



**2022 NATIONAL
RESEARCH CONFERENCE**
FIREARM INJURY PREVENTION

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Symposium 1: Does legally removing firearms from prohibited persons prevent harm? Examining extreme risk protection order and gun relinquishment policies

November 30th, 10:15-11:45 A.M. (Hampton Ballroom)

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April Zeoli PhD¹, Eli Ben-Michael PhD², Tom Scott PhD³

¹*School of Public Health, University of Michigan*, ²*Institute for Quantitative Social Science and Department of Statistics, Harvard University*, ³*Applied Justice Research Division, RTI International*

Symposium Summary: Research conducted in the U.S. consistently shows that gun access among certain types of people like domestic abusers or persons with severe mental disabilities is related to negative outcomes like murder, assault, and suicide. For this reason, Federal and state governments in the U.S. have enacted laws to restrict gun access among individuals included in specified groups. For example, U.S. Code Title 18 Section 922 lists groups of individuals who cannot legally purchase or possess a firearm. Yet, given the size of America's gun market, the frequency of private sales, and the fact that Federal law does not define a procedure for removing firearms from gun owners who can no longer possess them, Federal law is severely limited in its ability to protect residents from gun violence. Moreover, individuals often display warning signs that they are at extreme risk of engaging in violence and/or self-harm, and these warning signs are not included in Title 18 Section 922 of the U.S. Code. The 3 presentations in this symposium test the impact of 3 unique but related state policies that are designed to address limitations in Federal law to better protect state residents from being injured or killed with a gun.

Learning Objectives:

- Understand legal mechanisms for prohibiting the purchase and possession of firearms
- Understand legal mechanisms for removing firearms from prohibited owners
- Understand the evidence motivating the enactment of policies to legally remove firearms from persons at risk of future harm
- Understand sophisticated analytic techniques for testing the relationship between gun policies and relevant outcomes
- Understand research findings on how policies that remove guns from individuals at risk of future harm relate to negative outcomes like suicide and violence

1. Do Extreme Risk Protection Orders have a population-level association with firearm suicide?

April Zeoli PhD¹, Shannon Frattaroli PhD², Wenjuan Ma PhD³

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¹*School of Public Health, University of Michigan*, ²*Bloomberg School of Public Health, John Hopkins University*, ³*Center for Statistical Training and Consulting, Michigan State University*

Statement of Purpose: Extreme risk protection orders (ERPOs) provide an individual-level focused approach to suicide risk reduction. However, changes in suicide rates may be seen at the population-level if either enough suicides are averted through the use of ERPOs or community-level availability of firearms decreases. Here, we test whether there is an association of ERPOs with firearm suicide at the county level in 5 states. **Methods/Approach:** We used a bivariate latent growth curve model to estimate the county-level association between the number of active ERPOs and the number of firearm suicides per month. Fifteen months of data, all post-ERPO law enactment, were included for all counties in California, Connecticut, Florida, Maryland, and Washington (n = 196). Controlling for county characteristics known or hypothesized to be associated with firearm suicide, we tested both a simultaneous and one-month lagged effect of the number of active ERPOs on county-level firearm suicides. **Results/Conclusion:** Results suggest that the number of active ERPOs in a county-month is associated with a decrease in firearm suicide in the following month, suggesting a delayed effect. When active ERPOs and firearm suicides are tested in the same month, results suggest an increase in firearm suicides; however, temporal order between ERPOs and firearm suicides cannot be assumed when measured in the same month. **Innovation and Significance:** This is the first study to analyze the association of ERPOs with firearm suicide at the county level, allowing the month effects to vary by use of a latent growth curve model, and with data from multiple states. A county-level association was detected despite the individualized approach of ERPO.

2. The effect of a targeted effort to remove firearms from prohibited persons on state murder rates

Eli Ben-Michael PhD¹, Avi Feller PhD², Steven Raphael PhD²

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¹*Institute for Quantitative Social Science and Department of Statistics, Harvard University*, ²*Goldman School of Public Policy, University of California, Berkeley*

Statement of Purpose: In 2006 California implemented a unique firearm monitoring program, the Armed and Prohibited Persons System (APPS), to address gun violence in the state. The APPS program first identifies those firearm owners who become prohibited from owning one due to federal or state law, then confiscates their firearms. We assess whether the implementation of APPS affected California murder rates using annual, state-level crime data across the US for the years before and after the introduction of the program. **Methods/Approach:** To do so, we take two approaches. First, we compare California's murder rate to that of a synthetic control, a weighted average of other states designed to closely track California's murder rates prior to APPS. Second, we take a non-parametric Bayesian approach that allows for flexible and parsimonious panel data models with direct control over both dependence across time and dependence across units, as well as natural uncertainty quantification. **Results/Conclusion:** We find that the increased monitoring and enforcement from the APPS program substantially decreased homicides in California, leading to roughly 1.5 murders avoided per 100,000 people per year with a 95% credible interval of (0.32, 2.9) murders per 100,000 people. Taking the conservative end of this range of estimates, a rough back-of-the-envelope calculation indicates that program expenditures are ~\$100,000 per murder prevented. These cost estimates are much lower than conventional estimates of the value of a statistical life, suggesting a very high benefit-cost ratio for this enforcement effort. We also find that the effect on murder is driven entirely by declines in gun-related murder with no measurable effect on non-gun murder. **Innovation and Significance:** California was the first and remains the only state to undertake such a firearm confiscation effort; these results indicate that such programs can be effective in stemming gun violence in other states and jurisdictions.

