

The Impact of the Safe and Successful Youth Initiative on City-Level Youth Crime Victimization Rates: Substantive Results and Implications for Evaluation

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Background: The physical, emotional, and financial costs resulting from youth violence are well documented.

Purpose: This article summarizes the results of a quasi-experimental evaluation study to test a youth violence intervention program in eleven cities in Massachusetts.

Setting: In 2011, Massachusetts initiated the Safe and Successful Youth Initiative (SSYI), which provides a comprehensive public health approach for young men believed to be at "proven risk" for being involved with firearms.

Intervention: The SSYI program components include: (1) Specific identification of young men, ages 14-24, at highest risk for being involved in firearms violence; (2) Use of street outreach workers to find these young men, assess their needs, and act as brokers for services; (3) The provision of a continuum of comprehensive services including education, employment, and intensive supervision. Eleven cities with the highest count of violent offenses reported to the police in 2010 were selected for SSYI funding in 2011 and began implementing the program.

Research Design: Short-interrupted time series design with a comparison group. The observed and predicted trends in monthly violent victimization rates for the 11 SSYI cities were compared to the next 23 cities (as they ranked in reported violent crime in 2010).

Data Collection and Analysis: Using police incident data, researchers examined SSYI's impact on monthly city level violent crime, aggravated assault and homicide rates for persons ages 14-24.

Findings: Results indicated that SSYI had a statistically significant and positive impact on reducing the number of victims of violent crimes, aggravated assaults, and homicides per month that were reported to the police. A city with SSYI has approximately 60 fewer victims of violence each year, ages 14-24, per 100,000 citizens over the post-intervention period.

Keywords: *quasi-experiment; interrupted time series; crime prevention; violence; Massachusetts*

Introduction

Evidence-based policy has become, as some have called it, “all the rage” (Laycock & Tilley 2000). This move has several ramifications toward evidence-based policy in the violence prevention area, including greater emphasis on the use of rigorous experimental or quasi-experimental designs to evaluate violence prevention programs. In this paper, the authors describe one such rigorous quasi-experimental study, an interrupted time series design with a comparison group, to assess the impact of the Safe and Successful Youth Initiative (SSYI), a violence prevention program in Massachusetts. Following a discussion of the context and description of the program, the design and results are described. The authors then discuss the implications for the evaluation community and conclude with recommendations for the future evaluation of similar programs.

Massachusetts Safe & Successful Youth Initiative

Rather than focus exclusively on criminal justice responses to gun violence (e.g., suppression, arrest and incarceration), Massachusetts employs a public health approach to address gun violence across its most vulnerable cities, through its Safe and Successful Youth Initiative (SSYI), which targets young men (ages 14-24) at “proven risk” for being involved in firearms violence (Campie, et al. 2013).

SSYI began in 2011 when 11 cities were selected for state-level SSYI funding and began implementing the program. These 11 cities were ranked highest in counts of violent crime in 2010. Unfortunately, the implementation data on SSYI across the 11 sites are limited, making it difficult to discern whether city-level impacts were related to implementation capacity or fidelity to the program model. A related study (Campie et al., 2014) that examined youth-level outcomes found that level of engagement was statistically related to likelihood of future incarceration among SSYI participant. While the study cannot compare outcomes by varying levels of implementation or specific program component, there are SSYI components that are mandatory and must be included in each program at the city level:

- Specific identification of young men, 14-24, at highest risk for being involved in firearms violence

- Use of street outreach workers to find these young men, assess their current needs, and act as brokers for services to address unmet needs
- The provision of a continuum of comprehensive services including education, employment, and intensive supervision

To evaluate the impact of SSYI, the authors used a short interrupted time series (ITS) design with a comparison group. The study was guided by the research question, “*what is the impact of SSYI on monthly city-level victimization rates (per 10,000 citizens) for persons ages 14-24?*” that was examined for overall violent crime victimization rates; aggravated assault victimization rates; and homicide rates.

Evaluation design. In an ITS design, researchers examine a prediction of a trend before the start of an intervention with the actual observed results to determine whether the difference is large enough to be real and not due to chance.

