Journal of Urban Health: Bulletin of the New York Academy of Medicine, Vol. 90, No. 1
doi:10.1007/s11524-012-9731-5

Effects of Baltimore's *Safe Streets* Program on Gun Violence: A Replication of Chicago's *CeaseFire* Program

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ABSTRACT *Chicago's CeaseFire program is an evidence-based public health approach to preventing gun violence. Baltimore is one of many US cities attempting to replicate the program. We compared changes in the number of homicide and nonfatal shooting incidents per month in four intervention neighborhoods with changes in high-crime comparison areas (police posts) without the intervention, while controlling for several measures of police activity and baseline levels of homicide and nonfatal shootings. In South Baltimore there were large program-related reductions in homicide and nonfatal shooting incidents. Among three East Baltimore program sites, the program was associated with a reduction of homicides in one area, a reduction in nonfatal shootings in another area, and a simultaneous increase in homicides and decrease in nonfatal shootings in another area. In some instances, program effects extended to neighborhoods bordering the intervention areas. Program-related reductions in homicides appear to be linked with conflict mediations conducted by program outreach workers.*

KEYWORDS *Violence prevention, Community intervention, Firearm violence*

Among US males ages 15 to 24 years, homicide is the leading cause of death for Blacks and the second leading cause of death for Hispanics.[1] Nine out of 10 of these deaths are from gunfire.[2] For every youth murdered with a gun, there are about four additional youths treated in hospitals for nonfatal gunshot wounds from criminal assaults.[3] Homicide rates in most urban US counties are twice as high as the rates in less urban counties.[4] Exposure to gun violence has harmful effects on mental health[5] and has been associated with reduced healthy outdoor activities in communities where shootings are common.[6]

Many urban youth believe that gun carrying in high-crime neighborhoods is common, and that the "code of the street" or social norm in these neighborhoods is to be willing to respond with lethal violence if threatened.[7,8] Some youth believe that this code requires them to respond with violence, including lethal violence, if they are blatantly disrespected. Failure to do so increases risk not only to one's perceived

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masculinity and social status, but for future victimization.[7–9] These attitudes and perceptions pose a significant challenge to efforts to curtail urban gun violence.

Gun violence has historically been viewed as a problem to be addressed principally through policing and criminal justice responses. Although well-targeted and implemented law enforcement strategies designed to deter criminal gun possession and offending can reduce shootings,[10–15] persistently high rates of gun violence and long-term costs of incarceration suggest a need for effective community-based prevention as well. Some public health researchers and practitioners have advocated for new approaches to violence prevention that draw upon lessons learned from successful public health initiatives.[16]

Drawing upon his knowledge and experience combating infectious diseases, Gary Slutkin developed *CeaseFire*—a public health program to prevent shootings involving youth by changing behaviors, attitudes, and social norms most directly related to gun violence. The program targets communities with high rates of gun violence and often contracts with community-based organizations that are best positioned to work with high-risk youth in those areas. Street outreach workers identify and build trusting relationships with youth ages 14 to 25 years who are at greatest risk of being involved in gun violence. By serving as positive role models and connecting youth to educational and job opportunities, outreach workers direct high-risk youth toward paths away from violence. Outreach staff typically work during evening hours, when most shootings occur, and position themselves so they can mediate conflicts that have the potential to lead to shootings. Some outreach staff take on roles as "violence interrupters" and devote all or nearly all of their time to identifying and mediating conflicts between individuals or gangs. The program also attempts to mobilize communities by holding monthly events designed to bring the community together, promote nonviolence, and provide positive activities for youth.[17]

An evaluation of *CeaseFire* in Chicago found that the program was associated with significant reductions in shootings and retaliatory homicides in four of seven intervention neighborhoods studied.[18] When program implementation was interrupted as a result of funding cuts, shootings increased in the affected areas.[19] A recent evaluation of a similar program in Pittsburgh, however, found no evidence that the program reduced violence,[20] though this may have more to do with problems with program implementation than with the program model.[21]

Encouraged by preliminary data on the effects of *CeaseFire*, the Baltimore City Health Department sought funding to bring the program to Baltimore under the name of *Safe Streets*. This study presents data on the implementation of Baltimore's *Safe Streets* program and estimates its impact on homicide and nonfatal shootings.

PROGRAM IMPLEMENTATION

In 2007, the Baltimore City Health Department (BCHD) obtained a $1.6 million grant from the US Department of Justice to replicate Chicago's *CeaseFire* program. One departure from the *CeaseFire* model, however, was that there would be no specialized "violence interrupters" in Baltimore; street outreach workers would mediate conflicts as well as work with high-risk youth clients. Applicants had to implement the program in a neighborhood police post (precinct) within the top 25 % in the city for number of homicides and non-fatal shootings, be able to hire ex-offenders as outreach workers, and comply with staffing and monthly reporting

requirements. Prior to program implementation, *CeaseFire* staff provided extensive training to *Safe Streets* program staff.

The first *Safe Streets* program was implemented in the McElderry Park neighborhood in East Baltimore the summer of 2007. In 2008, the organization implementing the program in McElderry Park was funded to expand the program to two additional neighborhoods bordering McElderry Park–Ellwood Park (starting in February 2008) and Madison-Eastend (starting in November 2008). Finally, in November 2008, a *Safe Streets* program site was initiated in the South Baltimore community of Cherry Hill. Funding was discontinued in the summer of 2010 for the Ellwood Park and Madison-Eastend program sites.

