

Bridging the Response to Mass Shootings and Urban Violence: Exposure to Violence in New Haven, Connecticut

We have described self-reported exposure to gun violence in an urban community of color to inform the movement toward a public health approach to gun violence prevention.

The Community Alliance for Research and Engagement at Yale School of Public Health conducted community health needs assessments to document chronic disease prevalence and risk, including exposure to gun violence. We conducted surveys with residents in six low-income neighborhoods in New Haven, Connecticut, using a neighborhood-stratified, population-based sample ($n=1189$; weighted sample to represent the neighborhoods, $n=29\,675$).

Exposure to violence is pervasive in these neighborhoods: 73% heard gunshots; many had family members or close friends hurt (29%) or killed (18%) by violent acts. Although all respondents live in low-income neighborhoods, exposure to violence differs by race/ethnicity and social class. Residents of color experienced significantly more violence than did White residents, with a particularly disparate increase among young Black men aged 18 to 34 years. While not ignoring societal costs of horrific mass shootings, we must be clear that a public health approach to gun violence prevention means focusing on the dual epidemic of mass shootings and urban violence. (*Am J Public Health.* 2017;107:374–379. doi:10.2105/AJPH.2016.303613)

Alycia Santilli, MSW, Kathleen O'Connor Duffany, PhD, Amy Carroll-Scott, PhD, MPH, Jordan Thomas, BA, Ann Greene, BS, Anita Arora, MD, MBA, Alicia Agnoli, MD, MPH, Geliang Gan, PhD, and Jeannette Ickovics, PhD

Gun violence is one of the most pressing public health issues of our time; it has galvanized the nation's attention since the 1999 Columbine High School shooting, which was followed by many other mass shootings, including the most recent shootings in Orlando, Florida, in June 2016 and Dallas, Texas, in July 2016. In 2015, there were 332 mass shootings, defined as shootings in which four or more people are killed with firearms at one time.¹

Although the media focuses on mass shootings, 88 Americans die every day from gunshot wounds as a result of suicide or homicide.² Gun violence consistently ranks as a top-five leading cause of death for those aged 1 to 44 years; more than 30 000 people die from a firearm-related injury in the United States annually, accounting for one in six injury deaths.²

Gun violence disproportionately occurs in communities experiencing social and economic inequities, including residential racial segregation and concentrated poverty.^{2,3} In 2015, 369 people died in mass shootings in the United States¹; that same year, nearly 6000 Black men were murdered with guns.⁴ Although Black men make up only 6% of the population, they represent more than one half of gun homicide victims.²

The impacts of gun violence extend far beyond the victim, resulting in long-term adverse effects on community well-being. More than 20% of injured trauma survivors have symptoms consistent with a diagnosis of posttraumatic stress disorder even after acute care or inpatient hospitalization.⁵ Among children, witnessing community violence is a risk factor for substance abuse, aggression, anxiety, depression, and antisocial behavior.⁶ These behaviors contribute to the cycle of violence, as adolescent delinquency and substance use are predictive of violent offenses and substance use in adulthood.⁷ These adverse events also have been associated with other negative health risks and outcomes in adulthood such as smoking, physical inactivity, sexual risk taking, and suicide attempts.⁸

Research has demonstrated that urban violence is associated with neighborhoods

characterized by social disorder, such as less social cohesion and collective efficacy among residents, and by physical deterioration of urban landscapes, such as vacant lots and buildings, abandoned cars, and graffiti.^{9,10} It is theorized that this lack of informal social control leads to a sense that violence and crime are tolerated, which results in poorer quality of life for all residents; further breakdown of social cohesion and collective efficacy to address these behaviors; and the cyclical perpetuation of violence, neighborhood stigma, and socioeconomic and health inequities.¹¹

Since 2009, the Community Alliance for Research and Engagement at the Yale School of Public Health has conducted a triennial community health needs assessment in the six lowest-income New Haven, Connecticut, neighborhoods to document chronic disease prevalence and risk, including

ABOUT THE AUTHORS

At the time of study, Alycia Santilli, Kathleen O'Connor Duffany, Jordan Thomas, and Jeannette Ickovics were with the Community Alliance for Research and Engagement, Yale School of Public Health, New Haven, CT. Amy Carroll-Scott is with the Drexel University Dornsife School of Public Health, Philadelphia, PA. Ann Greene, Anita Arora, and Alicia Agnoli are with the Robert Wood Johnson Foundation Clinical Scholars Program, Yale School of Medicine, New Haven. Geliang Gan is with the Yale Center for Analytic Science, Yale School of Public Health.