3. The effect of gun relinquishment laws on domestic violence

Tom Scott PhD¹

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Statement of Purpose: An abuser's access to firearms increases their likelihood of shooting a partner during an act of domestic abuse. Although certain domestic abusers are prohibited from purchasing or possessing firearms under federal law, there is no conjoined mechanism for the courts and law enforcement to ensure that offenders remove any guns in their possession. This fact has led some states to enact gun relinquishment laws that define both a legal process for prohibited abusers to surrender any firearms in their possession and sanctions for not complying with the law. More research is needed to test whether these laws prevent violence. **Methods/Approach:** Using data from the Uniform Crime Reporting Program's Supplementary Homicide Reports and National Incident-Based Reporting System (NIBRS), I apply the synthetic control method to test whether states that put into effect gun relinquishment laws for domestic violence offenses experience a change in their expected level and characteristics of severe forms of domestic violence. **Results/Conclusion:** I find mixed results, characterized by small effect sizes and much uncertainty. Although these laws do not have a noticeable effect on outcomes at the state level, even small reductions in gun assaults would result in large reductions in harm and costs to victims and society. Future research should test the impact of these laws at the individual level using self-reported victimization data. **Innovation and Significance:** To my knowledge, this is the first study that has used NIBRS data to test the impact of gun relinquishment laws on nonfatal forms of domestic violence. Additionally, in comparison to prior research, this study tests the effect of these laws on violence among a broader set of domestic relationships to whom state laws apply. These findings advance the evidence base to better inform policymakers of the likely impact of these laws on public safety.

Symposium 2: Evidence-informed solutions to the prevention of school gun violence: Bridging research, practice, and policy

November 30, 1:15-2:45 P.M. (Hampton Ballroom)

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Sonali Rajan EdD MS¹, Janet Robinson PhD², Seth Prins PhD³

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Symposium Summary: Gun violence in K-12 schools persists as a growing social crisis in the U.S. Data estimate that hundreds of thousands of children have been exposed to gun violence in schools over the past two decades. And racial disparities among children exposed to gun violence (both during and outside of the school day) have only worsened over the past two years. To effectively prevent this kind of violence, we must draw on the existing science that brings together critical insights from multiple disciplines and stakeholders and thoughtfully bridges research, policy, and practice. This entails expanding our notion of how “school gun violence prevention” is currently defined to instead actively address upstream drivers of school gun violence in tandem with evidence-based efforts that we know are critical to responding to threats of gun violence in the moment. In this symposia we draw on the existing literature, current K-12 school safety practices, and novel data to present the following: 1) a K-12 school gun violence prevention framework that actively centers the well-being of children across disparate school communities (including the role of gun laws, meaningful investments in community structures, and increased access to early intervention services), 2) extending this framework, we present best practices on school responses to gun violence and their role in supporting their school communities in the aftermath of this kind of violence, and 3) in reimagining the scope of what “gun violence prevention” entails, we explore the relationship between community policing, school discipline, and school gun violence.

Learning Objectives:

- To identify specific primary prevention policies and practices that could contribute to meaningful reductions in K-12 school gun violence
- To describe the specific relationship between community policing, school discipline, and school gun violence.
- To identify specific and evidence-informed school safety strategies that are known to effectively reduce rates of gun violence in K-12 schools

1. Centering school communities via a more expansive and equitable approach to school gun violence prevention

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²Department of Epidemiology, Mailman School of Public Health, Columbia University, ³Department of Health and Behavior Studies, Columbia University, ⁴Professor, Department of Mathematics, Science, and Technology, Teachers College, Columbia University, ⁵Gelman Professor and Chair, Department of Epidemiology, Mailman School of Public Health, Columbia University

Statement of Purpose: School gun violence persists as a growing public health and educational crisis in the U.S. Unfortunately, existing responses to the persistence of gun violence almost exclusively center reactive strategies that are in place to respond to acts of gun violence in the moment of and that are largely counter to the purpose of schools. Critical research in the area of child development and school organization have underscored the ways in which current responses to gun violence may have negative unintended consequences on children and staff alike. Moreover, most current responses to school gun violence do not account for the stark inequities in gun violence

exposure that Black, Native American, Asian Pacific Islander, Hispanic, and multiracial children experience in comparison to their White peers. **Methods/Approach:** We conducted a scoping review based on PRISMA guidelines to identify and present a comprehensive school gun violence framework that broadens the spectrum of what currently constitutes “school gun violence prevention.” **Results/Conclusion:** Via this comprehensive review, we present a more expansive and equitable set of solutions to K-12 school gun violence prevention that together actively center the well-being of children across disparate school communities. Our findings highlight the role of specific gun laws, of meaningful investments in community structures, of increased access to early intervention services, and of shifts in specific school policies. Our findings also highlight the specific needs of teachers and school staff in moving certain prevention efforts forward. **Innovation and Significance:** There are nearly 100,000 K-12 public schools serving over 51 million children. There is an urgent need for the fields of education and public health to collectively attend to the persistence of gun violence in the U.S. K-12 schools in an evidence-informed manner that keeps school buildings safe, while centering the health, developmental, and learning needs of all children.

2. Preventing and responding to K-12 school shootings: best practices, lessons learned, and a way forward

Janet Robinson PhD¹

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¹*Superintendent, Stratford Public Schools; Former Superintendent, Newtown Public Schools*

Statement of Purpose: Because gun violence is so ubiquitous in the U.S. and its exposure places children at heightened risk for numerous poor physical and mental health outcomes, it is critical to invest in efforts that both reduce the likelihood of school shootings from happening, but that also support school communities in the aftermath of gun violence exposure. Barriers and facilitators to accessing and then effectively utilizing these resources requires insight from school-based leaders and practitioners. **Approach:** Drawing on knowledge around specific existing school safety policies and lessons learned from the perspective of K-12 school leadership, this second talk extends on the school violence prevention framework presented above, presents best practices on school responses to gun violence and their role in supporting their school communities in the aftermath of this kind of violence, and provides unique on-the-ground insight into the specific needs of K-12 schools following a school shooting. **Results/Conclusion:** This talk will present specific perspectives on existing school safety strategies, ways in which schools can reasonably expand access to comprehensive mental health care, and the importance of trauma-informed schools both in the prevention of – but also the aftermath – of school shootings. **Innovation and Significance:** Schools must have the resources and infrastructure in place to attend to the lingering trauma often experienced by members of a school community who have either been directly or indirectly exposed to school gun violence. By identifying specific gaps in practice, existing school safety policies can be refined and more thoughtful and nuanced school safety directions can be identified.