Data sources. The data come from the National Incident-Based Reporting System (NIBRS), as reported to the Massachusetts state police. NIBRS collects data on each crime incident and provides a more fine-grained picture of reported crime than the Uniform Crime Report (UCR). The data analyzed here comes from the victim file and include monthly victimization rates for persons ages 14-24 in each city in the study sample.

As it is voluntary, not all police departments report NIBRS data. Of the 11 cities receiving SSYI funding, nine report NIBRS data to the Massachusetts State Police. Lawrence and Boston do not, but do provide “proxy data,” and thus were included in the data file that was the subject of the analyses described below. In addition, two comparison cities did not report data to NIBRS until 2011 and 2012, respectively (not contributing data to the pre-intervention trends). They were dropped from the analyses.¹

The offenses included in the data file that the research team received included: homicide, aggravated assault, forcible rape, robbery, simple assault, burglary and breaking and entering (B&E), all other larceny, and motor vehicle theft.

¹ However, note that sensitivity analyses were done including the post-intervention data from both cities. This was done to determine if there were any differences in the estimates with or without them. The differences were negligible.

Because the offenders included in the SSYI program are males ages 14-24, and much of the violence perpetrated by this group is directed toward persons of a similar age group, the victims data file is specific to persons in that range.

Key Components of the Interrupted Time Series Design

The treatment group. In this study, the treatment group is 11 cities receiving SSYI funding that implemented the program: Boston, Brockton, Chelsea, Fall River, Holyoke, Lawrence, Lowell, Lynn, New Bedford, Springfield, and Worcester.

The comparison group. The comparison group is comprised of the 23 cities with the next highest levels of reported violent crime incidence in 2010.²

The time frame. The monthly data covered 60 months (from January 2009 to December 2013). This includes 24 months of pre-intervention data and 36 months of post-intervention data (using a start date of SSYI funding as January 1, 2011).³ Not all cities in the sample reported all 60 months of data, but all cities were included as long as they provided some pre-intervention data.

The interruption. The intervention is “the interruption” and is plotted as the point in time when the intervention began. The main analysis examines the impact of the advent of SSYI funding, established January 1, 2011.

Controlling for pre-existing differences. To control for factors for which the 11 SSYI cities (treatment group) may differ from the non-SSYI cities (comparison group), the authors included the data on two factors in the analytical model. The first is poverty level. Using data from the U.S. Census, the authors added the percentage of persons living in poverty in the jurisdictions to the

model to reduce any pre-existing differences between the study groups in poverty levels. The authors also included data from the Massachusetts Department of Elementary and Secondary Education (DESE), on the percentage of high school completers. This is to control for the fact that SSYI cities are dealing with more challenging circumstances than comparison cities, in terms of persons living in poverty and the number of youth completing high school.⁴

Victimization Rates for Persons Ages 14-24

The outcome data are based on the number of victims (ages 14-24) per offense per 10,000 persons. Although many offenses have just one victim, there are incidents that include multiple victims. Thus, this rate should not be confused with an incident rate, but rather a rate based on total number of victims.

Outcome measures. Violent crimes include: homicide, forcible rape, aggravated assault, robbery, and simple assault. Again, a rate per 10,000 persons was created to standardize data across all cities in the study sample. For example, to create a homicide rate, the authors use data from Boston in July 2011, when six homicides were reported. The rate is calculated as $((6/617,594)*10000) = .097$ homicides per 10,000 persons. The outcome measure for all three outcomes (monthly violent crime victimization rate, homicide rate, and aggravated assault rate) are computed for persons ages 14-24.

The authors analyzed two of these violent offenses separately: homicide and aggravated assault, as SSYI targets young men at grave risk for being involved in firearms violence, and these offenses are the most relevant. These data were also converted to rates per 10,000 persons: the homicide victimization rate for persons ages 14-24 and the aggravated assault victimization rate for persons ages 14-24.

Results

The authors present the results for each analysis conducted to answer the research questions based on the three indicators.

² The authors also looked at a second comparison group as a sensitivity check and examined *the* six cities that did not receive another state funding source for gang prevention (Shannon grants) that reported sufficient data to the NIBRS. The results remained robust even with this second comparison group. Readers are encouraged to read Petrosino et al. (2014) for the full technical report.

