OAKLAND CEASEFIRE EVALUATION

Final Report to the City of Oakland

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EXECUTIVE SUMMARY

The City of Oakland, California, has long suffered from very high levels of serious violence. According to the FBI's Uniform Crime Reports, Oakland's homicide rate (31.8 per 100,000) was almost 6.8 times higher than the national homicide rate (4.7 per 100,000) in 2012. That year, the City of Oakland engaged the California Partnership for Safe Communities (CPSC) to help design and implement a focused deterrence program to reduce serious gun violence. The CPSC collaborated with the Oakland Police Department (OPD) on ongoing problem analysis research to understand the underlying nature of gun violence in Oakland. The OPD led an interagency Ceasefire enforcement group comprised of federal, state, and county criminal justice agencies. The broader Oakland Ceasefire Partnership included the Mayor's Office, social service agencies led by the Human Services Department, and community leaders from local organizations such as Oakland Community Organizations (OCO).

The Oakland Ceasefire program closely followed the key elements of a focused deterrence Group Violence Reduction Strategy (GVRS). Briefly, GVRS programs seek to change offender behavior by understanding underlying crime-producing dynamics and conditions that sustain recurring crime problems, and implementing a blended strategy of law enforcement, community mobilization, and social service actions. The Oakland Ceasefire program was fully implemented in early 2013.

Between 2010 and 2017, total Oakland shooting victimizations peaked at 710 in 2011 (93 gun homicide victims and 617 non-fatal shooting victims) and decreased by 52.1 percent to a low of 340 in 2017 (63 gun homicide victims and 277 non-fatal shooting victims). The impact evaluation was designed to determine whether the Ceasefire intervention was associated with this steep decline in serious gun violence and assess how Ceasefire partners and community leaders perceived the implementation of the strategy.

Place Impact Evaluation

Methods

The place impact evaluation comprised two quasi-experimental designs to determine whether the implementation of Oakland Ceasefire was associated with citywide reductions in gun homicide. First, the cross-city quasi-experimental design compared gun homicide trends in Oakland to gun homicide trends in 12 comparison cities: Fresno, Sacramento, Stockton, Santa Ana, Anaheim, Long Beach, Riverside, Bakersfield, Alameda, San Francisco, Richmond, and East Palo Alto. For each of the 13 cities, interrupted time series analyses of monthly counts of gun homicide between 2010 and 2017 were used to estimate the existence of post-2013 gun violence reduction impacts. These models controlled for population trends, violent crime trends, linear and non-linear trends, and seasonal effects.

Second, the within-Oakland quasi-experimental design compared shooting trends in census block groups with gangs / groups that experienced the Ceasefire intervention relative to shooting trends in matched census block groups with gangs/ groups that did not experience the intervention. Some 93 of 311 census block groups (24.9%) had groups/gang turf that experienced Ceasefire treatment. Propensity score matching was used to develop matched treated and untreated block groups based on prior violence, the number of gangs / groups with turf in the block group, neighborhood disadvantage, resident race/ethnicity, and gentrification (this resulted

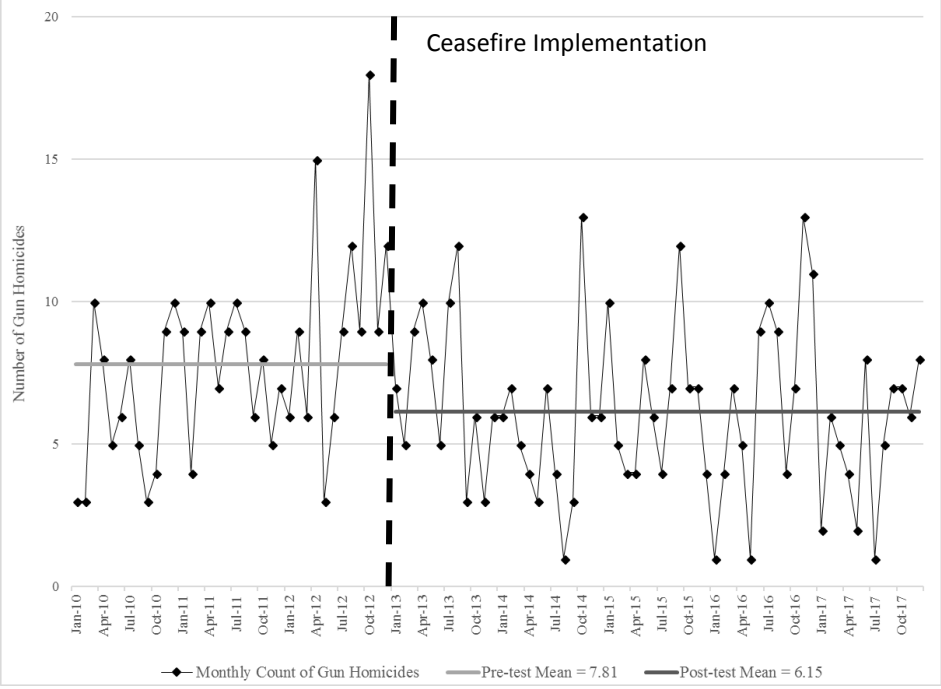
in 47 treated and 95 untreated matched block groups). Growth curve regression models with differences-in-differences estimators (DID) were used to analyze monthly counts of fatal and non-fatal shootings in matched treated and untreated block groups between 2010 and 2017. Gun violence displacement and diffusion of program benefit effects were analyzed in block groups adjacent to treated and untreated places.

Results

- The Ceasefire intervention was associated with an estimated 31.5% reduction in Oakland gun homicides controlling for other trends and seasonal variations ($p<.05$, see Figure 1). Only 2 of 12 comparison cities experienced significant reductions during this time period (Stockton, San Francisco). The cross-city quasi-experiment suggests that the Ceasefire intervention was associated with a noteworthy citywide reduction of gun homicide in Oakland that seemed distinct from gun homicide trends in other California cities.

- The DID estimator suggested that the Ceasefire intervention was associated with a 20.0% reduction in shootings in matched treated block groups relative to matched comparison block groups ($p<.05$). The analysis further suggested a non-significant reduction in shootings in areas surrounding treated block groups relative to areas surrounding untreated block groups. The within-Oakland quasi-experiment suggests that neighborhoods with gangs / groups that experienced the Ceasefire treatment experienced noteworthy reductions in gun violence that were not displaced to surrounding areas.

Figure 1. Monthly Counts of Fatal and Non-Fatal Shootings in Oakland, 2010-2017



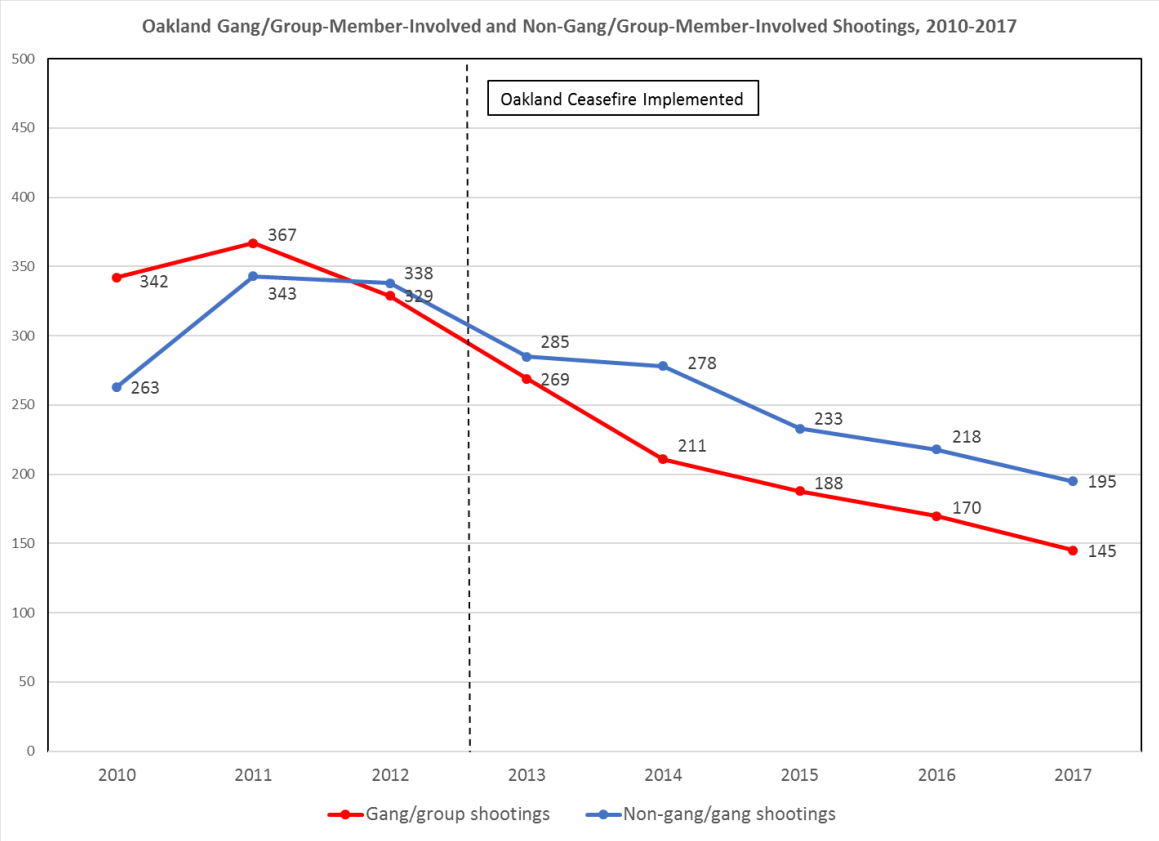
Gang / Group Impact Evaluation

Methods

A quasi-experimental design was used to determine whether shooting trends involving gangs and other criminally-active groups that experienced Ceasefire treatment were reduced relative to shooting trends involving gangs/groups that did not experience Ceasefire treatment. Problem analysis research revealed that there were 76 active gangs/groups in Oakland between 2010 and 2017. There were 15 gangs/groups directly treated by Ceasefire intervention after the 2013 launch of the program. Social network analysis revealed 13 gang/groups connected to treated gangs/groups through conflicts and alliances (i.e., vicarious treatment). The identification of these socially-connected gangs/groups provided an opportunity to determine whether the Ceasefire program generated "spillover" violence reduction impacts on these untreated gangs/groups.

Propensity score matching based on prior violence, gang/group size, conflicts/alliances, longevity, housing project location were used to identify similar gangs/groups (this process resulted in 13 directly treated, 9 vicariously treated, 36 untreated matched gangs/groups). Growth curve regression models with differences-in-differences estimators (DID) were used to analyze monthly counts of fatal and non-fatal shootings involving matched treated, vicariously treated, and untreated gangs/groups between 2010 and 2017. These models estimated both direct and vicarious ("spillover") effects of the Ceasefire treatment.

Figure 2.



Results

- Figure 2 presents the yearly count of fatal and non-fatal shooting incidents that did and did not involve gang / group members between 2010 and 2017. Both gang/group-member-involved and non-gang/group-member-involved shooting incidents decreased markedly during the study time period. However, the decrease in gang/group-member-involved shootings was steeper than the decrease in non-gang/group-member-involved shootings after Ceasefire was implemented in 2013. The yearly mean number of gang/group-member-involved shootings decreased by 43.2 percent from 346.0 during the pre-intervention years (2010-2012) to 196.6 during the intervention years (2013-2017). By comparison, the yearly mean number of non-gang/group-member-involved shootings decreased by only 23.2 percent from 314.7 during the pre-intervention years (2010-2012) to 241.8 during the intervention years (2013-2017).

- The growth curve regression models and DID estimator suggest that the Ceasefire intervention was associated with an estimated 27.0% reduction in shootings by treated gangs/groups relative to untreated gangs/groups ($p<.05$). The models further revealed and estimated 26.0% reduction in shootings by vicariously-treated gangs/groups relative to untreated gangs/groups ($p<.05$). These results suggest that the Ceasefire intervention reduced shootings involving treated gangs/groups and their rivals and allies.

Individual Impact Evaluation

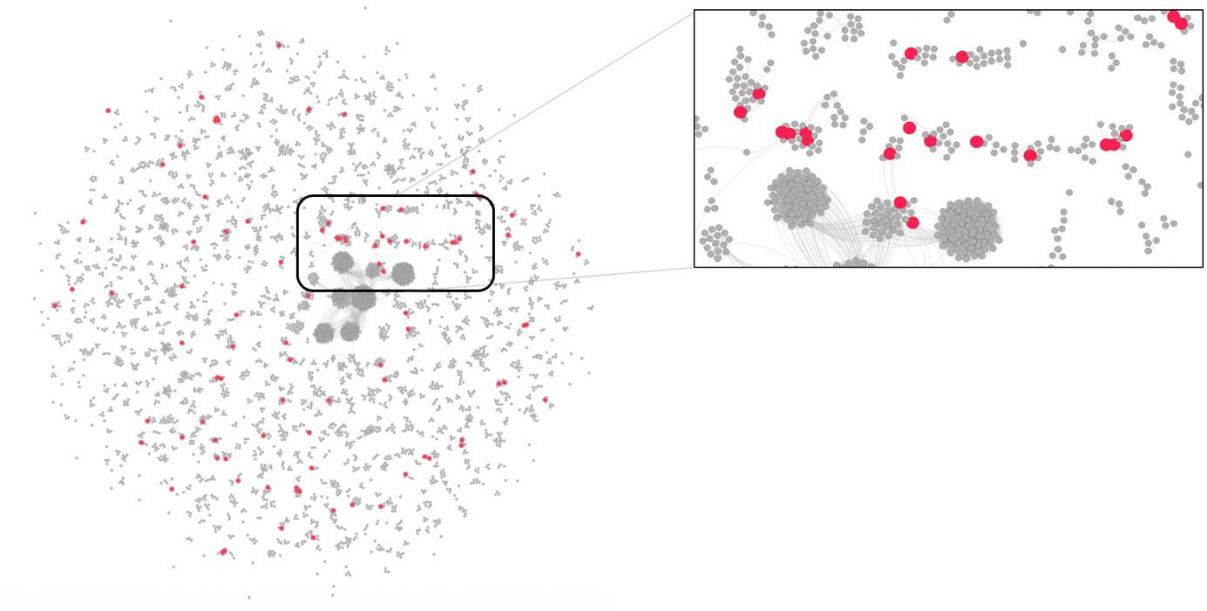
Methods

The individual impact evaluation is designed to assess the extent to which Oakland Ceasefire is associated with gunshot victimization of those *individuals* who were part of the initiative (i.e., individuals who were part of a group that was the focus of Ceasefire, who attended a call-in or custom notification, received law enforcement attention, or were referred to services by Ceasefire). The major challenge for this part of the research is how to parse out the impact of Ceasefire on any individual's behavior as distinct from the observed impact of the group. Another methodological challenge involves developing a comparable control group since Ceasefire individuals are selected by virtue of being amongst the highest-risk people in the city at any one time. The individual impact evaluation builds on one of Ceasefire's foundational premises that gun violence concentrates within social networks and seeks to leverage these exact networks to create a quasi-experimental condition. Specifically, the individual impact evaluation leverages **co-arrest networks** of individuals arrested in Oakland.

Figure 3 depicts this co-arrest network in Oakland created by linking unique individuals through instance of co-arrest arrested from 2010 to 2017. Each of the nodes represents a unique person; each of the lines connecting the nodes represents a single instance of "co-arrest." There are more than 9,912 unique individuals in this network and the connections among them create several smaller distinct subnetworks across the city. The **red** nodes represent those individuals who were part of the Ceasefire program. As might be expected given the concentration of gun violence in such networks, one can see in the call-out in Figure one the way that the Ceasefire participants cluster in the network—i.e., multiple participants are in close proximity to each other.

This component of the evaluation leverages the network (1) to create a quasi-experimental condition that allows us to assess changes in gunshot victimization of individual

Figure 3. Oakland Co-Arrest Network, 2010 to 2017



Ceasefire participants as well as non-participants and (2) to detect possible individual "spillover" effects from one participant to another, especially within network clusters and gangs/groups.

The network in Figure 3 is large enough that we can use a variety of network analytics to "match" individuals who were part of Ceasefire with other individuals similar in risk factors that are in other parts of the network who did not receive treatment. The present evaluation analyzes the post-treatment patterns of gunshot victimization and violent recidivism of (1) those individuals who were part of Ceasefire relative to (2) those individuals who were also in high-shooting parts of the network.

Results

- Compared to both of the comparison groups, the results suggest that Ceasefire participants experienced a *decrease in victimization* and an *increase in arrests*. However, only the increase in arrests for Ceasefire participants was statistically significant and only when compared to non-participating individuals who had similar covariate profiles to participating individuals.

- Ceasefire attendees had *lower rates of victimization* and *lower rates of arrest* in the two-years following Ceasefire than in the two-years prior to participation.

- These results are indicative, but not definitive. All results point to a decrease in victimization. The results are mixed on arrests: with the before and after analysis suggesting participants experienced a *reduction* in contact with the criminal justice system and the comparison to other groups suggesting *more frequent* arrests for Ceasefire participants.

- Both comparison results on victimization and one of the comparison results on arrest are not statistically significant. This owes largely to the *sample size and the relatively low frequency* of victimizations, in statistical terms. For example, there were 15 victimizations among the 289 individuals (5.2%) who participated in Ceasefire and 7 among the 88 (8.0%) individuals who were invited but did not participate. Given these numbers, in order for the difference in victimization between these two groups to be significant, the number of victimizations among the 289 participants would need to have been at most 9 (3.1%). This would constitute a very large and perhaps unrealistic treatment effect.

Qualitative Assessment of Oakland Ceasefire

Methods

The objective of the qualitative assessment was to acquire a variety of local stakeholders' perceptions of and experiences with Oakland's Ceasefire strategy. To achieve this goal, in-depth interviews were conducted with individuals having considerable knowledge, varied perspectives, and keen insights regarding: (1) the effectiveness of current and prior Ceasefire initiatives, (2) the nature and extent of gun violence occurring across Oakland, and (3) whether Ceasefire has improved police-community relations and helped to build mutual trust. Data collection purposively involved diverse groups of respondents in recognition of their informal/formal program roles and particular viewpoints concerning Ceasefire.

The project involved 21 qualitative, in-depth interviews with: Ceasefire call-in clients, City, clergy, and community leaders, police and probation officers, and social service providers. Interview subjects were recruited and scheduled with the assistance of Oakland-based study partners. Researchers were also permitted to use snowball sampling techniques to recruit additional participants by enlisting the help of those previously interviewed to introduce additional individuals suitable for inclusion in the study. Interviews were voluntary, conducted in private offices, and respondents were promised strict confidentiality. Furthermore, we were mindful not to record personally identifying information.

The interview guide was semi-structured, consisting of both closed- and open-ended questions that allowed for considerable probing on key topics (i.e., whether or not respondents viewed Ceasefire as both an effective and fair crime-reduction strategy, perceptions of increased/reduced gun violence, and the current state of police-community relations). Except on three occasions, interviews were digitally recorded (audio only, however) and later transcribed in their entirety for accuracy. The aforementioned transcriptions serve as the primary data for our preliminary analysis. Finally, we took considerable care to ensure that results typified the most common themes and subthemes respondents provided.

Results

The results herein are focused around Ceasefire's three key aims, representing respondents' statements and observations consistently found throughout the data. We also present study participants' views regarding what appears to be working along with their recommendations for moving forward.

Aim 1: Reduce shootings and homicides citywide

- There was strong consensus among study participants that Ceasefire greatly enhanced the City's capacity to systematically and thoughtfully reduce shootings and homicides. Respondents living and providing social services in the most disadvantaged neighborhoods, however, were quick to point out that too much violence persists. Nonetheless, study participants uniformly agree that a few bad actors are disproportionately responsible for serious violence in Oakland.
    - Many study participants reported that the City is experiencing a generational shift concerning the nature of interpersonal violence. In particular, respondents commented that non-fatal shootings and homicides are no longer about gaining control of drug territory. To the contrary, contemporary violence is primarily fueled by everyday disputes (e.g., card games, fights over romantic interests, disparaging social media posts)., making it appear more random and uncontrollable.
    - Unlike in the past concerning gang beefs, those at highest risk of gun violence are seldom aware of impending danger (and or potential assailants' identities and/or motives).

- While the overwhelming majority of study participants were highly supportive of Ceasefire, they took care to express concern about its sustainability given deeply entrenched, underlying social conditions highly correlated with urban violence (i.e., extreme poverty, unemployment, poor educational outcomes).

- Untreated / undiagnosed psychological trauma resulting from living in high crime environments was a prominent theme among some respondents. This subset of study participants believed that this potentially debilitating byproduct of urban violence has not received adequate attention.

- Study participants questioned whether the current Ceasefire messaging resonates with younger (i.e., juveniles), at-risk individuals who have not yet come to the attention of criminal justice agents.

Aim 2: Decrease recidivism and improve outcomes for those at highest risk of violence

- There is considerable confusion (even among those highly supportive of the intervention) regarding the accuracy and integrity of the call-in lists. At the heart of the issue may be definitional differences among partners from different professional backgrounds. Nonetheless, there is considerable misunderstanding (among nearly all non-police

stakeholders) regarding what actions warrant being "in the game" and ambiguity regarding what call-in clients must do to be removed from the list.

- There is also concern among respondents that call-ins are not always conducted in a respectful manner (e.g., they tend to feel coercive and exploitive), deepening clients' distrust of police and the overall criminal justice system.

Aim 3: Strengthen police-community relations and trust.

- While the majority of study participants reported that police-community relations had steadily improved since 2012, almost every respondent identified the nationally publicized sex scandal (of 2016 involving a minor) as a devastating setback that continues to undermine citizen trust.

- Respondents emphasized that positive police-community relations were not merely about officers no longer shooting unarmed blacks. Instead, they were insistent that OPD police leadership must also ensure that rank-and-file officers treat citizens with dignity and respect during routine encounters.

What is Working and Going Well

- There is great support for dedicating law enforcement and social service resources to the small number of individuals at highest risk for violence (both as perpetrators and victims). Study participants prefer Ceasefire over indiscriminate and heavy-handed policing initiatives that have the potential to criminalize entire communities.

- Study participants enthusiastically applaud City leaders for their unwavering commitment to Ceasefire. Respondents openly acknowledge that the current political support is unprecedented, deserving a great deal of credit for the observed success.

- Ceasefire has deliberately enlisted and mobilized people of color to work toward improved police-community relation.

Qualitative Recommendations

- Better involve clients' romantic partners and family members to reduce program stigma and increase community support.

- Be more inclusive and strategic regarding the public messaging (and face) of Ceasefire. Several study participants pointed out that compared to well-publicized OPD enforcement efforts (e.g., press conferences held following arrests and seizures), the general public knows very little about the equally important social service delivery component.

I. THE OAKLAND CEASEFIRE INTERVENTION

INTRODUCTION

For over four decades, the City of Oakland has faced a seemingly intractable violence problem that has resisted state and national downward trends. Since 2003, the city's murder rate has consistently been about 4-6 times the state and national rate. These murders typically involve young people from disadvantaged minority neighborhoods in which police-community relations remain tense. However, similar to other urban environments, violence is highly concentrated amongst a very small number of people in Oakland. Ongoing problem analysis research by the California Partnership for Safe Communities (CPSC) and the Oakland Police Department (OPD) suggests less than one half of one percent of the city's population generates the majority of Oakland's gun violence and that these high-risk individuals tend to be involved in gangs and other criminally-active groups. Despite ongoing attention to serious violence in the city, previously-adopted violence reduction strategies have experienced varied implementation challenges and have not led to sustained decreases in fatal or non-fatal shootings.

The goal of Oakland's Ceasefire program is to reduce shootings and killings by focusing social service, community-based, and criminal justice resources on this small group of people involved in the majority of the city's violence. The Ceasefire approach involves applying data-driven analysis to identify the groups and individuals at highest risk for violence and engaging in direct communication with these groups and individuals. This direct communication entails informing them of the legal risks and personal and community consequences of engaging in violence, offering them specially-tailored services and support, and focusing precision enforcement efforts on those who continue to behave violently.