3. School gun violence prevention in the context of school discipline and the school-to-prison pipeline

Seth Prins PhD¹

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¹*Assistant Professor of Epidemiology and Sociomedical Sciences Mailman School of Public Health, Columbia University*

Statement of Purpose: In reimagining the scope of what “school gun violence prevention” entails, the work presented in our symposium’s third presentation links multiple data sets to explore the critical relationships between community policing, school discipline, and school gun violence. These findings build on the framework presented above and that is central to our collective work, which recognizes the inherent relationship between health and learning and underscores the important relationship between schools and communities. **Methods/Approach:** In this study, data from both California and New York City (including via the California Healthy Kids Survey, the Civil Rights Data Collection effort, and the CDC’s Youth Risk Behavior Surveillance System) were utilized to evaluate the relationship between school discipline, indicators of mental health, community policing, school and community support, and school gun violence. **Results/Conclusion:** Preliminary results indicate that students experiencing less support at the school and community levels in conjunction with higher rates of school discipline, are less likely to feel safe. Connections specifically to experiences of school gun violence are presented. And implications for the school-to-prison pipeline are also discussed. **Innovation and Significance:** As we seek to extend our school gun

violence prevention framework to be more expansive, inclusive, and equitable, we must better understand the role of systemic factors in exacerbating poor student health outcomes (including and especially in the context of gun violence). This work utilizes data from students and schools in both California and New York City to provide novel insight into these critical relationships.

Symposium 3: The roles of racial segregation, tree canopy, and heat in urban health and firearm violence

November 30, 3:00 - 4:30 P.M. (Hampton Ballroom)

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Jonathan Jay DrPH JD¹, Emma L. Gause MS MA², Ijeoma Unachukwu MS MD Candidate (2023 expected)³

¹Department of Community Health Sciences, Boston University School of Public Health; ²Firearm Injury & Policy Research Program, Harborview Injury Prevention & Research Center, University of Washington, ³Rutgers Robert Wood Johnson Medical School

Symposium Summary: The built environment is an important and modifiable determinant of urban firearm violence. Recently, researchers have demonstrated that increasing access to green space can reduce neighborhood firearm violence. Such changes occur against the backdrop of important historical processes and ongoing trends: residential racial segregation and climate change. Segregation has led to historical and ongoing disinvestment from the built environment in predominantly Black neighborhoods. Climate change increases exposure to high temperatures, particularly in segregated, disinvested neighborhoods that experience the greatest urban heat island effects. Therefore, urban greening interventions might not only reduce firearm violence, but could potentially reverse patterns of racialized disinvestment and buffer against the effects of climate change. Sessions in this symposium address issues of green space, segregation, and climate change from multiple, interlocking perspectives. The first paper examines tree cover as a possible mediator of the relationship between segregation and firearm violence, and tests whether increasing equity in tree cover would reduce inequities in firearm violence exposure, in 6 U.S. cities. The second paper estimates the association between above-average daily temperatures and firearm violence incidence, in 100 U.S. cities. The third paper, which links the first two, compares tree canopy, urban heat island intensity, and segregation as contributors to mental distress. Attendees will gain a deeper understanding of the root causes of urban firearm violence, growing threats to urban health and safety, and the efforts we can implement immediately to address both.

Learning Objectives:

- Articulate the rationale for built environment interventions to prevent urban firearm violence, specifically community greening.
- Explain the relationships between racial segregation, green space, and heat, due to disinvestment and urban heat islands.
- Evaluate community greening as an intervention to reduce firearm violence, specifically as it relates to segregation and heat, with psychological distress as a potential causal mechanism.

1. Neighborhood segregation, tree cover and firearm violence in 6 U.S. cities, 2015-2020

Jonathan Jay DrPH JD¹, Michelle Kondo PhD², Vivian H. Lyons PhD MPH³, Emma Gause MS MA⁴, Eugenia South MD MS⁵

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¹Department of Community Health Sciences, Boston University School of Public Health, ²USDA Forest Service, Northern Research Station, ³Social Development Research Group, School of Social Work, University of Washington, ⁴Firearm Injury and Policy Research Program, Harborview Injury Prevention and Research Program, University of Washington, ⁵Urban Health Lab, Department of Emergency Medicine, University of Pennsylvania

Purpose: Neighborhood segregation by race and income is a structural determinant of firearm violence. Addressing the lack of green space in segregated neighborhoods is a promising strategy for preventing firearm violence. This study assessed the potential for reducing disparities in firearm violence by increasing access to green space, specifically tree cover. **Methods:** Units of analysis were census tracts in six U.S. cities (Baltimore, MD; Philadelphia, PA; Richmond, VA; Syracuse, NY; Washington, DC; and Wilmington, DE). We measured segregation using the index of concentration at the extremes (ICE) for race-income. We calculated the proportion of tree cover based on 2013-2014 aerial imagery. Outcomes were 2015-2020 fatal and non-fatal shootings from the Gun Violence Archive. We used quasi-Poisson regressions to model the association between ICE and firearm violence, then tested whether tree cover mediated the ICE-firearm violence association. Finally, we simulated the effects of progress towards “tree

equity,” i.e., raising tract-level tree cover to a specified baseline level. **Results:** Higher privilege on the ICE measure (1 standard deviation, SD) was associated with a 47% reduction in shootings (incidence rate ratio (IRR)=0.53, 95% CI [0.49, 0.58], $p < 0.001$). A 1-SD increase in tree cover was associated with a 15% reduction (IRR=0.85, 95% CI [0.78, 0.93], $p < 0.001$). Tree cover did not mediate the ICE-firearm violence association. However, achieving 40% baseline tree cover produced substantial (17%) reductions in firearm violence, especially in highly-deprived neighborhoods. **Innovation/Significance:** Using data from multiple U.S. cities, this study is the first to examine the tree canopy-firearm violence relationship through the lens of segregation. Findings indicate that advancing tree equity would not disrupt the fundamental causes of racial disparities in firearm violence exposure, but could nonetheless help mitigate those disparities.