The BCHD specified that each site would operate with a site director, a community coordinator, four full-time-equivalent outreach worker positions, and an outreach worker supervisor. However, the three program sites clustered together in East Baltimore shared a single office (located in McElderry Park), director, outreach supervisor, and community coordinator. The three East Baltimore sites were staffed with four outreach workers each, but during parts of 2008 and 2009, some outreach staff from McElderry Park were asked to work in Ellwood Park and Madison-Eastend where the program had to contend with substantial gang conflicts and violence.

Table 1 presents monthly averages for program implementation data for each program site and year. Some differences across sites and time are worth noting. McElderry Park and Ellwood Park had more program participants and in-person participant contacts per month than the other two sites. McElderry Park also

TABLE 1 Monthly averages for program implementation data by program site by year, 2007–2010

	2007	2008	2009	2010	Total
McElderry Park					
Program participants	–	36.1	50.4	59.5	48.7
In-person contacts with participants	–	134	153	271	186
Incidents mediated	3.8	2.7	1.9	7.7	4.0
Community events	1.7	1.2	1	1.7	1.4
Attendees at community events	250	216	176	187	207
Ellwood Park					
Program participants	–	53.3	61.7	36.3[a]	53.3
In-person contacts with participants	–	196	279	180[a]	226
Incidents mediated	–	0.8	0.8	3.7[a]	1.4
Community events	–	0.8	1	0.8[a]	0.9
Attendees at community events	–	122	100	99[a]	109
Madison-Eastend					
Program participants	–	–	39.4	34.5[a]	37.8
In-person contacts with participants	–	–	152	168[a]	157
Incidents mediated	–	–	0.9	1.7[a]	1.2
Community events	–	–	1.2	0.8[a]	1.1
Attendees at community events	–	–	119	110[a]	116
Cherry Hill					
Program participants	–	–	45.1	36.7	40.9
In-person contacts with participants	–	–	158	127	143
Incidents mediated	–	–	3.9	2.4	3.2
Community events	–	–	1.8	1.7	1.8
Attendees at community events	–	–	150	159	155

[a]Data for January–June, 2010. Program ended 6/30/2010

generally had more people attending community events. The average number of incidents mediated per month was lowest in Madison-Eastend (1.2) and Ellwood Park (1.4) and notably higher in Cherry Hill (3.2) and McElderry Park (4.0). The number of mediations conducted in McElderry Park varied considerably between 2007 and 2010 with the highest number of mediation occurring during the times before and after the other East Baltimore program sites were in operation.

RESEARCH METHODS

Data and Measures

Because *Safe Streets* was focused on reducing gun violence, the primary outcomes of interest were homicides and nonfatal shootings (NFS). We obtained data on these outcomes from the Baltimore Police Department (BPD) to create monthly panel datasets for both homicides and NFS incidents for 39 police posts in Baltimore for the period January 1, 2003 through December 31, 2010. We used the number of homicide and NFS incidents as outcome measures rather than the number of victims because single incidents with a very large number of victims can skew the data and estimates of program impact.

Safe Streets was designed to be implemented within the boundaries of a police post (precinct) and eligibility required that the post was in the top quartile for number of homicides and nonfatal shootings during the 3 years prior to the program's launch. Therefore, we focused the study on the 39 police posts that were either in the top quartile for gun violence during the pre-intervention period or bordered a *Safe Streets* post. Figure 1 depicts the location of the intervention, border, and comparison posts. One intervention area which encompassed most of the Madison-Eastend neighborhood was not bounded by police post borders but made up of parts of three different polices posts. For incidents in this area, we created a composite "post" to represent the Madison-Eastend program neighborhood. For each incident occurring in any of the three posts overlapping the neighborhood, we determined whether or not it occurred in the intervention neighborhood.

Direct exposure to the program was measured using dichotomous variables (program operating = 1, no program = 0) for each program site and month. We did not assume that the program would have the same effect in each program site based on what we learned about the difference in context and implementation across the sites; therefore, separate intervention variables were examined for each site. Each program site needed 1 to 3 months before substantial program activities were taking place. A program site was not considered fully active until there were at least 20 program participants being mentored or at least two incidents had been mediated by program staff. For McElderry Park, full program implementation was measured for 42 months, July 2007 through December 2010. Outreach staff and supervisors in McElderry Park diverted their energies somewhat to attend to conflicts in Madison-Eastend and Ellwood Park based on conflict mediation data and interviews with program managers. Therefore, in separate models, we assessed the effects of McElderry Park's program when the program activities were also taking place in Madison-Eastend and when that site was not in operation. Ellwood Park's program was fully implemented for 28 months, Madison-Eastend's program was in place for 18 months, and Cherry Hill's program ran for 24 months.