National experience suggests a robust network of collaborating partners is needed to legitimize, fund, equip, and operate complex strategies that are most likely to succeed in preventing serious violence (Moore 2002). The Oakland "network of capacity" that developed the city's Ceasefire strategy was well-positioned to launch an effective response to serious violence because criminal justice agencies, community groups, and social service agencies coordinated and combined their efforts, with intensive support from a seasoned technical assistance organization, in ways that magnified their separate effects. Further, the Oakland Ceasefire partnership not only sought to reduce violence, but it was also dedicated to improving strained police-community relationships and supporting better outcomes for young people at greatest risk of violence. These goals reflected the core values and concerns of the partners which included directly affected community leaders as well as police executives, city leaders, local intervention and social service providers, and technical assistance partners.

Oakland Ceasefire has faced varied challenges during its initial adoption and throughout its ongoing implementation. The program has required a great amount of flexibility to adapt communication, service and support and enforcement strategies to the city's unique and shifting violence dynamics. A series of tumultuous political tensions and unexpected police administration changes have also threatened program integrity and sustainability. Despite these difficulties, the Ceasefire partners have been diligent in maintaining effective working relationships, enhancing communications, and improving overall coordination of the strategy amongst its network partners. Furthermore, these partners developed innovative trust-building strategies, re-designed the City of Oakland's approach to providing violence prevention services, and developed a citywide implementation infrastructure designed to withstand potential future disruptions. This section reviews the unique context of Oakland's history of violence, the design

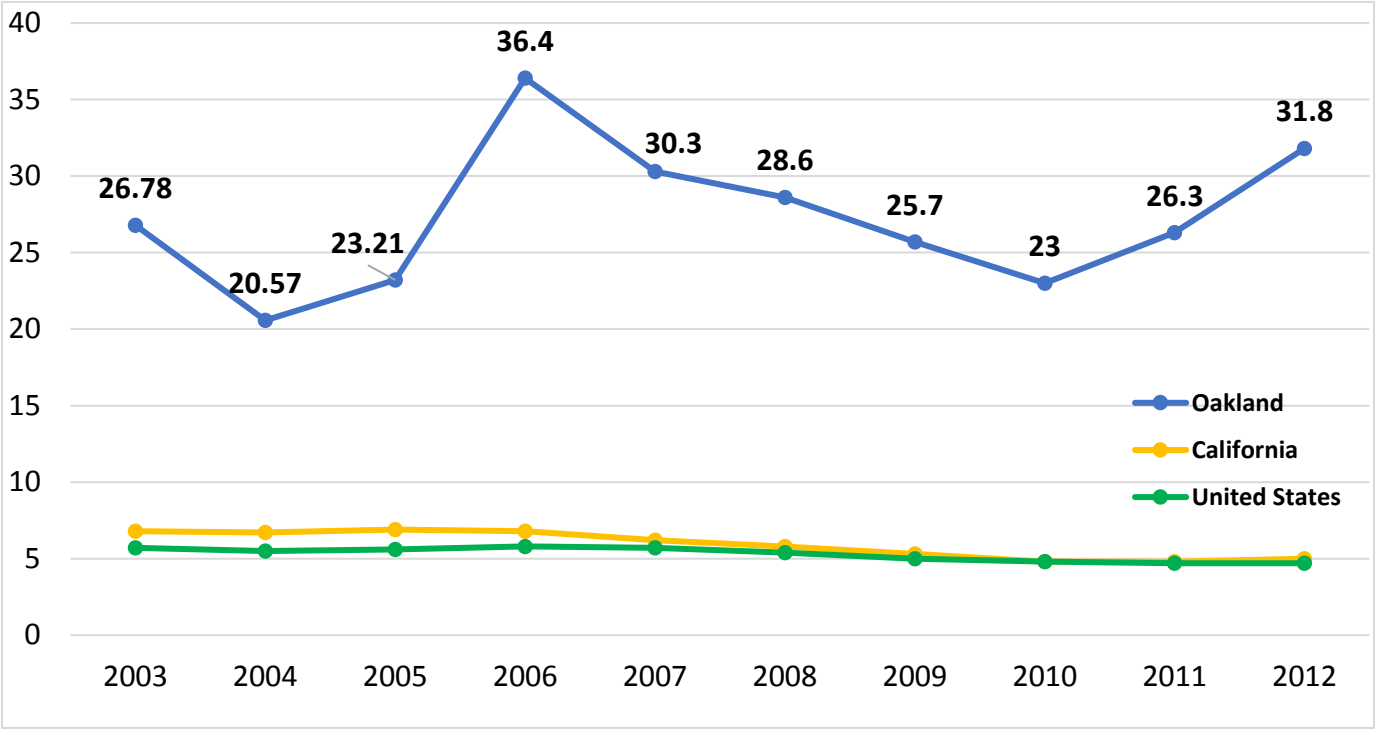
of Oakland's Ceasefire strategy, the challenges faced during implementation, and the obstacles overcome to ensure continued quality intervention and sustained reductions in shootings and homicides.

BACKGROUND

Context

For over four decades, Oakland's homicide rate has remained strikingly high. The city's murder rate is typically about 4-6 times the national average, and it has remained one of the most dangerous cities in the United States. In 2011, prior to Ceasefire launch in late 2012, Oakland's rate of murder or non-negligent homicide was 5.6 times the national rate (Figure 4). Additionally, the city's rates of aggravated assault and total violent crime were 3.1 and 4.4 times

Figure 4: Oakland Homicide Rate (per 100,000 population) 2003-2012



Source: Data for this figure was retrieved from the Federal Bureau of Investigation's Uniform Crime Reports 2003-2012.

higher than the national rate, respectively.[1] Notably, the vast majority of victims of violence are young African-American males between the ages of 18-35.[2]

Oakland's history is important to understanding the development and persistence of its ongoing violence dynamics. During World War II, a rapid rise in industry led to an economic boom and an influx of workers, especially workers of color. However, in the following decades, deindustrialization, economic downturn, and housing segregation led to fewer opportunities and many fled the failing city (Bagwell 2012). Resulting economic hardships and the flight of many businesses and families was associated with a rise in crime and the proliferation of gangs throughout the city, especially in the impoverished areas of West and East Oakland.

Law enforcement strategies to reduce Oakland's consistently high rate of violence have been hindered by a long history of poor police-community relations. A few noteworthy examples are briefly mentioned here. For instance, in 1966, the Black Panther Party emerged in Oakland in response to numerous occurrences of police brutality (Delli Carpini 2000). Decades later, the reputation of the police department worsened as a result of the Riders Scandal. It was revealed that four veteran Oakland police officers were accused of kidnapping, beating, and planting evidence on over one hundred plaintiffs who filed civil lawsuits. The city settled the case in 2003, paying out nearly $11 million to plaintiffs and entering a negotiated settlement agreement that remains in place today (Oakland City Attorney 2003). Six years later, a parolee murdered four Oakland police officers during an initial traffic stop and the subsequent search to apprehend

[1] Data retrieved from the Federal Bureau of Investigation's Uniform Crime Reports (2011). The national rate of aggravated assault in 2011 was 241.1 while Oakland's rate of aggravated assault was 754.1. The national rate of violent crime in 2011 was 386.3 while Oakland's rate of violent crime was 1682.7.

[2] According to data provided by the OPD, about 74% of homicide victims in 2011 (N=111) were identified as black. Additionally, 74% of homicide victims were between the ages of 18-35.

him. In the aftermath of the killings, some groups escalated police-community tensions further by praising the murders as an act of resistance toward police brutality.

In response to decades of persistent violence and troubled relations with the police, several community organizations led by Oakland Communities Organizing (OCO) united to pressure a citywide response which led to the adoption of Measure Y in 2004. Measure Y, or the Violence Prevention and Public Safety Act of 2004, provided funding through 2014 for fire safety, police services, and violence prevention programs to address the numerous intertwined risk factors that may lead to criminal involvement. As a result, a number of service-oriented violence prevention initiatives were pursued in subsequent years. These included social services for criminal justice system involved youth, with a focus on education and employment and support services for victims and families. Though well-intentioned, these programs weren't based in an analysis of serious violence and consequently overlooked significantly important characteristics of Oakland's violence problem: the drivers of violence were primarily group-involved adult men (the average age of a homicide suspect or victim being 30), and the motives of these homicides were primarily personal disputes and running gang conflicts, not economically driven crime such as drug dealing.[3] Furthermore, Oakland's multi-million dollar investment of public funds– matched by very significant private funding– was not coordinated into a unified, citywide strategy, but rather, operated as a series of separate programs functioning semi-independently of each other. In addition to these various programs, youth curfews and gang injunctions were also pursued during this time with no impact on violence. Ceasefire programs

[3] These findings were revealed in a 2013 Oakland homicide problem analysis conducted by the California Partnership for Safe Communities (2014).

were also attempted in both 2006 and 2009, but both efforts were poorly designed and poorly managed and neither achieved citywide implementation.

Despite previously failed attempts to implement the program, community organizations renewed their efforts to pressure the city to adopt Ceasefire in 2011. In 2012, Oakland's Mayor Jean Quan, then Police Chief Howard Jordan, and former City Administrator Deanna Santana engaged with the California Partnership for Safe Communities (CPSC) and the National Network for Safe Communities (NNSC) to learn more about effective Ceasefire strategies. With support from community organizations, the City entered into a contract with CPSC to help design and implement the new Ceasefire effort. CPSC helped city and community partners develop the initial strategy from a problem analysis of homicide, tailor it to Oakland violence and political dynamics, and anchor it inside of a diverse working group referred to as the Oakland Ceasefire Partnership. The Oakland Ceasefire Partnership included local law enforcement, social service agencies, city leaders, and community leaders from local organizations including The Brotherhood of Elders and Oakland Community Organizations (OCO). In contrast to prior efforts, the 2012 Ceasefire was well-designed and included the key elements of fidelity to the Ceasefire model including the assignment of a full-time civilian manager, Reygan Harmon, who would later become the Ceasefire Program Director. This Ceasefire strategy reached full citywide implementation and has successfully reduced violence in Oakland through more than five years in practice.

Ceasefire Objectives and Design

Ceasefire's primary goals are to reduce citywide shootings and homicides, decrease recidivism and improve outcomes for young men at highest risk of violence, and strengthen police-community relations. Resources are focused on those who are determined through careful

analysis and ongoing shooting reviews to be at the highest risk for involvement in violence. The cornerstone of Ceasefire is the partnership of criminal justice and community organizations who deliver a compassionate and respectful anti-violence message to identified high risk individuals and groups. A primary vehicle for communicating this message is the call-in meeting. This meeting consists of direct communication to the selected group of highest-risk people by key figures from affected communities, faith-based organizations, social service agencies and law enforcement. Community-based partners and social service agencies communicate to the young men that they care about their safety and success, but they need the shooting to stop. Law enforcement partners clearly and directly inform them of the legal consequences they can bring upon themselves and the irreparable harm their families will experience if they chose to engage in violence. High-risk individuals are offered opportunities to step away from violence with life coaching (specially tailored, high-intensity case management) and social services if they choose to accept the assistance. Regardless of their decision to accept or reject services, it is emphasized that continued shootings will result in intense law enforcement attention directed toward those who engage in violence.

Oakland's Ceasefire efforts draw on a combination of four areas of theory and practice: a) focused deterrence, b) procedural justice and police legitimacy, c) gang intervention and violence interruption best practice, and d) performance management. Focused deterrence strategies, such as Oakland Ceasefire, require municipalities to follow a problem-oriented policing framework (Braga et al. 2001; Braga, Weisburd, and Turchan 2018). For the strategy to generate violence reduction gains, jurisdictions must customize the intervention to their own operational capacities and distinctive violent crime problem. To ensure that the Ceasefire approach was appropriately suited to the unique context of Oakland, CPSC worked with the

OPD to conduct a problem and opportunity analysis of homicides occurring in an 18-month period between January 2012 and June 2013 to gain a thorough understanding of the city's violence dynamics.

Problem and opportunity analyses generally begin by systematically examining homicide events in a specific jurisdiction. Researchers collect information regarding the circumstances of each homicide, the demographics and criminal history of each victim and offender, and area gang/group dynamics. This analysis reveals patterns of violence and its concentration in particular places and among particular individuals, groups, and social networks. This information is used to determine who is at the highest risk of violence and subsequently directs communication and enforcement actions to those identified groups and individuals. The 2013 Oakland analysis conducted by the CPSC revealed that nearly 53% of the 171 homicides analyzed occurred in East Oakland, and group-involved victims, suspects, or both were involved at least 59%, but up to 84%, of all citywide homicides. Researchers further identified 18 actively violent groups in Oakland who were associated with the majority of violence.

Since strained police-community relations negatively affect community partnerships and hinder violence reduction efforts, it was also important for the Oakland Police Department to adopt and integrate procedural justice practices into its Ceasefire program. Police officers are viewed as procedurally just when they treat citizens with respect, allow them to express their views and concerns, and demonstrate fairness in decision-making (Tyler 1990). Research has consistently found that procedural justice can lead to increased views of police legitimacy which translates to increases in confidence, trust, and cooperation with the police (Mazerolle et al. 2013). By focusing on procedural justice, Oakland aimed to move away from overly harsh tactics that rely on increasing rates of incarceration with little benefit to the community. In order to fully

and effectively integrate these concepts into the Oakland Police Department, key department figures and community partners visited the Chicago Police Department to learn about their innovative procedural justice training and develop a similar curriculum for use in Oakland.

In designing the Oakland program, four components were crucial to achieving the goals of Ceasefire: direct communication of risk, concern, and support through call-ins and custom notifications; intervention and support services that are effective for individuals at the highest risk of violence; focused, strategic enforcement action that quickly and effectively diffuses violent conflicts; and performance management strategies. Moreover, the Oakland Ceasefire implementation was managed through the Ceasefire Program Director who coordinated a dedicated team of cross-sector managers from the police department and the Human Services Department (HSD), active support from the Mayor's Office, the intensive support of the CPSC as a technical assistance partner, and the political advocacy and support of community partners, particularly OCO and Make Oakland Better Now (MOBN). These factors seemed to have sustained the Ceasefire implementation despite difficult and sometimes volatile changes and challenges faced by many cities.

CEASEFIRE IMPLEMENTATION & CHALLENGES

Prior to 2012, Oakland violence did not seem to be meaningfully influenced by previous interventions including youth curfews, gang injunctions, service investments and a series of failed attempts to start Ceasefire-like programs. Even with a 10-year investment of over $80 million dollars into violence prevention and reduction services through Measure Y, homicides rose by more than 25% between 2005-2012 compared to the previous eight years.[4] Keenly aware

[4] According to the FBI's UCR, the average rate of murder and non-negligent homicide in Oakland from 1997-2004 was 22.14. The eight-year average rose to 28.16 from 2005-2012.

of the shortcomings and downfalls of prior initiatives, CPSC and Ceasefire partners worked to strategically focus on only those at the very highest risk of violence as identified by rigorous analysis of shootings, therefore resulting in meaningful reductions in shootings and homicides. To guarantee sustained performance and reductions, they also took steps to build organizational capacity and fully integrate this focus into the City of Oakland, including the Mayor's Office, Human Services Department, and OPD.

Understanding the Nature of the Problem

In order to address complex social problems, the underlying conditions and dynamics that cause problems to recur need to be identified and well understood. The initial strategy design in Oakland began with a problem and opportunity analysis to achieve a more in-depth understanding of the city's serious violent crime problem. As suggested above, problem analyses to frame focused deterrence interventions involve a detailed and comprehensive analysis of local serious violent crime dynamics and includes exercises to understand the characteristics of those involved in homicide and the role of groups and networks in fostering ongoing violence. The initial problem analysis examined 171 homicides between January of 2012 and June of 2013.

The problem analysis revealed that the nature of Oakland's violence was significantly different than commonly believed (that is, that homicides were mostly driven by drug disputes and largely involved juveniles who were not connected to criminally-active groups and gangs). The small group of people involved in homicide in Oakland as victims or suspects were much older (the average age is 30), more heavily justice system involved (averaging 12 prior arrests), and more connected to identifiable street groups and gang networks. The majority of homicides (59-84%) involved gang / group members as victims or suspects and were primarily driven by ongoing conflicts between gangs/ groups or between gang/ group members who used violence to

resolve personal disputes. Drugs played only a minor role in homicide (California Partnership for Safe Communities, 2014). These findings are generally consistent with a recently updated problem analysis (Table 1) covering 2016 to June 2017 (California Partnership for Safe Communities 2018).

Both problem analyses furthermore revealed a concentration of violence among specific groups. In homicides occurring between January 2016 and June 2017, ten groups were identified as being involved in three or more homicides as either victims or suspects. Of those groups, 80% were also identified as highly criminally active and involved in three or more homicides between January 2012 and June 2013. The problem analyses also indicated that violence among group-involved individuals resulted from conflicts among predominantly African-American gangs/groups located in East and West Oakland as well as a meaningful set of conflicts among Hispanic gangs/groups. The likelihood of group-involved violence is further exacerbated by

Table 1: Oakland Homicide Victims and Suspects				
	2013 Problem Analysis		2017 Problem Analysis	
	Victims	Suspects	Victims	Suspect
Sex				
Male	84%	94%	89%	89%
Female	16%	6%	11%	11%
Race				
Asian/Pacific Islander	8%	6%	0%	5%
Black	78%	82%	67%	71%
Hispanic	9%	11%	24%	21%
White	5%	2%	7%	3%
Age				
17 and under	8%	15%	4%	11%
18-24	36%	36%	37%	47%
25-34	30%	33%	27%	24%
35-44	12%	9%	15%	11%
45 and older	14%	7%	18%	8%
Group-Involved				
Yes	47%	53%	46%	51%
No	9%	20%	42%	38%
Unknown	44%	27%	12%	11%

several tight concentrations of criminally active groups and gangs in both East and West Oakland. Overall, these patterns suggested a much more concentrated problem more closely tied to specific group and gang dynamics than previously understood. This also shed light on why prior strategies had likely failed – youth curfews wouldn't address a homicide problem involving adults; and the previous Measure Y investment didn't provide services for people over 24 – as such, more than half of the highest-risk population did not have access to services.

Initial Implementation (2012-2013)

Though previous violence reduction strategies had failed and led to confusion and pessimism amongst local residents, efforts by community organizations to help bring attention to the new Ceasefire program bolstered citizen support. OCO regularly organized night walks in

different neighborhoods throughout the city led by local faith leaders connected to those neighborhoods. Night walks bring together local residents and faith partners to seek to communicate, engage, and build relationships with community members who live in neighborhoods affected by violence. Typically, they take place in communities in which shootings often occur. In addition to generating greater awareness of the Ceasefire strategy, these walks helped create a base of support for Measure Z. Measure Z, passed in 2014, replaced the expired Measure Y and provided ongoing funding for violence intervention and support services which are critical to strategies like Ceasefire.

Preliminary Ceasefire work started in late 2012, and the first call-ins and custom notifications began in October. The first call-in focused on groups and individuals responsible for the majority of violent incidents in East Oakland and took place in the midst of a highly violent gang war. The meeting consisted of approximately 20 high-risk individuals from 10 different groups and gangs connected to the ongoing conflict. This meeting was followed in November and December by a series of one-on-one conversations, or "custom risk notifications," with influential members of the two groups at the center of the violent conflict. These initial call-ins and custom notifications were largely successful, and Ceasefire partners worked together to find opportunities for improvements for a formal implementation in 2013. Partners acknowledged that one important area of improvement was to increase the number of service providers and case managers available to attendees. At the time of the first call-in, the program had only one dedicated case manager and this severely limited their ability to provide adequate services. Additionally, partners recognized the need to find ways to maximize attendance at call-ins since face-to-face, direct communications are critical to the success of the program. A large proportion of probationers and parolees provided false or inaccurate addresses which made it

difficult or impossible to notify them of their required call-in attendance. Therefore, organizers sought to develop an outreach and invitation process that leveraged a range of partners including OPD, probation, parole and faith and community partners.

As the program rollout continued and call-ins proceeded throughout 2013, community partners and law enforcement personnel also focused on methods of easing tension and increasing trust in the process and strategy. Research suggests that procedural justice tactics can improve trust and confidence in the police across a wide range of ethnic and socioeconomic backgrounds (Weisburd and Majmundar 2018). As such, the city viewed the adoption of procedural justice practices in the Oakland Police Department as an essential first step to the long and difficult process of improving citywide police-community relations. In 2013, CPSC organized a workshop in which key police department and community figures attended procedural justice "train the trainer" event at the Chicago Police Department. Chicago's two-day curriculum includes a complementary set of procedural justice, police legitimacy, and implicit bias lessons and has been used to train thousands of Chicago police officers. Following this training event, community and police leaders from Oakland worked to develop a tailored course curriculum to train all officers in the OPD in the historical legacy of policing in communities of color in Oakland, the importance of procedural justice, and the need to invest in trust building with these communities. Importantly, this course was co-taught with community leaders involved in Ceasefire, became the first procedural justice course certified by the California Commission on Peace Officer Standards and Training (POST), and heavily influenced a subsequent "Principled Policing Initiative" by the California Department of Justice to build fluency and support for procedural justice amongst local law enforcement leaders in California.

During this period of initial implementation, several attempts were made to increase organizational capacity. These attempts were met with special difficulty in the wake of the abrupt resignation of then Oakland Police Chief Howard Jordan in May 2013, a key figure responsible for the department's renewed interest and dedication to Ceasefire. Support from command staff is vital to sustaining stable program operations as well as maintaining officer buy-in. Following Chief Jordan's resignation, a flurry of efforts to organize and stabilize the Ceasefire program ensued. Among the command staff, then Assistant Chief Paul Figueroa became a key supporter of Ceasefire, and this support helped stabilize program activities and secure active support from Chief Shawn Whent.

Continued Development (2014-2015)

With CPSC's support, OPD implemented "shooting reviews" that involved frontline officers who helped analyze recent fatal and non-fatal shootings that had occurred throughout the city.[5] Reviewing prior weeks' shootings helped inform Ceasefire personnel of any gang-related conflicts, possible retaliation, and key players. Although shooting reviews began taking place in 2013, they did not become fully developed until late 2014 and early 2015. In this same period, then Assistant Chief Figueroa formed a centralized unit consisting of specialized Ceasefire enforcement teams and placed them under the command of Captain Ersie Joyner and Lt. Tony Jones. These teams were trained to understand and embrace the core goals of the Ceasefire strategy to reduce serious violence and reduce rates of recidivism while also building community trust. Adhering to the values of this mission, enforcement teams used information gathered from shooting reviews to direct intelligence gathering and enforcement actions like social media

[5] See Braga, Hureau, and Grossman (2014) for a general discussion on the use of shooting reviews to manage the implementation of focused deterrence strategies.

monitoring, field-based surveillance, and performing direct communications. In the next four years, the OPD would experience four more changes in leadership, and the shooting reviews, Ceasefire Director, and enforcement teams ensured ongoing, effective program operations. Staying informed of recent shootings, changes in group and gang alliances and conflicts, personal problems that could lead to violence, and influential members returning home from jail or prison all became critical to reducing violence.

Weekly shooting reviews ensured that the program operated effectively, but continued success also relied on the availability of resources and financial support. Funding for the implementation of Ceasefire was provided through Oakland's Measure Y, which allocated resources to the police department and community organizations for violence reduction and community policing efforts. However, Measure Y's funding was set to expire at the end of 2014. Without ongoing resources, the program would have been in serious peril. Several community organizations like OCO engaged in significant efforts to raise awareness and support for Measure Z, which would replace Measure Y and continue funding for violence reduction efforts like Ceasefire. This mobilization of community support led to the passage of Measure Z in 2014. Similar to Measure Y, Measure Z provides ongoing resources for fire and police services, violence reduction efforts, and research and evaluation. However, Measure Z contained a special focus on emphasizing and prioritizing funding for services directed toward those who are identified as being at the highest risk of violence using data-driven approaches like the problem and opportunity analysis and specifically named the Ceasefire strategy as a priority. Funding is provided to organizations responsible for providing a range of services geared toward violence intervention like education, job training, re-entry services, and outreach services. A portion of Measure Z further maintains necessary officer staffing levels and supports OPD initiatives like

intelligence-led policing, responses to domestic violence, community policing efforts, and ongoing operations of the Ceasefire initiative.