2. The association between daily ambient temperature and firearm violence: A time series analysis in 100 US cities

Vivian H. Lyons PhD MPH¹, Emma L. Gause MS MA², Keith Spangler PhD ScM³, Gregory A. Wellenius ScD MSc⁴, Jonathan Jay DrPH JD⁵

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¹*Social Development Research Group, School of Social Work, University of Washington*, ²*Firearm Injury & Policy Research Program, Harborview Injury Prevention & Research Center, University of Washington*, ³*Department of Environmental Health, Boston University School of Public Health*, ⁴*Department of Environmental Health, Boston University School of Public Health*, ⁵*Department of Community Health Sciences, Boston University School of Public Health*

Statement of Purpose: Prior research suggests an association between warmer temperatures and higher risk of violence, but no prior study has examined the association between heat and firearm violence across multiple locations. **Methods/Approach:** We estimated maximum daily temperature by city, created from the North American Land Data Assimilation System and obtained cross-sectional data on assault-related firearm injuries and deaths in the 100 most populous cities in the United States 2015 to 2020 from the Gun Violence Archive. Our outcome of interest was the number of firearm incidents (i.e., shootings) by city. We used a distributed lag non-linear modelling approach (DLNM) to fit the temperature and firearm incident data, controlling for seasonality and long-term time trends. We used DLNMs to model associations to assess the temperature and firearm incident relationship across individual cities, and pooled results across all study cities and climate regions. **Results/Conclusion:** The pooled analysis estimated that 6.9% (95% CI: 6.1, 7.5) of all shootings were attributable to hot days (Table 1). This attributable risk fraction equates to 7,973 (95% CI: 7092, 8688) total shootings across the 100 cities over the study period, though the number of total persons injured or killed would be higher. A greater proportion of these shootings were attributable to moderate heat temperatures (5.0%; 95% CI: 4.44, 5.43) as opposed to extreme heat days (1.9%; 95% CI: 1.58, 2.05). Significant heterogeneity was found between cities ($I^2 = 11.7\%$, $p = 0.02$), indicating regional variation in the daily temperature and incident shootings relationship. **Innovation & Significance to the field:** Findings underscore the importance of heat mitigation strategies to reduce shootings, reducing the impact of daily heat by deploying more resources on warmer days. Results also highlight the importance of employing these strategies more broadly throughout the year, rather than focusing only on the extreme heat days.

3. The association between trees, temperature, and mental health distress in Philadelphia, PA

Ijeoma Unachukwu MS MD Candidate (2023 expected)¹, Michelle Kondo PhD², Emily Seeburger MPH³, Jonathan Jay DrPH JD⁴, Eugenia South MD MS⁵

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¹*Rutgers Robert Wood Johnson Medical School*, ²*Research Scientist, USDA Forest Service*, ³*Penn Urban Health Lab, Penn Emergency Medicine Department*, ⁴*Department of Community Health Science, Boston University School of Public Health*, ⁵*Penn Urban Health Lab, Penn Emergency Medicine Department*

Statement of Purpose: Urban Heat Islands (UHI) are an increasingly prevalent phenomenon that create microclimates of extreme heat within cities. Racially segregated and disadvantaged neighborhoods tend to be hotter than more privileged neighborhoods. While prior research suggests that extreme heat is linked to poor mental health outcomes, few studies investigate how intracity heat disparities may contribute to mental health disparities. Tree canopy is a modifiable aspect of the built environment that contributes to temperature and is also associated with

mental health. This study aimed to first determine the association between tree canopy and mental health distress in Philadelphia, PA and then evaluate if heat is a mediator of this relationship. **Methods/Approach:** This is a cross-sectional, observation study using secondary data. The unit of analysis was the census tract (n=384). Our primary dependent variable was tract prevalence of mental health distress defined by the 2020 CDC Places national survey. We measured tree canopy using land cover data derived from LiDAR satellite imaging. Temperature was derived from Landsat thermal sensors during the summer months of 2019-2020. We measured segregation using the index of concentration at the extremes (ICE) for race-income. We ran a multivariate stepwise linear regression model to predict prevalence of mental health distress based on tree canopy, temperature, and segregation. **Results/Conclusion:** We found a significant negative relationship between tree canopy and mental health ($\beta = -0.11$, 95% CI [-0.127, -0.075], $p < 0.01$). When temperature was added to the model, the tree canopy coefficient is reduced ($\beta = -0.069$, 95% CI [-0.106, -0.03], $p < 0.01$). In the fully adjusted model, trees, temperature, and ICE are all associated with mental health distress, with ICE having the strongest association ($\beta = -0.04$, 95% CI [-0.070, -0.015], $p < 0.01$; $\beta = 0.28$, 95% CI [0.12, 0.44], $p < 0.01$; $\beta = -9.66$, 95% CI [-10.62, -8.71], $p < 0.01$). In a subsample analysis of deprived and privileged neighborhoods separately, temperature had a significant association with mental health distress in deprived neighborhoods ($\beta = 0.61$, 95% CI [0.37, 0.86], $p < 0.01$), but not privileged neighborhoods ($\beta = -0.05$, 95% CI [-0.30, 0.20], $p = 0.69$). **Innovation and Significance to the field:** Lower tree canopy is associated with higher mental health distress across all neighborhoods, and temperature appears to be a mechanism through which trees impact mental health, especially in more segregated and disadvantaged neighborhoods.

Symposium 4: Community violence intervention strategies: The state of street outreach

December 1, 8:30 - 10:00 A.M., Hampton Ballroom

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Andrew V. Papachristos PhD^{1,2}, Marisa Ross PhD², David Hureau PhD³, Nathan Aguilar LCSW Doctoral Candidate⁴, Artimimeo Williamson⁵, Jordan Costa MA Doctoral Student⁶, Paul Carrillo⁶

¹Department of Sociology, Institute for Policy Research, Northwestern University, ²Northwestern Neighborhood & Network Initiative, Institute for Policy Research, Northwestern University, ³School of Criminal Justice, Rockefeller College of Public Affairs and Policy, Sociology, The University at Albany, ⁴Columbia University School of Social Work, ⁵Institute for Nonviolence Chicago, ⁶Giffords Center for Violence Intervention

Symposium Summary: Community Violence Intervention (CVI) strategies seek to reduce violence and mitigate its effects by engaging those individuals at the highest risk of involvement in gun violence. In June 2021, President Biden publicly named community violence intervention (CVI) as a key component of his comprehensive plan to respond to firearm crime and ensure public safety. Despite the current spotlight however, research is still emerging as to the impact of outreach programs and very little is known about the work itself and the workforce behind it. At the core of many CVI strategies is street outreach, an approach that employs and relies on local, community expertise and experience to prevent retaliatory shootings, mediate group and interpersonal conflicts, monitor and respond to flash points for community violence, and mentor those at highest risk of violence and connect them to crucial social services.