³ As a sensitivity check, the authors also looked at a later “interruption date” of January 1, 2012 (one year later). This provided 36 months of pre-intervention data and 24 months of post-intervention data. Again, the results remained robust. Readers are encouraged to read Petrosino et al. 2014 for the full technical report.

⁴ The authors also ran regression models with additional covariates as a sensitivity analysis. Again, the results were similar with or without the additional variables in the model. Readers are encouraged to read Petrosino et al. 2014 for the full technical report.

Table 1
SSYI Impact on Violent Crime Monthly Victimization Rates for Young Persons, 14-24

No. of Incidents: 2028

No. of Cities: 34

Violent Crime	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Time1	-0.225625	.0030707	-7.37	0.000	-.0285614	-.0165636
Percent_HS_Completion	-9.580426	3.69887	-2.59	0.010	-16.83008	-2.330774
Percent_Living_Poverty	9.97638	7.519853	1.33	0.185	-4.762261	24.71502
Interruption (treatment)	.240446	.1150686	2.09	0.037	.0150258	.4660862
Comparison group	1.684498	.7606469	2.21	0.027	.1936571	3.175338
Interruption x Comparison	-.569656	.1224171	-4.65	0.000	-.809589	-.329723
_cons	9.368071	3.527239	2.66	0.008	2.45481	16.28133
sigma_u	1.1610027					
sigma_e	1.263671					
rho	.45773263	(Fraction of variance due to u_i)				

1. *What is the impact of SSYI on city-level violent crime victimization rates (per 10,000 citizens) for persons ages 14-24?* As Table 1 indicates, the rates for monthly violent crime victimization of young people, ages 14-24, are approximately double in SSYI cities than in the comparison group, highlighting the fact that SSYI cities are by and large more violent communities compared to those in the control group. The results from the analysis indicate that cities that receive SSYI funding are associated with a statistically significant and positive effect on monthly violent crime victimization of young persons.

Table 1 provides the detailed analytic table for the comparison between SSYI and all comparison cities, using 2011 as the interruption period. According to these results, the victimization rates of persons ages 14-24 went down for SSYI cities during the post-intervention period by -.57. (The effect in the table is represented by the term, *Interruption x Comparison*, the interaction between the pre and post intervention periods and whether a city was in the treatment or comparison group). This result is statistically significant and means that an SSYI city experiences the prevention of approximately 5.7 victims of violent crimes every month between ages 14-24 for every 100,000 citizens over the three-year post-intervention period.⁵

⁵ Rates in the tables and analyses were based on crime victimization per 10,000 citizens. However, to help provide more interpretable findings at the city-level, and particularly given the very small rates for homicide, the authors converted the impact estimate to the anticipated number of victims prevented each month per 100,000 citizens. This was done for all analysis tables.

2. *What is the impact of SSYI on city-level homicide rates (per 10,000 citizens) for persons ages 14-24?* The authors examined the impact of SSYI on monthly homicide victimization rates of young persons, ages 14-24. Table 2 provides the average rates for the pre-intervention and post-intervention periods for the study groups. The rate goes down in SSYI cities, but increases slightly in the comparison group.

The results indicate that being in a SSYI city is associated with a statistically significant positive effect on the rates of monthly homicide victimization of young persons. Table 2 shows the comparison between SSYI and all comparison cities. According to these results, being in a SSYI city is associated with a reduction in the monthly rates of homicide victimization of youth ages 14-24 of .010. This result is statistically significant and means that an SSYI city experiences the prevention of approximately .10 victims of a homicide each month between ages 14-24 for every 100,000 citizens (or one victim each month, ages 14-24, of homicide over 1 million citizens) over the three-year post-intervention period.