Correspondence should be sent to Alycia Santilli, MSW, Community Alliance for Research and Engagement, Southern Connecticut State University, 501 Crescent Street, New Haven, CT 06515 (e-mail: santillia1@southernct.edu). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

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neighborhood violence in 2015. The Community Alliance for Research and Engagement's goal is to use data to inform, develop, and build community support for neighborhood-focused prevention efforts.¹²

New Haven has nearly 130 000 residents with substantial wealth and health disparities.¹³ Racial/ethnic composition includes 33% Black, 32% White, and 27% Hispanic/Latino. Forty-nine percent of the population is low-income (i.e., household income is < 2 times the federal poverty level), compared with 24% in Connecticut.¹³ In the six lowest-income neighborhoods in New Haven—where most residents are people of color—11% are unemployed, compared with 7% citywide (US Census, American Community Survey, 2010–2014).

Crime statistics indicate that rates of violent crime in New Haven far exceed the national average and are threefold higher than the average for cities of comparable population.¹⁴ A well-known limitation of crime incident data is that they capture only violence that results in police reports and do not take into account all individuals affected by the violent act.^{15a} Therefore, these statistics underestimate violence exposure. We have described self-reported exposure to gun violence among residents in a population-based sample to inform the movement toward a public health approach to gun violence prevention.

METHODS

From a citywide list of addresses, we randomly selected households in the six lowest-income neighborhoods in New Haven on the basis of

a neighborhood-stratified, population-based research design. Trained community surveyors approached households up to three times, and they conducted face-to-face interviews with one interested resident aged 18 to 65 years per household.¹² There was no random selection within household. The household participation rate was 64%.

Survey questions included valid, reliable measures of health, behavioral and social assets or risks, and civic engagement. Sociodemographic characteristics were self-reported and included racial/ethnic identity, age in years, gender, household income, educational attainment, employment status, and food insecurity. For analyses, we collapsed sociodemographic item categories as shown in Table 1. In 2015, questions were added about neighborhood violence, using the exposure to violence items created by the Project on Human Development in Chicago Neighborhoods among youth respondents^{15b} and pilot tested among New Haven adults in a smaller community survey in 2014.¹⁶ Respondents were asked about violence specific to their own neighborhood: whether they heard gunshots more than once and, if so, how frequently; whether a family member or close friend had been hurt by a violent act; whether a family member or close friend had been killed by a violent act; whether they were afraid that they or a family member would be hurt by violence; whether they were present when someone was shot; and whether they knew the victim.

We conducted simple univariate and bivariate analyses with these items to describe the study sample and examine differences by social and demographic

TABLE 1—Population Characteristics: Community Alliance for Research and Engagement Neighborhood Survey; New Haven, CT; 2015

Characteristic	Unweighted/Weighted No. (%)
Race/ethnicity	
Non-Hispanic White	128/3 924 (13.26)
Non-Hispanic Black	718/14 478 (48.91)
Hispanic/Latino	267/9 434 (31.87)
Non-Hispanic other or multirace	72/1 766 (5.96)
Age, y	
18–34	420/14 192 (47.83)
35–49	336/8 796 (29.64)
50–65	433/6 686 (22.53)
Gender	
Male	416/14 337 (48.32)
Female	773/15 337 (51.68)
Household income, \$	
< 15 000	388/10 520 (36.82)
15 000–30 000	383/9 777 (34.22)
30 000–50 000	202/4 995 (17.48)
> 50 000	156/3 281 (11.48)
Education	
< HS degree	166/4 642 (15.67)
HS degree	480/12 150 (41.00)
AA or some college	377/9 600 (32.39)
≥ college degree	164/3 242 (10.94)
Employment status	
Unemployed	131/3 679 (12.45)
Employed	677/17 979 (60.84)
Not in labor force	373/7 894 (26.71)
Food security (USDA scale)	
Food secure	801/19 706 (67.47)
Food insecure	375/9 502 (32.53)

Note. AA = associate's degree; HS = high school; USDA = US Department of Agriculture. Total n = 1189 but might vary because of missing values.

characteristics. We assessed second-order χ^2 s with significance set at $P < .05$. We used logistic regression to calculate odds ratios to confirm significant associations within groups with a 5% significance level and 95% confidence intervals. We employed a finite population correction to adjust for the design effect. We performed analyses using SAS version 9.4 (SAS Institute, Cary, NC).