At this time of opportunity and expansion of outreach-based violence intervention programs, there exists a simultaneous need to examine challenges in CVI practice which include, but are not limited to, community capacity to implement evidence-based violence reduction strategies, workforce-related challenges, and how CVI is integrated into broader public safety strategies. Chicago is a key site where street outreach is being incorporated into broader initiatives aimed at reducing gun violence. This symposium panel presents findings and insights from the research and evaluation of several ongoing outreach efforts in Chicago, which include the importance of centering frontline workers in research efforts to better understand these challenges and the development of solutions.

Learning Objectives:

- To gain a deeper understanding of the impact of street outreach centered interventions on gun violence
- To understand the composition and characteristics of CVI, and advancements in the practice - specifically street outreach
- Define manifestations, analyze the impact of, and identify best practices to alleviate traumatic stress in the workplace among community violence intervention workers

1. The work. Evaluating impact: Applications of mixed methods and quasi-experimental research designs for assessing the effect of street outreach on participant outcomes

Andrew V. Papachristos PhD^{1,2}, Marisa Ross PhD², Erin Ochoa Doctoral Student², Tina Law Doctoral Student², Dallas Wright MA²

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Statement of Purpose: An enduring question in street outreach is one of the most difficult ones to answer: “Does it reduce violence?” The decidedly non-random nature of gun violence makes assessing impact extremely difficult and, overall, the field has produced mixed results of the impact of outreach on aggregate levels of gun violence; few studies have examined individual level outcomes. **Methods/Approach:** This session will present the results of several quasi-experimental and mixed methods studies that assess (a) the impact of street outreach work on individual (participant) level involvement in gun violence and (b) neighborhood levels of gun violence. Analysis will focus on two on-going efforts: Chicago CRED and Communities Partnering 4 Peace (CP4P). **Results/Conclusion:** At the **individual level**, quasi-experimental results using Bayesian survival analysis show substantial reductions in the probability of arrests for violent crimes for Chicago CRED alumni participants, but not for CRED participants more

generally suggesting that programming dosage (especially program completion) is key for reducing risky street behaviors. At the **neighborhood level**, results from synthetic control group designs for CP4P and CRED find that rates of gun violence were lower than they would have otherwise been in the majority (but not all) of communities that had active street outreach efforts. Data and insights from on-going observational and interview studies of these programs offer unique insights into possible mechanisms explaining the successes and limitations of these efforts in Chicago. **Innovation and Significance:** The non-random and clustered nature of gun violence leads to numerous evaluation and research design challenges. Our analyses offer some unique approaches for overcoming these challenges and, in so doing, provide updated insights into the successes and limitations of outreach efforts as well as possible ways for more accurately measuring and assessing the impact of such programs on the lives of participants and their neighborhoods.

2. The workforce. The violence intervention workers survey: An in-depth perspective of outreach workers in Chicago

David Hureau PhD¹, Jalon Arthur, MS², Chris Patterson³

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Statement of Purpose: Who are the street outreach workers performing violence intervention work in American cities? Despite the increased importance of street outreach efforts to gun violence prevention efforts, there is little knowledge about this vital workforce or the nature of the work itself. **Methods Approach:** This paper presents results from a first-of-its-kind survey of over 180 street outreach workers developed in a partnership between researchers and practitioners. The Violence Intervention Worker Study (VIEWS) develops foundational knowledge about street outreach workers, including demographics, work experience and history, health and well-being, family and home life, professional training and supervision, experience with criminal justice institutions, exposure to violence, and more. A researcher-guided web-based survey was used to obtain a near-census of Chicago community-based violence interventionists (N=181, 93% response rate, representing 87% of the interventionist population). **Results/Conclusion:** Workers were mostly male (84%) and Black (80.9%), with a mean age of 43.6 years (range, 23-71). Exposure to violence on the job was common. 59.4% of workers witnessed someone being shot at, and 32.4% witnessed someone being shot and hit. Direct victimization of interventionists was less common but still substantial. 19.6% reported being shot at on the job, while 2.2% were nonfatally shot at work. Workers also experience extensive Secondary Traumatic Stress (STS): 94% of workers reported at least one STS indicator in the past 7 days and a full 50% reported experiencing 9 out of the 17 STS items. **Innovation & Significance to the field:** Understanding the basic composition, opinions, experiences, and attitudes of this workforce are fundamental in ensuring their success as violence preventionists. Our results suggest public health practice should consider methods for improving worker safety and reducing violence exposure, while developing systemic support for CVI workers.

3. Between a bullet and its target: Street intervention, trauma exposure, professional consequences

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Statement of Purpose: The aim of the study is to understand the manifestations of traumatic stress that occur among outreach workers engaged in community violence intervention (CVI) work and how it impacts their work performance. **Methods/Approach:** The study involved 35 in-depth interviews with outreach workers and their supervisors based in Chicago, Illinois. The interviews were analyzed using thematic analysis and constant comparative methods. The results identified four major sources of traumatic stress in CVI work: intervening in violent conflict, working with families of victims and survivors of gun violence, interfacing with criminal legal professionals, and organizational trauma. **Results/Conclusion:** While the implications of the first two themes may be self-evident, CVI workers described how negative interactions with law enforcement, correctional professionals, and other system

actors undermined their professional legitimacy, resurfaced past traumas associated with systems involvement, and provoked traumatic stress among their clients. Similarly, the study sample described “organizational trauma” as a dynamic when nonprofit organizations enact, as well as act out of, traumatizing dynamics circumstances. CVI workers described instances where they were dehumanized and where organizational leaders leveraged personal mission commitments of employees to maintain low pay and overwork them. In the study’s analysis of the impact of these manifestations of traumatic stress, workers admitted to a compromised work performance associated with difficulties engaging clients, trusting coworkers, and fulfilling job requirements. **Innovation & Significance to the Field:** This study is the first to qualitatively examine the traumatic experiences of CVI workers and the implications of traumatic stress within the workplace. Furthermore, this study is among the first to apply the framework of Continuous Traumatic Stress to a domestic context related to urban gun violence. The recommendations in the study provide guidelines as to how nonprofit organizations employing CVI workers can move towards trauma responsive, healing centered engagement of staff.