3. *What is the impact of SSYI on city-level aggravated assault rates (per 10,000 citizens) for persons ages 14-24?* The authors also examined the impact of SSYI on monthly aggravated assault victimization rates of young persons ages 14-24. As Table 3 indicates, aggravated assault occurs twice as much in SSYI cities (2.16 per 10,000 persons prior to 2011) than in the comparison group (1.00 for all comparison cities prior to 2011). Table 3 provides the average monthly rates for the pre-intervention and post-intervention periods for

Table 2
SSYI Impact on Monthly Homicide Victimization Rates for Young Persons, 14-24

No. of Incidents= 2028
No. of Cities= 34

homicide	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Time1	-.0001859	.0000935	-1.99	0.047	-.0003691	-2.74e-06
Percent_HS_Completion	-.0387976	.0255461	-1.52	0.129	-.088867	0.112717
Percent_Living_Poverty	.0437234	.0519573	0.84	0.400	-.058111	.1455579
Interruption (treatment)	.0055996	.0035141	1.59	0.111	-.001288	.0124871
Comparison group	.0122929	.0056884	2.16	0.031	.0011438	.0234421
Interruption x Comparison	-.0100992	.0037379	-2.70	0.007	-.0174254	-.002773
_cons	0.258918	.0244222	1.06	0.289	-.0219748	.0737584
sigma_u	.00637676					
sigma_e	.03856486					
rho	.0266135	(Fraction of variance due to u_i)				

the study groups. The rate goes down in both groups although the decrease is larger in the SSYI cities.

The results indicate that being in a SSYI city is associated with a statistically significant positive effect on the monthly rates of aggravated assault victimization of young persons. Table 3 indicates that being in an SSYI city during the post-

intervention period is associated with a reduction in the monthly rates of aggravated assault victimization of youth ages 14-24 of .21, or the prevention of approximately 2.1 youth victims of aggravated assault per month between ages 14-24 for every 100,000 citizens over the three-year post-intervention period.

Table 3
SSYI Impact on Monthly Aggravated Assault Victimization Rates for Young Persons, 14-24

No. of Incidents= 2028
No. of Cities= 34

Aggravated assault	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Time1	-0080735	.0014997	-5.38	0.000	-.0110128	-.0051343
Percent_HS_Completion	-.8644988	1.111644	-0.78	0.437	-3.04328	1.314283
Percent_Living_Poverty	1.699226	2.260078	0.75	0.452	-2.730445	6.128898
Interruption (treatment)	.0402845	.0563808	0.71	0.475	-.0702198	.1507889
Comparison group	.7999539	.2303572	3.47	0.001	.348462	1.251446
Interruption x Comparison	-.206798	.0599804	-3.45	0.001	-.3243574	-.0892385
_cons	1.385137	1.060304	1.31	0.191	-.6930202	3.463295
sigma_u	.34286387					
sigma_e	.61863699					
rho	.23498561	(Fraction of variance due to u_i)				

Implications for Evaluation Practice

There were challenges and limitations to the current study that illuminated implications for broader evaluation practice. Generally, the broad implications for evaluators relate to research

design and methods, measurement, and considerations for setting in the evaluation of complex community-based initiatives.

When randomization is not possible, evaluators are often asked to develop rigorous

quasi-experimental methods. When a series of similar data points are available, such as monthly or annual counts of crime, and there is an intervention with a designated start date, such as a new law or policy, it is possible to use an interrupted time series design. By adding a comparison group that is not exposed to the intervention, one further strengthens the internal validity claim that can be made (Shadish, Cook & Campbell 2002). Not surprisingly, the interrupted time series design with a comparison group has been the most common design used in evaluating similar types of initiatives (Petrosino et al. 2015). However, evaluators should note some thorny issues relevant to using this design with violence prevention initiatives such as this one. The authors confronted several potential limitations in the study that may similarly be confronted by other evaluators in the future.

The Interruption

The interrupted time series design, by its very nature, requires an interruption, i.e., a specific point in time in which a program or policy begins. However, some social programs and policies do not have such clear start dates because they take time to be fully implemented. In the case of SSYI, there is considerable variation across the 11 cities as to when the program was implemented, the degree to which each was implemented, and whether a city built its SSYI programs on violence prevention initiatives already operating in the jurisdiction. In the sensitivity analyses, no substantial difference in impact was found whether January 1, 2011 or January 1, 2012 was used as the start date of the program (and the interruption). This sensitivity analysis, rather than being comforting, is concerning. Even though the SSYI cities were significantly improved relevant to the comparison group regardless of what interruption date was used, it causes one to question whether it was specifically SSYI that led to these observed changes.