We created base weights to account for unequal probability of selection because of lack of

randomization at the household level. We employed multiple imputation (imputations = 5) to impute missing data for the number of adults living in each housing unit, number of units within each address, age, and gender. Final weights included a poststratification weight (age and gender) on the basis of 2010 US decennial census data to provide better estimates for each neighborhood population. Surveys were completed by 1189 participants. Weighting provided estimated responses from all

TABLE 2—Percentage of Population Exposed to Violence by Characteristic: Community Alliance for Research and Engagement Neighborhood Survey; New Haven, CT; 2015

Characteristic	Unweighted/Weighted No.	Heard Gunshot More Than Once, 884/21 684 (73.07%)		Family Members or Close Friends Hurt by Violent Act in Neighborhood, 318/8462 (28.61%)		Family Members or Close Friends Killed by Violent Act in Neighborhood, 244/5359 (18.09%)		Present When Someone Was Shot, 208/4715 (15.91%)	
		%	<i>p</i> ^a	%	<i>p</i> ^a	%	<i>p</i> ^a	%	<i>p</i> ^a
Race/ethnicity			.07		.22		.002		.15
Non-Hispanic White	128/3 924	56.74		18.45		9.74		18.57	
Non-Hispanic Black	718/14 478	80.05		31.94		24.23		18.64	
Hispanic/Latino	267/9 434	71.83		24.43		12.06		9.29	
Non-Hispanic other or multirace	72/1 766	57.68		45.10		15.81		21.63	
Age, y			.009		.16		.94		.11
18–34	420/14 192	66.44		32.80		17.59		15.93	
35–49	336/8 796	81.18		25.38		18.82		12.05	
50–65	433/6 686	76.49		24.01		18.17		20.96	
Gender			.31		.007		.25		.003
Male	416/14 337	70.54		35.19		20.09		20.95	
Female	773/15 337	75.43		22.48		16.20		11.19	
Household income, \$.65		.52		.88		.17
< 15 000	388/10 520	73.22		25.85		19.72		20.46	
15 000–30 000	383/9 777	76.81		30.37		17.53		13.84	
30 000–50 000	202/4 995	67.73		35.02		15.95		11.67	
> 50 000	156/3 281	70.04		24.23		17.73		15.12	
Education			.003		.98		.20		.24
< HS degree	166/4 642	74.59		30.23		19.14		16.76	
HS degree	480/12 150	79.08		28.61		20.35		18.61	
AA or some college	377/9 600	74.50		28.63		17.88		14.50	
≥ college degree	164/3 242	44.49		26.58		8.87		8.89	
Employment status			.60		.53		.044		.06
Unemployed	131/3 679	76.46		35.86		26.19		29.02	
Employed	677/17 979	74.13		27.93		18.89		14.95	
Not in labor force	373/7 894	69.01		26.52		12.08		12.12	
Food security (USDA scale)			.11		.06		.029		.06
Food secure	801/19 706	71.46		25.80		15.60		13.84	
Food insecure	375/9 502	78.50		35.23		23.57		20.74	

Note. AA = associate’s degree; HS = high school; USDA = US Department of Agriculture. Total n = 1189 but might vary because of missing values.

^aSecond order χ^2 with finite population correction.

29 675 residents aged 18 to 65 years of these six neighborhoods. We weighted the results.

RESULTS

The weighted sample in Table 1 reflects the demographics of the six neighborhoods: 51.7%

women, 48.9% non-Hispanic Black, 31.9% Hispanic/Latino, 13.3% non-Hispanic White, and 6.0% non-Hispanic other or multirace. Age ranged from 18 to 65 years (mean = 37.7; SE = 0.58). More than one third (36.8%) reported a household income of less than \$15 000.