4. On the front lines: Elevating the voices of violence intervention workers

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Statement of Purpose: The effectiveness of a violence intervention strategy is largely dependent on the individual's service as violence intervention workers. CVI workers utilize their credibility to develop relationships with community members and groups that might cause violence with the goal of preventing the spread of violence and building peace in a community. This study is one of the first national samples of CVI workers to better understand the challenges they experience in the field. **Methods/Approach:** The sample (N=200) included CVI workers from Chicago, Los Angeles, Baltimore and Oakland. CVI workers took a survey assessing their primary challenges, and the survey findings were complemented by focus groups with executive directors, administrators, or other senior managers. **Results/Conclusion:** The results indicate that at least 60% of the sample reported an annual salary of less than \$42,000. Over half the sample reported concern over losing their jobs due to budget cuts, and correspondingly 82% of the sample described anxiety over their ability to pay rent and other living expenses. 61% of the sample did not feel that their work was supported by state and federal government, while 93% of the respondents indicated that there were not enough CVI workers doing violence intervention work. **Innovation & Significance to the Field:** This study provides concrete guidelines for nonprofits, local, state, and federal government to better support CVI workers in the field. This study is among the first to collectively represent the perspective and needs of CVI workers and provides critical insights at a time when federal and state resources to support CVI work are increasing.

Symposium 5: Promising approaches to ending community violence: Evidence from Chicago

December 1, 10:15 - 11:45 A.M. (Blue Ballroom)

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Monica Bhatt MPP¹, Nour Abdul-Razzak PhD², Max Kapustin PhD^{3,4}, Zachary Honoroff MPP [symposium organizer]⁴

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Symposium Abstract: In 2020, America saw the largest rise in murders in 50 years. But with nearly eight of every 10 murders having been committed with a gun, this is not just a crime crisis—it's a gun violence crisis. The surge in gun violence has exacerbated preexisting safety gaps experienced by many Black and Brown communities, and in some neighborhoods, has erased the progress made in reducing gun violence since it peaked in the 1990s. Efforts to improve gun regulation, reduce poverty, and eliminate segregation are essential to helping to close these safety gaps. But in the short-term, new evidence suggests steps we can take to address gun violence now. Most homicides are not the result of benefit-cost type analysis, and instead the result of arguments that could have been de-escalated but were not, ending in tragedy because someone had a gun. Insights from behavioral science offer policy solutions that make those difficult situations easier to navigate and less likely to end in violence. We propose a symposium featuring evidence from Chicago about three such promising approaches. The first highlights READI Chicago, a community violence intervention (CVI) offering men at highest risk of violence job training and cognitive-behavioral therapy programming. The second highlights Choose to Change, another CVI program that connects young people at risk of violence involvement with trauma-informed therapy and supports. The third features a different but equally critical lever for de-escalating situations that can lead to violence: promoting fair and effective policing through improved, data-driven management.

Learning Objectives:

- The first presentation will feature findings from a randomized controlled trial of READI Chicago, a community violence intervention (CVI) program that offers men at highest risk of violence involvement a subsidized, supported job and cognitive- behavioral therapy (CBT) programming. We will share promising evidence both about the innovative ways in which the program identifies and reaches this population, and about how this combination of programming—which has never before been rigorously tested with people at highest risk of gun violence—can reduce serious violence involvement. We hope these insights will provide a clear rationale for other researchers to continue rigorously studying similar CVI programs, especially as more funding is becoming available for CVI programming nationally and the need for evidence about these alternative approaches to addressing gun violence grows increasingly urgent.
- In our second presentation, the results from our randomized controlled trial of the Choose to Change program will demonstrate the potential of trauma-informed CBT, when coupled with intensive mentoring and wraparound supports, to effectively engage and support young people to reduce violence and justice system involvement. Taken together with the findings about READI Chicago, we hope this presentation will increase awareness among conference attendees about the growing evidence base for CVI programs and their potential for reducing violence without exacerbating the harms of the criminal justice system.
- Research on whether police reduce crime typically focuses on two levers: police resources and policing strategies or policies. Our final presentation will feature evidence about another, underexplored policy lever: police department management quality, or how a department implements its chosen strategy with available resources. Our results show that many police departments underperform because of their management practices, indicating that improving police management may be a way to decrease the harms of policing simultaneously. By sharing this work, we hope to engage attendees with this underappreciated, understudied area of research, particularly as the surge in gun violence makes the search for policies that reduce violence without exacerbating the harms of the criminal justice system all the more urgent.

1. Predicting and preventing gun violence: An experimental evaluation of READI Chicago

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Statement of Purpose: The neighborhoods most affected by gun violence - overwhelmingly communities of color—are also disproportionately the subject of justice system responses to that violence. Policymakers and the public are demanding solutions that reduce gun violence without exacerbating the harms of the criminal legal system. **Methods/Approach:** We conduct a randomized controlled trial of the Rapid Employment and Development Initiative (READI) Chicago, an intervention that identifies men at highest risk of gun violence involvement and offers them an 18-month subsidized, supported job and cognitive-behavioral therapy (CBT) programming. **Results/Conclusion:** Three different referral methods identified men with strikingly high scope for gun violence reduction: for every 100 in the control group, there were over 11 shootings and homicides during the 20-month outcome period. Take-up and retention rates were also high, comparable to programs for people facing far lower mortality risk. Though READI did not have a significant impact on an index combining multiple measures of serious violence (the study's primary outcome), we did find a large, suggestive decline in shooting and homicide arrests. The clearest benefits—enormous declines in both arrests and victimizations for shootings and homicides—occur within one referral pathway (a pre-specified subgroup) and remain statistically significant even after multiple testing adjustments. Because shootings are so socially costly, even imprecise overall declines imply a benefit-cost ratio that is conservatively 3:1. **Innovation and Significance to the Field:** The combination of CBT and employment has never been rigorously tested with people at the highest risk of violence, or on the deadliest forms of violence: shootings and homicides. The research we describe here fills this important gap. Given how little we know about alternative responses to gun violence—and the very high costs this violence imposes on our most vulnerable communities—these findings provide a clear rationale to continue rigorously studying similar approaches.