Gun violence can spread similarly to an infectious disease,[22] and efforts to prevent gun violence could, therefore, reduce the spread of gun violence to areas adjacent to

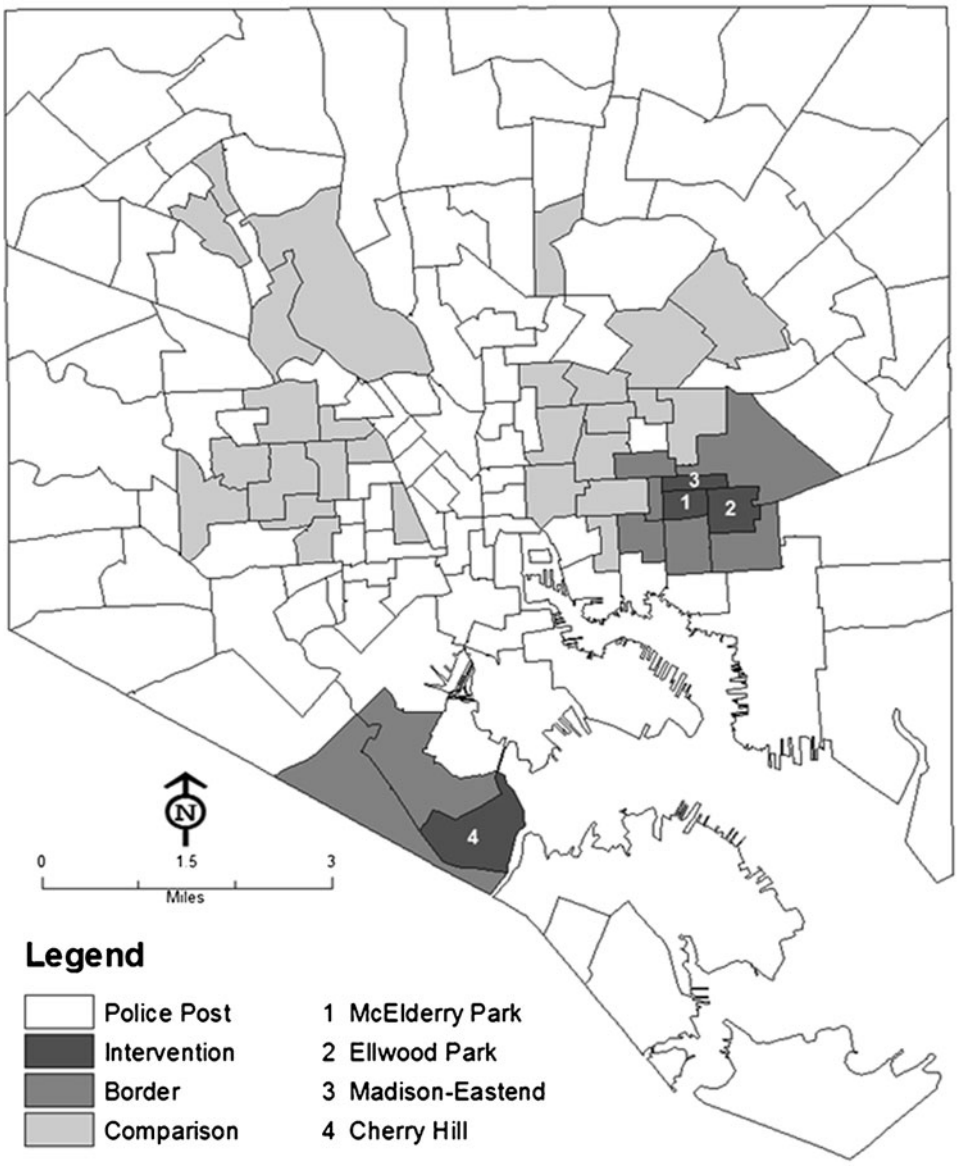

FIGURE 1. Map of Baltimore Police Department's posts with *Safe Streets*, border posts, and comparison posts indicated.

the intervention sites. Also, program participants and others exposed to the program cross boundaries of adjacent neighborhoods. Program effects on police posts bordering the program sites were estimated in the same way that we measured direct program exposure, with variables indicating whether or not *Safe Streets* was implemented in an adjacent post.

Data Analysis

Program effects were estimated using negative binomial regression appropriate for modeling outcomes represented as incident counts and preferred to Poisson regression when the data exhibit overdisperion.[23] Regression inference was based

on generalized estimating equations to adjust effect standard errors to account for the clustering of the data by police post.[24] These models estimate program effects by contrasting changes in the gun violence target communities with changes in communities that did not have the program, while controlling for baseline levels of gun violence and targeted law enforcement activities directed at controlling violence in specific neighborhoods. Specifically, the regression models included indicator variables for the presence of BPD's Violent Crime Impact Section, specialized detective units deployed to areas with some of the highest rates of gun violence to suppress illegal gun carrying and gun violence. Similar efforts have been shown to reduce violence in other high-crime urban areas.[10] The models also controlled for the effects of Project Exile offender notification meetings. Project Exile targets offenders in high-crime areas who are deemed to be the most dangerous. Offenders are called in and warned by law enforcement officials that they will face federal prosecution and the likelihood of much longer prison sentences if they reoffend. Offenders are also offered services and support to help them avoid reoffending. Finally, the models controlled for the number of arrests for drug and weapons (possession only) offenses in the previous month in each post. Using the number of weapons and drug arrests in the previous month avoids problems of endogeneity.[25]

The regression models controlled for pre-intervention differences in levels of homicides and NFS for each post by using an indicator variable for each post. We controlled for changes in unmeasured determinants of gun violence operating in Baltimore's most violent neighborhoods with indicator variables for year. Because there are seasonal fluctuations in gun violence, we also controlled for calendar month with a set of indicator variables for each month with January as the reference. Regression coefficients were exponentiated (e^{β}) to permit interpretation as adjusted incident rate ratios (IRR) and percent changes associated with the program.