Additional support for Oakland's Ceasefire was achieved through Mayor Libby Schaaf's issuance of the city's first Executive Directive in October 2015, which was subsequently updated in 2017. Developed with guidance from CPSC based on their extensive knowledge of the management practices and organization necessary for the city to strengthen and sustain its Ceasefire effort, The Executive Directive put in place a series of measures intended to institutionalize the program and ensure ongoing quality implementation through several performance management strategies. The Oakland Police Department was made responsible for forming a Ceasefire Management Team– reporting directly to the Chief's Office—which meets weekly to review and reassess plans of action. The Directive also guaranteed that the staffing of Ceasefire units, along with a dedicated crime analyst, were prioritized.

Other measures included in the Directive ensured that the Police Department, Human Services Department, and Mayor's Office were jointly responsible for the accountability and success of Ceasefire through the bi-weekly coordination meeting as well as the bi-monthly performance review process specifically tailored to the Oakland Ceasefire strategy. This became part of the three-part partnership-based management system including weekly shooting reviews, bi-weekly coordination meetings, and bi-monthly performance reviews. Shooting reviews examine citywide shootings and violence dynamics to direct resources in efforts to reduce risk and prevent shootings. Bi-weekly coordination meetings gather managers of several outreach and intervention providers together with police department officials to identify and review priorities and ensure follow-through with actions and outreach directed toward the highest risk individuals. Bi-monthly performance review meetings include the Mayor's Office, local agency heads, and

community partners to review recent key activities and review outcomes in order to foster transparency and trust as well as mutual accountability for the effective use of resources. Lastly, the Executive Directive charged both city agencies with developing institutionalization plans, including agency policies, to ensure long-term sustainability of Ceasefire.

Overcoming Instability (2016-2017)

Despite significant efforts to fully integrate Ceasefire into the Oakland Police Department's operations and maintain ongoing stability, a mid-year scandal within the department interrupted a substantial portion of the program's activities throughout 2016. In March 2016, federal investigators took over an internal affairs case involving several officers from OPD and surrounding departments who were patronizing an underage girl. As the investigation proceeded, it resulted in the charging, suspension, or resignation of more than a dozen officers and left the department without a chief. A lack of focus and consistent leadership meant that shooting reviews, intelligence gathering, direct communication and focused enforcement activity all sharply plummeted. In fact, most activity and nearly all performance management strategies came to a halt in the summer of 2016. Direct communications and shooting reviews were sparse and infrequent, and no enforcement operations or performance review meetings took place for months. Beginning in the fall, normal operations gradually returned, but full stability in Ceasefire activity was not again achieved until early 2017. During the second half of 2016, immediately following the scandal, the monthly rate of shootings and homicides in Oakland increased dramatically.

Although the strategy was largely derailed for the second half of 2016, with severe consequences for the rates of fatal and non-fatal shootings in Oakland, several important developments continued to take place within OPD. The police department, in partnership with

the former Director of Public Safety, Venus Johnson, continued to move forward in expanding its procedural justice trainings. This revamping of police procedural justice training included continued training for all staff using the national "Procedural Justice 2" scenario-based training curriculum, the development of procedural justice training for specialized proactive units, and continued work to adhere to procedural justice principles at shooting crime scenes.

In an effort to develop a sustainable stream of officers with the highly specialized skillset necessary to support the Ceasefire Strategy, OPD Ceasefire leaders led by Captain Ersie Joyner utilized curriculum developed and implemented by Sgt. Anthony Tedesco and Sgt. Fred Shavies to establish a "skill development pipeline" oriented around specific competencies, development goals, and training progressions for officers in the Ceasefire section. This included the ability to develop intelligence specifically related to gun violence, intervene in violent conflicts, build community relationships, and reduce shootings with an awareness of minimizing the departments "footprint" on the community.

Additionally, the OPD worked to improve its ability to collect information and develop enforcement plans through the creation of a specialized intelligence cell. This intelligence cell was created in response to a long series of murders occurring in West Oakland. The unit is tasked with collecting any information related to gang/group violence that can then be used to shape call-ins, custom notifications, and enforcement actions. The intelligence cell is currently housed within the specialized Ceasefire unit, coordinates gun violence-related intelligence gathering across the Department and has been touted as being crucial to the implementation of Ceasefire throughout 2017.

ENSURING QUALITY & IMPACT IN OAKLAND

Throughout its five years in practice, the Oakland Ceasefire team developed and continuously improved four core elements which have built upon the program's foundation of careful analysis used to focus on those at very highest risk of violence and formed the key components of Ceasefire's implementation. First, direct communication (call-ins and custom notifications) organized with the help of consistent shooting reviews have ensured regular, quality communication. Second, supports, opportunities, and services are specially tailored to and focused on individuals at the very highest risk of violence with a focus on building relationships and reducing risk of harm. Third, individuals who continue to perpetrate violence are given swift, strategic and proportionate enforcement attention as necessary to prevent further violence. Finally, performance management strategies have helped improve coordination amongst partners, develop both near and long-term strategies, and create accountability for meeting key goals and performance indicators.

Call-Ins and Custom Notifications

Call-ins are face-to-face meetings with community members, social service providers, and law enforcement personnel who deliver Ceasefire's core message of care and concern for those at highest risk of being shot or killed, the legal and personal consequences of violence, and the community's need for these young men to play a leadership role in making the community safe. The message delivered clearly opposes violence from a moral standpoint and communicates the individual consequences of continuing to shoot. Attendees are informed of the severe risks they bring to themselves and those they care about if they are engaged in violence including the legal penalties for specific gun-related crimes and the enhancements on those penalties if the

person who commits them is already a convicted felon, which most participants are.[6] Alongside this no-violence message is a genuine offer of help to those who are interested in receiving support. This can include case management and social services but can also take the form of an ongoing relationship with a "life coach" oriented around managing risk.

Call-ins typically include speakers from a variety of community organizations and criminal justice agencies. Speakers may include faith leaders, outreach and service coordinators, a district attorney, probation/parole personnel, and local police leaders. Additionally, it is important to include speakers who can deliver powerful messages about the tangible effects of violence like trauma surgeons, victims of violence, and formerly incarcerated individuals. In preparing for call-ins, speakers are reminded that an important initial step is making participants feel comfortable and at ease. Speakers help do this through seemingly minor actions like showing participants to their seats, thanking them for coming, and approaching them with a supportive and respectful attitude. Through these interactions with the invited young men, the involved presenters seek to create an environment in which participants are treated with dignity and respect. Each of the included presenters give short speeches of about 2-3 minutes, and they all stress that they are present because they care. The goal of their presentations is to share their desire to see these young men alive, safe, and free while communicating the risks and consequences of continued violence. They emphasize that the lives of the attendees have dignity and value, and though they want to use arrest as a last resort, they will not hesitate to use it if the violence continues.

[6] The 2012-2013 Oakland problem analysis found that about 74% of homicide victims and 72% of homicide suspects had previously been convicted of a felony (California Partnership for Safe Communities 2014). Similarly, the updated 2016-2017 problem analysis found that 72% of homicide victims and 61% of homicide suspects were convicted felons (California Partnership for Safe Communities 2018).

At the end of each call-in meeting, participants have the opportunity to connect one-on-one with service providers and community partners over a shared meal. If they express interest in services and supports, they are assigned a case manager who follows up within 24 hours and then repeatedly thereafter for up to 30 days. Case managers can then connect them with opportunities and support in areas like education, job training, mental health, and legal services. Since the first

Table 2. Oakland Call-Ins and Custom Notifications

Year	Call-In Attendees	Custom Notifications
2012	20	6
2013	63	14
2014	50	85
2015	48	215
2016	46	195
2017	61	260
TOTAL	**288**	**775**

call-in in 2012, over 200 participants have attended these meetings (Table 2). In the past three years, 80% or more of the call-in participants have signed up for the services offered.

The structure of call-in meetings has continued to change in response to feedback from participants, partners and the unique needs of the Oakland community. First, partners ensured that meetings occurred in neutral communities unaffiliated with any groups or gangs. Additionally, in order to maximize meeting attendance and minimize the need to penalize those with false or old address information, a partnership of community leaders, probation/parole, and law enforcement officials were utilized improve the effectiveness of the meeting invitation process. For those with genuine conflicts preventing their attendance, alternative methods of direct communication were used to deliver the message of non-violence, typically in the form of a custom notification. Also important, the number of law enforcement officials present was reduced while the number of service providers was increased. Each of these adjustments were

driven by feedback shared in quarterly focus groups with Ceasefire participants and were viewed as enhancing trust and emphasizing the strategy's focus on service and support with enforcement and incarceration as a last resort.

Custom notifications are a second method of direct communication and are designed to supplement call-ins. Since call-in meetings can only require attendance from those under community supervision, and since they only occur once every few months, officers periodically visit high-risk individuals in their neighborhoods to reach them in a timely manner or to reach those who are ineligible for call-ins. Ideally, custom notifications are delivered by one or two community leaders together with a law enforcement official. Prior to giving a custom notification, law enforcement personnel investigate prior charges, warrants, and consequences faced by friends and family members. Individuals are reminded that continued violence will result in enhanced law enforcement attention.

The first call-in meeting during the preliminary Ceasefire implementation included 20 attendees from the most violent and active groups in East Oakland. However, only about 25% of members in East Oakland's most violent groups were under active community supervision, only half of whom were eligible to be called in. In order to reach other high-risk players, a series of custom notifications were planned with action focused on 8-12 of the most active and influential individuals in these violent groups. Prior to administering the custom notifications, law enforcement personnel pulled each individual's criminal history so that they could discuss his eligibility for enhanced prosecution if he became a focus for enforcement action. Personnel also investigated any charges the individual might have been facing as well as any information about friends who may have been subjected to enforcement action that could be used as examples of the possible consequences he might face. Early on these custom notifications included the

Ceasefire Director, Captain, and Lieutenant but eventually expanded to include community members and representatives from service providing agencies.

During each one-on-one notification, the same message of the call-in meeting was conveyed to the participating individual. Additionally, partners take time to customize each message so that it is impactful. The partners warned some participants that if caught with a gun, they could face federal case adoption because of their criminal history. They reminded others of friends who had been shot and that the same could happen to them or other loved ones. They discussed how ongoing violence could affect them and those they care about. The participants were each informed of the services available to them and opportunities to safely step away from violence. Finally, the participants were told of the ways by which law enforcement, probation/parole, and prosecution personnel could direct attention toward them if they continued to behave violently.

Outreach & Support

A core mission of Oakland's Ceasefire strategy is to achieve reductions in violence and recidivism through outreach and intervention with service and support for those at highest risk of becoming victims or perpetrators of violence. A network of service providers coordinated by the Oakland Unite Section of the Human Services Department was assembled to address the needs of high-risk individuals and connect them to additional services. Call-in meeting participants were able to connect with services and case managers during these meetings, and outreach efforts were organized to connect those receiving other forms of direct communication. Since Ceasefire partners believed that messages would be most effective coming from respected community members, community and faith leaders engaged in outreach with individuals identified as being at risk for involvement in violence. Each individual is provided with a case

manager who provides life-coaching and connects them with additional support based on their specific needs. Services and support may include job training, education, mental health, and legal services, emergency relocation and trauma-informed CBT groups. To enhance the integrity of call-in meetings, Oakland Unite would host feedback sessions after the call-in with participants. These meetings were held with Life Coaches, OU leadership, the Ceasefire Director, the CPSC, but without law enforcement specifically to get the feedback of participants on their experience at the call-in as well as to get their ideas about reducing gun violence. The ideas and solutions from these sessions were made anonymous and shared with the larger Partnership, and where possible, changes were made to the strategy utilizing this feedback.

When Oakland Ceasefire first began and throughout most of 2013, there were no dedicated services and supports for Ceasefire "clients" identified through call-ins and custom notifications. Through technical assistance by CPSC, the passage of Measure Z, advocacy by OCO and careful planning by the City of Oakland's Human Services Department, fourteen dedicated case managers were assigned to specifically work with very high-risk clients identified through Ceasefire. These case managers were also trained to adopt a focus primarily centered around developing trusting relationships with and reducing the risk of harm for Ceasefire clients, rather than only prioritizing traditional service-brokering case management. Toward this end, the Ceasefire case managers are now known as Life Coaches.

Case management typically involves frequent in-person and phone contacts, contact with the client's family members to help support and sustain service engagement, arrangement of appointments and transportation, and employment assistance. Connecting clients with crucial services was made easier because of service prioritization funded by Measure Z. Both employment service providers and housing support organizations receiving Measure Z funds

were required to prioritize services for Ceasefire clients. Measure Z also provided funding for clients to receive an incentive for signing up for life-coaching services and up to $350 per month in stipend rewards for achievements throughout their period of case management. The dedication of life coaches together with the direction of resources to support Ceasefire clients ensure trust-building, skill development, and continued service engagement for individuals who are at the greatest risk of involvement in violence.

Fair and Focused Enforcement

If high-risk individuals continue to participate in violence after call-ins or custom notifications, enforcement efforts are concentrated on those responsible for the greatest amount of violence as determined by rigorous review of each shooting in the City of Oakland every week in the shooting review. Short and medium-term enforcement strategies may include surveillance, wiretap operations, federal adoption of cases, probation/parole searches and compliance checks and GPS monitoring, warrant service and DA-initiated increases in bail terms and changes to pleading guidelines. Generally, most enforcement actions were short, taking less than 60 days, and small, focusing on ten or fewer people. These enforcement actions are specifically designed to interrupt violent conflicts while minimizing the unnecessary use of arrest.

Once individuals and groups self-select for enforcement through involvement in violence, the OPD organizes its intelligence and assembles an interagency enforcement committee to develop and finalize a plan of action. After a series of call-ins and custom notifications in 2013 and 2014, Ceasefire partners identified two groups who continued violence despite multiple warnings and direct communication. Law enforcement first focused their attention on Group A and aimed to target and imprison those actively shooting and those with the most power and

influence to direct violence. They gathered and analyzed intelligence to identify three of the most powerful players as well as several associates who would be likely successors.

OPD utilized numerous internal resources and agency partners in this enforcement action plan. Since group members committed crimes in other towns and cities in the Bay Area, they communicated with outside agencies who may also have an interest in these individuals. Both the FBI and ATF assisted with surveillance, interrogations, and the development of undercover operations. Since group members regularly engaged in fraud as a source of income, the Secret Service also dedicated resources and personnel. Lastly, OPD partnered with the United States Attorney General since the lengthy criminal histories of some members made them candidates for federal prosecution if they were caught with guns. This approach serves to disrupt persistently violent groups and gangs and delivers a message to other associates and gang members citywide that continued shooting will result in a serious, coordinated law enforcement response.

Performance Management

Performance management has been essential to maintaining the success and sustainability of Ceasefire in Oakland. There is a strong need to establish and measure clear indicators to make certain that Ceasefire is approached with the right focus and tactics to reduce citywide violence. Performance management strategies further ensure that community leaders are involved in decision-making and policy development while maintaining transparency with stakeholders. Performance management in Oakland's Ceasefire involves three key components: weekly shooting reviews, bi-weekly coordination meetings, and bi-monthly performance review meetings.

Shooting reviews, as described above, are meetings geared toward reviewing recent violent incidents, identifying and prioritizing potential conflicts and opportunities for retaliation and mediation, and pinpointing priority enforcement targets. In each shooting review meeting, a team consisting of predominantly law enforcement personnel review and systematically analyze each fatal and non-fatal shooting that occurred in the week prior. They begin by discussing basic information about each incident such as the time and place of occurrence and any known involvements. Next, participants engage in additional discussion and analysis of the shooting's motives and circumstances. They discuss groups and networks to which the shooter and/or victim may be connected as well as how the shooting affects the likelihood of retaliation and overall street dynamics. These discussions center on the role that community, intervention, and law enforcement partners can play in a plan of communication, interruption and, if necessary, enforcement action aimed toward halting future violence.

Output information from shooting review meetings is shared with community partners and the managers of the HSD in bi-weekly coordination meetings. Coordination meetings include police, probation and parole, community leaders, and managers who coordinate outreach and life coaching from the HSD and other community organizations. These meetings strongly emphasize confidentiality and **a one-way** flow of information from OPD to Human Services and the community partners to protect line staff safety and credibility. The overarching goal of these meetings is to understand the effects of recent shootings on groups and violence dynamics and then align intervention and support activities and resources to concentrate on highly prioritized individuals, groups, and conflicts. Involved partners utilize information from the shooting reviews to develop near-term strategies for those individuals and conflicts identified as needing

prioritized attention. These near-term strategies may include hospital response, funeral coverage, outreach and case management, and crisis response.

Lastly, in bi-monthly performance review meetings, Ceasefire partners discuss citywide violence trends, outcomes of direct communication and enforcement efforts, and assess opportunities for improvement. Performance review meetings are led by the Mayor, supported by CPSC and include key citywide stakeholders like agency heads, Ceasefire management, and important community leaders. These partners assess progress toward established benchmarks to continually ensure quality implementation. In particular, these benchmarks include assessments of recent shooting trends, call-ins and custom notification activity, outreach and service uptake, and enforcement actions. By assessing these indicators, partners aim to monitor progress, solve operational challenges, and refine strategies to meet changing needs and citywide dynamics.

These performance management strategies have proven especially valuable in identifying large, unexpected shifts in citywide violence. Traditionally, groups in both East and West Oakland remained separated and operated independently in their own regions of the city. However, upon reviewing ongoing violence in multiple shooting review meetings in 2015 and 2016, officials recognized an unusual trend of East Oakland figures shooting in West Oakland and vice versa. Further investigation into these occurrences revealed that several powerful, high-ranking figures had cross-affiliated with other groups as a consequence of open enrollment and prison sentences with other Oakland gang members in the years prior. This cross-affiliation resulted in a citywide violence dynamic that had never previously been encountered in Oakland. Without the aid of shooting reviews and coordination meetings, this emerging citywide dynamic would have taken much longer to discover and resulting violence would have grown much worse. Through performance management strategies like performance review meetings,

information was disseminated through OPD's specialized units, and partners developed approached for each unit to break down and address a piece of the conflict to reduce the power, influence, and violence of these citywide alliances.

CEASEFIRE IMPACT EVALUATION

The City of Oakland, California, has long suffered from high levels of serious violence. Like in other jurisdictions (Braga, Kennedy, and Tita 2002), problem analysis research suggested that the bulk of gun homicides and nonfatal shootings were highly concentrated among a small number of criminally active individuals who were involved in violent conflicts among street groups and gangs. For instance, street group / gang members represented less than 1 percent of the city's population but were involved in nearly two thirds of gun homicides between January 2012 and June 2013. The Oakland Ceasefire program closely followed the key elements of a focused deterrence Group Violence Reduction Strategy (GVRS; see Kennedy 2006). Relevant to our evaluation, the CPSC problem analysis included a group audit was used to identify specific street groups / gangs and their rivalries and alliances with other groups / gangs (Kennedy, Braga, and Piehl 1997; Papachristos and Kirk 2015), and social network analysis was used to target specific groups / gangs and think strategically about the diffusion of the deterrence message to socially connected groups / gangs (Gravel and Tita 2015).

Beyond analytic support, the CPSC remained a key partner in the implementation of the Ceasefire GVRS by working with the OPD to ensure fidelity to core prevention principles, execution of program activities as intended, and robust collaborations with community and social service partners. The OPD led an interagency Ceasefire enforcement group comprised of federal law enforcement agencies (e.g., U.S. Attorney's Office, Federal Bureau of Investigation, and Bureau of Alcohol, Tobacco, Firearms and Explosives) and state and county criminal justice

agencies (e.g., California Department of Justice, California Department of Corrections and Rehabilitation, Alameda County Sheriff's Office, Alameda County Prosecutor's Office, and Alameda County Probation Department). The OPD enforcement actions were coordinated through Ceasefire units (four centralized units of eight officers and one sergeant each) and its intelligence unit that included crime analysts and police officers unit (eight plainclothes officers and detectives).

The broader Oakland Ceasefire Partnership included the Mayor's Office; social service agencies led by the Human Services Department, including case managers, hospital responders, and street outreach workers; and community leaders from local organizations, including The Brotherhood of Elders, Make Oakland Better Now, and Oakland Community Organizations (a faith-based community organization). The Oakland Mayor's Office institutionalized the Ceasefire GVRS program by establishing a directive designating Ceasefire as official city policy and ensuring that the initiative would be managed through weekly shooting reviews, biweekly coordination meetings, and bimonthly performance appraisals.

The Ceasefire GVRS intervention was triggered when specific gangs engaged in serious gun violence. The OPD and enforcement partners developed special enforcement strategies that were customized to the criminal justice vulnerabilities of targeted gangs. These enforcement actions were matched with a parallel effort to direct social services and the moral voices of communities negatively affected by serious gun violence driven by targeted gangs. Importantly, the Oakland Ceasefire Partnership leveraged the structure of gang networks by communicating not only with the targeted group but also their rivals and allies to make sure that they understood the violence prevention regime that was being implemented.

This impact evaluation seeks to examine the effect of the Oakland Ceasefire program on serious violence and individuals at high-risk for engaging in serious violence. First, drawing on place- and group-based quasi-experimental evaluation methods pioneered in Los Angeles and Boston, we test the direct and spillover deterrent effects of the Oakland Ceasefire program. Second, this evaluation engages in individual-level analyses to determine the impact of Ceasefire on participant victimization and arrest outcomes. We examine groups of program participants and groups of non-participants to compare rates of gunshot victimization and arrest in the two years prior and two years following Ceasefire participation. Finally, this study conducts a qualitative assessment of the perceptions and experiences of a variety of local stakeholders concerning Oakland's Ceasefire strategy.

II. PLACE-BASED AND GROUP-BASED ANALYSES

INTRODUCTION

Focused deterrence strategies seek to change offender behavior by understanding underlying crime-producing dynamics and conditions that sustain recurring crime problems and by implementing a blended strategy of law enforcement, community mobilization, and social service actions (Kennedy 1997, 2008). Direct communications of increased enforcement risks and the availability of social service assistance to target groups and individuals are defining characteristics of focused deterrence. The available scientific evidence suggests that focused deterrence programs are effective at controlling street group and gang violence. A recently updated Campbell Collaboration systematic review found that focused deterrence programs were associated with significant crime reduction impacts, with GVRS programs generating the largest crime reduction effects (Braga et al. 2018). Further, the National Academies' Committee on Proactive Policing concluded that "evaluations of focused deterrence programs show consistent crime-control impacts in reducing gang violence" (Weisburd and Majmundar 2018:175).

GVRS focused deterrence strategies intentionally exploit social ties among gangs and criminally active groups to produce spillover violence reduction impacts. The updated Campbell review found that only 2 of the 12 identified GVRS program evaluations conducted supplemental analyses to determine whether the intervention generated spillover violence reductions for untreated groups that were connected to treated groups through ongoing rivalries and alliances (Braga et al. 2018). These two program evaluations used different place-based and group-based approaches when measuring spillover deterrent impacts. The Los Angeles Ceasefire GVRS analyzed serious violent crime trends in proximate census block groups with untreated gangs socially tied to treated gangs in targeted block groups, relative to serious violent crime

trends in matched untreated block groups (Tita et al. 2003). In contrast, an evaluation of a revitalized Boston Ceasefire GVRS analyzed shootings by and against matched untreated gangs that were socially connected to treated gangs, relative to matched untreated gangs not socially connected to treated gangs (Braga, Apel, and Welsh 2013). Both evaluations reported significant spillover violence reductions generated by the respective GVRS programs.