Selecting the Most Rigorous and Most Feasible Design

A common issue with studies that this is that it is often the case that the evaluation team is brought in after the treatment cities have been selected. The best way to ensure that the SSYI cities and the comparison cities were similar on both known and unknown factors would be to establish a pool of eligible cities and then randomize them to SSYI or non-SSYI groups. The possibility that there are

other explanations that account for any of the observed results cannot be ruled out. Given that randomization was not possible here, the authors employed the strategy that they believed would be most rigorous in answering the research questions. Unless there were a larger pool of cities in Massachusetts requiring SSYI intervention, it is not clear that randomization would have been a viable option even if the authors had been on the scene at the outset of program deliberations.

Aligning Unit of Analysis with Program Implementation

Researchers who examine complex community initiatives, whether using experimental or quasi-experimental design, face a common issue related to measurement and unit of analysis. These initiatives may be theorized to produce community change, but the actual program is experienced by a small selective group of individuals (e.g. youth identified to be at proven risk for gun violence). However, the current study (and many before it) does not measure outcomes for these individuals who experience the program but rather for the community as whole because it is limited to using administrative data (i.e., police reports) typically available at an aggregate level. Although data could be obtained from the individuals directly, this can be expensive. In addition, if self-report is used, participants may not be likely to disclose their participation in certain offenses.

Sensitivity of the Outcome Measure

Although the authors do report positive impact for SSYI, they questioned whether the impact would have been greater if the outcomes were much more aligned to the targets of SSYI. That is, the program was designed to ameliorate violence by youth and young adults, 14-24 years of age. Nearly all youthful offenders in the SSYI cities were gang-involved with firearms the weapon of choice. It would be better, given the goals of SSYI and population involved, for the authors to use outcomes such as “gang-involved shootings” or “firearms-involved homicides,” as was done in existing studies on similar initiatives.

Furthermore, evaluation studies of complex community initiatives regardless of primary outcome should consider the secondary benefits and side effects of the initiative and seek opportunity to include these measures in their analyses. The primary aim of a violence prevention initiative is to reduce violence, so a primary

measure of reductions in homicide or violent victimization is a sensible decision. However, if a program is designed to reduce violence through outreach and engagement in positive supports and services such as employment, education, and physical and mental health, there are potential benefits with considerable social and economic benefit that may be missed if one only considers the primary violence outcomes. There may also be unintended and toxic side effects that are overlooked. For example, if the violence prevention initiative reduces violence through targeted suppression activities, it may succeed in its primary goal to reduce violence but at a cost to police-community relations. Again, this highlights the importance of incorporating a more holistic set of outcomes aligned to a program's logic model or theory of change.

Disentangling Outcomes in Complex Initiatives

Researchers who evaluate complex community initiatives such as SSYI face challenges in unpacking what components within the initiative lead to the positive or negative outcomes that participants experience. For example, it is known that the use of outreach workers was a common component in several successful complex multi-agency initiatives to reduce gun violence (Petrosino et al., 2015), but not one of those studies was able to demonstrate whether the outreach worker was integral to the success of the program. One approach to studying a specific component is to isolate components and randomly assign program participants to variations of the initiative with and without the key feature under investigation (e.g. outreach). Another approach is for evaluators to collect more robust implementation data to document how the program was experienced by participants, and whether certain experiences or components led to differential outcomes.

Conclusions

This study extends the body of literature on efforts to reduce violent crime and presents evidence of the impact of a comprehensive public health approach. These data provide encouraging evidence that SSYI is impacting monthly violent crime victimization rates for young persons in SSYI cities. This was true whether looking at monthly victimization rates for violent crime, homicides, or aggravated assaults. The effects of

SSYI are large enough that it is not believed that chance fluctuation is a good explanation for the observed results.

What does this mean in terms of public safety in SSYI cities in Massachusetts? For example, a city with SSYI has approximately 5.0-5.7 fewer victims of violence per month, ages 14-24, for every 100,000 citizens, over the entire post-intervention period. That could result in 60-68 fewer victims of violent crime per year, per 100,000 citizens. Given the human misery and financial costs associated with each violent crime, these data indicate SSYI could be resulting in important reductions in both.

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