and 2) Contextualize these changes according to risk factors for suicide and family violence.

Survey population. In June and July 2020, the study team conducted a national survey of 2,924 U.S. parents regarding firearm-related practices.

Methods. We asked parents if, since the beginning of the COVID-19 pandemic they: 1) purchased a firearm (and if this was their first firearm purchase); 2) purchased more ammunition than typical; and 3) stored firearms in a manner that made them more accessible. We conducted Pearson’s chi-square tests to identify if firearm ownership changes following the pandemic differ according to risk factors for suicide and family violence.

Results. Among firearm-owning families, 17% purchased a firearm, 20% purchased more ammunition than usual, and 6% of firearm owners stored firearms in a manner that made them more accessible since the beginning of the COVID-19 pandemic. Additionally, 26% of parents who reported purchasing a firearm during the COVID-19 pandemic were first time firearm owners. We found no significant differences in firearm ownership changes according to risk factors for suicide and family violence.

Conclusions. Given the increases in firearm and ammunition purchases during the pandemic, the threat of a suicide epidemic and increased family violence remain critical public health issues during the COVID-19 pandemic.
Parent and child report of adolescent access to loaded firearms: Results from a nationally representative survey
Carmel Salhi, ScM, ScD¹, Deborah Azrael, PhD², Matthew Miller, MD, ScD, MPH¹,²

¹Department of Health Sciences, Northeastern University, ²Harvard Injury Control Research Center, Harvard TH Chan School of Public Health

Statement of Purpose: The American Academy of Pediatrics has long recommended reducing access to household firearms, through safer storage or removal, to prevent adolescent firearm injury and death. However, locking firearms may not be an impediment to easy access for many adolescents. Using a national survey, we examine adolescents’ access to loaded household firearms and discordance between parent and child reports of access.

Methods: The 2019 National Firearm Survey is representative of US adults in homes with firearms. Adults with a child 13-17 years of age were asked to allow their child to participate. Adolescents were asked how long it would take them to access a loaded firearm. Parents were asked whether their child could access a loaded firearm in their home without assistance. Statistics are weighted to be nationally representative of parents who live in homes with guns and have a child between the ages of 13-17.

Results: The final sample included 318 parent-adolescent dyads. One-third (34%) of adolescents said they would be able to access a loaded gun in their home in under 5 minutes. Among the 72% of parents who believed their adolescent could not access a loaded firearm independently, 22% had an adolescent who could access a loaded gun in under 5 minutes. Among the 55% of firearm-owning parents who reported all firearms were locked, 25% had an adolescent who could access a loaded gun in under 5 minutes.

Conclusions: Many adolescents report ready access to a loaded household firearm, including those who live in homes where all firearms are locked.

Innovation & Significance: Coupled with the substantial discordance in parental knowledge of adolescent access to loaded firearms, our findings underscore the need to emphasize reducing access, not merely locking firearms, and caution against assuming parents know whether their children have easy access to household firearms.
Discussions Regarding Firearm Safety Between Clinicians and U.S. Adults Living in Households with Firearms: Results from a National Survey

Andrew Conner, BS1, Deborah Azrael, PhD2, Matthew Miller, MD ScD MPH2,3

1Frank H. Netter MD School of Medicine, Quinnipiac University, North Haven, CT, 2Harvard Injury Control Research Center, Harvard T.H. Chan School of Public Health, Harvard University, Boston, MA, 3Bouve´ College of Health Sciences, Northeastern University, Boston, MA

Statement of Purpose: Several medical organizations recommend that clinicians counsel patients about firearm risk. How often these conversations occur and what topics are covered is unknown. We sought to estimate the proportion of U.S. adults in gun-owning households who have discussed firearm safety with a clinician and characterize these encounters.

Methods/Approach: We conducted a cross-sectional analysis of a nationally representative, probability-based online survey of U.S. adults in gun-owning households (n=4011) in Summer 2019. Our primary outcome was response to the question: “Has a physician or other healthcare practitioner ever spoken to you about firearm safety?” Those answering affirmatively were asked about their most recent discussions, including clinical setting, patient type, and whether firearm storage was discussed.

Results: 7.5% (95%CI:6.6%-8.6%) of adults in gun-owning households had discussed firearm safety with a provider (12.0% [95%CI:9.9%-14.6%] with children in their home vs. 5.3% [95%CI:4.4%-6.3%] without). Most encounters involved an outpatient medical visit by the respondent. Half (48.0% [95%CI:41.1%-54.9%]) of discussion covered storing all firearms locked; one-third (31.8% [95%CI:23.6%-38.7%) locking ammunition separate from firearms; and one-in-seven (15.9% [95%CI:11.3%-21.9%) removing firearms from the home. Removing firearms was rarely discussed when a child was the patient; when the patient was the respondent or another adult, removal was reported to have been discussed by one-quarter and half of respondents, respectively.