GVRS programs, such as Oakland Ceasefire, are intended to generate citywide reductions in serious violence in the near term by preventing gangs/groups not directly treated by the intervention from continuing their violent behavior. The communication strategy is explicitly designed to create "spillover effects" onto other gangs/groups through their social connections to targeted gangs/groups within the larger city network of conflicts and alliances (Kennedy, Piehl, and Braga 1996). For instance, the seminal Operation Ceasefire working group in Boston marketed enforcement actions, such as the apprehension and prosecution of 23 well-known Intervale gang members, to other Boston gangs as credible examples of the increased apprehension risks generated by the new deterrence regime that was being imposed on violent gangs in the city (Kennedy, Braga, and Piehl 2001). The Indianapolis Violence Reduction Partnership working group included the arrest and prosecution of 15 highly violent Brightwood gang members in their "zero tolerance for violence" message as a tangible warning of the enhanced sanction risks associated with continued violent gun behaviors (McGarrell et al. 2006).

METHODS

Cross-City Evaluation

The key outcomes in our assessment of the impact of the Ceasefire intervention were the citywide monthly counts of homicides and gun homicides in Oakland between January 1, 2010 and December 31, 2017. Oakland homicide and gun homicide data used in these analyses were

provided by the OPD. As Figure 1 suggests, monthly counts of gun homicides in Oakland were distributed in the form of rare event counts, suitable for analysis with Poisson regression, or negative binomial regression when the sample count distribution exhibits overdispersion. The negative binomial regression model is an extension of the Poisson regression model that allows the conditional variance of the dependent variable to exceed the conditional mean through the estimation of a dispersion parameter (Long 1997). Using Deviance and Pearson goodness-of-fit tests, the outcome variable distribution was found to be significantly different from a Poisson process (Deviance goodness-of-fit = 127.99, $p < .01$; Pearson goodness-of-fit = 122.28, $p < .05$). Therefore, we can conclude that the distribution of monthly gun homicides was overdispersed and we model gun homicides using negative binomial regression models.

In addition to determining the nature of the outcome variable distribution, there are three sources of noise in any time series which could confound intervention effects: trend—the series could drift upwards or downwards; seasonality—the series could spike at different times (e.g., gun homicides increase in summer months); and random error—observations could fluctuate randomly around some mean level (McDowall, McCleary, Meidinger, and Hay 1980). If a time-series model does not account for these sources of error, the intervention analysis will be confounded.

To account for trends in the time series, we included a simple trend variable for linear trends and a trend-squared variable for curvilinear trends. The trend variable was calculated as the month number from the start to the end of the time series (i.e., for the January 2010 through December 2017 series, the trend variable ranged from 1 to 96). The trend-squared variable was calculated by taking the square of the trend variable. In order to account for seasonal effects in our model, we included dummy variables for each season minus one.

To identify whether there was a serial autocorrelation component, we analyzed the pre-intervention time series. We used Auto Regressive Integrated Moving Average (ARIMA) models to detect whether the monthly counts of gun violence events were serially autocorrelated (i.e., the number of gun homicides in January 2010 was significantly correlated with the number of gun homicides in February 2010, and so on) (McDowall et al. 1980). The pre-intervention time series data did not show significant serial autocorrelation: (1) we did not detect statistically significant nonseasonal serial autocorrelation in the time series data using an ARIMA (1,1,1) model (Nonseasonal AR(1) = –.06, $z = -.32$, $p = .747$); (2) we also ran an ordinary least squares regression model and analyzed the residuals using the Durbin–Watson Test (result = 2.179). According to Pindyck and Rubinfeld (1991), the Durbin–Watson Test ranges from 0 to 4, and first-order serial correlation does not exist when the Durbin–Watson statistic is close to 2. Based on these tests, we concluded that the pre-intervention time series data did not show significant serial autocorrelation, and we did not estimate an AR(1) autoregressive component in our model.

We also included covariates to control for any changes in the monthly counts of gun homicides that could be associated with changes in Oakland's population size or existing secular violent crime rate trends. A binary dummy variable indicating whether the Ceasefire intervention was present (2013–2017) or not (2010–2012) was constructed to estimate the effects of the intervention on the monthly counts of gun homicides.

The basic model is as follows:

$$\begin{aligned}\text{Monthly Count of Gun Homicides} &= \beta_0 + \beta_1(\text{Ceasefire Intervention}) + \beta_2(\text{Violent Crime Rate}) \\ &+ \beta_3(\text{Population}) + \beta_4(\text{Trend of Gun Homicides}) + \beta_5(\text{Trend}^2) \\ &+ \text{Seasonal Dummy Variables} + \text{Error}\end{aligned}$$

We analyze the data in Stata 15 statistical software, using Huber/White/sandwich robust variance estimators to ensure that the coefficient variances were robust to violations of the homoskedastic errors assumption of linear regression models. We display the parameters for the independent variables as incidence rate ratios (i.e., exponentiated coefficients).

Table 3 presents the results of the negative binomial regression model. Controlling for the other predictor variables, the Ceasefire intervention was associated with a statistically significant 31.5 percent decrease in the monthly count of gun homicides (p = .047). Additionally, monthly counts of gun homicides in Oakland were positively associated with the simple linear trend variable (p = .006) and inversely associated with population size (p = .011). Controlling for the other covariates, the citywide violent crime rate, the curvilinear trend variable, and the seasonal effect dummy variables were not statistically significant.

Table 3. Results of Negative Binomial Regression Model Predicting the Monthly Counts of Gun Homicides in Oakland from 2010-2017, Controlling for Population Trends, Violent Crime Trends, Linear Trends, Nonlinear Trends, and Seasonal Effects

Variable	IRR	Robust SE	Z	P>|Z|	95% CI LL	95% CI UL
Ceasefire intervention	0.68589*	0.13010	-1.99	0.047	0.47293	0.99473
Violent crime rate	1.00026	0.00033	0.79	0.428	0.99961	1.00092
Population	0.99991*	0.00004	-2.53	0.011	0.99983	0.99998
Trend	1.03219**	0.01193	2.74	0.006	1.00908	1.05584
Trend^2	1.00009	0.00012	0.71	0.476	0.99985	1.00033
Seasonal Effects[a]						
Spring	1.06922	0.14055	0.51	0.611	0.82637	1.38343
Summer	1.07368	0.11278	0.68	0.499	0.87390	1.31913
Fall	0.96908	0.12171	-0.25	0.803	0.75763	1.23954

Pseudo R^2 = 0.0438
Log pseudolikelihood = -233.66
Wald $\chi^2(8)$ = 27.13***
Observations (Years x Months) = 96

Abbreviations: IRR = incident rate ratio; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit

[a]Reference category = Winter
*p<.05; **p<.01; ***p<.001

Gun Homicides in Oakland Relative to Gun Homicides in Other California Cities

Although the within-Oakland analyses support the assertion that a significant reduction in gun homicides was associated with the Ceasefire intervention, it is necessary to determine whether gun homicide trends in Oakland were part of a broader statewide trend. The following exploratory analyses provide insight on whether Oakland's reduction in gun homicides was part of existing trends in California and whether the program impact associated with the Ceasefire intervention was distinct from gun homicide trends in other California cities.

Our analyses focus on the following twelve cities in California: Alameda, Anaheim, Bakersfield, East Palo Alto, Fresno, Long Beach, Richmond, Riverside, Sacramento, San Francisco, Santa Ana, and Stockton. Table 4 displays violent crime rates for the sample cities, available through the FBI's Uniform Crime Reports; and population, racial composition, poverty, and employment data, available from the U.S. Census Bureau. All but two of these cities (Alameda and East Palo Alto) had a population over 100,000 residents and higher than average

Table 4. Demographic, crime, and employment data for Oakland and cities used in comparison analysis, 2013

Variable	Population	Violent Crime Rate per 100,000	Percent black	Percent persons below poverty	Unemployment rate
Oakland	397,011	1,976.8	28.0	20.4	33.0
Fresno	500,819	501.5	49.6	29.8	38.4
Sacramento	471,477	656.0	45.0	22.0	36.6
Stockton	294,406	1,208.2	37.0	25.3	40.4
Santa Ana	328,719	336.8	45.9	22.1	33.4
Anaheim	340,081	327.2	52.7	16.5	32.4
Long Beach	465,424	499.5	46.1	20.6	34.4
Riverside	309,150	420.3	56.5	18.8	36.9
Bakersfield	352,918	513.2	56.6	19.8	35.4
Alameda	74,818	207.3	50.8	9.8	33.1
San Francisco	817,501	847.1	48.5	13.2	30.6
Richmond	105,280	1,036.0	31.4	17.5	34.7
East Palo Alto	28,597	1,193.0	38.6	16.6	26.8

Notes: Violent crime data are available from the FBI's Uniform Crime Reports. Population, racial composition, poverty, and employment data are available from the U.S. Census Bureau.

violent crime rates. These cities have also been used for crime-based comparison analyses for California in prior studies (Braga 2008; McCarthy and Lawrence 2014).

We specified city-specific regression models to maximize our ability to control for the various sources of error in the time series of each city. We analyzed monthly counts of gun homicides for each city, gathered from the FBI's Supplementary Homicide Reports (SHR). The results are displayed in Table 5. Although the models control for linear and curvilinear trend variables, violent crime rate, population size, and the seasonal dummies, as specified above, the results for these variables are suppressed in the table. Also note that we used Deviance and Pearson goodness-of-fit tests to specify the correct model (Poisson or negative binomial), as displayed in the table.

Table 5 presents the results of the final Poisson and negative binomial models, displaying the incidence rate ratios for the Ceasefire intervention dummy variables. Four of the twelve comparison cities in California (Santa Ana, Long Beach, Alameda, and East Palo Alto) experienced non-significant increases in the monthly count of gun homicide after the Ceasefire intervention fully commenced in January 2013. Six of the twelve comparison cities (Fresno,

Table 5. Results of Poisson and Negative Binomial Regression Models Predicting the Monthly Counts of Gun Homicides in Comparison Cities from 2010-2016,[a] Controlling for Population Trends, Violent Crime Trends, Linear Trends, Nonlinear Trends, and Seasonal Effects

Variable	Model	Ceasefire IRR	Robust SE	Z	P>|Z|	Log pseudolikelihood
Fresno	NB	0.8217	0.2560	-0.63	0.528	-189.25
Sacramento	NB	0.7530	0.2199	-0.97	0.331	-192.89
Stockton	NB	0.4363**	0.1230	-2.94	0.003	-180.88
Santa Ana	Poisson	1.3095	0.5685	0.62	0.534	-106.17
Anaheim	Poisson	0.3181	0.1917	-1.90	0.057	-84.00
Long Beach	NB	1.2669	0.5655	0.53	0.596	-145.69
Riverside	NB	1.2187	0.5703	0.42	0.672	-142.99
Bakersfield	NB	0.5245	0.2493	-1.36	0.175	-138.66
Alameda	Poisson	1.4492	1.5179	0.35	0.723	-62.69
San Francisco	NB	0.5491*	0.1672	-1.97	0.049	-175.92
Richmond	NB	0.7627	0.3521	-0.59	0.557	-135.62
East Palo Alto	Poisson	1.2064	0.7498	0.30	0.763	-68.21

Abbreviations: IRR = incident rate ratio; SE = standard error

[a]The study period for comparison cities is restricted to 2016 because 2017 homicide and gun homicide information was not yet available at the time of analysis.

*$p<.05$; **$p<.01$; ***$p<.001$

Sacramento, Anaheim, Riverside, Bakersfield, and Richmond) experienced non-significant decreases in gun homicide from 2013 through 2016. Controlling for violent crime, population size, existing trends, and seasonal variations, only Stockton ($p < .01$) and San Francisco ($p < .05$) experienced statistically significant decreases in monthly counts of gun homicides after Oakland implemented its Ceasefire intervention.

Within-City Evaluation Design

We use nonrandomized, quasi-experimental designs to compare shooting trends for Oakland gangs/groups and census block groups that experienced Ceasefire treatment to shooting trends for comparison Oakland gangs/groups and census block groups, respectively, that did not directly receive the Ceasefire treatment (Shadish, Cook, and Campbell 2002). The place impact (block group) evaluation was also designed to test whether untreated block groups immediately surrounding matched treated block groups experienced spatial shooting displacement or diffusion of crime control benefits impacts relative to untreated block groups surrounding matched untreated block groups. The group impact evaluation was likewise designed to consider the main program effects on the shooting behaviors of directly treated gangs/groups and whether there were any spillover program effects on the shooting behaviors of vicariously treated gangs/groups relative to untreated gangs/groups.

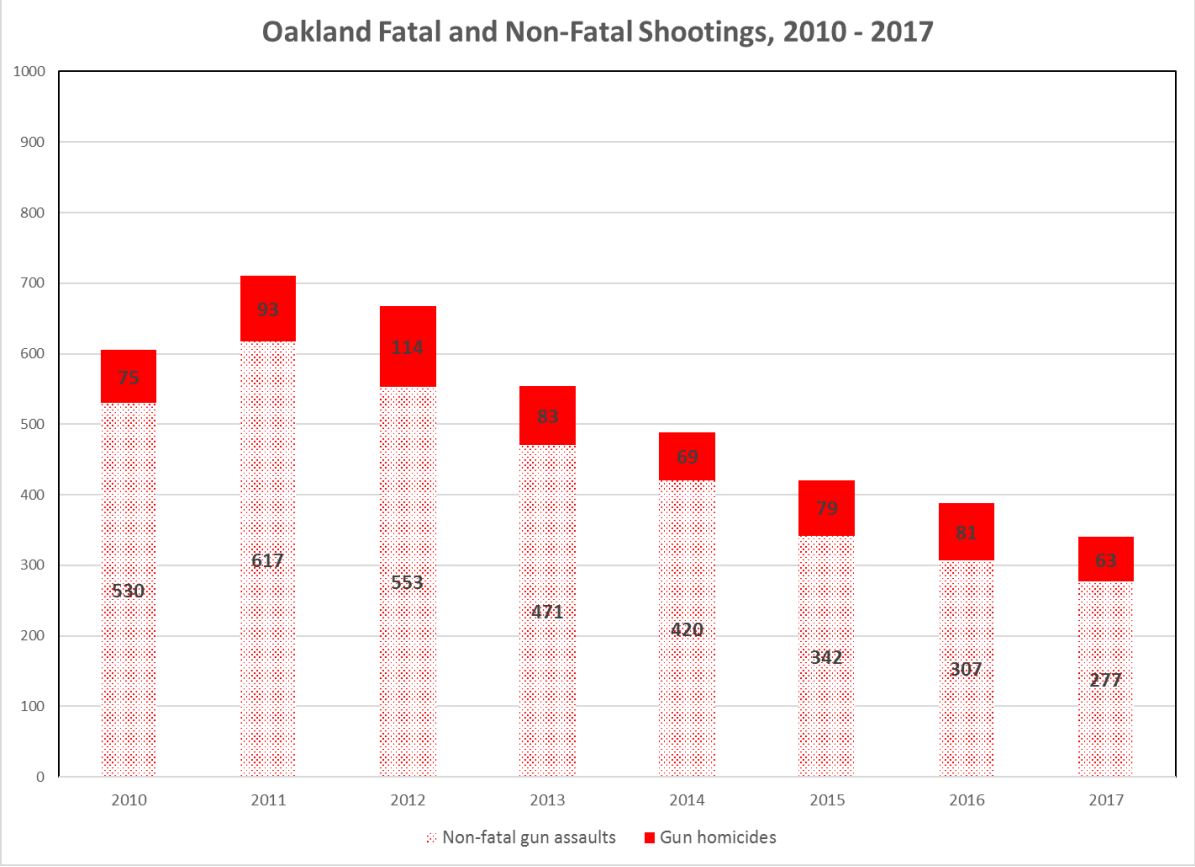
The Oakland Ceasefire program was explicitly designed to ensure that knowledge of Ceasefire actions would diffuse to non-Ceasefire rivals and allies and therefore influence these groups' own shooting behaviors. The inclusion of census block groups that were immediately adjacent to treated block groups and non-Ceasefire gangs that were socially connected to Ceasefire gangs in the comparison groups would violate the "stable unit treatment value assumption" (SUTVA). As suggested by Rubin (1990), SUTVA requires that an outcome

observation on one unit should be unaffected by the particular assignment of treatments to the other units. To safeguard against interference between units, our quasi-experimental designs considered the adjacent census block groups and vicariously treated gangs/groups that were known to have a rivalry or an alliance with a Ceasefire gang/group.

Data and Units of Analysis

Serious gun violence was measured by using computerized records of OPD official reports of Homicide by Firearm (CA Penal Code 187 [A]) and Assault with a Firearm on Person (CA Penal Code 245 [A][2]) incidents between January 1, 2010, and December 31, 2017. Oakland experienced a total of n = 4,174 fatal and nonfatal shooting victimizations during the

Figure 5. Oakland Gun Homicides and Nonfatal shootings, 2010–2017.



study period. Figure 5 presents the yearly counts of fatal and nonfatal shooting victimizations. Total Oakland shooting victimizations peaked at 710 in 2011 (93 fatal victims and 617 nonfatal victims) and decreased by 52.1 percent to a low of 340 in 2017 (63 fatal victims and 277 nonfatal victims).

The CPSC provided us with OPD problem analysis data that included detailed historical information on the number of members, turf locations, rivalries, and alliances for each Oakland gang/group during the study period.[7] We used block groups as the spatial units of analysis because block groups represent the most granular spatial level connected to gangs/groups that were directly treated by the Ceasefire intervention.[8] Gang turf boundaries were translated from a physical map with drawn-on boundaries from the CPSC to a digital map in ArcGIS [version 10.6.1] where polygons were created to designate gang turf boundaries. Gang turf locations were then connected to census block group geography from the 2016 U.S. census. This process identified block groups (n = 374) that contained geographical space within the city of Oakland, of which one half (n = 187) contained at least one gang/group. OPD shooting data included event addresses, which were geocoded to longitude/latitude coordinates and assigned to block groups.[9]

[7] The OPD and California Partnership for Safe Communities (CPSC) conducted three problem analyses during the study time period: 2010, 2013, and 2017. The 2010 problem analysis was used to investigate the plausibility of implementing a focused deterrence program, but the City of Oakland did not implement a program at that time. OPD uses gang and gang membership definitions in CA Penal Code 186. For instance, a "criminal street gang" is defined in section 186.22, subdivision (f), as "an ongoing organization, association, or group of three or more persons, whether formal or informal, having as one of its primary activities the commission of one or more of the criminal acts enumerated in paragraphs (1) to (25), inclusive, of subdivision (e), having a common name or common identifying sign or symbol, and whose members individually or collectively engage in or have engaged in a pattern of criminal gang activity. This definition may be broken into three elements: 1. Ongoing organization of three or more persons with a common name or sign or symbol; 2. Primary activity is the commission of one or more of the 25 offenses in subdivision (e) (or at least one of the first 25 and one of (26)-(30), per subd. (j)); and 3. Members individually or collectively engage in or have engaged in a 'pattern of criminal gang activity.'"

[8] We also considered blocks and census tracts as units of analysis. Census tracts were too broad, as they were often comprised of both rival and alliance gangs. Street segments and specific blocks were too refined as a spatial unit to capture meaningful variation in shootings and homicides over time.

[9] After geocoding via ArcGIS and searching remaining addresses by hand to obtain X, Y coordinates and census geography, we were able to geocode 91 percent of nonfatal shootings and 98.3 percent of homicides via ArcGIS.

Gang or group involvement in fatal and nonfatal shooting victimizations between 2010 and 2017 was determined through the use of "crime incident reviews" (see Klofas and Hipple 2006). To facilitate the design and implementation of Ceasefire, the OPD convened a series of shooting review meetings attended by experienced homicide detectives, gang unit officers, and crime analysts. The meeting participants shared their qualitative insights on circumstances of the shooting event, the relationships between victims and suspects, and details on the gangs/groups (if any) involved in the shooting. For this evaluation, all shooting data were also subjected to a retrospective review by well-informed detectives and gang officers to ensure that prior attributions on gang/group involvement remained accurate as additional intelligence was acquired over time. A total of n = 2,021 (48.4 percent of 4,174) fatal and nonfatal shootings involved gang or group members as victims, offenders, or both. The shooting review data suggested that distinct gangs/groups (n = 76) were involved in more than one shooting incident between 2010 and 2017.[10]

Official crime incident data suffer from well-known limitations such as citizens not reporting all crimes to the police and police decision-making on whether a reported event should be recorded as a crime incident (Black 1970). Police-reported data on gang activity and violence, however, have been found to be valid and reliable indicators of gang violence. For instance, Decker and Pyrooz (2010) reviewed police reports of gang homicides in large U.S. cities and found that these data had consistent internal reliability, strong construct validity, and robust

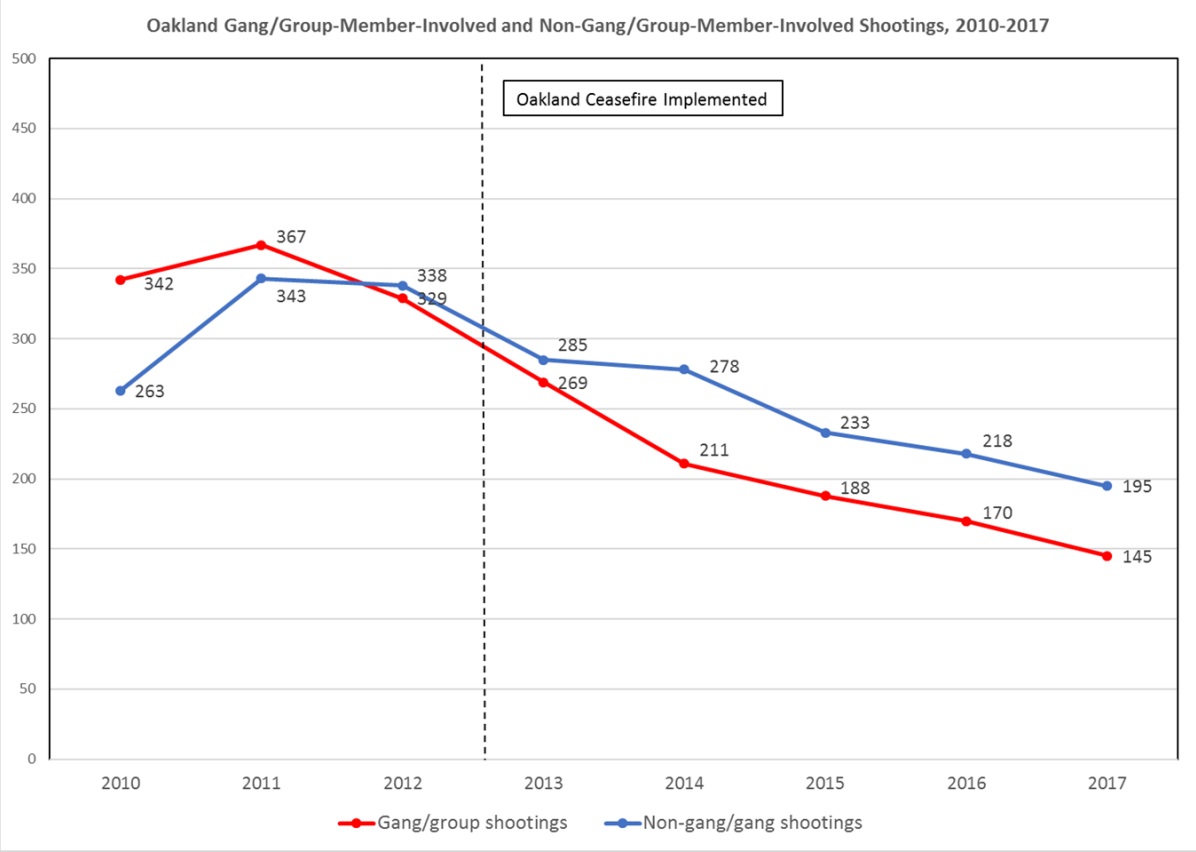
The most common reasons that a shooting or homicide could not be geocoded included: (1) the address provided was a highway, (2) no address number or cross street was provided, and (3) the address was outside of Oakland city limits.

[10] A total of 114 gangs/groups with different names were identified in the shooting review data. We aggregated shooting data for groups that changed gang names, such as those who evolved into different gangs or for smaller groups that consolidated into larger groups. We also excluded gangs with only one shooting during the study period that no longer existed in Oakland (e.g., one group was considered defunct due to gentrification in their neighborhood).

external validity. Police departments with gang units, such as OPD, were noted to generate more reliable and valid indicators of gang violence relative to police departments without such units (Katz, Webb, and Schaefer 2000).