Table 2 demonstrates that gun violence was pervasive in these six neighborhoods. Nearly three quarters (73.1%) heard gunshots in their neighborhood more than once, 40.4% heard gunshots at least monthly, and 15.0% heard gunshots weekly or more. Many residents had family members or close friends hurt (28.6%) or

killed (18.1%) by violent acts in their neighborhood. Sixteen percent reported being present when someone was shot; of these, 68.5% knew the victim. Nearly 1 in 10 (9.8%) residents were present more than once when someone was shot. Consequently, one third (33.1%) feared that they or a family

member would be hurt by violence in their neighborhood in the future.

Although all respondents lived in low-income neighborhoods, exposure to violence differed by race/ethnicity and gender. Residents of color reported experiencing significantly more violence than did White residents: 80.1% of Black and 71.8% of Hispanic/Latino residents reported hearing gunshots in their neighborhoods more than once, compared with 56.7% of White residents. Nearly one quarter (24.2%) of Black residents reported that a family member or close friend had been killed by violence, double the rate reported by Hispanic/Latino residents (12.1%) and two and a half times the rate reported by White respondents (9.7%). Men were more likely than were women to have had friends or family members hurt by a violent act (35.2% vs 22.5%) or to have been present when someone was shot (21.0% vs 11.2%).

Results reflect disparities seen in national crime data. Young Black men aged 18–34 years (37.6%) were nearly six times more likely than were young White men (6.4%) to have had a family member or close friend killed by a violent act in their neighborhood ($P = .01$).

Exposure to violence is also associated with measures of social class. Respondents with college and advanced degrees were significantly less likely (44.5%) to have heard gunshots more than once than were those with some college or an associate's degree, high school degree, or less than a high school degree (74.5%–79.1%). Unemployed respondents (26.2%) were significantly more likely to report that a family member or close friend was killed by a violent act in their neighborhood than were

employed residents (18.9%) or those not in the labor force (12.1%). Residents who were food insecure were more likely to report that a family member or close friend was killed by a violent act in their neighborhood (23.6%) than were those who were food secure (15.6%).

DISCUSSION

Rates of exposure to violence are substantially higher than the rates traditionally captured through crime incident reports, which represent only a subset of violent acts.^{15a} The data we have presented provide population-based self-reported exposure measures not previously available in crime reports and emphasize the deep impact of violence in urban communities. Exposure to violence is high among all respondents from these low-income neighborhoods. Yet, it is significantly higher among Black, male, and socioeconomically disadvantaged residents.

Although the public health community argues for a more comprehensive approach to gun violence,¹⁷ we must ensure that the focus on mass shootings does not marginalize urban communities of color experiencing the most disproportionate burden of exposure to violence.⁴ In response to mass shootings, the national focus has been on more gun control and background checks. This approach is not always aligned with prevention priorities for urban communities, where the focus is on collaboration with law enforcement for violence-interruption initiatives, gun buyback programs, rehabilitation of the reentry population, and trauma-informed community interventions. We must better allocate resources between preventing the next

mass shooting and preventing chronic violence and trauma in low-income, urban communities of color. Indeed, it is likely that the community-based, trauma-informed, and behavioral health-focused approaches effective in urban contexts will also be effective in mass shooting prevention.

In a multifaceted approach, first, we must better establish an evidence base for our public health approach. The most immediate needs are quality surveillance of gun violence incidents, gun-related admissions to the emergency department, and research into the effectiveness of various prevention strategies. We must also better understand social determinants. The 1996 Dickey Amendment (introduced into the omnibus spending bill) prohibited the Centers for Disease Control and Prevention (CDC) from conducting gun violence research; it redirected \$2.6 million spent on gun violence research to traumatic brain injury research.¹⁸ Despite President Obama's executive order allowing the CDC to fund gun violence research in 2013 and support from 110 House Democrats to lift the ban in 2015, there remains a lack of congressional support to fund gun violence research.¹⁸ We must continue to pressure policymakers to overturn the amendment and properly fund this research through the CDC or other federal agencies.