2. Unpacking the impacts of a youth behavioral health intervention: Experimental evidence from Chicago

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Statement of Purpose: Racial disparities in violence exposure and criminal justice contact are a subject of growing policy and public concern. We conduct a large-scale, randomized controlled trial of a six-month behavioral health intervention combining intensive mentoring and group therapy, “Choose to Change,” designed to reduce violence and criminal justice involvement among minority youth in Chicago. **Methods/Approach:** To understand program impact, we first look at total arrests and arrests broken out by associated charges. To better understand mechanisms of impact, we incorporate the role of police discretion in measures of criminal justice contact, given arrests are the result of both youth behavior and police decisions. We apply novel machine learning tools to arrest narratives to identify arrests initiated by police discretion. We also conduct a supplementary analysis of traffic and street stops, over which police have substantial discretion. **Results/Conclusion:** Over 12 months, participants experience a 42% reduction in the probability of a violent offense arrest and a 30% reduction in the probability of any arrest, both statistically significant differences. Incorporating machine learning, we find the program significantly reduces both the intensive and extensive margin of arrests where officers have little discretion in initiating contact (incidents related to interpersonal conflict or those flagged for police through 911 calls), while having no significant impact on more discretionary contact arrests (e.g. a young person exhibiting “suspicious” behavior). We also find that the program has no effect on the probability of being stopped by police. **Innovation & Significance to the Field:** Our findings highlight the promise of this intervention in reducing youth violence, and the City of Chicago has invested in expanding the program based on these results. Our work also suggests programs like Choose to Change may not reduce potentially harmful justice system contact influenced by police discretion.

3. Policing and management

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Max Kapustin PhD¹, Jens Ludwig PhD², Terrence Newmann PhD Candidate³

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Statement of Purpose: How can we get more ‘output,’ and of the right sort, from policing? The question has taken on greater importance with recent instances of police misconduct, and rising gun violence, both concentrated in disadvantaged communities of color. This paper examines an underexplored policy lever: management quality, or how a department implements its chosen strategy with available resources. Can improving management simultaneously reduce crime and the harms of policing? **Methods/Approach:** First, using data from the 100 largest US departments—and Chicago’s 22 police districts—on homicides, police killings of civilians, and tenures of their leaders over two decades, we examine variability in outcomes, and whether variability aligns with leaders’ tenures. Second, we examine data from management improvements made in high-violence Chicago police districts, called the Strategic Decision Support Centers (SDSCs). **Results/Conclusion:** First, we find substantial variability in violent crime and police killings of civilians across cities and Chicago districts related to the timing of police leader tenures. Second, we show SDSCs generated large, statistically significant short-term declines in shootings and violent crime, with no detectable changes in arrests, stops, and uses of force. Third, even within the context of the SDSCs—designed to improve strategy implementation—we find variability in implementation. **Innovation & Significance to the Field:** Improving policing is vital for our cities, particularly for communities of color, on whom the burdens of suboptimal policing disproportionately fall. We hope to stimulate additional research on the role of management quality in policing outcomes. One example of such future research is the May 2022 launch of the University of Chicago Community Safety Leadership Academies, designed to train the next generation of policing leaders. A large-scale experiment will measure the impact of investing in the leadership and management skills of police leaders on community safety and the harms of policing.

Symposium 6: Innovations in firearm suicide research in varied populations

December 1, 1:15 - 2:45 P.M. (Blue Ballroom)

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Symposium Abstract: Firearms complicate suicide prevention. Firearms are responsible for approximately 50% of all suicides and are overwhelmingly the most lethal method of suicide death. This symposium will present innovative approaches to firearm injury prevention in varied populations including women, older adults, and veterans. First, we will discuss findings from a study aiming to understand risk profiles for female firearm suicide death and to identify potential channels for intervention. Second, we will share findings from a study aiming to develop a natural language processing algorithm to identify mentions of firearms in the Veterans Health Administration (VHA) electronic health record. Next, we will introduce voluntary firearm retirement as an approach to prevent firearm injury among older adults, and share about the development of a tool to assist in the planning process. Finally, we will share findings from a study evaluating a low-cost intervention using an electronic record portal invitation to support patients with moderate-high suicide risk to follow safe storage recommendations.

Learning Objectives:

- Develop comprehensive knowledge on key typologies of female firearm suicide, and how these groups of females are using the health care system in the year prior to death.
- Understand how Natural Language Processing can be applied to National Violent Death Reporting System data for sub-groups of suicide decedents
- Describe the values older adults align with firearm ownership and use, and how they factor into planning
- Share potential uses of a publicly available web-based decision aid (Lock to Live) to help counsel patients with suicide risk on safe firearm storage options

1. Typologies of female firearm suicide: Using mental and physical health diagnoses and interactions with the health care system to identify intervention channels

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Purpose: Little is understood about risk profiles for females who die from firearm suicide. While existing, tailored interventions may be slowing the rise in firearm suicide rates for white males, female firearm suicide rates continue to increase. We aim to understand risk profiles for female firearm suicide death and to identify potential channels for intervention. **Methods/Approach:** We used female firearm suicide records from the NVDRS Restricted Access Database from 2014-2018. Using latent class analysis with mental and physical health variables, we identified classes of female firearm suicides and examined key demographic/circumstantial variables across the classes. **Results/Conclusion:** There were 8,318 female firearm suicides from 2014 to 2018. A seven class model was identified as the best fitting, producing the following groups: 1) Alcohol/Substance Use Disorder (AUD/SUD) (n=516; 6.2%); 2) Depression + Suicidal Ideation (SI) (n=1,859; 22.4%); 3) AUD/SUD + Depression/ SI + Suicide Attempt (SA) (n=540; 6.5%); 4) No Pattern - i.e., no Mental Health/ Physical Health Problems identified (n=3,029; 36.4%); 5) Physical Health Problem + Pain (n=552; 6.6%); 6) Depression Only (n=1,552; 18.7%); and 7) Depression + Physical Health Problem + Pain + SI (n=270; 3.3%). Over 36.4% of females – identified as Class 4 – had no mental or physical health problems identified. Compared to approximately 60% of females in Class 7, 4-6% of females in Class 4 were undergoing mental health treatment prior to suicide death. **Innovation/Significance:** Our results identified a large class of female firearm suicide decedents without mental or physical health diagnoses and a lack of prior treatment. Physical health problems and pain more commonly manifested without mental health diagnoses or suicidal ideation/behavior, indicating non-mental health care settings (i.e., pain clinics or specialty outpatient clinics) as a potential avenue for intervention. Our findings underscore non-traditional intervention opportunities both outside and within the health care system.