Figure 6 presents the yearly count of fatal and nonfatal shooting incidents that did and did not involve group members between 2010 and 2017. Both group-member-involved and non-group-member-involved shooting incidents decreased markedly during the study time period. However, the decrease in group-member-involved shootings was steeper than the decrease in non-group-member-involved shootings after the Ceasefire GVRS was implemented in 2013. The

Figure 6. Oakland group-member-involved and non-group-member-involved shootings, 2010–2017.



yearly mean number of group -member-involved shootings decreased by 43.2 percent from 346.0 during the preintervention years (2010–2012) to 196.6 during the intervention years (2013–2017). By comparison, the yearly mean number of non-group-member-involved shootings decreased by only 23.2 percent from 314.7 during the preintervention years (2010–2012) to 241.8 during the intervention years (2013–2017).

Quarterly counts of shootings by and against particular Oakland gangs/groups between 2010 and 2017 were the units of analysis in our group impact evaluations. To provide more stable estimates of the impacts of the Ceasefire GVRS on shootings and homicides across Oakland block groups, the units of analysis in our place impact evaluation were annual counts of fatal and nonfatal shootings in Oakland block groups—or block group years—between 2010 and 2017. Approximately 83.4 percent (n = 311) of Oakland's block groups had at least one shooting between 2010 and 2017.

WITHIN-CITY PLACE IMPACT EVALUATION

Design

In the within-city place impact evaluation, treated block groups contained at least one gang/group that received the Ceasefire intervention during the study period (n = 93; 24.9 percent). Block groups with more than one gang/group were considered "treated" from the month of intervention with the first gang. A block group was considered untreated if it did not intersect with gang turf or if it included gang turf but none of the gangs/groups within the block group were treated. Additionally, to estimate spatial displacement and diffusion effects, we excluded all untreated Oakland block groups that were geographically adjacent to the Ceasefire

block groups from consideration as comparison groups in our quasi-experimental evaluation.[11] This process resulted in block groups (n = 189) that were not spatially connected to the Ceasefire block groups (n = 93) as possible comparison groups.

Stata 15 statistical software was used to execute PSMATCH2 propensity score matching routines (Leuven and Sianesi 2003) to develop matched treatment and comparison block groups from the Ceasefire and untreated block groups (n = 282). Propensity score matching routines summarize relevant pretreatment characteristics of each block group into a single-index variable—the propensity score—and then match block groups in the comparison pool to Ceasefire block groups on values of the propensity score (Rosenbaum and Rubin 1985). Radius matching with a caliper = .01 was selected from the diverse pool of propensity score matching techniques (Apel and Sweeten 2010). After the maximum propensity score caliper is established, this algorithm matches all untreated units within the given radius of a treated units (Caliendo and Kopeinig 2005 ; Dehejia and Wahba 2002). The propensity score matching routine included the following characteristics:

1. Number of total shootings in each block group in 2010 (pre-Ceasefire).
2. Number of total shootings in each block group in 2011 (pre-Ceasefire).
3. Number of total shootings in each block group in 2012 (pre-Ceasefire).

The Ceasefire intervention was more likely to be applied to block groups that experienced persistently high yearly counts of shootings. To ensure similar levels of gun violence over the preintervention time period, three covariates measuring

[11] A similar approach was previously used by Braga, Hureau, and Papachristos (2011) to evaluate displacement and diffusion effects associated with a hot spots policing program. Using ArcGIS mapping software, we created a matrix of block group adjacency where a tie occurs if any side of a block group polygon touches at least one side of a Ceasefire treated block group (queen weights).

the yearly number of shootings in eligible Oakland block groups were included in the propensity score model.

4. Number of unique gangs/groups in each block group during the study period.

   Gangs/groups engaged in serious gun violence are targeted for Ceasefire attention. Gangs/groups located in close spatial proximity, especially when their turfs are adjacent, are more likely to be involved in violent conflicts (Tita and Greenbaum 2009; Tita and Radil 2011).[12]

5. Concentrated disadvantage.

   Research reveals that the degree of concentrated social disadvantage in a neighborhood is strongly correlated with the concentration of violent crime (Morenoff, Sampson, and Raudenbush 2001) and gang crime in these areas (Papachristos and Kirk 2006 ; Rosenfeld, Bray, and Egley 1999). An index measuring concentrated social disadvantage was calculated by standardizing and summing the following block group–level variables from the 2016 U.S. Census's American Community Survey (ACS): the proportion of families below the poverty level, proportion of households receiving public assistance, proportion of female-headed households with children, and proportion of the population unemployed.[13]

[12] As described above in note 8, the OPD and CPSC conducted three problem analyses during the study time period: 2010, 2013, and 2017 that followed the same approach used by Kennedy et al. (1997) to identify gang turf locations drawing on the experiential knowledge of seasoned gang investigators on the places claimed by Oakland gangs/groups. Participants in a gang audit session identified specific gang/group turf boundaries based on their experiences repeatedly interacting with gang/group members at specific locations and investigating particular gang/group crimes. The research team convened another working group of OPD gang experts to review the three maps from different years to develop a final Oakland gang turf map of stable turf locations between 2010 and 2017.

[13] These indicators loaded on a single factor and had a Cronbach's reliability coefficient of .73.

6. Racial and ethnic heterogeneity.

   A measure of racial and ethnic heterogeneity was constructed from the 2016 ACS using Blau's (1977) index by summing the squared proportion of the population in each racial/ethnic group and then subtracting this summation from 1.[14]

7. Gentrification.

   Using information from the ACS, we calculated whether or not (1 = yes, 0 = no) the percent increase in educational attainment, median income, and home value in each of Oakland's census tracts from 2010 to 2016 was greater than the average percent increase in these attributes across the city of Oakland as a whole.[15] Census tracts with a larger percent increase than the city of Oakland for any two of these three indicators were considered gentrified. Block groups were then assigned the gentrification value of the broader census tract.

The propensity score matching routine results are presented in Table 6. This includes the prematching and postmatching means for the 47 matched Ceasefire block groups and the 95 matched comparison block groups, t-tests and p values, and standardized bias statistics showing the average difference as a percentage of the mean standard deviation between the groups (Rosenbaum and Rubin 1985).[16] Table 6 confirms that the matched sample created balanced

[14] The equation for this measure is: $1 - \sum \pi 2$, where π is the proportion of the population in each racial/ethnic group (Hispanic, Non-Hispanic Black, Non-Hispanic White, Non-Hispanic American Indian or Native Alaskan, Non-Hispanic Asian, Non-Hispanic Native Hawaiian or Pacific Islander, Non-Hispanic Other, Non-Hispanic Biracial).

[15] Gentrification is often measured at the census tract level because change over time is typically not isolated to smaller geographical units such as block groups. Moreover, information on educational attainment, median income, and home value was not available for study block groups.

[16] The 46 unmatched, treated block groups that were dropped from this stage of analysis differed noticeably from the 47 matched, treated block groups that remained. In particular, the unmatched, treated block groups represented the block groups with the highest levels of violence that had no suitable control group. For comparison purposes, the

treatment and comparison groups as all p values are higher than .05 and the bias statistics are generally less than 20.0 (Austin, Grootendorst, and Anderson 2007). The propensity score matching routine indicated that the 47 matched Ceasefire block groups and the 95 matched comparison block groups were in the common support region, ensuring that block groups with the same values of covariates have the same probability of being treated and untreated (Heckman, LaLonde, and Smith 1999).

Table 6. Balancing Treatment and Comparison Block Groups through Propensity Score Matching

Characteristics	Treated	Untreated	% Bias	% Bias Reduction	*t* test	p>|*t*|
Total shootings 2010						
Unmatched	4.28	0.81	132		11.97	<0.000
Matched	3.15	2.82	12.7	90.4	0.64	0.525
Total shootings 2011						
Unmatched	5	1.06	141.5		12.45	<0.000
Matched	3.6	4.1	–17.9	87.3	–0.80	0.424
Total shootings 2012						
Unmatched	5.33	1.4	134.6		11.52	<0.000
Matched	3.87	3.33	18.7	86.1	0.93	0.352
Number of gangs/groups						
Unmatched	2.16	0.49	177.6		14.24	<0.000
Matched	1.94	2.12	–19.9	88.8	–0.71	0.482
Gentrified						
Unmatched	0.48	0.42	12.1		0.96	0.337
Matched	0.51	0.41	20.9	–72.0	1.01	0.316
Concentrated disadvantage						
Unmatched	0.76	–0.26	103.5		8.71	<0.000
Matched	0.34	0.48	–13.8	86.6	–0.80	0.423
Racial and ethnic heterogeneity						
Unmatched	0.61	0.59	18.1		1.36	0.175
Matched	0.63	0.61	19.6	–8.2	0.95	0.345

N = 142 (47 treated block groups, 95 comparison block groups)

Note: Results based on radius matching propensity score model (caliper = 0.01)

unmatched, treated block groups had an average annual count of 5.17 shootings from 2010 to 2017, while the matched, treated block groups had an average annual count of 3.16 shootings from 2010 to 2017.

The annual change in shootings for treatment and comparison block groups over the eight-year observation period (2010–2017) was analyzed using a multilevel count regression model.[17] Individual growth curve models using longitudinal, hierarchical negative binomial models were developed to predict within-unit variation at level 1 (repeated measures in block groups across time) and between-unit variation at level 2 (across block groups). Thus, we analyze the overall trend in shootings for each block group during the study period, while allowing for variation in starting levels of shootings and homicides as well as varying rates of change during the study period (Gelman 2005 ; Singer and Willet 2003).

Our baseline analysis compares the 93 Ceasefire block groups to all 281 untreated block groups that were not geographically adjacent to Ceasefire block groups. Our model is specified as:

$$Y_{ij} = \propto_i + \beta_{1i}(\text{Ceasefire}) + \beta_{2i}(\text{Period}) + \beta_{3i}(\text{Impact}) + \beta_{4i}(\text{Trend}) + \beta_{5i}(\text{Trend}^2) + u_i$$

where the annual counts of shootings over the eight-year study period served as our primary outcome measure (Y_{ij}). To estimate the effect of the Oakland Ceasefire treatment, we created binary dummy variables indicating whether a block group was in the treatment group (1) or in the comparison group (0) (Ceasefire) and whether the year was preintervention (0) for 2010–2012 or during the intervention period (1) for 2013–2017 (Period). A DID estimator (Impact) was created by interacting the Ceasefire and Period dummy variables (see, e.g., Card and Krueger 1994). The DID estimator provides estimates of the effects of the Ceasefire intervention on the treatment block groups relative to the comparison block groups. Secular linear and

[17] The annual shootings for the treatment and comparison block groups used in the analyses were distributed as overdispersed count data. The distribution had a mean = 2.04, standard deviation = 2.68, and variance = 7.18. One sample skewness/kurtosis tests for normality (sktest in Stata 15) and Shapiro–Wilk tests for normal data (swilk in Stata 15) rejected the null hypotheses that the observed distribution was not different from a normal distribution ($p < .001$).

nonlinear annual trends in the dependent variable were estimated through the inclusion of variables measuring the simple linear additive progression for each year over the course of the eight-year observation period (Trend) and its square ($Trend^2$).

In the second stage of analysis, we compare the 47 matched Ceasefire block groups to the 95 matched control block groups. To accomplish this, we estimate the growth curve regression model specified above for the matched treatment and control block groups but include the inverse probability of treatment weighted (IPTW) propensity score value (IPTW = 1/propensity score) for each of the treatment and comparison block groups. The IPTW covariate controls for observable differences between the block groups in the treatment and comparison groups, given the variables used to estimate the propensity score (Imbens and Wooldredge 2009).

In the third stage of analysis, we investigate the possibility for spillover or displacement effects. Using ArcGIS mapping software, we created a matrix of block group adjacency where a tie occurs if any side of an unmatched, untreated block group polygon touches at least one side of a matched, treated block group or a matched, comparison block group.[18] A total of 26 unmatched, untreated block groups bordered only matched, treated block groups and serve as our treatment buffer block groups; and 83 unmatched, untreated block groups bordered only matched, comparison block groups and serve as our control buffer block groups. We then estimated the growth curve regression model specified above for the treatment buffer block

[18] In total, 155 block groups were geographically adjacent to the matched treatment block groups and the matched comparison block groups. However, 46 of these block groups bordered at least one matched treatment block group and at least one matched control group. These block groups were excluded from the analysis, which left (1) 26 unmatched, untreated block groups that were geographically adjacent to at least one of the matched, treated block groups and did not also border a matched comparison block group and (2) 83 unmatched, untreated block groups that were geographically adjacent to at least one of the matched comparison block groups and did not also border a matched treated block group.

groups and the control buffer block groups. Stata 15 statistical software was used to calculate the maximum likelihood estimate of the parameters estimates via the XTNBREG command.[19] For ease of interpretation, incidence rate ratios (i.e., exponentiated coefficients) were used to express the parameter estimates.

Results

Model 1 in Table 7 presents the results of the growth curve regression models for the raw DID analysis comparing the 93 Ceasefire block groups to the 281 untreated block groups that were not geographically adjacent to the treated block groups. Controlling for the other covariates, the Oakland Ceasefire intervention was associated with a statistically significant 22 percent reduction ($p < .01$) in yearly total shootings. Additionally, the Ceasefire dummy variable was statistically significant ($p < .01$), indicating that there were more shootings in the treated block groups, relative to the untreated block groups, and the significant Trend ($p < .01$) and $Trend^2$ ($p < .01$) variables indicate secular linear and nonlinear annual trends in the dependent variable.[20]

[19] The default random effects specification in XTNBREG is a fully efficient specification of block group effects and is preferred due to higher efficiency. Nonetheless, we used a Hausman test to differentiate between the fixed effects model—which captures all temporally constant block group effects—and the random effects model with panel data. The Hausman test was not significant ($p = .8177$) indicating that the difference in coefficients between random and fixed effects was not systematic, and the default random effects specification is adequate.

[20] Sensitivity analyses suggest that the differences-in-differences (DID) estimator is robust to several methodological and statistical specifications. First, we reestimated the models with a pooled estimator with clustered robust variance estimates using the NBREG command in Stata 15 with the vce (cluster block group ID) option. The differences-in-differences (DID) estimator was highly significant and unchanged using this approach (DID coefficient, incidence rate ratio [IRR] = .78, $p < .01$). Additionally, to investigate the impact of the staggered timing of the Ceasefire intervention, we reestimated the growth curve regression model with a Period variable that was coded in the affirmative only after a gang in the specific block group was treated (and the DID estimator was recalculated using this variable). Again, the results were substantively unchanged, as the DID estimator was still highly significant, albeit slightly attenuated (DID coefficient, IRR = .83, $p = .01$); We tested for first-order autocorrelation in the data using XTSERIAL, which examines serial correlation in the idiosyncratic errors of a panel data model. It tests the null hypothesis of no serial autocorrelation using a Wald test of this hypothesis. The results indicated that there was no first-order autocorrelation ($p = .2476$). Relatedly, we included a measure of the lagged outcome to further account for possible serial autocorrelation. The DID estimator was attenuated slightly but still highly significant when controlling for lagged total shootings (DID = .85, $p < .01$; IRR of lagged total shootings = 1.08, $p < .001$). We also calculated and included spatial lags in the growth curve regression model to examine spatial autocorrelation.

Model 2 in Table 7 shows the results of the growth curve regression model comparing the 47 matched Ceasefire block groups to the 95 matched comparison block groups. Controlling for the other covariates, the Ceasefire intervention was associated with a statistically significant 20 percent reduction ($p < .05$) in yearly total shootings. Additionally, the incidence rate ratio for the Ceasefire dummy variable was attenuated from model 1, indicating that gap between shootings

Table 7. Difference-in-Differences Estimates of Ceasefire Impacts on Total Shootings in Oakland Block Groups: Growth Curve Regression Models, 2010-2017

	Model 1	**Model 2**	**Model 3**
Variable	IRR (SE)	IRR (SE)	IRR (SE)
Ceasefire impact (DID)	0.78 (0.04)**	0.80 (0.07)*	0.81 (0.11)
Ceasefire block group (1 = treated)	3.77 (0.57)**	2.64 (0.53)**	2.76 (0.90)**
Period (1 = intervention)	0.89 (0.06)	0.99 (0.10)	0.77 (0.12)
Trend	1.33 (0.05)**	1.28 (0.08)**	1.47 (0.14)**
$Trend^2$	0.97 (0.01)**	0.97 (0.01)**	0.96 (0.01)**
Inverse Propensity Score		1.07 (0.03)*	
Constant	15.68 (6.66)**	17.02 (13.41)**	11.94 (11.23)*
Log likelihood	-4,457.27	-1,824.74	-1,811.24
Wald $\chi 2$	208.57**	62.90**	61.76**
Wald df	5	6	5
Observations (BGs x Years)	2992	1136	1136
Number of BGs	374	142	142

Note: There were *n* =93 Ceasefire-treated BGs and *n* =281 untreated BGs included in Model 1. There were *n* =47 matched Ceasefire-treated BGs and *n* =95 matched untreated BGs included in Model 2. There were *n* =26 treatment buffer BGs and *n* =83 comparison buffer BGs included in Model 3.

DID = Difference-in-Differences estimator, IRR = Incidence Rate Ratio, SE = Standard Error, BG = Block Group.

* = $p < .05$; ** = $p < .01$

Adjacent weights matrices were constructed using both a queen weights specification and a rook weights specification with first-order contiguity. There were no spatial effects, and the DID estimator was unaltered with the inclusion of the spatial lags (DID = .78, $p < .01$).

in the treated and untreated block groups was reduced by the matching routines.[21]

Model 3 in Table 7 presents the results from the analysis of immediate spatial diffusion and displacement effects. A growth curve regression model comparing the 26 treatment buffer block groups to the 83 comparison buffer groups generated a DID estimator of .82 ($p > .05$), indicating that the treatment buffer block groups experienced a nonsignificant 18 percent reduction in yearly total shootings relative to the control buffer block groups. This finding suggests that there were not displacement effects, with the DID estimate favoring a nonsignificant diffusion of benefits of the Ceasefire intervention.

We note two complexities involved in the block group analysis. First, block groups may intersect with the turf of more than one gang/gang, and treated block groups may contain a mixture of treated and untreated groups/gangs. The propensity score matching routines included the number of unique groups/gangs in the block group as a covariate, but this does not negate the possibility of contaminated results from a mixture of treated and untreated groups/gangs in treated areas, as well as different numbers of groups/gangs across block groups. Indeed, approximately 12 percent of the untreated block groups (n = 33/281) contained more than one gang, while almost three quarters of the treated block groups (n = 25/93) contained more than one group/gang, most of which (63/68 = 92.7 percent) also contained an untreated group/gang. To address this concern, we conducted several sensitivity analyses (before and after the matching routines). The results indicated (1) that the treated block groups containing only treated

[21] Note that the program impacts were robust across a variety of matching algorithms and caliper/bandwidth selections: radius matching (caliper = .1, .01); Gaussian kernel matching (bandwidth = .01, .001), Epanechnikov kernel matching (bandwidth = .1, .01), and simple nearest neighbor matching. Although the estimates differed slightly across the varying propensity score matching methods, the Ceasefire treatment effect remained robust, ranging from a statistically significant 18 percent reduction ($p < .01$) to a statistically significant 25 percent reduction ($p < .001$).

groups/gangs and the treated block groups containing a mixture of treated and untreated groups/gangs had comparable decreases in yearly total shootings over time and (2) that both of these groups had significant reductions in yearly shootings, relative to the untreated block groups.[22] These results provide credence to our analytic strategy of considering any block group with at least one treated group/gang in it similarly, regardless of whether or not the block group also had an untreated group/gang in it.

Second, we explore the possibility that untreated group/gangs in our untreated block groups could have been connected to treated group/gangs, thereby resulting in vicariously treated block groups. Indeed, we can consider 17 of the 95 matched, untreated block groups (17.9 percent) in our analysis to be vicariously treated based on group/gang structure and group/gang relationships. Specifically, we can consider an untreated block group as vicariously treated if it (1) contained an untreated group/gang that had at least one treated subgroup/gang, an untreated gang that was a subgroup/gang of a larger treated group/gang, or an untreated subgroup/gang that was connected to treated subgroup/gang through a larger untreated group/gang and (2) contained an untreated group/gang that had a conflict or alliance with a treated group/gang or an untreated subgroup/gang of a larger untreated group/gang that had a conflict or alliance with a treated group/gang. A growth curve regression model comparing the 17 matched, vicariously treated block groups to the 78 matched, untreated (and not vicariously treated) block groups generated a

[22] A growth curve regression model comparing the 30 treated block groups that only contained treated groups/gangs to the 63 treated block groups that had a mixture of treated and untreated groups/gangs generated a DID estimator of 1.035 ($p = .784$), indicating that these two groups had comparable decreases in yearly total shootings over time. Additionally, these groups both experienced statistically significant 20 percent reductions ($p < .05$) in yearly total shootings, relative to the 281 untreated block groups. These substantive results were replicated with the matched analysis following propensity score matching (PSM) routines. For example, a growth curve regression model comparing the 21 matched, treated block groups that only contained treated groups/gangs to the 26 matched, treated block groups that had a mixture of treated and untreated groups/gangs generated a DID estimator of .96 ($p = .783$), indicating that these two groups had comparable decreases in yearly total shootings over time.

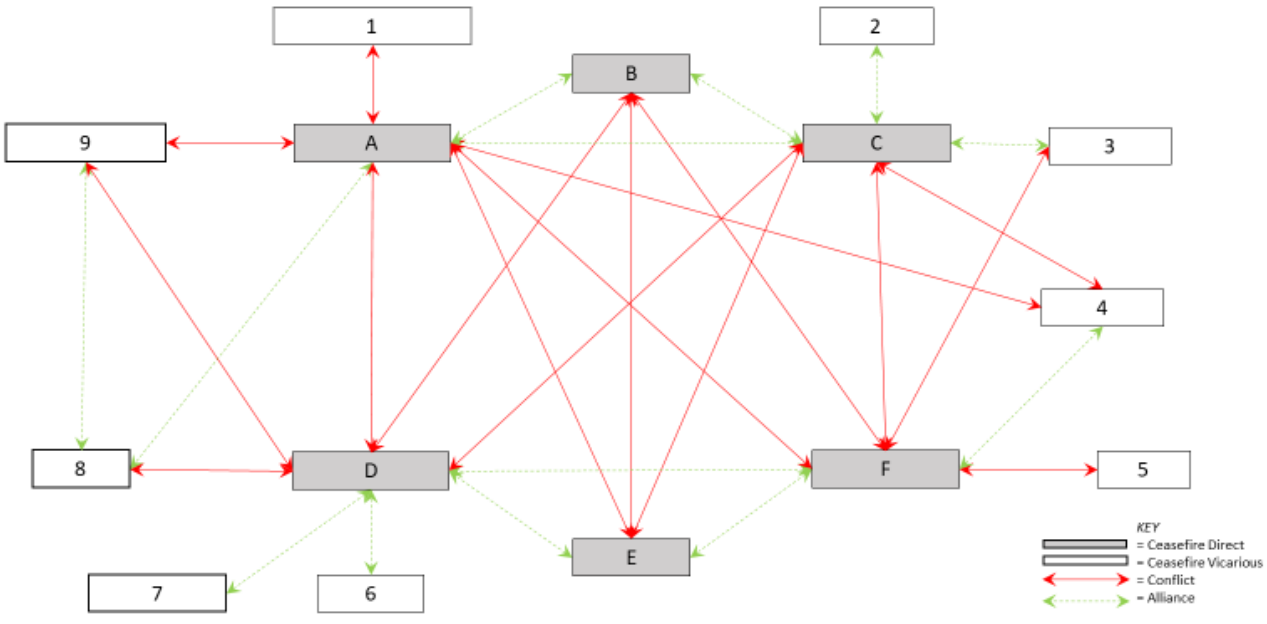
DID estimator of .95 ($p > .05$), indicating that the matched, vicariously treated block groups experienced a nonsignificant 5 percent reduction in yearly total shootings relative to the matched, untreated (and not vicariously treated) block groups. This finding suggests that there was a nonsignificant diffusion of benefits of the Ceasefire GVRS intervention to vicariously treated block groups.