Although the standard errors of regression coefficients were adjusted to account for the lack of independence and clustering of the data by police post, spatial autocorrelation of model residuals could still bias standard errors and tests of statistical significance. We used Moran's I statistic, a common test of spatial autocorrelation, to test whether model residuals for each year and month were spatially correlated.[26] There was little evidence of spatial autocorrelation in the model residuals.

RESULTS

Table 2 shows the means and standard deviations for the outcome variables and non-dichotomous control variables during the pre-intervention period (January 1, 2003–June 30, 2007). Homicides and nonfatal shooting incidents were more common in the intervention areas than in the nonintervention comparison areas despite limiting the analyses to police posts in the top quartile in the number of homicides and shootings. Weapon and drug arrests were much higher in McElderry Park than in the other sites or in the comparison posts.

Figures 2, 3, 4, and 5 depict 3-month moving average trends for homicides plus nonfatal shooting incidents for each intervention area contrasted with the comparison posts. Among the comparison posts, gun violence shifted downward in the middle of 2007 and leveled off for 2009–2010. Gun violence shifted downward in McElderry Park when the program was first implemented, but rose from mid-2009 to mid-2010 (Figure 2). In Ellwood Park, gun violence surged when

TABLE 2 Baseline monthly means and standard deviations for outcome and control variables for program sites, police posts bordering program sites, and nonintervention comparison posts

	Homicide incidents Mean (SD)	Non-fatal shooting incidents Mean (SD)	All incidents (homicide + NFS) Mean (SD)	Drug arrests Mean (SD)	Weapon arrests Mean (SD)
Safe Streets—McElderry Park	0.32	0.72	1.02	41.48	0.85
	(0.61)	(0.88)	(0.61)	(14.86)	(1.05)
Posts bordering McElderry Park	0.09	0.18	0.25	8.78	0.20
	(0.31)	(0.43)	(0.51)	(5.94)	(0.51)
Safe Streets—Ellwood Park	0.35	0.94	1.24	29.35	0.56
	(0.68)	(1.00)	(1.16)	(10.36)	(0.84)
Posts bordering Ellwood Park	0.07	0.24	0.29	10.38	0.29
	(0.26)	(0.51)	(0.59)	(6.84)	(0.73)
Safe Streets—Madison-Eastend	0.28	0.93	1.17	29.37	0.52
	(0.49)	(1.04)	(1.11)	(11.23)	(0.69)
Posts bordering Madison-Eastend	0.18	0.38	0.52	17.71	0.43
	(0.42)	(0.65)	(0.76)	(12.41)	(0.83)
Safe Streets—Cherry Hill	0.28	0.93	1.17	29.37	0.52
	(0.49)	(1.04)	(1.11)	(11.23)	(0.69)
Posts bordering Cherry Hill	0.31	0.59	0.88	14.47	0.43
	(0.57)	(0.92)	(1.05)	(10.21)	(0.86)
Comparison posts	0.27	0.59	0.82	23.84	0.48
	(0.52)	(0.77)	(0.52)	(14.49)	(0.85)

the program was discontinued (Figure 3). Madison-Eastend's brief intervention period was marked by an early spike in gun violence followed by a decline that continued after the intervention period (Figure 4). The clearest program-related reduction in gun violence is evident in Cherry Hill (Figure 5).

Estimates of program effects from the regression models are presented in Table 3. Program effects were most consistent across outcomes for Cherry Hill where the program was associated with a 56 % reduction in homicide incidents (IRR = 0.44, $p<0.001$) and a 34 % reduction in NFS incidents (IRR = 0.66, $p<0.001$). When homicide and NFS events are summed into a single outcome measure, Cherry Hill's *Safe Streets* program was associated with a 45 % decrease in this outcome (IRR = 0.55, $p<0.001$).

Program effects at the three sites in East Baltimore were more varied (Table 3). When the total effects of McElderry Park's *Safe Streets* program were estimated for the entire intervention period, the program was associated with a 26 % decrease in homicide incidents (IRR = 0.74, $p=0.003$) and a 22 % increase in NFS incidents (IRR = 1.22, $p=0.001$). However, estimates of McElderry Park's program effects varied depending on whether or not program staff and managers were also attending to violence prevention efforts in Madison-Eastend. When staff were not also attending to Madison-Eastend (August 2007–November 2008 and July–December 2010) *Safe Streets* in McElderry Park was associated with a 53 % reduction in homicide incidents (IRR = 0.47, $p<0.001$), no statistically significant change in NFS incidents, and a 10 % reduction in homicides plus NFS incidents (IRR = 0.090, $p=0.038$). During the period when McElderry Park and Madison-Eastend's programs were both being implemented from the McElderry Park office,

