New Haven Public Health Department

Creating a Healthy and Safe City:

The Impact of Violence in New Haven

Complete Report

Mario Garcia, MPH
Director of Health

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Preface

The New Haven Health Department launched a Health Equity Alliance (HEA) in 2009 to focus on the underlying causes of health disparities in our city. Drawing upon a growing number of health equity efforts in other cities and regions, the goal of HEA is to ensure that all community members have equal opportunity to experience optimal health.

We believe that health begins in our homes, workplaces, neighborhoods, and schools. Health is a product of our broader environmental circumstances as much as it is a result of individual behaviors, actions, or having access to good doctors and affordable health care. Neighborhood conditions play a large part in determining health status and must be a target of city-wide efforts to improve overall community health. To align with the priorities of the New Haven Board of Health and other community leaders, the HEA has begun by emphasizing the issues of neighborhood safety, obesity and tobacco use.

This first "issue brief" focuses on the subject of violence within our communities, and was developed by the *Health Data Workgroup* of the HEA for presentation to the New Haven *Health Matters!* Planning Group. Consisting of community leaders from a variety of sectors, the *Health Matters*! Planning Group was created by Mayor DeStefano in 2010 to inform and guide policy changes related to health in New Haven. Within this document, we describe trends in community violence as well as the community and societal level factors that increase the risk of or protect against injury from violence. We also identify possible remedies. The data comes from multiple sources including the *Health Equity Index* (HEI), an innovative tool developed by the Connecticut Association of Directors of Health for local communities to use to examine the connection between social and economic conditions in neighborhoods and the health status of local residents. The HEI uses a 10 point scale (1 is poor and 10 is excellent) to measure health outcomes and the social and environmental factors that influence them, such as educational attainment, environmental quality, economic opportunity, and public safety.

Executive Summary

Community violence can cause injury and death. It may also result in psychological harm to, and other adverse health effects for, victims, witnesses and other people who live in areas considered to be unsafe.

The New Haven Health Department is one of three local health departments in Connecticut that has received funding from the Connecticut Association of Directors of Health (CADH) to create a Health Equity Alliance. This Alliance of diverse partners addresses the relationship between social and economic conditions and health outcomes of New Haven residents using a novel tool called the Health Equity Index. This document presents the findings of the Alliance on community violence in New Haven.

Community violence is a significant public health problem in New Haven that calls for a united response. Although the impact of community violence can affect us all, the analysis presented here shows that certain neighborhoods, communities of color, and young people bear a disproportionate burden of violent crime and its effect.

Health Matters! is an ambitious movement to improve the health status of the City of New Haven, under the leadership of Mayor John DeStefano, Jr. and the Community Services Administration. Health Matters! aims to use local data to prioritize and assess health issues, policies and practices for long-term health impact on New Haven residents. It is intended that the information and recommendations presented in this document support the work of Health Matters! on community violence.

The Concern

Data from the Health Equity Index and other sources of information provided by researchers, residents and government officials detail why community violence is a significant public health concern in New Haven:

- In 2007-2008, deaths from assault were as significant a cause of premature death as cancer, heart disease and accidents. Death from assault was the leading cause of death among males 15 – 29. Non-fatal injury from assault has also caused a substantial health burden in the City.
- The impact of community violence on young Black and Hispanic males has been particularly pronounced. In 2007 and 2008, death from assault accounted for over a third of the deaths of Black and Hispanic males age 15 – 29. All those killed by gunfire during that period were Black or Hispanic males.
- Over 85% of deaths from assault in 2007 and 2008 were caused by handguns. The vast majority of the handgun deaths occurred outdoors in parking lots, in the street and on sidewalks.
- Violent crime is not evenly distributed in New Haven, but heavily concentrated in some districts of the City. Violent criminal behavior is also geographically associated with, though not necessarily caused by, economic distress and locations with parolees, prison releases, retail businesses, and illegal drug markets.
- The majority of city residents are unlikely to be physically injured by violent crime. However, due to a variety of potentially negative impacts on mental health, physical activity and quality of life, the indirect burden of violence on residents of a city like New Haven may be considerable.

Next Steps

The Health Equity Alliance and Health Matters! seek to identify, develop and advance policies that address the root causes of violence. Community violence prevention interventions that are currently recognized as best practices focus on the knowledge, attitudes, behaviors and relationships of individuals. Best practices in community- and society-level changes have not been well-defined. In this context it is suggested that potential areas for policy initiatives in New Haven include:

- Expansion of economic and job opportunities for youth and adults;
- Physical and environmental improvements, quality housing, and enhancements to community stewardship within neighborhoods experiencing high levels of street violence;
- Improved access to positive social activities for youth and adults;
- Further enhancements to prisoner reentry programs;
- Increased deterrents to handgun use in the perpetration of crime.

Finally, we recommend that:

- A systematic review be undertaken of community- and society-level violence prevention strategies implemented in US cities.
- The City of New Haven adopt a process, such as health impact assessment, to guide decisions concerning the design and development of neighborhoods that support safe, healthy lives.

1. Background and Scope of Report

Violence is a major cause of premature death in the United States. Nationally, homicide is the second leading cause of death for people 15-24 and the third leading cause of death for people 10-14 and 25-34[1].