GROUP IMPACT EVALUATION

Design

Figure 7 illustrates how social network analysis concepts were used to determine directly treated and vicariously treated gangs/groups in one highly violent and densely connected clique of Oakland gangs. In this sociogram, there were six gangs/groups that directly received the Oakland GVRS Ceasefire treatment and nine socially connected gangs/groups that received

Figure 7. Direct and vicarious ceasefire treatment applied to Oakland gangs.



vicarious treatment during the study period. As described above, the Oakland Ceasefire Intervention was directly applied to 15 gangs/groups (19.7 percent of 76 Oakland gangs active during the study period) and vicariously applied to 13 gangs/groups (17.1 percent of 76) that were socially connected to the directly treated Ceasefire gangs/groups through rivalries and alliances. Forty-eight gangs/groups (63.2 percent of 76) that did not experience direct or vicarious treatment were available to serve as untreated comparison groups.

The PSMATCH2 radius matching (caliper = .01) routine was used to develop matched comparison and treatment groups from the 48 untreated gangs/groups and the 28 directly treated and vicariously treated Oakland Ceasefire groups/gangs. The following seven characteristics were used in the propensity score matching routine:

1. Mean number of total shootings committed by each gang/group between 2010 and 2012 (pre-Ceasefire).

   Research suggests that ongoing conflicts among street gangs are characterized by retaliatory cycles of violence (Decker 1996 ; Hughes and Short 2005 ; Papachristos 2009). Oakland gangs/groups that generate persistently high levels of gun violence over time are more likely to attract law enforcement attention.

2. Adjacency to another gang's turf.

   Gang violence tends to occur in areas with adjacent gang turfs (Papachristos 2009; Tita and Greenbaum 2009; Tita and Radil 2011). Oakland gangs/groups with turf boundaries that intersect with another groups' turf boundaries may be at elevated risk of involvement in serious gun violence.[23]

[23] We used ArcGIS mapping software to map the turf of Oakland groups/gangs as polygons that occupied a circumscribed amount of space. We then created a matrix of turf adjacency where a tie occurs if any side of a group/gang polygon touches at least one side of another group/gang polygon. Adjacent group/gang turf was coded

3. Gang/group longevity.

   Long-standing Oakland gangs/groups will tend to have persistent rivalries with other gangs/groups and have more extensive histories of death and injuries of members as result of ongoing retaliations by their enemies. As such, gang/group longevity could increase the likelihood of shootings by and against these groups over the course of the intervention.[24]

4. Number of rivalries with other gangs/groups.

   Retaliation and retribution characterize outbreaks of gang violence (Decker 1996 ; Hughes and Short 2005 ; Papachristos 2009). Oakland groups/gangs with larger number of rivalries with other groups/gangs may have been at increased risk of experiencing gun violence if latent disputes with their rivals became active during the study period.

5. Number of alliances with other gangs/groups.

   Allied gangs sometimes aid each other in violent disputes with their rivals (e.g., see Levitt and Venkatesh 2000). Groups/gangs with increased number of alliances with other groups/gangs may have been at higher risk of involvement in serious gun violence when their allies became involved in active violent disputes.

6. Gang/group located in housing project.

"0" for groups/gangs that did not have turf adjacent to another group/gang's turf and "1" for groups/gangs that did have turf adjacent to another group/gang's turf.

[24] Longevity was determined by comparing the roster of N = 76 groups/gangs with at least one shooting during the 2010–2017 study time period to the roster of active Oakland groups/gangs in 2006 as identified by a problem analysis completed by the former Berkeley Center for Criminal Justice at the University of California, Berkeley. This problem analysis was conducted to discuss the possible implementation of a focused deterrence strategy in 2007. OPD did not implement the strategy during that time period. Longevity was coded "0" for groups/gangs that did not exist in 2006 and "1" for groups/gangs that did exist in 2006.

Relative to urban areas without public housing developments, housing project areas tend to be associated with higher levels of gang homicide (Smith 2014).

7. The concentration of social disadvantage in each group/gang turf area.

   To ensure that treated and untreated gangs/groups were selected from similar neighborhoods, the concentrated social disadvantage index metric was calculated for the block group(s) surrounding gang turfs.

The propensity score matching routine revealed that 13 matched directly treated gangs/groups, 9 matched vicariously treated gangs/groups, and 36 matched comparison gangs/groups were in the common support region (Table 8). In the matched sample, all p values are higher than .05, and all bias statistics are less than 20.0. This confirmed that we achieved balanced matched treatment and matched comparison groups.

Growth curve negative binomial regression models were used to analyze the quarterly change in group/gang-involved shootings for treatment and comparison gangs/groups over the eight-year observation period (2010–2017, n = 32 quarters, outcome variable Y_{it}).[25] Two separate DID estimators were used to measure the impact of the Oakland Ceasefire focused deterrence strategy on total shootings involving directly treated groups (n = 15) and vicariously treated groups (n = 13) relative to total shootings involving all other nontargeted groups in Oakland (n = 48). As such, our initial growth curve regression model was as follows:

$$Y_{ij} = \propto_i + \beta_{1i}(\text{Ceasefire}) + \beta_{2i}(\text{Connected}) + \beta_{3i}(\text{Period}) + \beta_{4i}(\text{Direct Impact}) + \beta_{5i}(\text{Indirect Impact}) + u_i.$$

[25] The quarterly shootings for the matched treatment and comparison groups/gangs used in the analyses were distributed as overdispersed count data. The distribution had a mean = 1.44, standard deviation = 2.12, and variance = 4.49. One sample skewness/kurtosis tests for normality and Shapiro–Wilk tests for normal data rejected the null hypotheses that the observed distribution was not different from a normal distribution ($p < .001$).

Table 8. Balancing Treatment and Comparison Gangs/Groups through Propensity Score Matching						
Characteristics	**Treated**	**Untreated**	**% Bias**	**% Bias Reduction**	***t* test**	**p>|*t*|**
Mean shootings 2010-2012						
Unmatched	9.17	2.7	113.7		5.72	<0.000
Matched	5.3	5.41	-1.7	98.5	-0.04	0.969
Gang/group size						
Unmatched	64.66	17.86	93.6		4.98	<0.000
Matched	35.45	40.08	-9.3	90.1	-0.24	0.812
Adjacent gang/group turf						
Unmatched	0.6	0.29	64.2		2.4	0.018
Matched	0.57	0.63	-13.9	78.3	-0.35	0.729
Longevity						
Unmatched	0.4	0.31	18.1		0.67	0.503
Matched	0.36	0.33	5.6	69.3	0.13	0.9
Gang/group rivalries						
Unmatched	2.13	1.21	90		3.77	<0.000
Matched	2	1.96	3.4	96.2	0.07	0.948
Gang/group alliances						
Unmatched	2.33	1.09	112		4.46	<0.000
Matched	1.8	1.95	-14.5	87.1	-0.33	0.748
Housing project gang/group						
Unmatched	0.4	0.21	40		1.56	0.122
Matched	0.27	0.22	10.6	73.4	0.25	0.801
Concentrated disadvantage in census block group						
Unmatched	1.06	0.58	59.4		2.6	0.011
Matched	0.9	0.76	17.4	70.7	0.51	0.615

N = 58 (13 directly-treated gangs/groups, 9 vicariously-treated gangs/groups, 36 comparison gangs/groups)

Note: Results based on radius matching propensity score model (caliper =.01)

The Ceasefire covariate identified whether a gang/group was directly targeted by the Ceasefire focused deterrence program (1) or not (0). The Connected regressor indicated whether a gang/group was socially connected as an ally or rival to a gang/group that was subjected to the Ceasefire strategy (1) or not (0). Oakland gangs/groups that were neither the direct nor indirect targets of the Ceasefire program served as the reference category for these two dummy variables.

Period indicated whether the quarter was during the postintervention period (1) or during the preintervention period (0). The DID estimates of the direct and indirect Oakland Ceasefire effects were represented by the coefficients β_4 and β_5, respectively.

The impact of the Ceasefire intervention on group-involved gun violence was further appraised using a more conservative approach that compared total shooting trends for matched treated gangs/groups (n = 13 directly treated and n = 9 vicariously treated) relative to total shooting trends for matched untreated gangs/groups (n = 36). This model included the inverse-weighted propensity score values for each matched gang as a covariate. In addition to our total shooting analyses, we analyzed changes in the quarterly counts of victim group-involved shootings and the quarterly counts of suspect group-involved shootings. As with the place impact analyses, XTNBREG was used to estimate the group impact model coefficients.

Results

Model 1 in Table 9 presents the results of our growth curve regression models estimating Ceasefire impacts on total shootings by directly treated and vicariously treated gangs/groups as compared to total shootings by all untreated Oakland gangs/groups. The DID estimators suggest the Ceasefire strategy was associated with a statistically significant 33 percent reduction ($p < .01$) in quarterly total group-involved shootings for the directly treated gangs/groups and a statistically significant 24 percent reduction ($p < .05$) in quarterly total group-involved shootings for the vicariously treated gangs/groups relative to the comparison gangs/groups, holding the other variables constant. It is important to note here that both the directly treated and the vicariously treated Ceasefire gangs/groups had more total shootings when compared to total shootings involving untreated gangs/groups over the course of the study period. The statistically

matched treated and untreated Oakland gangs/groups were balanced on this important outcome and, as such, provide a more conservative estimate of Ceasefire impacts.

The results of the growth curve regression models estimating the impacts of the Ceasefire on gun violence outcomes for matched directly treated and vicariously treated gangs/groups relative to gun violence outcomes for matched untreated gangs/groups are also reported in Table 9.[26] The direct impact DID estimators revealed that the Ceasefire intervention was associated with a statistically significant 26 percent reduction ($p < .01$, model 2) in quarterly total group-

Table 9. Difference-in-Differences Estimates of Ceasefire Impacts on Total Shootings in Oakland Group-Involved Shootings: Growth Curve Regression Models, 2010-2017

	Model 1	**Model 2**	**Model 3**	**Model 4**
	Total	**Total**	**Suspect**	**Victim**
Variable	IRR (SE)	IRR (SE)	IRR (SE)	IRR (SE)
Ceasefire impact (DID)	0.67 (0.05)**	0.73 (0.05)**	0.70 (0.04)**	0.77 (0.06)*
Ceasefire gang/group (1 = treated)	3.61 (0.74)**	1.24 (0.26)	1.31 (0.27)	1.19 (0.25)
Period (1 = intervention)	0.72 (0.09)*	0.76 (0.04)**	0.74 (0.05)**	0.75 (0.05)**
Ceasefire vicarious impact (DID)	0.76 (0.09)*	0.74 (0.05)**	0.76 (0.06)*	0.72 (0.05)**
Connected gang/group (1 = treated)	3.05 (0.62)**	1.11 (0.22)	1.09 (0.23)	1.12 (0.23)
Inverse propensity score		0.96 (0.01)**	0.97 (0.01)**	0.96 (0.01)**
Intercept	1.61 (0.24)**	1.72 (0.23)**	1.41 (0.23)*	1.42 (0.23)*
Log likelihood	-2,578.33	-1,644.54	-1,513.95	-1,489.11
Wald $\chi 2$	115.15**	84.67**	78.91**	74.23**
Wald df	5	6	6	6
Observations (gangs X quarters)	2432	1856	1856	1856
Number of gangs/groups	76	58	58	58

Note: There were n =15 directly-treated gangs/groups, n =13 vicariously-treated gangs/groups, and n =48 untreated gangs/groups included in Model 1. There were n =13 matched directly-treated gangs/groups, n =9 vicariously-treated gangs/groups, and n =36 matched untreated gangs/groups included in Models 2, 3, and 4.

DID = Difference-in-Differences estimator, IRR = Incidence Rate Ratio, SE = Standard Error

* = p < .05; ** = p <.01

[26] Once again, Ceasefire group impacts were robust across a variety of matching algorithms and caliper/bandwidth selections, ranging from a statistically significant 22 percent reduction ($p < .01$) to a statistically significant 37 percent reduction ($p < .001$) in total shootings.

involved shootings and a statistically significant 30 percent reduction ($p < .01$, model 3) in quarterly suspect group-involved shootings for the matched directly treated gangs/groups relative to the matched comparison gangs/groups, holding the other predictor variables constant. The Ceasefire intervention was also associated with a 23 percent reduction in quarterly shooting victimizations for the matched directly treated gangs/groups when compared to the matched untreated gangs/groups ($p < .05$, model 4). For all four models, the postintervention covariates revealed statistically significant reductions in group-involved shootings controlling for the other covariates. This suggests that gang shootings in Oakland were generally declining during the postintervention period beyond any focused Ceasefire intervention.

The indirect impact DID estimators also revealed that the Ceasefire program was associated with a statistically significant 26 percent reduction in quarterly total group-involved shootings ($p < .01$, model 2), a 24 percent reduction in quarterly suspect group-involved shootings ($p < .05$, model 3), and a 28 percent reduction in quarterly victim group-involved shootings ($p < .01$, model 4) for the matched vicariously treated gangs/groups relative to the matched comparison gangs/groups. As confirmed by the nonstatistically significant Ceasefire dummy variables in models 2, 3, and 4, the matched groups were comparable on the three group-involved gun violence outcome measures. What is more, Oakland gangs/groups associated with higher levels of gun violence were included in the matched quasi-experimental analysis as suggested by the significant negative associations between the inverse-weighted propensity score values and the three group-involved shooting outcome variables ($p < .01$).

CONCLUSION

These results confirm that Ceasefire strategies can be effective in reducing gang violence in very challenging urban environments such as Oakland, a city that has long suffered tragically

high homicide rates. The Oakland Ceasefire GVRS generated statistically significant direct reductions in shootings in treated block group areas and by treated gangs/groups relative to shootings in untreated block group areas and by untreated gangs/groups, respectively. The place- and group-based analyses of spillover effects yielded complementary results that diverged in magnitude and significance. The census block groups immediately surrounding treated block groups experienced a nonsignificant reduction in shootings relative to census block groups immediately surrounding untreated block groups. Vicariously treated gangs/groups that were socially connected to treated gangs/groups through rivalries and alliances experienced a statistically significant reduction in shootings relative to untreated comparison gangs/groups.

We suspect that these divergent magnitudes in spillover impacts may be linked to the varying dosage strength of the deterrence intervention as applied to the differing units of analysis. That is, untreated groups/gangs that are connected to groups/gangs directly experiencing intense enforcement attention are more likely to notice the elevated scrutiny by virtue of the social connection and the supporting message warning them against shooting rivals. But, adjacent areas are likely to contain a mix of socially connected groups/gangs, not socially connected groups/gangs, and other nongroup/nongang gun offenders. This mix of potential shooters within geographic areas may have varying levels of knowledge regarding surrounding areas and, as such, may have very different perceptions of the risks associated with perpetrating gun violence. In essence, street group / gang networks are a smaller part of much larger neighborhood networks of violence (Papachristos, Hureau, and Braga 2013). As such, there are other conflicts and networks in target and surrounding geographic areas that are outside the conflict networks targeted by Ceasefire.

III. INDIVIDUAL-LEVEL ANALYSIS

INTRODUCTION

The individual-level analysis focused on victimization and arrest outcomes for Ceasefire participants. In the absence of a randomized control group, we compared participants to two distinct groups of non-participants: (i) individuals with arrest records who had similar covariate profiles to Ceasefire participants; and (ii) individuals who were invited to participate but did not attend a call-in meeting. We also compared rates of gunshot victimization and arrest in the two years before participation in Ceasefire to rates in the two years following participation. The remainder of this report describe the data, methods, and results of the individual-level analysis in more detail.

DATA

To conduct the individual-level analysis, we used data on participation in the Ceasefire program, arrest records from 2010-17, and gunshot victimization records from 2010-18 for the city of Oakland. Table 7 summarizes the Ceasefire and arrest data, including the number of individuals covered by the data and their basic demographic profiles.

Table 10. Summary of Ceasefire and Arrest Data

	Ceasefire	Arrest
n	377	47,298
Mean Age	26	36
Black %	66.3	61.4
Hispanic %	20.7	20
White %	0	11.4
Male %	99.2	74.2
Total Arrests	1,106	67,846
Mean Arrests	2.9	1.4

METHODS

The Ceasefire program does not have a built-in randomized control group against which to compare the individuals who participated in the program. Consequently, our evaluation of the individual-level effects of the program rely on designing a strategy for causal inference in an observational setting. This is particularly challenging in the context of Ceasefire because there does not exist a "natural" comparison group for the Ceasefire participants, who are by design, drawn from the upper tail of the victimization and arrest risk distribution. In other words, Ceasefire itself is designed to treat those at the highest levels of involvement in gun violence.

We employed **two strategies** for constructing a comparison group for our evaluation of the effects of the program on gunshot victimization and arrests. The **first** strategy—which we call the ***matching* strategy**—compared arrest and victimization outcomes for Ceasefire participants against a matched group of individuals who did not participate in Ceasefire but who had been arrested within Oakland during or in the three-years prior to Ceasefire's implementation. To conduct a "like-for-like" comparison, we searched through non-participants in the broader arrest data to find individuals who matched the Ceasefire participants on six dimensions: age, race, gender, victimization history, arrest history, and network degree, which is a count of the number of people alongside whom an individual has been arrested. In this way, we ensure that Ceasefire participants are compared to non-participating individuals who have similar demographic and network attributes. We use a *nearest-neighbor* matching algorithm to find the closest match for each Ceasefire participant along the above dimensions. It is common for some Ceasefire participants to have more than one closest match. We therefore ran the algorithm 1,000 times, in each pass randomly selecting a match from the set of closest matches for each

participant and re-estimating the effects of Ceasefire. This strategy ensures that are estimation strategy is not sensitive to the selection of a particular subset of the possible matches.

The second strategy—which we call the ***compliance* strategy**—compared victimization and arrest outcomes for individuals who were invited to participate and attended a Ceasefire call-in meeting, and hence were compliant with the intervention, against individuals who were invited but did not attend a call-in meeting.

The two approaches have different strengths and limitations. The matching strategy allows for a comparison among all individuals "treated" by Ceasefire against individuals who were not treated. By comparing Ceasefire participants to individuals with similar attributes using the matching algorithm, we can rule out the possibility that any differences in victimization and arrest outcomes are due to baseline differences in attributes such as age, gender, and arrest and victimization history. However, the matching strategy does not guarantee a comprehensive "like-for-like" comparison due to the possibility of there being attributes which are not accounted for in the matching algorithm. As such, under the matching strategy, we cannot rule out the possibility that differences in victimization and arrest outcomes following Ceasefire are in fact driven by baseline risk differences unaccounted for in our matching algorithm rather than participation in Ceasefire. This is especially important to note because Ceasefire participants were not selected based on a randomized process or a risk assessment algorithm, making it difficult to precisely model the selection process.

The compliance strategy, by design, allows for a comparison between individuals who were all selected for Ceasefire and therefore have similar baseline risks of victimization and arrest. As such, this approach does not suffer from the limitation of the matching strategy whereby ex-ante differences in the baseline risk could be underlying any observed differences in

outcomes. The compliance strategy suffers from a related limitation, however: individuals opt-out of compliance with the Ceasefire program and therefore the comparison could be prone to selection bias. That is, selection into either compliance or non-compliance with the program could be related to the risk of victimization or arrest or some unmeasured variable. To the extent that selection bias exists, our estimates will pick up that selection bias in addition to any Ceasefire effects, and we will not be able to distinguish between the two. Furthermore, non-compliance may itself be thought of as a "treatment" insofar as individuals who do not participate may be affected by parole violations or related consequences of non-compliance.

By employing both the matching and compliance strategies, we aim to provide two angles on the effects of Ceasefire using two different comparison groups. For both strategies, we estimate a logistic regression model where the outcome is either arrest or victimization. We are interested in the effect of participation in Ceasefire on the probability of these outcomes, conditional on other covariates which may be related to the risk of either outcome and the decision to participate in Ceasefire or be invited to participate in Ceasefire. The model is given by:

$$Y_i = \alpha + \gamma C_i + \beta X_i$$

Where Y_i is an indicator for victimization (1 = victimized; 0 = not victimized) for individual *i* during the two-years after assignment to Ceasefire, α is a constant which captures the average probability of the outcome among the sample, C_i is an indicator of Ceasefire participation (1 = participated; 0 = did not participate) for individual *i*, γ is the coefficient capturing the effect of Ceasefire participation, and β are coefficients associated with the control variables *X*. We estimate the same model, switching the Y_i to an indicator for arrest (1 = arrested;

0 = not arrested) in the two-years after assignment to Ceasefire. Due to the follow-up data falling short of a full two years for some individuals, we additionally include an offset variable that measures the number of follow-up days for each individual. For individuals in the matched control group, we set the assignment date at which follow-up begins to that of the Ceasefire participant to whom they are matched. For the victimization model, we include a count of victimizations in the two years before assignment to Ceasefire as a control variable. Similarly, for the arrest model, we include a count of arrests in the two years before assignment.

RESULTS

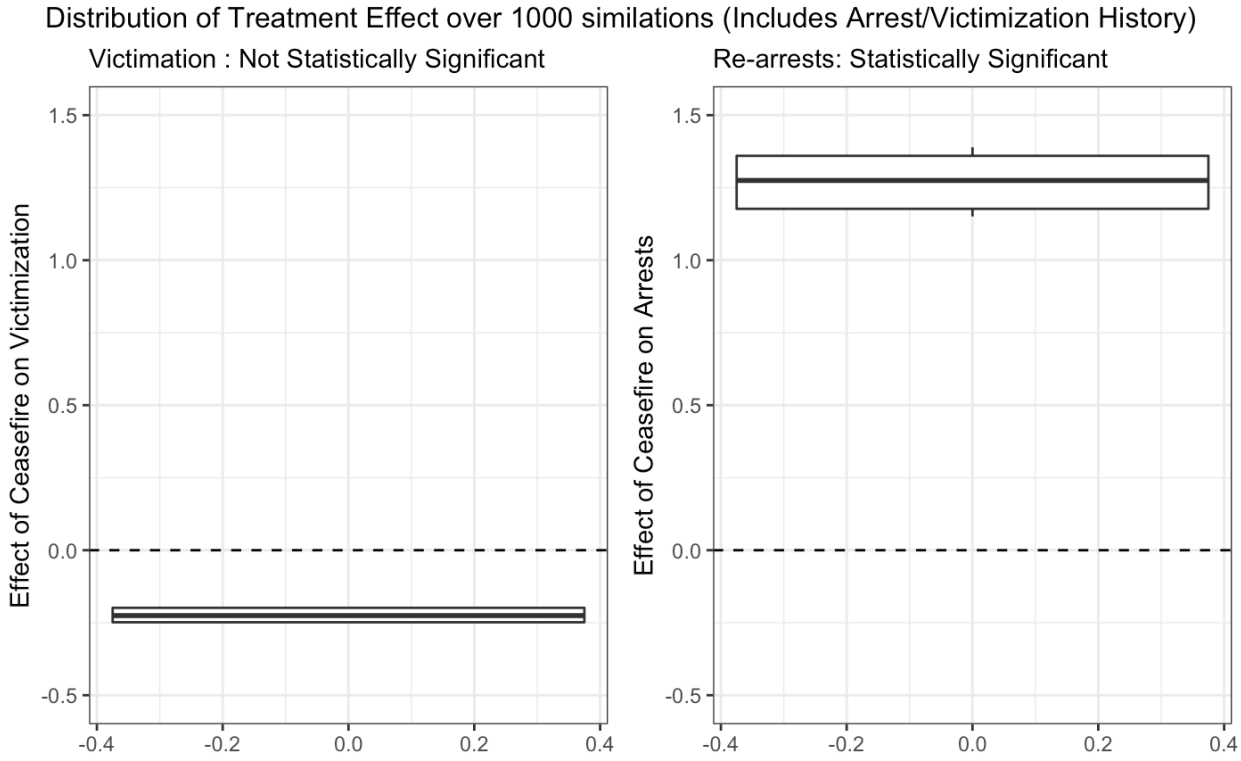
Matching Strategy

Figure 8 presents the estimated effect of Ceasefire on victimization and arrest outcomes using the matching strategy. Each boxplot shows the distribution of estimates from 1,000 runs of the matching algorithm. We estimate that Ceasefire participants were 1.2 times less likely ($p = 0.31$) to be victimized than matched control individuals. However, participants were 3.5 times more likely ($p < 0.001$) than matched controls to be re-arrested in the two years after Ceasefire. Hence, under our matching strategy, we estimate that participants have a lower chance of victimization, although there is sufficient uncertainty around this estimate that we cannot reject the null hypothesis of no effect at the 0.05 level, and a higher chance of re-arrest.