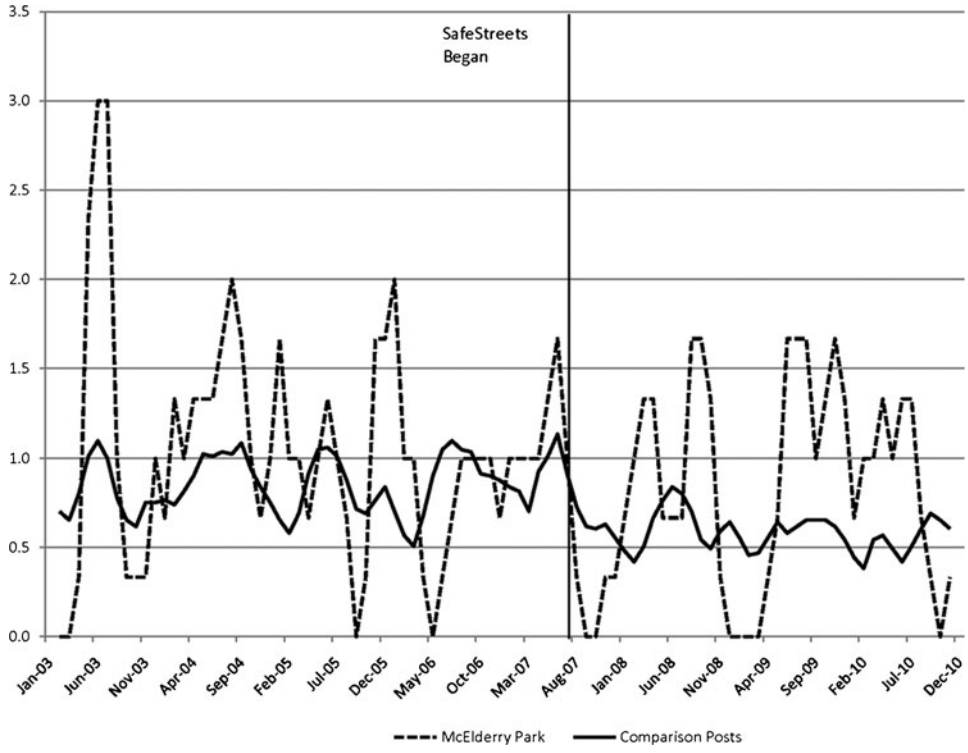

FIGURE 2. Three-month moving average of homicide and nonfatal shooting events in McElderry Park and non-intervention comparison posts.

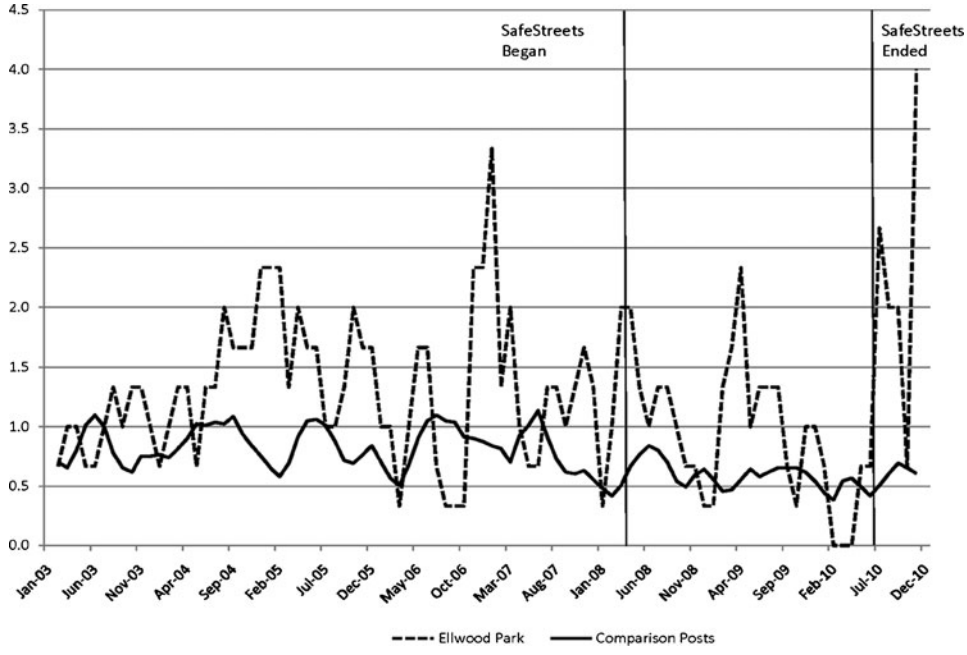

FIGURE 3. Three-month moving average of homicide and nonfatal shooting events in Ellwood Park and non-intervention comparison posts.