Conclusion: Few adults in gun-owning households have discussed firearms with clinicians, underscoring the need for additional work to promote these conversations.

Innovation/Significance to the Field: Clinicians can be effective messengers about the risks posed by household firearms, playing a role in a broader firearm injury prevention strategy. Findings from our study, the first to use a nationally representative sample to determine what percentage of adults in gun-owning households have ever discussed firearm safety with a clinician, suggest that realizing this potential requires additional efforts.
Health Care Counseling about Firearm Safety
Patrick Carter, MD¹, Laney Rupp, MPH², Rebecca Cunningham, MD¹, Marc Zimmerman, PhD²

¹Emergency Medicine, University of Michigan, Ann Arbor, MI, ²Health Behavior and Health Education, University of Michigan School of Public Health, Ann Arbor, MI

Innovation/Significance: Limited research has explored patient experiences/perspectives about health care provider (HCP) counseling on firearm safety. Such data can inform future interventions to improve screening/counseling approaches and family safety practices.

Statement of Purpose: Study objectives were to: 1) characterize the proportion of parents/teens receiving anticipatory guidance about firearm safety from their teen’s HCP; 2) characterize the quality/components of these discussions and any changes in safety practices; 3) Characterize parent/teen attitudes about the perceived importance of firearm safety counseling.

Methods: Data is from a cross-sectional survey of parents (n=2,924) and their teenage (n=2000) children (age 14-18) conducted in collaboration with Gallop (6/24/20-7/22/20). Parents and their teens separately completed web-based surveys (~15-min/each) that included measures characterizing personal/family firearm behaviors, healthcare provider screening/counseling experiences, and perceptions about HCP counseling. Data was weighted to be nationally representative.

Results: Few parents (14.9%) and teens (10.0%) reported that HCPs had discussed firearm safety as a part of a regular well-child visit in the past 5-years. Among families receiving any counseling, few (<10%) reported changing their safety practices. Further, a minority of both parents (24.3%) and teens (29.9%) perceived that firearm safety counseling was an important component of HCP anticipatory guidance. Parents also reported low levels (22%) of trust in their teen’s HCP ability to provide adequate counseling on firearm safety.

Conclusion: Firearm safety is rarely included as a component of HCP anticipatory guidance, with few families improving their own safety practices when they receive counseling. Lack of trust in HCPs around the topic of firearm safety may be a key barrier. Future interventions should address the low incidence of effective screening/counseling by HCP, as well as optimal ways of improving counseling delivery that both enhances the trust between HCP and their patients and the effectiveness of counseling interventions.
Mini-Symposia

Race, Policing & Firearms

Speaker 1: **Trina Kumodzi, PhD, RN, CCRN**
Postdoctoral Fellow, University of Pennsylvania and University of Michigan (FACTS)
“Firearm-Related Injuries Deaths Among Children and Adolescents in St. Kitts and Nevis, 2000-2018”

Speaker 2: **Dylan Jackson, BS, MS, PhD**
Assistant Professor, Johns Hopkins Bloomberg School of Public Health, Department of Population, Family, and Reproductive Health
“Police Stops Among At-Risk Youth: Repercussions for Mental Health”

Speaker 3: **Joseph Wertz, AB**
Research Assistant, Harvard Injury Control Research Center

Speaker 4: **Daniel Webster, ScD, MPH**
Professor, Johns Hopkins Center for Gun Policy and Research, Bloomberg School of Public Health
“The Role of Firearms, Firearm Policy, and Risk of Fatal Police Violence”
Firearm-Related Homicide Victimization and Perpetration Among Children and Adolescents in St. Kitts and Nevis, 2000-2018: A Retrospective Analysis of the Federation’s Police Reports
Trina K. Kumodzi, PhD, RN, CCRN

1University of Pennsylvania Injury Science Center and Firearm Safety Among Children and Teens Consortium

Statement of purpose: To determine the epidemiological profile of firearm-related homicide among children and adolescents in St. Kitts and Nevis (SKN) while exposing firearm violence as a public health threat.

Methods/Approach: A retrospective descriptive observational research study design was used to analyze all police reports of SKN homicides between 1/1/2000-12/31/2018. Eight variables were examined: Month and year of incident, victim demographics, perpetrator demographics, weapon used, parish location of incident, motive, type of location where the homicide was committed, and if victim died at the hospital or was found dead at the scene.

Results: There were 353 homicides in SKN between 2000-2018, of which 72 victims were under age 20. Approximately 64% of all adolescent homicides were firearm-related. Discrepancies exist in available perpetrator data in firearm-related homicides. Over 50% of adult homicides with at least one adolescent perpetrator were firearm-related. However, perpetrators that used firearms in homicide against adolescents have the least amount of available information when compared to all other weapons. All adolescent homicides by firearm were committed in the community setting. None of these victims lived long enough to receive any medical treatment.