Compliance Strategy

Figure 9 shows the percentage of the compliant and non-compliant groups who were victimized in the two years after assignment to the Ceasefire program. Approximately 5% of compliant participants were victimized compared to 8% of individuals who were invited to

Figure 8: The effect of Ceasefire on victimization and arrests in the two-years after participation.



NOTE: The effects are presented in log-odds. Each boxplot shows the distribution of estimates from 1,000 runs of the matching algorithm.

participate in Ceasefire but did not attend. Thus, the rate of victimization was 3 percentage points lower in the compliant group. Due to the difference in these group sizes, this is equal to 15 and 7 gunshot victimizations, respectively.

Figure 10 shows the estimated effect of Ceasefire participation on victimization and arrests using the compliance strategy. The two-year probability of victimization in the compliant and non-compliant groups was 0.05 (a 1 in 20 chance) and 0.08 (a 1 in 12 chance), respectively. However, this difference was not statistically significant ($p = 0.26$) at the 0.05 level. The

Figure 9: Percentage victimized in compliant and non-group groups in the two years after assignment to Ceasefire.

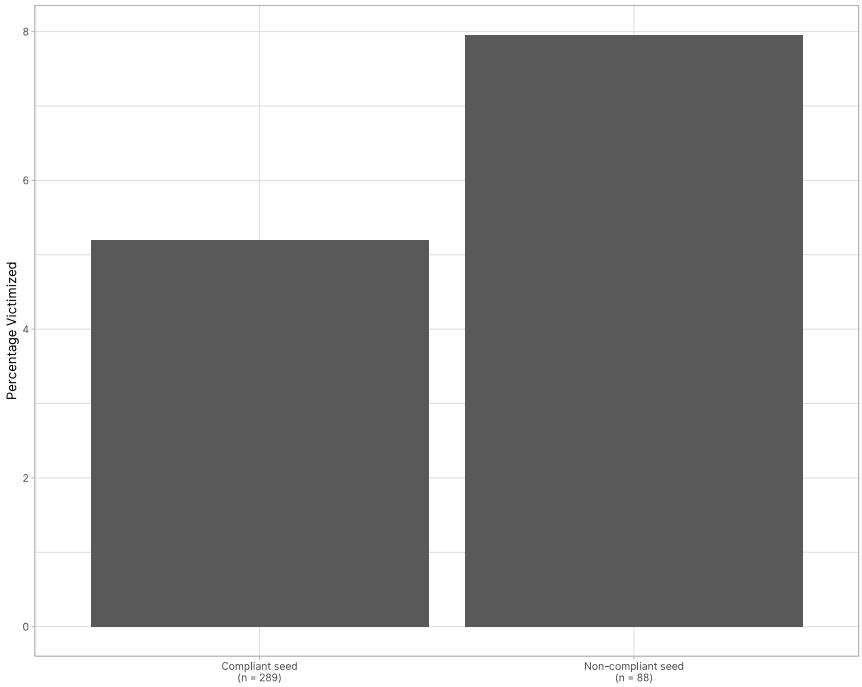
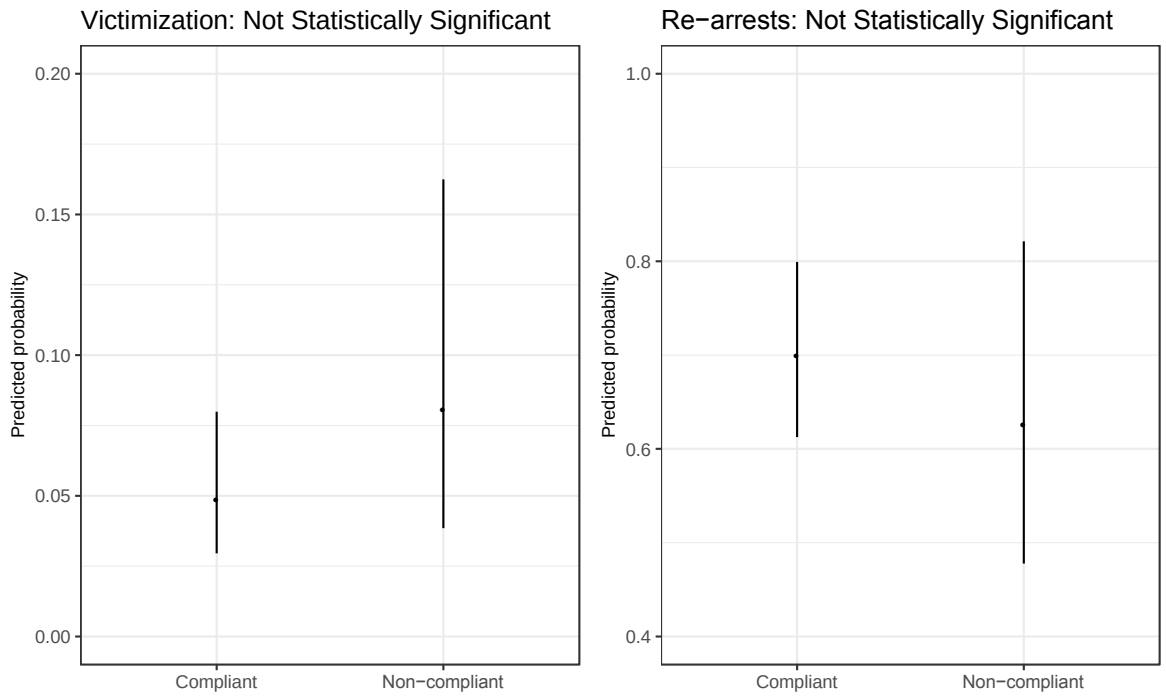


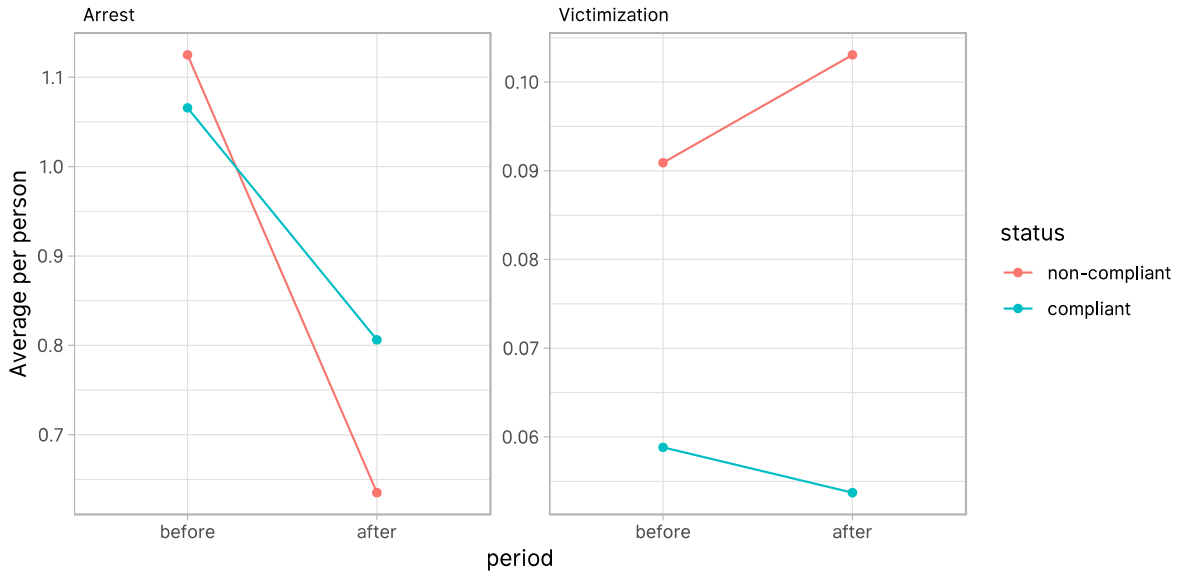
Figure 10: Estimates of the effect of Ceasefire compliance on victimization and arrests.



two-year probability of arrest was 0.70 and 0.63 for compliant and non-compliant individuals, respectively, and not statistically significant ($p = 0.47$). Thus, our estimates based on the compliance strategy suggest a lower probability of victimization and a higher probability of arrest, although these differences are not statistically significant.

Figure 11 shows average arrest and victimization outcomes for compliant and non-compliant individuals in the two years before and after Ceasefire. Individuals who complied with the Ceasefire program had 1.07 arrests in the two-years prior to their participation compared to 1.12 for non-compliant individuals. The number of arrests in the two years after Ceasefire was lower in both groups, falling to 0.80 and 0.64, respectively. The mean number of victimizations before Ceasefire was 0.06 and 0.09 for the compliant and non-compliant individuals, respectively.

Figure 11: Pre- and post-Ceasefire outcomes for compliant and non-compliant participants in the program.



NOTE: Outcomes were observed for two years before Ceasefire and for two years after, for individuals with two years of available follow-up data. For individuals without the full two-years, we weighted the arrest and victimization outcomes by dividing the frequency of each outcome by the number of years observed in the post-Ceasefire period (e.g. 1.8 years) and multiplying the result by two.

The compliant individuals sustained slightly fewer victimizations after Ceasefire at 0.054, whereas victimization increased by 0.01 (approximately 1 additional victimization per 100 people) for non-compliant individuals.

CONCLUSION

The pre- and post-Ceasefire measures indicate that compliant participants in Ceasefire had fewer victimizations and arrests in the two years after the enrollment in the program than in the two years prior. Our regression estimates of the individual-level effects of Ceasefire suggest a reduction in victimization and an increase in arrests in the two-years after participation, and these results are consistent across our matching and compliance strategies. However, only the difference in arrests under the matching strategy is statistically significant. In summarizing the results of our evaluation, it is important to note that with the scale of the Ceasefire intervention, the estimates can best be understood as indicative rather than definitive. This caution is primarily due to the relatively low frequency of victimization among Ceasefire participants: the follow-up data collected so far shows that a total of 22 of the individuals who were invited to participate in Ceasefire have been victimized. While each of these victimizations is a tragic outcome, this is a relatively low number in statistical terms and imposes a "floor" on the magnitude of any reduction. In other words, under the compliance strategy and given the number of Ceasefire participants, the program would need to almost eliminate victimization completely to produce a statistically significant effect, which represents a high bar. Moreover, although lower contact with the criminal justice system is desirable—and our arrest results indicate higher contact—this could plausibly be a product of the Ceasefire program working as designed. The program pledged to participants that there would be consequences in terms of contact with police if participants or their close associates engaged in acts of violence.

IV. QUALITATIVE ANALYSIS

INTRODUCTION

> …law enforcement as a whole has kind of gone away from [trying to arrest everybody] and I'm glad. Back in the day, if we had a problem, like drug dealing at a corner, 14th and Broadway, we'd just go out there and arrest everybody. …you're all going to jail! …of course we [would] get the drug dealers but in with the group of drug dealers would be the guy going home from work, the guy going to work, somebody who just happened to be walking through and all these… people who didn't deserve to get caught up… Now, we're a lot more targeted... …we're trying to leave… people alone and [only] go after the bad guy. (Law enforcement, 5)

The Oakland Ceasefire strategy has been implemented against a historic backdrop of police misconduct, civil unrest, and citizen distrust. Therefore, efforts to reduce gun violence in this milieu has required negotiating a thorny narrative about racial injustice—often leading to widespread suspicion about law enforcement actions launched in communities of color. In Oakland, activists, police officers, politicians, residents, and social service providers collaboratively work toward creating more effective public safety initiatives while resisting the urge to plow headlong, embracing outdated and injurious crime-control strategies. Despite being faced with several hefty challenges, the City has repeatedly demonstrated resilience, innovation, and high levels of civic engagement. For example, Oakland is credited as the birthplace of the Black Panther movement and has forcibly responded against social injustice. In sum, when challenged, this City fights back!

Communicating messages of care within settings where trauma is worsened by recurring threats to citizen trust and police legitimacy is fraught with difficulty. Nonetheless, those who are responsible for enforcing the law and individuals routinely on the receiving end of heavy-handed crime-control strategies have seemingly embraced Ceasefire. Officers, probation

workers, social service providers, and activists have come together in the hope of achieving something special—devoting their time, energy, and resources toward positively intervening in the lives of high-risk individuals disproportionately involved in violence (both as perpetrators and victims). Collectively, these stakeholders battle the legacy of state intervention in the form of mass incarceration. For disadvantaged communities of color, implementing fair and effective crime control strategies continues to be complicated.

Scholars have documented the adverse impact that aggressive policing tactics have on citizen satisfaction and willingness to partner in crime-reduction efforts (Tyler 1990; Weitzer and Tuch 2005; Brunson 2007). Furthermore, mounting evidence suggests that over-policing in black and Latino communities contributes to residents' higher reported levels of legal cynicism and distrust (Gau and Brunson 2010; Kirk and Papachristos 2011; Sampson and Bartusch 1998). At the same time, however, communities of color have long complained that persistently high crime rates are byproducts of systemic under-policing (Burke 2013). Finally, an abundant body of research has identified the cumulative effect of over- and under-enforcement of the law as a primary source of strained police-minority community relations.

Although fragile police-citizen relations are not unique to OPD, the agency has endured several years of highly-publicized incidents of police misconduct, public outcry, a federal consent decree, and demoralizing, successive leadership changes. Many study participants were steadfast, however, that violence was finally continually decreasing and OPD's efforts to strengthen relationships with stakeholders was moving in the right direction. This was not a small accomplishment given the devastating blow to citizen trust following the nationally publicized sex scandal involving several OPD officers and a minor. In fact, many respondents

noted that in spite of the hovering dark clouds cast by some OPD personnel, something about Ceasefire is working.

> I've learned [a lot from participating in Ceasefire]. …when you're a kid you don't have nobody to [say], "okay, that's going to hurt. that's got to stop," and give you a full point of view of the situation. …I like Ceasefire because its literally helping me, more than my dad even did. I'm going to school, I'm starting work. …A lot of things that Oakland Unite and Ceasefire [are helping with are things we used to] complain about [not having], you can't complain about [them] now. [Before] we'd be like, I had to rob somebody to go to school. [With Ceasefire], [you have] a BART ticket, …you need school clothes for your kids and you [might] go rob somebody… Well come down here, we got a gift card from Target. …[Now] you shouldn't have no excuses… (Call-in client, 3).

For Ceasefire clients, disproportionately young men of color, who are at considerable risk for perpetrating or becoming victims of gun violence, the strategy offers a much needed lifestyle change. There was huge support among respondents for dedicating law enforcement and social service resources to a targeted, small number of high-risk individuals. Specifically, study participants preferred Ceasefire over indiscriminate and heavy-handed policing initiatives that have all too often resulted in the criminalization of entire communities. Interviewees enthusiastically applauded City leaders for their unwavering commitment to Ceasefire. Furthermore, respondents readily acknowledged that the current political support is unprecedented and deserves a great deal of credit for the observed success. Finally, several individuals commended the effort for purposefully enlisting people of color to work collaboratively toward strengthened police-minority community relations.

METHODS & ANALYTIC STRATEGY

Project Objective

The objective of the study was to acquire a variety of local stakeholders' perceptions of and experiences with Oakland's Ceasefire strategy. To achieve this goal, in-depth interviews

were conducted with individuals having considerable knowledge, varied perspectives, and keen insights regarding: (1) the effectiveness of current (since 2012) and prior Ceasefire initiatives, (2) the nature and extent of gun violence occurring across Oakland, and (3) whether Ceasefire has improved police-community relations and helped to build mutual trust.

The project benefitted from the use of in-depth interview techniques; which provided unique opportunities to examine not just the context and circumstances of events, but also their meanings for study participants. In particular, data collection purposively involved diverse groups of respondents in recognition of their informal/formal program roles and particular viewpoints concerning Ceasefire.

Sampling

The project involved 21 qualitative, in-depth interviews with: Ceasefire call-in clients, City, clergy, and community leaders, police and probation officers, and social service providers. Interview subjects were recruited and scheduled with the assistance of Oakland-based study partners. Researchers were also permitted to use snowball sampling techniques to recruit additional participants by enlisting the help of those previously interviewed to introduce additional individuals suitable for inclusion in the study. Interviews were voluntary, conducted in private offices, and respondents were promised strict confidentiality. Furthermore, we were mindful not to record study participants' personally identifying information and use Pseudonyms throughout this report.

Analysis

The interview guide was semi-structured, consisting of both closed- and open-ended questions that allowed for considerable probing on key topics (i.e., whether or not respondents viewed Ceasefire as both an effective and fair crime-reduction strategy, perceptions of

increased/reduced gun violence, and the current state of police-community relations). Face-to-face interviews typically lasted approximately sixty minutes. Except on three occasions, interviews were digitally recorded (audio only, however), later transcribed in their entirety for accuracy, and serve as the primary data for our qualitative analysis. Finally, we took considerable care to ensure that results typified the most common themes and subthemes representing respondents' statements and observations consistently found throughout the data.

FINDINGS

The results presented herein help to elucidate Oakland Ceasefire's three key aims: *1. Reduce shootings and homicides citywide, 2. Decrease recidivism and improve outcomes for those at highest risk of violence, and 3. Strengthen police-community relations and trust.* We also examine study participants' views regarding what appeared to be working along with their recommendations for moving forward.

Reduce Shootings and Homicides Citywide

There was strong consensus among study participants that Ceasefire greatly enhanced the City's capacity to systematically and thoughtfully reduce shootings and homicides. Respondents living, working, and providing social services in the most disadvantaged neighborhoods, however, were emphatic that too much violence persists. While the overwhelming majority of study participants were highly supportive of Ceasefire, they took care to express concern about its sustainability given deeply entrenched social conditions highly correlated with urban violence (i.e., extreme poverty, unemployment, poor educational outcomes). In particular, study participants questioned whether the current Ceasefire messaging resonates with younger (i.e., juveniles), at-risk individuals growing up in high-crime contexts. Several salient themes

emerged from study participants' detailed accounts regarding their experiences with and perceptions of the Ceasefire strategy.

In light of the touted decreases in shooting and homicide rates, the vast majority of respondents acknowledged that *something* about the strategy was working. There was little consensus among study participants, however, regarding what specific program component (community engagement, law enforcement, social service) produced the greatest impact on Oakland's unprecedented violence reduction. One respondent's remark illustrates the expressed ambiguity. S/he remarked, "which of [the program pillars] is the secret ingredients? I think it's all three, right, but is there any evidence that one is more significant than the other?" (Service Provider, 8)

The aforementioned question regarding program impact lingers, in part, because according to study participants, the nature of interpersonal violence in Oakland had witnessed a generational and technological shift. In particular, respondents frequently commented that non-fatal shootings and homicides were no longer about gang members' efforts to seize control of drug territory. To the contrary, stakeholders reported that contemporary violence is primarily fueled by everyday disputes (e.g., card games, fights over romantic interests, disparaging social media posts), making it appear more random and unmanageable. Furthermore, unlike previous gang and drug motivated attacks, those currently at highest risk of gun violence are reportedly seldom aware of impending dangers (assailants' identities and /or motives). We have pasted below excerpts from study participants illustrating their views regarding the current state of Oakland gun violence:

> I don't really see gang violence in the city of Oakland being driven over a fight over, a physical location, a sale of narcotics or some [turf]… …it's more [about] feeling disrespected by the other group... (Law Enforcement, 18)

> …there's just a lot more fights over stupid stuff. …twenty years ago people were fighting over money. Like real money… and now people are fighting over stupid money. Like twenty dollars that they thought someone scammed them out of in a dice game... (Service Provider, 1)

> Now [disputes are] over social media and disrespect, or my friend doesn't like you so I'm going to shoot you. I don't even know you but I don't like you and I rock with [my friend] so you got to die... (Law Enforcement, 2)

> …the folks responsible for violence in Oakland are folks who are intent on [succumbing to] their fears, and don't have a shut off mechanism… …the smallest thing sends them into an atmosphere where guns are the solution to resolve any and all infractions in their lives, small, large… People really go from 0-60 is what I always say. (Clergy, 14)

> …the mindset of youngsters now, is win or lose a fight, somebody has to die. And fear of retaliation. "If you beat me up, you better kill me, because if not I'm going to come back and I'm going to kill you." That's the mindset of these youngsters now-a-days… …and the other mindset of these guys now-a-days is they'd rather get caught with a gun than without a gun… …with a gun you go to jail, without a gun, you get killed. (Service Provider, 11)

Strengthen Police-Community Relations and Trust

Criminological research has consistently shown that a disproportionate amount of serious violence is committed by a small number of chronic offenders. Therefore, like in Oakland, some of the nation's most progressive police departments recognize the promise that dedicating resources to evidence-based and cost-effective crime-control approaches has for improved public safety. Respondents also expressed a great deal of support for dedicating law enforcement and social service resources to individuals at highest risk for violence (both as perpetrators and victims). In fact, the vast majority of study participants endorsed Ceasefire over indiscriminate

and heavy-handed policing initiatives (e.g., Stop, Question, and Frisk) shown to unjustly criminalize entire communities.

While most constituents that we interviewed spoke very favorably of the Ceasefire strategy, several persons identified disconcerting issues directly related to the accuracy and integrity of the call-in lists. These contentious matters proved critical to citizen confidence and overall trust in the police, and by extension, the overall initiative. Definitional differences among partners, largely based on their respective professional backgrounds, was at the center of disagreements. Furthermore, there was a great deal of misunderstanding (especially among nearly all non-police stakeholders) regarding what actions warranted clients being placed on "the list" and equal ambiguity regarding what individuals might do to have their names removed. On the other hand, police officials were adamant that they were on firm footing because the list was compiled using credible intelligence (often confirmed during shooting incident reviews), accurately identifying those most at-risk for becoming perpetrators or victims of gun violence. In further defense of the list, OPD officers reflected on previous crime control tactics that perhaps lacked fairness, noting that many of the unintended and harmful consequences of past initiatives might be avoided by using data driven approaches. These sentiments are fittingly expressed by two OPD officers quoted below:

> …a big chunk of our resources is focused on violent crimes and violent offenders in particular serial violent offenders—guys that have done several shootings or homicides or that are [responsible for] a large string of violent robberies. That's what's really opened my eyes to the small number of people that are really doing most of the violence in the city and what we've found is that you see immediate drops when you do enforcement in that space… …we've see ten and fifteen percent reductions in robberies by taking down one group of five or six people because they're doing two or three robberies a day. And that effort, I think, if sustained, can continue to maintain the reductions that we've seen. (Law Enforcement, 18)

> …you have to take a step back and if you're being critical and being honest were we arresting the right people? Were we doing things the right way? We were breaking up families, individuals were going to jail… …but were we focused on the right individuals that were driving the violence and I would have to say in my opinion—humble opinion, no. The work that's being done now, where I talk about a paradigm shift, it's not about the numbers anymore, it's not about the dope officers, photo op of all the dope on the table and the smiles on our faces, it's about going out into the community and actually fighting for those who can't fight for themselves and removing individuals who are causing violence and when you do that, I believe you reduce your arrest rates. If you do it right, you are being mindful, thoughtful, and strategic about things, our uses of force will go down, our internal affairs complaints will go down and at the same time, our trust and relationships will go up (Law Enforcement, 12)

In a city plagued by historic racialized law enforcement practices and substantial allegations of pervasive misconduct, a data-driven approach provides opportunities for strengthening police-minority community relations. For example, OPD respondents reported that the department's enforcement efforts had intentionally shifted over the past several years, moving away from dubious stop-and-frisk tactics in favor of devoting increased attention to the most persistent and active offenders.