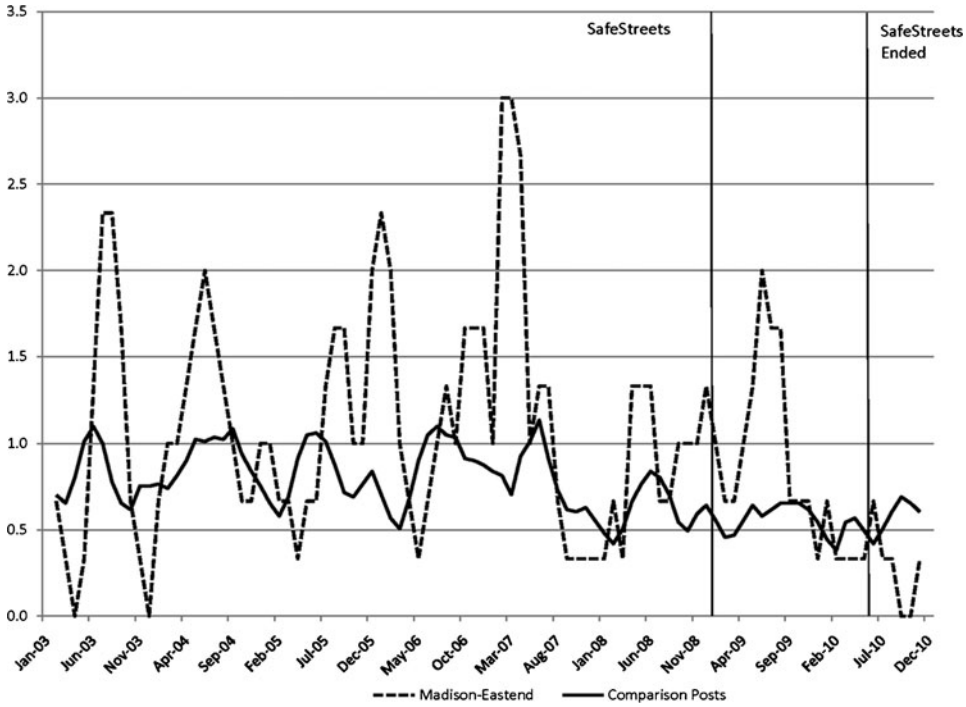

FIGURE 4. Three-month moving average of homicide and nonfatal shooting events in Madison-Eastend and non-intervention comparison posts.

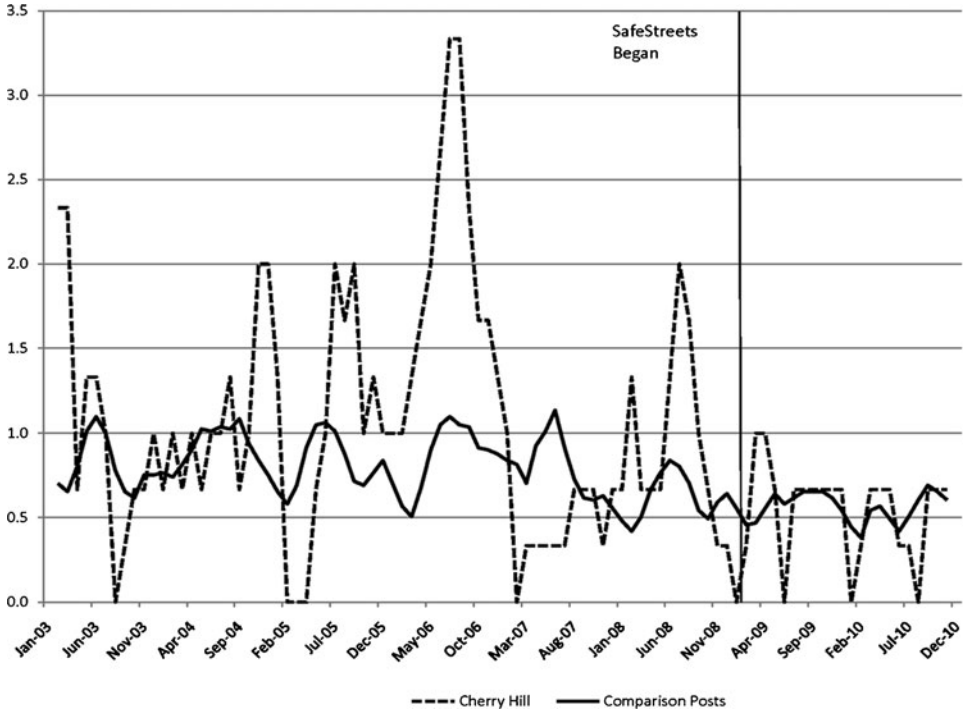

FIGURE 5. Three-month moving average of homicide and nonfatal shooting events in Cherry Hill and non-intervention comparison posts.

TABLE 3 Estimates of *Safe Streets* effects on homicides and nonfatal shootings from regression models