2. Using natural language processing to identify firearm mentions in the electronic health record

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Statement of Purpose: Risk prediction models, clinical interventions, and research efforts are limited because it is difficult to extract information about firearms from electronic health records (EHR). Our objective is to develop a natural language processing algorithm to identify mentions of firearms in the Veterans Health Administration (VHA) EHR. **Methods/Approach:** We identified firearm-related terms using the Unified Medical Language System (UMLS) Metathesaurus and expanded the term list through two rounds of stakeholder engagement (R1: researchers; R2: veteran firearm owners). We then identified a national subsample of veterans who died by suicide from 5/2020-4/2022 (n=2,175) and matched them 1:1 with control patients of the same gender who had no history of suicide attempt and were: alive on that index date; not identified within the EHR as having high suicide risk; born in the same month/year; and enrolled in the same VHA center. We used Structured Query Language to identify and compare firearm mentions between groups using the three terminology sets in all clinical notes written within 90 days of the index date. **Results/Conclusion:** Using 25 UMLS terms, 51.9% of suicide decedents and 6.2% of controls had a firearm-related mention in their record. Identification increased using term lists expanded by researchers (65 terms; example term “AR-15;” 53.7% cases, 7.1% controls) and veterans (89 terms; example term “Remington;” 56.3% cases, 7.7% controls). **Innovation/Significance:** Using stakeholders to expand on established firearm terminology, we identified firearm mentions in the EHR of one-half of veteran suicide decedents and only eight percent of living controls. Current work includes developing a word embedding model using a Continuous Bag of Words Model, and incorporating machine and deep learning methods to differentiate between mentions of firearms indicating access or lack thereof. The availability of such an algorithm may accelerate research and clinical efforts around firearm injury prevention in clinical settings.

3. Aging, firearms, and development of the “Firearm Life Plan”

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Statement of Purpose: Age-associated changes in physical health, mental health, and cognition increase the likelihood of firearm injury. Little is known about stakeholder perspectives on making plans to reduce access to firearms as firearm owners age or develop such impairments. Using “driving retirement” as a comparative concept,

the aim of this study was to explore stakeholders' perspectives on "firearm retirement." **Methods/Approach:** From 2020-2021, we conducted focus groups with older (age 65+) firearm owners and family members of older firearm owners, using semi-structured interview guides which explored the role of firearms in older adults' lives, circumstances where it might be necessary to limit access to them, and the process of planning for those circumstances. Sessions also explored "firearm retirement," including similarities and differences with "driving retirement." We audio-recorded and transcribed discussions and completed structured debriefs to identify key themes and insights emerging within and across groups. **Results/Conclusion:** Of 81 participants, 60 were older adult firearm owners and 21 were family members. Overall, participants responded positively to the concept of firearm retirement. Participants described key decisions that would be necessary to retire from firearms, including identifying who would enact plans and acquire their firearms. Challenges included knowing when someone is unsafe to use firearms, and the costs of limiting firearm access (e.g., decreased ability to protect oneself). In relation to driving retirement, several important similarities (e.g., emotional process, loss of autonomy, aging increases safety concerns) and differences (e.g., driving retirement more impactful on daily independence, few alternatives to using firearms for self-protection, more legal concerns with firearm transfers) were identified. A key finding was the need for a resource for a "firearm life plan"; working with a professional communications firm and firearm experts, we created an educational website for older firearm owners and their family members. **Innovation/Significance:** Voluntary firearm retirement is a novel approach to prevent firearm injury among older adults. These preliminary findings suggest that firearm owners consider the concept to be acceptable, and focus groups provided insights for the development of the Firearm Life Plan online resource.

4. Randomized trial of population-based outreach to Lock to Live - A web-based decision aid for safe storage of firearms in patients with suicide risk

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Purpose: *Lock to Live (L2L)* is a web-based decision aid that incorporates patients' values with motivational nudges towards safe storage practices. This randomized trial evaluated whether an electronic health record portal invitation to visit L2L for patients with moderate-high suicide risk in the outpatient setting impacted firearm storage decisions and behavior. **Methods:** Invitation messages were sent to patients in the >75th risk percentiles for suicidal behavior (death or attempt) within 3 months from a prediction model. Half were randomized to receive *L2L+survey* and half received *survey only* (control). A single post-survey administered 2 weeks after the final L2L invitation compared groups on Stages of Change: pre-contemplative (do not believe in safe storage), contemplative (believe in safe storage but not doing it), preparation (thinking or planning to change storage), or action (safely storing). Primary outcomes were tested using a cumulative logit model comparing stage of change between groups. **Results:** There were 21,131 patients randomized over a 6-month period of which 27% responded to the anonymous survey (men = 48%, women = 42%, other/unknown gender = 10%). Among respondents, 44% had any access to a firearm and 81% of those didn't endorse any safe storage behaviors. Intervention patients were significantly more likely to be in preparation vs. contemplative stages compared to control (7% difference, OR = 1.21 (1.01 - 1.452)). When examining action (safe storage) alone, there were no statistically significant differences between intervention and control groups. **Results/Conclusion:** Efficiently sending an invitation message through the EHR to visit L2L encouraged patients with suicide risk to consider safer firearm storage practices, but a stronger intervention and/or more time is needed to change behavior. Most firearm owners with suicide risk factors do not use safe storage practices. **Innovation/Significance:** Future studies should evaluate whether this low-cost intervention primes patients to follow safe-storage recommendations from providers.