Second, researchers and communities must use this evidence base to address the epidemic through tailored prevention and intervention strategies. Although the aim of strategies should be identical—reductions in gun violence—how they are achieved will vary. In rural areas, where gun ownership is an integral part of the

culture, gun-related injuries and deaths are primarily a result of suicides and accidents. Successful interventions have worked with gun shop owners to identify customers in crisis and disseminate important safety and mental health information.¹⁹ In urban environments, “violence interrupter” prevention programs (e.g., Project Ceasefire, CureViolence, Safe Streets), often led by street outreach workers who are ex-gang members, show evidence of reducing gun violence by empowering community members and building social cohesion and collective efficacy to proactively address violence and retaliation.^{20,21} Rural or urban, these programs take a collaborative, problem-solving approach to violence prevention, conducting interventions and evaluation with diverse community stakeholders (e.g., residents, activists, gun sellers, law enforcement, researchers).

Lastly, urban-focused prevention programs should include a strong public health framework within the context of the social determinants of health. We cannot address gun violence in America's cities without confronting the racial inequities, racism, and stigma at the heart of urban violence, including the cycle of violence and trauma perpetuated in families and neighborhoods. Furthermore, the collective firsthand, videotaped witnessing of shootings of unarmed Black men exposes structural racism and reinforces centuries' old distrust of the police, creating additional obstacles to authentic public safety in communities of color.^{22a,22b} With previously suppressed feelings of racism having been more vocalized during the 2016 presidential election, this fraught atmosphere threatens to further diminish community collective

efficacy and ability to confront gun violence.

An effective public health approach means working upstream on primary prevention interventions that address root causes of violence. We can use evidence-based interventions associated with reduced violence, such as greening vacant lots in Philadelphia, Pennsylvania; increasing job access for Chicago, Illinois, youths; and a peaceful conflict resolution curriculum for youths in Augusta, Georgia.^{23–25}

Despite prevalent violence in New Haven, local efforts also demonstrate promising interdisciplinary solutions focused on upstream prevention and social determinants of health. Project Longevity is a partnership between community residents; local, state, and federal law enforcement agencies; and universities to reduce gun violence. It targets high-risk repeat offenders while supporting and connecting them to social and educational support developed through robust community partnerships. The New Haven Street Outreach Program, established in 2007 by the New Haven Family Alliance, provides youth mentorship and interrupts violence by mediating disputes. Results indicate a 31% decrease in the number of youth victims of nonfatal shootings.²⁶ Two neighborhoods have formed community resilience teams, working to increase engagement and social cohesion through community building to help prevent and recover from adverse, chronic exposure to gun violence. The New Haven Police Department recently heeded citizens' demands to resume community policing in 2012. Although not yet formally evaluated, perceptions of police have become more

positive. This is an important foundation from which to increase successful violence prevention partnerships.

Although they are derived from robust community-based, neighborhood-stratified research methods, our data were limited. Our analyses did not account for the timing of exposure to violence, and so we do not know the frequency or recency of these experiences. However, our results indicate that exposure to violence is more pervasive than crime statistics demonstrate. We believe these data may be generalizable to similar urban communities.

While not ignoring societal costs of horrific mass shootings, we must be clear that a public health approach to gun violence prevention means focusing on the dual epidemic of mass shootings and urban violence. We must work with the most affected communities to more deeply understand determinants and consequences of gun violence. Moreover, we must summon the moral and political will to invest resources, including funding for research and prevention programs. With the election of Donald Trump—who was endorsed by the National Rifle Association—and a Republican-controlled Congress, there is already movement to eliminate gun-carrying restrictions. Our difficult fight will become more arduous. Public health must support research, prevention programs, and policies that courageously confront our nation's gun violence epidemic and its structural and socioeconomic determinants. A just and safe society can do no less. **AJPH**

CONTRIBUTORS

A. Santilli led article writing, contributed substantively to research design and data collection instruments, and directed all

aspects of the fieldwork. K. O'Connor Duffy led data analyses and interpretation and contributed to research design and operations. A. Carroll-Scott led local adaptation and development of research design and data collection instruments, advised on national trends, and contributed to data analysis and interpretation. J. Thomas led the literature review. A. Greene, A. Arora, and A. Agnoli advised on inclusion of the exposure to violence measures and interpretation of these data. G. Gan consulted on statistical analyses and performed weighting of the data. J. Ickovics was the principal investigator, had overall responsibility for the parent study, and conceptualized the article. All authors contributed to the writing and editing.

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HUMAN PARTICIPANT PROTECTION

This study was approved by the Yale University Human Subjects Committee.

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