Conclusion: Without insight into the factors associated with homicidal violence in SKN, developing effective intervention strategies to reduce it is compromised. This study is among the first to shed light on the demographic factors associated with adolescent homicidal violence in SKN and may assist in developing and implementing violence reduction/prevention interventions and policies.

Innovation & Significance to the Field: This is an epidemiologic study of adolescent violence from the trauma nursing perspective. SKN has 6.4 nurses per 1,000 people compared to 9.4 nurses per 1,000 people in the U.S. Homicidal violence is the second leading cause of death among adolescents in both countries. A study of this kind may contribute to empowering nurse-driven trauma care, increase initiatives for a larger nursing workforce, and/or redistribute the nursing workforce to optimize primary and tertiary health care service delivery.
Police Stops Among At-Risk Youth: Repercussions for Mental Health

Dylan B. Jackson¹, Chantal Fahmy², Michael G. Vaughn³, and Alexander Testa²

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Statement of Purpose: The aim of the study was to examine the proximate mental health consequences of stressful and emotionally charged interactions with police officers among a national sample of at-risk youth who have been stopped by the police.

Methods/Approach: A sample of 918 youth (average age 15 years) in the U.S. who reported being stopped by police in the most recent wave (2014–2017) of the Fragile Families & Child Wellbeing Study was used in the present study.

Results: Although age at first stop was not associated with mental health outcomes, youth stopped by police more frequently were more likely to report heightened emotional distress and posttraumatic stress symptoms. Findings also indicate that being stopped at school and officer intrusiveness were potent predictors of these adverse emotional and mental health responses to the stop.

Conclusion: Under certain circumstances, the police stop can result in feelings of stigma and trauma among at-risk youth. Youth may benefit when school counselors or social workers provide mental health screenings and offer counseling care after police encounters, particularly when such encounters are intrusive and/or occur at school.

Innovation & Significance to the field: The current study extends prior work on police-youth interactions in two key ways. First, prior work lacks details containing specific contextual features of the adolescent police stop, including age at first stop, times stopped, locations stopped, and the level of police intrusiveness and hostility during the stop. Second, research has largely overlooked potential variation in mental health responses among a sample of stopped youth with differing stop experiences. Understanding these nuances is crucial to improving police-youth interactions in the efforts to make them more developmentally appropriate and trauma-informed.
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The Role of Firearms, Firearm Policy, and Risk of Fatal Police Violence
Daniel W. Webster, ScD, MPH,1 Maria D. Booty, MSPH1

1Johns Hopkins Center for Gun Policy and Research, Bloomberg School of Public Health
Johns Hopkins University

Statement of Purpose: Available data indicate that law enforcement officers kill at least 1,100 people per year in the United States and do so at a rate that far exceeds that of other high-income countries. Prior research shows that the elevated risks of being killed by police among Blacks increase with higher levels of structural racism within a state (Mesic et al., 2018). Hemenway and colleagues (2018) found the higher levels of firearm ownership within a state were strongly associated with higher rates of police killings, especially for incidents involving victims armed with a gun. This presentation will highlight key facts and research relevant to understanding the role of race and firearms in killings by police and present new data on the association between strong handgun licensing laws and rates of killings by police.

Methods/Approach: We reviewed and synthesized key studies relevant to fatal police violence, firearms, and race. We accessed data on police killings for the years 2013-2019 through www.mappingpoliceviolence.org to examine patterns relevant to victim weapons, age, and the category of the state’s firearm laws – 1) strong purchaser or owner licensing; 2) purchaser/owner licensing without in-person application or comprehensive background checks (CBC) without licensing; or 3) no CBC or purchaser licensing.

Results: 92% of persons killed by police were shot. 52% of victims were noted to have had a gun when they were fatally shot and 17% were unarmed. Blacks were killed by police at a rate that was 2.5 times higher than that of whites; the Black/White ratio was 3.5 for police killings of unarmed victims. Our analysis found that rates of fatal police shootings in states with strong purchaser licensing were less than ½ as high as those in states with weak licensing or CBC only laws and ¼ as high as states that neither had purchaser licensing or CBC. When the analyses were restricted to victims under age 20, rates of police killings in states with strong handgun purchaser licensing were 38% as high as those in states with weak licensing or CBC only, and 32% has high as in states without licensing or CBC laws. Differences by type of firearm sales policy category were evident for armed and unarmed victims and did not vary significantly across racial groups.

Conclusion: Blacks risk for being killed by a police officer relative to the risks for Whites is most pronounced when victims are unarmed. Firearm availability appears to play an important role in population rates of police officers killing civilians. Strong firearm purchaser licensing laws, which are associated with reduced risks of criminal misuse of firearms, suicides, and law enforcement officers shot in the line of duty, may also reduce risks for fatal shootings of civilians by police.

Innovation & Significance to the field: While there is going evidence of racial disparities in fatal police violence and some evidence on the important role of firearm availability in fatal police shootings, prior research has not examined associations between fatal police shootings and key firearm policies. This research connects dots between firearm availability, firearm policy, and police violence.