While one might expect officers to uniformly provide positive views of enforcement actions, the perceived effectiveness of targeted approaches to public safety were also noted by community members and social service providers, stakeholders known to offer critical views of police operations. Interestingly, many of their views were consistent with OPD personnel.

> …mathematically, if we're calling these people in they can say they're not the right folks, everybody says they're not the right folks, but there's been a consistent down[ward] trend in homicide, some communities [are] getting the word, something is [happening]… (Clergy, 14).

> … some of the greatest strengths is we started with this set of data… …this problem analysis that really honed in on who is this population that we now call very highest risk involved in gun violence and for me, that's been by far the main issue because really the 5,000 foot look at this type of work is two steps—one is identification and two is intervention and often we might have a good program but if it's serving the wrong people then it's not effective at doing this, which is reducing violence. (Service Provider, 8)

> I think focused, targeted intervention with the highest risk individuals is a smart strategy... Whether its Ceasefire or whether its advanced peace model or whatever it is, I think that makes a lot of sense. (Service Provider, 1)

Still, some respondents reported having persistent misgivings about the call-in list, claiming that it lacked legitimacy and unwittingly thwarted high-risk individuals from taking advantage of gravely needed social services, fearing that they would perpetually be subject to heightened law enforcement scrutiny. For example, a probation officer and service provider similarly noted:

> … a lot of times I'll talk to guys and they get hung up on the list, saying, "…I'm on the Ceasefire list…" …now there's a Ceasefire list as far as who we go and invite to sit down at the table. But Ceasefire is an initiative in the city of Oakland. It's a violence suppression strategy for the whole city it's not just about you, you are not John Gotti. …don't get it twisted, you are not the most important man on the face of the earth, you're not the most interesting man alive. (Probation, 4)

> … [Call-in clients] always say, how do I get off the list? …And the reality is there's not like a list, there's not a patrol [officer] driving down the street with the list… there is a [list] in the Ceasefire squad, there are folks doing surveillance [and]… …focusing on [you guys], but I tell people, it's your behavior... If they're doing surveillance on you and you're never doing anything, the department has precious little resources…. They're not going to continue to waste resources on someone who's not doing anything… (Service provider, 8)

It is striking that no respondent outside of OPD personnel were able to articulate how the call-in list was generated, vetted, and maintained. In particular, when explicitly probed regarding the list, most study participants merely offered that OPD command staff created it from a set of risk factors and confidential intelligence. The seeming lack of transparency was a clear source of resentment among non-police stakeholders who were hardly satisfied with organizer's defense of the list on scientific and objective grounds. The clergy person's quote pasted below exemplifies the smoldering dissatisfaction among some Ceasefire partners:

> …the argument that we continued to raise was what science and formula is leading to people being on this list? And, who gets to make that decision? …that always was a consistent fight and the fact that it was a fight was always to me a [red] flag that that the police department was not trying to share power… I understand certain things have to be confidential for the sake of investigations etc… …fundamentally, one of the crippling things about the strategy right now is that the police department does not want to share power with the community. It wants to lord the power over the community, it does not want to work with a third party. It does not want to have some other group of people [scrutinize the list fearing that] the community and the brothers that are being called into these rooms [might] take issue with why [they're] being put on this radar, and being put on this list based upon what? (Clergy, 3)

As noted above, perceived lack of transparency and questions regarding the extent there was truly shared decision-making among strategy partners resulted in substantial discord. In fact, in challenging the list's authenticity, respondents pointed out that it was sometimes comprised of clients that had long "been out of the game" (e.g., no longer involved in criminal activity), gainfully employed, enrolled in substance abuse treatment programs). Moreover, study participants' who were highly skeptical of the list, routinely warned that incorrectly targeting low-level offenders for increased attention and services has the potential to increase citizen distrust and result in missed

opportunities to intervene with persons disproportionately involved in violence. Interestingly, some participants were less forgiving, explicitly accusing Ceasefire leadership of purposefully establishing criteria that would justify enforcement against low hanging fruit (i.e., young men of color). That is, respondents reasoned that it was not hard to find young men of color deemed at-risk, especially those living in disadvantaged, high crime neighborhoods. Furthermore, some partners were especially troubled on occasions when they believed that OPD intentionally abandoned the established criteria for expediency. These swirling (and shared) accusations called into question the veracity of Ceasefire's heralded data- driven approach. The narratives pasted below demonstrate a subset of study participants' stated disquiet:

> …my concern with some of the call-ins is that we're not always 100% sticking to the criteria, we're better than most [other Ceasefire initiatives] but …we have this criteria, 18-35 year-old black and Latino males, significant criminal justice involvement, involved in a gang that's active, has been shot before, has had a close friend or family member shot in the last twelve months…. …we talk about if you're at four or five of these factors you are incredibly highly at-risk to be involved in a shooting... …I would say 80% of the Ceasefire guys meet that criteria, we're not going out selecting folks just solely based on that criteria, so that would be one criticism I have of our strategy… …Now again, most of the list the Ceasefire team has picked based on [these] criteria so we're not way the hell off, but occasionally we get off the criteria. Some of that is because we're doing so many customs (notifications) and call in's that we've reached a saturation point that we're doing some creeping outside the criteria. (Service Provider, 8)

> …there had already been challenges that we'd been having of young men who were telling us that they hadn't been active… and yet they were still getting called-in through our Ceasefire strategy and folks saying, "hey man I haven't active been active in four, five, six, seven years, I haven't been active since I came home from prison six, seven, eight, nine, years ago." …there's a lot of concern that I started having towards the end of the strategy that the Ceasefire strategy was now being really used as a form of… …what's the word I'm looking for, suppression strategy… …that okay, we've got the strategy that the

> community will sign off on and we can really just start getting twenty-five, thirty brothers at a time bringing them in, say we're giving you this message then we can drop the hammer on them and take them to jail. (Clergy, 3)

> …we've had clients who started working and kind of got their stuff together and then they don't get messed with anymore. …but then you have clients who still get messed with who are working, who are doing really well and then police hit (raid) their house because they heard something and they're still harassing them so, I don't know if they ever get off the list or if they [ever] stop getting harassed... …[or] stop being hot (under suspicion)—I don't know. (Service provider, 9)

> …there's a lot people [that get] missed… I feel like it's happened more than once that someone will be on the list or get called in and they've been out of the game for years. …but you know, they're still on the list and so then it becomes, now a sort of a hindrance to their success to be on the list and I just feel if there was more communication with the community that wouldn't happen. (Service Provider, 1)

As noted above, much of the underlying tension regarding the list likely stems from definitional differences regarding what constituted risk across stakeholders. Additionally, as the strategy was being built and implemented it was very important for all parties to stay in separate but coordinated lanes so as not to compromise the integrity of service providers, and this included Oakland Unite not wanted the call-in list in advance of the call-in. For example, depending on their occupational backgrounds, study participants debated the fundamental purpose of the list, expressing divergent views regarding what conditions justified someone being designated an ongoing threat to public safety. On the other hand, a few respondents argued that call-in lists should also include names for prevention purposes, individuals who may not be active perpetrators of violence, but who facilitate crime in less obvious ways. Without consensus about who, how, and when targets should be added to (and purged from) the list, non-OPD team members readily

admitted to sometimes losing faith in the initiative. Finally, the overwhelming majority of study participants, regardless of their professions, maintained that the strategy should target those who were most dangerous, insisting that the list was a crucial, albeit imperfect tool. As a social service provider explained below, given the undisputed crime reductions, most stakeholders reconciled the inherent flaws. S/he noted:

> …about twenty-five percent of [call-ins clients say], "why am I on the list, I shouldn't be on the list," and maybe half of those have a legitimate issue. …the selection process is not perfect, I think it's good, and it's gotten better. I used to say, twenty-five percent of the people we call in should not be called-in and I would now say twenty-five percent of the people say they shouldn't be called in and a good half or more of them, there's some legitimacy to it… …that being said, it's an ongoing issue and I think when occasionally the wrong person is the subject of more activity or attention, that gets exacerbated on the street and even within the service community… (Service Provider, 8)

Some respondents applauded Ceasefire and OPD leadership for their thoughtful responses to and respectful handling of their constructive criticisms regarding the list. As a result, study participants said that they left those discussions with renewed confidence in the partnership. Specifically, non-police study participants reported that they greatly appreciated being afforded opportunities to ask OPD and Ceasefire decision-makers to clarity why specific individuals had been designated call-in candidates. Specifically, stakeholders said that following these sometimes heated debates, they better understood why certain names had been put forward, and vowed to resist the urge to blindly advocate on individuals' behalf going forward:

> …we had one young man in this room swearing to God that he had no idea why he's on that list. They've got you on surveillance brother! But he [insisted], "I'm innocent!" (laughing), everybody's innocent! [There] has been a learning curve for us because there have been instances where, there have been legitimate situations where people needed to be on the list and there are the situations where it wasn't clear that this kid needed to be on the list. (Clergy, 7)

While the majority of study participants reported that police-community relations had steadily improved since implementing Ceasefire (in 2012), almost every respondent begrudgingly identified the nationally publicized sex scandal (of 2016 involving a minor) as a devastating setback that continues to hinder citizen trust. Respondents emphasized, however, that improved police-community relations were underway and praised City leaders for understanding that discriminatory policing practices were not merely about officers shooting unarmed people of color. Instead, they were insistent that OPD police leadership had taken affirmative steps toward ensuring that rank-and-file officers treat citizens with dignity and respect during routine encounters.

Decrease Recidivism and Improve Outcomes for Those at Highest Risk of Violence

Call-ins were intended to deliver the Ceasefire message to a small group of high-risk individuals and their social networks. Besides notifying call-in participants that they have been selected for increased law enforcement attention in the hope that they desist from crime, the forums also provide opportunities for connecting high-risk persons to a wide range of social services. Thus, how call-ins are carried out is critical to the overall Ceasefire mission. Specifically, messages of compassion and care delivered to eligible call-in attendees hinge on their sincerity. Similar to call-in lists, however, study participants mentioned that the initial forums were met with considerable backlash.

Respondents reported that early call-in meetings were not always conducted in a respectful manner and tended to have a disproportionate law enforcement (i.e., police, probation and parole) presence that felt coercive and exploitive, potentially deepening offenders distrust of police and the overall criminal justice system. Furthermore, some study participants questioned the appropriateness of using individuals' probation and parole status to compel their attendance, taking

particular exception to organizers' repeated characterization of call-in clients' participation as "voluntary."

> …this has always been to me the poison in the coffee… …folks coming into the call-ins didn't come voluntarily. Folks always say, "well you chose to be here." No. …if your probation [officer] says, "if you don't come to this, then, I'm going to violate you," …guys would always tell us, "I was threatened to come…" (Clergy, 3)

Study participants, including former call-in clients interviewed, readily acknowledged that Ceasefire organizers had been responsive to feedback regarding problematic aspects of the meetings. For example, strategy partners made several adjustments following criticisms about call-in participants' identities being publicly exposed (e.g., by listing their names on tent cards) and hosting events in places that young men deemed unsafe. As demonstrated by respondents' quotes pasted below, subsequent call-in meetings were greatly improved:

> …we were having [call-in meetings] in East Oakland and those guys couldn't wait to get out of there... We weren't getting that many people signed up and somebody suggested [that] we invite folks to a [follow-up] meeting a week after the call-in, like a feedback session. …sure enough, [clients] said, "you'll having it at the wrong place, just because I live in East Oakland, I can't be on this block and I'm trying to get in and out of there. …then you'll had all these police cars around, supposed to make whoever's coming feel safe that they coming but it just making it worse [for us]." So, we moved it to central, Lakeshore, upper middle class white church and we started having better results. …there we said cut it out with the police, we don't want police cars up and down the block. Now it's got a little bit better. We start feeding them better… …We don't need lookie-loos in here, so for somebody to come they have to be approved by the partnership... We don't want these folks to feel like they're in a specimen jar. It was like that the first couple times, people would say, "oh it was a complete disaster." Yes, it was. That doesn't mean the strategy doesn't work. …we learned from our mistakes... (Clergy, 14)

> We eventually evolved into just one uniform officer in the room at the call-in, there are tons of service providers… …it's [now held] at a church there's more community speakers than there are law enforcement speakers and at the end we dismiss the law enforcement and have a longer meeting with just community providers and food and so it's been a huge difference. …its emblematic of the evolution, the strategy from being mostly law enforcement to at least balanced, if not more service oriented. (Service Provider, 8)

> …we wanted [call-clients] to give us some real feedback, real talk. …they'd tell us for example when we started, we had a whole lot of police presence. I mean you'd drive up and there's like fifteen police cars… …and they said, "…when we roll up and its like that it's like man," so we stopped doing that and if we have cops present, they're often in plainclothes and sometimes it's necessary to have police present because we've [rival] groups coming together and there's tension... …so we've had to modify the degree to which we encourage or nurture police presence [at] call-ins (Clergy, 7)

A handful of respondents questioned whether the strategy was adept at addressing call-in clients' untreated and undiagnosed psychological trauma, potentially debilitating byproducts of urban violence that for them, has not received adequate attention. For instance, one service provider reasoned that those deeply entrenched in violent lifestyles were not well positioned to take advantage of the strategy. S/he noted:

> …the clients who are coming in… …are dealing with a lot of trauma… …they're depressed, they don't say, "I'm depressed," they're just depressed. …they're fatalistic. …like whatever happens, happens. …a lot of the people we [serve] do go get jobs but those are the ones who are not as caught up in that life. …they're not the ones who are ducking from bullets… …the ones who don't know if they're going to be here next week… (Service Provider, 9)

Likewise, a police officer recognized the myriad challenges faced by disadvantaged populations. S/he explained:

> A lot of [these young men are] broken. I get on them about not keeping their appointment but not realizing that they had nowhere to sleep last night. …they didn't eat last night… …they [haven't taken] a shower in two days. …they've been couch surfing for the last two weeks… …so there's layers on top of layers and maybe they're just doing what they got to do in order to survive… …in order to adapt. So, to understand somebody you got to understand what they're going through, what they've been through… (Law Enforcement, 11)

Finally, a social service provider challenged the false narrative that offenders do not want to work. S/he explained that violence permeated high-risk individuals lives, impacting dimensions that others may take for granted. S/he reported:

> I can say [to clients], "put down [your] gun, I'm going to replace it with a job." I've had guys turn down jobs because let's say they're working at [a local fast-food restaurant]… …the fact is that if anybody can come in and they see them then they can target them... …that's the other level… …you don't know who's after you… ….that's got to be scary. You know. (Service Provider, 11)

As the above excerpts demonstrate, there were numerous outpourings of compassion displayed during face-to-face interviews, represented across different types of Ceasefire stakeholders. These sentiments were especially strong, however, among police officers, social service providers, and community members who grew up Oakland. In fact, many of the aforementioned persons reported growing up in challenging neighborhood environments similar to call-in clients. natives who reported growing up in distressed neighborhood settings. Social service providers who had themselves made substantial lifestyle changes offered profound insights regarding their role in the strategy:

> …we've been blessed to live in the area that we work in for a long time. …we know how the streets operate. …we have a history ourselves of being some of the individuals at the forefront of some of this community violence but it's also been years past… …we took advantage, went to school, got a little college

> degree or [done] community work along the way… …ten-fifteen years later we've addressed some stuff in our personal lives and now we're role models for this work. (Service provider, 10)

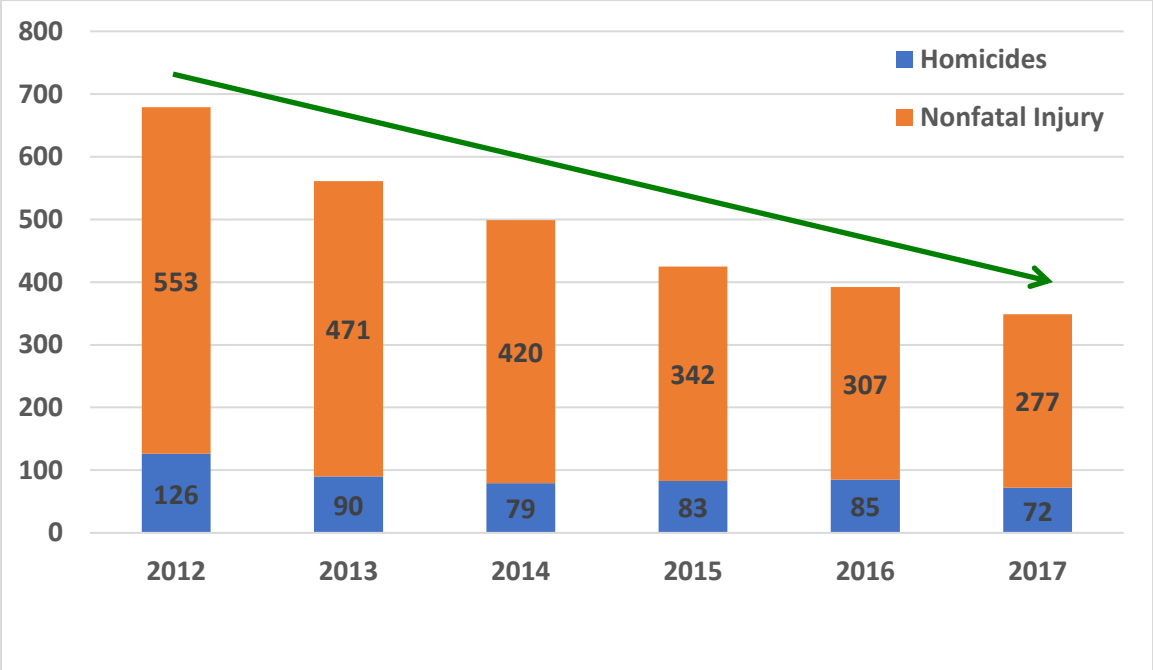
QUALITATIVE RECOMMENDATIONS

While the overwhelming majority of study participants lauded the strategy, touting unprecedented decreases in fatal- and non-fatal shootings, they were asked to provide the research team with advice instructive for moving forward. Respondents believed that Oakland Ceasefire could benefit from more inclusive and strategic public messaging. For example, several study participants pointed out that compared to well-publicized OPD enforcement efforts (e.g., press conferences held following sizeable arrests and seizures), by comparison, Oakland residents perhaps know less about equally important grass-roots efforts, and social service delivery components. Therefore, non-police partners suggest a comprehensive communications strategy, highlighting law enforcement, neighborhood-based, and social service delivery achievements.

V. CONCLUSION

To date, Oakland's Ceasefire program has resulted in continuous, sustained reductions in citywide shootings and homicides. From 2012 to 2017, Oakland has experienced a 43% reduction in homicides and a 50% reduction in non-fatal shootings (Figure 12). Although the city has faced unique challenges to the ongoing operation of this program, its paths to overcoming such obstacles can provide important guidance for the adoption and sustainability of Ceasefire programs in other cities. At its outset, Ceasefire first required a comprehensive problem and opportunity analysis to allow for strategic and effective program development and implementation. Ceasefire intends to narrow the focus of its intervention to those who are responsible for the greatest number of shootings and homicides. This carefully executed analysis undertaken by skilled experts helped direct city resources, personnel and service resources toward those individuals and groups at the highest risk of violence. Also important during the

Figure 12: Oakland Homicides and Non-Fatal Shootings 2012-2017



Source: Fatal and non-fatal shooting data provided by the Oakland Police Department.

initial implementation phase was full organizational investment and allocation of resources. Key leaders in the City of Oakland, management within the OPD, and community leaders with Oakland Communities Organizing were fully dedicated to a renewed Ceasefire effort and helped generate significant support from citizens. Alongside this dedication and support, expert technical assistance from CPSC helped ensure the development of an effective strategy and funds from Measure Y and later Measure Z, helped ensure that program activities and services continued without interruption for the duration of the program.

To achieve its goals, Ceasefire required that partners were able to communicate directly with those at high risk for violence effectively and in a timely manner. Program organizers developed a strong network of devoted law enforcement and community partners who regularly participated in call-in meetings and worked to consistently deliver an impactful and respectful anti-violence message. Working together, they ensured that call-in meetings took place on a quarterly basis and that attendees were targeted based on timely and accurate intelligence. For those who could not be called in or when communication was urgent, officers and community leaders delivered custom notifications with messages carefully tailored to the person's history and current circumstances. Additionally, police department personnel acknowledged that in order for these messages to be as effective as possible, they had to work to increase trust and repair damaged police-community relations. The OPD adopted an in-depth procedural justice training curriculum administered to all officers to build awareness of the legacy of policing in communities of color and the need to actively work to build trust with community residents.

Finally, sustaining Ceasefire's success relied heavily on the development of consistent performance management strategies. Adopting weekly shooting reviews with frontline officers ensured that all direct communications and enforcement actions were focused on the most

appropriate targets. Partners were kept informed of recent shootings, persistent and emerging gang conflicts, possible opportunities for retaliation, and overall street dynamics. This information was communicated to community and social service partners through bi-weekly coordination meetings. Additionally, managers and department heads reviewed performance indicators and goals in bi-monthly performance review meetings which helped keep the entire program on track while also revealing potential areas for improvement.

This impact evaluation of Oakland's Ceasefire highlights several noteworthy effects of the violence reduction initiative. First, a place-based analysis showed that the program is associated with a reduction in gun homicides in Oakland that is distinct from the trends in other comparison cities. Within Oakland, the intervention reduced gun violence in neighborhoods with groups/gangs that were subjected to the Ceasefire treatment, and this violence was not displaced to surrounding neighborhoods. Next, a gang/group-based analysis revealed a steeper decline in group-member-involved shootings compared to non-group-member-involved shootings. There was furthermore a significant reduction in shootings by treated groups/gangs and vicariously treated groups/gangs relative to untreated groups/gangs. A third component of the impact evaluation involved individual-level analysis to explore the effect of Ceasefire participation on individual victimization and arrests. Compared to non-participants, individuals who participated in the Ceasefire program experienced a non-significant decrease in victimization. However, participants also experienced more arrests when compared to the non-participant comparison group. The increase in arrests is likely due to continuing focus on high-risk individuals by law enforcement agencies seeking to ensure that participants are not returning to criminal behaviors that could undermine Ceasefire's violence prevention message. This also may be due to the

challenges associated with developing a comparison group for Ceasefire participants due to their particularly high risk level.

Lastly, the qualitative analysis involving 21 interviews with local stakeholders shed light on the program's successes and continued opportunities for improvement. Respondents recommended that Ceasefire partners continue to focus on increasing trust and respect among participants, community members, and law enforcement officials. They also highlighted concerns about the program's ability to sustain reductions given longstanding socioeconomic factors, like widespread poverty and unemployment, that may hinder their efforts. Despite these concerns, respondents tended to support the program's organized ability to reduce gun violence, and they were supportive of dedicating law enforcement and social service resources to those at the highest risk of violence. Additionally, stakeholders commended Ceasefire partners for remaining dedicated to the program and sustaining reductions in citywide gun violence.

Many cities are likely to face numerous challenges throughout the course of any violence reduction program, but Oakland's difficulties have been compounded by a stubbornly high homicide rate which had been resistant to previous efforts as well as leadership turnover at the Oakland Police Department. Given the stubbornly high rate of violence, two mayoral administrations, chronic understaffing, a national scandal, and multiple and constant leadership changes in the OPD during this time, it is quite remarkable that Oakland and this Partnership was able to achieve these results. Oakland's Ceasefire strategy has been able to overcome these obstacles first by using careful intelligence and analysis to direct respectful communication, effective service and support approaches, and informed enforcement action toward the most appropriate individuals—those at the very highest risk of violence. Furthermore, they ensured that their actions were effective and that they adapted to any changing needs and street dynamics

by holding consistent shooting reviews, coordination meetings, and performance review meetings. With these components in place and with the help of an expert technical assistance provider and a dedicated and passionate network of partners, Oakland's Ceasefire has been able to endure several challenges and develop into what is widely considered to be the city's most impactful violence reduction initiative.

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