	Homicide incidents		Nonfatal shootings		Homicides + nonfatal shootings	
	IRR	*p* value	IRR	*p* value	IRR	*p* value
Safe Streets—McElderry Park—phase 1[a]	0.47	<0.001	1.05	0.395	0.90	0.038
Safe Streets—McElderry Park—phase 2[b]	0.90	0.436	1.15	0.064	1.02	0.713
Posts bordering McElderry Park	0.72	0.310	0.82	0.464	0.76	0.143
Safe Streets—Ellwood Park	1.11	0.306	0.66	<0.001	0.94	0.229
Posts bordering Ellwood Park	1.55	0.005	0.92	0.814	1.17	0.507
Safe Streets—Madison-Eastend	2.70	<0.001	0.56	<0.001	1.01	0.887
Posts bordering Madison-Eastend	1.04	0.916	0.48	0.030	0.77	0.379
Safe Streets—Cherry Hill	0.44	<0.001	0.66	<0.001	0.55	<0.001
Posts bordering Cherry Hill	0.52	<0.001	0.53	<0.001	0.55	<0.001
Violent crime impact section deployment	0.76	0.097	0.85	0.127	0.84	0.027
Project exile offender notification meeting—Northwest District	0.82	0.542	0.56	<0.001	0.65	<0.001
Project exile offender notification meeting—Western District	0.97	0.881	0.83	0.250	0.94	0.635
Illegal weapon possession arrests, lagged 1 month	1.03	0.408	1.03	0.329	1.03	0.252
Drug offense arrests, lagged 1 month	1.00	0.587	1.00	0.798	1.00	0.668
Year fixed effects (reference = 2003)						
2004	1.24	0.130	1.22	0.022	1.26	0.003
2005	1.06	0.635	1.02	0.822	1.04	0.540
2006	1.12	0.239	1.13	0.082	1.14	0.033
2007	1.15	0.233	0.91	0.300	0.984	0.836
2008	0.90	0.554	0.88	0.167	0.900	0.224
2009	1.15	0.460	0.83	0.075	0.910	0.350
2010	1.16	0.395	0.60	<0.001	0.751	0.001

Models also control for police post baseline means and calendar month

IRR incidence rate ratio, *IRR=1* indicate no change, *IRR<1* indicate decrease in risk, *IRR>1* indicate increase in risk, *p value* probability that the true IRR = 1.0

[a]First 16 months of full implementation before addition of Madison-Eastend as border intervention site and last 6 months after Madison-Eastend's program was discontinued

[b]Eighteen months when supervisors and some outreach staff working in Madison-Eastend *Safe Streets* site, in addition to Ellwood Park

Safe Streets in McElderry Park was associated with a 10 % reduction in homicide incidents that was not statistically significant, and a 15 % increase in NFS incidents that approached statistical significance ($p=0.064$).

Safe Streets in Ellwood Park was associated with no statistically significant change in homicide incidents and a 34 % reduction in NFS (IRR=0.66, $p<0.001$). Homicide incidents in Madison-Eastend during the 18 months of full implementation were estimated to be 2.7 times higher than would have been anticipated without the intervention (IRR=2.70, $p<0.001$), yet the program was associated with a 44 % decrease in NFS (IRR=0.56, $p<0.001$). When homicide and NFS incidents were

combined, neither Ellwood Park's program nor Madison-Eastend's program had statistically significant effects.

Estimates of program effects on bordering neighborhoods were similar to the effects in the intervention neighborhoods. Police posts bordering Cherry Hill experienced beneficial spill-over effects on homicide incidents (IRR = 0.52, $p < 0.001$). Estimates for program effects on posts bordering Ellwood Park suggest detrimental spill-over for homicide incidents (IRR = 1.55, $p = 0.005$); however, these effects were counterbalanced by Ellwood Park's program's beneficial effects on NFS in its border posts (IRR = 0.48, $p = 0.030$).

Across all the program sites and border posts, these statistically significant estimates of *Safe Streets*' impact, both negative and positive, translate into 5.4 fewer homicide incidents (2.8 in the intervention areas and 2.6 in the border areas) and 34.6 fewer nonfatal shooting incidents (17.1 in the intervention areas and 17.5 in the border areas) during 112 cumulative months of intervention post observations. There would have been more than 10 additional homicide incidents prevented had there not been significant increases associated with program implementation in Madison-Eastend and in the area bordering Ellwood Park.

Deployment of BPD's Violent Crime Impact Section was associated with a 16 % reduction in the measure of homicide plus NFS incidents (IRR = 0.84, $p = 0.027$). The Project Exile call-in in Northwest Baltimore was linked with reductions of 44 % for NFS (IRR = 0.56, $p < 0.001$) and 35 % for homicide plus NFS incidents (IRR = 0.65, $p < 0.001$); however, there were no statistically significant effects associated with the call-in that occurred in West Baltimore. One-month-lagged measures of arrests for the possession or distribution of illegal drugs and for arrests for illegal possession of weapons were not predictive of the number of homicide or NFS incidents within a police post. Estimates for year fixed effects reveal a downward shift in NFS incidents broadly beginning in 2008—a year when many gun-offender-focused law enforcement efforts were initiated or ramped up—that intensified through 2010 (Table 3).

Although we controlled for baseline differences in the gun violence outcome measures as well as for variations in arrests for weapons and drugs, baseline differences between some intervention areas and the comparison posts led us to examine the sensitivity of our estimates of program effects to the inclusion of lower-risk comparison posts. When we repeated our analysis with only the 10 comparison posts with the highest numbers of homicide and NFS incidents during the pre-intervention period, the estimates of program effect were very similar to the estimates produced when all 29 nonintervention comparison posts in the top quartile of homicides plus nonfatal shooting incidents were used.

DISCUSSION

Although estimates of program effect varied, three of the four intervention neighborhoods experienced relatively large program-related reductions in at least one measure of gun violence without also having a statistically significant increase in another measure of gun violence. Consistent with the notion that gun violence often spreads like a social contagion,[22] we found significant program-related reductions in gun violence in areas bordering *Safe Streets* sites. Our analyses indicate that the program was associated with the prevention of about 35 nonfatal shootings and at least five homicides across 112 cumulative months of program implementation across the four sites. These reductions were accomplished in some of Baltimore's most violent neighborhoods and were evident soon after program implementation.

Program effects were strongest in Cherry Hill where the program was associated with a 56 % decrease in homicides and a 34 % decrease in nonfatal shootings incidents. McElderry Park experienced one 22-month period with no homicides (July 2007 to April 2009).

Implementation data suggest that the frequency of conflict mediations may at least partially explain variation in program effects on homicides. The two sites with large reductions in homicides had about three times as many conflict mediations as the other two sites, and the 22-month period without a homicide in McElderry Park occurred when *Safe Streets*' outreach workers conducted 16 mediations—many involving large numbers of gang members—within the first 4 months of full program implementation. Cherry Hill's program may have also benefited from having to contend with little violence caused by outsiders because it is geographically isolated from most of the rest of the city.

The only program site where there was no evidence of a beneficial program impact on gun violence, Madison-Eastend, experienced a large spike in homicides not long after *Safe Streets* was implemented while simultaneously experiencing a 44 % decline in NFS incidents. These estimates of program impact may be less reliable than the other estimates because there were only 18 months of full program operation in that location. We believe it is unlikely that program activities spurred more homicides in Madison-Eastend. One possible reason for the positive association between the program and homicides is that the conditions which led the city to decide to implement the program in this neighborhood at the time (e.g., increased gang activity) may have heightened by the time the program was actually put into place. In fact, Baltimore police reported that there was an intense feud between drug-selling gangs during the intervention period in Madison-Eastend and surrounding areas. The feud allegedly involved abductions of gang leaders' family and murders, and peaked on July 27, 2009 when 18 people were shot in a single day, 12 at an incident in Madison-Eastend.[27] The low number of mediations performed in Madison-Eastend and nearby Ellwood Park might reflect some gangs' unwillingness to consider nonviolent alternatives to settling their grievances during the heightened tension at that time.

Safe Streets faced challenges in Ellwood Park and Madison-Eastend in addition to the intense gang feud. Unlike Cherry Hill and McElderry Park, these communities lacked strong neighborhood organizations to support the program and a program office within the neighborhood because they worked from a *Safe Streets* office in nearby McElderry Park. The three sites in East Baltimore also differed from Cherry Hill in that they shared a site director, outreach supervisor, and community coordinator.

McElderry Park was the only intervention neighborhood which did not experience a program-related reduction in NFS. It also had 60 % more illegal weapon arrests during the pre-intervention study period than the other neighborhoods studied. If the higher number of weapon arrests in McElderry Park reflects a greater propensity to keep and carry firearms compared to other neighborhoods, this may have limited the program's effectiveness in reducing NFS that result from spontaneous altercations involving one or more individuals.

As with any non-experimental study, our estimates of program effect could be biased by unmeasured factors that were related to the place and time of program implementation as well as to gun violence. We sought to minimize any such potential biases by limiting our study to police posts which were in the 75th to 100th percentile for the number of homicides and nonfatal shootings, a prerequisite to

being eligible to compete for funds to implement the program. Although intervention areas had somewhat higher rates of gun violence prior to *Safe Streets*, the analyses control for baseline differences in gun violence and estimates of program impact were consistent with those produced with all comparison areas. Our analyses also control for conditions other than *Safe Streets* that seem most likely to explain changes in gun violence within the intervention areas during the study period—the implementation of key law enforcement initiatives intended to curb gun violence that were focused on discrete areas, and arrests for weapon and drug-related offenses yearly shifts in gun violence not attributable to these public safety measures, and calendar month.

Selection bias can skew estimates of program effects if the program is only implemented in neighborhoods with exceptional capacity and motivation to address gun violence (because they are the most competitive in the open bidding process for program funds). However, while the organizations selected in the open competition for funding demonstrated the strongest capacity for implementing a program of this type, three of the four *neighborhood locations* for the program were selected more on the basis of need than for the community's capacity. The organization which ran the program in McElderry Park, Ellwood Park, and Madison-Eastend had worked in East Baltimore, but not worked in these specific neighborhoods prior to *Safe Streets*. They were asked to work in these neighborhoods by city officials primarily because those neighborhoods were considered to be in greatest need of the program.

Although both the prior study of *CeaseFire*'s effects in Chicago and this study of *Safe Streets* in Baltimore provide evidence that the program prevented gun violence, the magnitude and consistency of the effects vary and some program sites did not experience program-related reductions in gun violence. Our findings from Baltimore suggest that strength of program implementation, especially with respect to conflict mediations, is likely to explain differences in program effects. Given the threat that gun violence poses to the safety, health, and prosperity of urban communities and the growing popularity of Chicago's *CeaseFire* approach, more research is needed both on the relationship between program implementation and effects on violence.

ACKNOWLEDGMENTS

Funding for this study was provided by a grant from the Centers for Disease Control and Prevention (CE000728) and a contract with the Baltimore City Health Department.

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