While devastating, homicides are only part of the burden that violence places on community health. Violent crime can also lead to non-fatal injury, some of it severe and/or disabling. Moreover, violence may have a far reaching affect on the health of some communities as a whole. Fear of crime may impact behaviors and attitudes, such as outdoor physical activity, neighborly trust, collective efficacy, and sense of security, that can help improve and maintain physical and mental health.

Violent crime and its impact on health is a particular concern within the City of New Haven. Data from the Connecticut Association of Directors of Health's *Health Equity Index* demonstrate the extent of the problem. The Health Equity Index uses a 10 point scale (1 is poor and 10 is excellent) to measure health outcomes and the social and environmental factors that influence them, such as educational attainment, environmental quality, economic opportunity, and public safety. Within the Index, New Haven scores a 1 out of 10 for violent crime when compared to the other towns and cities in Connecticut[2].

As part of our collective efforts to create a city where all neighborhoods and families are safe and prosperous, this document will attempt to describe community violence and its impact on health in New Haven. We will also consider why some people and areas may experience higher rates of violence. To do this, we will supplement data from the HEA Index with a variety of stories, surveys, and data to demonstrate why safety is an everyday concern of many city residents. We will focus on information about New Haven but will include findings from other similar US urban environments as needed.

For the purposes of this document, we define violence as *the exercise of a physical force in a manner that creates or is intended to create injury to another person*[3]. Although intentional self-harm and unintentional injury caused by unsafe conditions or negligent behavior, such as aggressive driving, are extremely important public health issues, they are beyond the scope of our analysis.

The next section of this document will provide a brief overview of the public health approach to addressing community violence. Section 2 will give an overview of the public health approach to community violence prevention. Section 3 will present New Haven crime statistics primarily from the FBI Uniform Crime Report and New Haven Independent Crime Log. Section 4 examines physical injury caused by violence in New Haven. Section 5 considers available information on the effects of community violence on other aspect of health. Section 6 will describe factors that may increase or protect against the likelihood of involvement in community violence. Finally, section 7 will present conclusions including recommendations and potential areas for policy development to prevent community violence.

2. A Public Health Approach to Addressing Community Violence

The public health approach to improving community safety is based on the assumption that violent crime, like other types of injury, is preventable through a 4 step process of study and action (Figure 1) [1]. These steps are:

Step 1: Describe the problem of violence.

Step 2: Identify things that put people at risk (or protect against) involvement with violence.

Step 3: Develop, implement and evaluate violence prevention strategies.

Step 4: Disseminate successful violence prevention strategies and ensure their adoption.

Figure 1. Public health approach to prevention

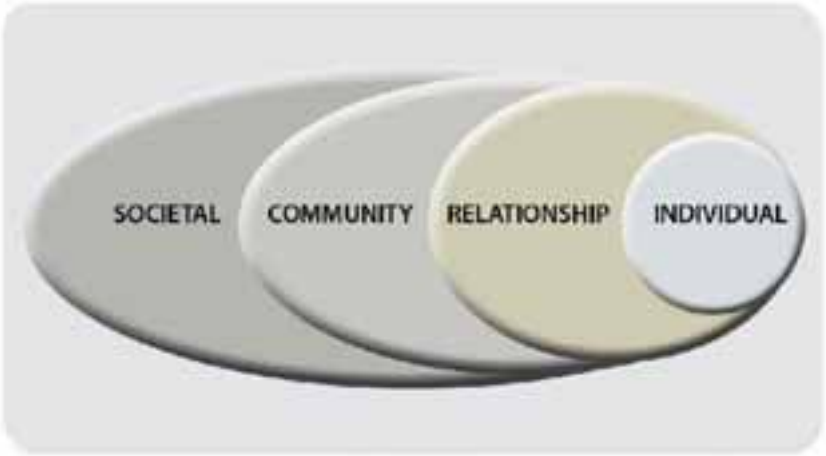
The *social-ecological model* (Figure 2)[1] helps to examine factors that increase or decrease the risk of involvement in violence by dividing them into the following levels:

Individual: Biological and personal history factors, such as age, attitudes to violence, or history of aggressive behavior.

Relationship: Relationships with family, friends, intimate partners and peers, such as having peers engaged in violence, victimization or lack of adequate supervision.

Community: The community context in which relationships exist (schools, workplaces, neighborhoods). These factors include population density, availability of quality employment, and existence of an illegal drug trade.

Figure 2. Social-ecological model



Societal: Societal factors that help create a climate in which violence is encouraged or inhibited, such as laws and regulations, social norms, and cross-sector health, housing, economic, educational and social policies.

3. New Haven Crime Statistics

Crime rates are an indicator of the safety of our community and its quality of life. Part 1 of the FBI Uniform Crime Report (UCR) provides us with standardized, audited data on crimes reported to or otherwise known by law enforcement authorities. This report includes information on the number of violent crimes: murder, forcible rape, robbery. Crimes that are not known to law enforcement are not included in the UCR.

Based on UCR data, there were 2183 violent crimes reported in New Haven in 2009, or 17.7 per 1,000 residents (95% confidence interval: 17.0-18.4). This compares to 3.0 per 1,000 residents in the State of Connecticut overall in the same year (95% confidence interval: 2.9-3.1). Among the 2183 reported violent crimes in 2008, there were 12 (1%) reported murders, 58 (3%) reported rapes, 906 (42%) reported robberies, and 1207 (55%) reported aggravated assaults[4].

Figure 3 - Uniform Crime Report Part 1 - Violent Crime Rate Per 1000 Residents
New Haven and Connecticut, 1990-2009

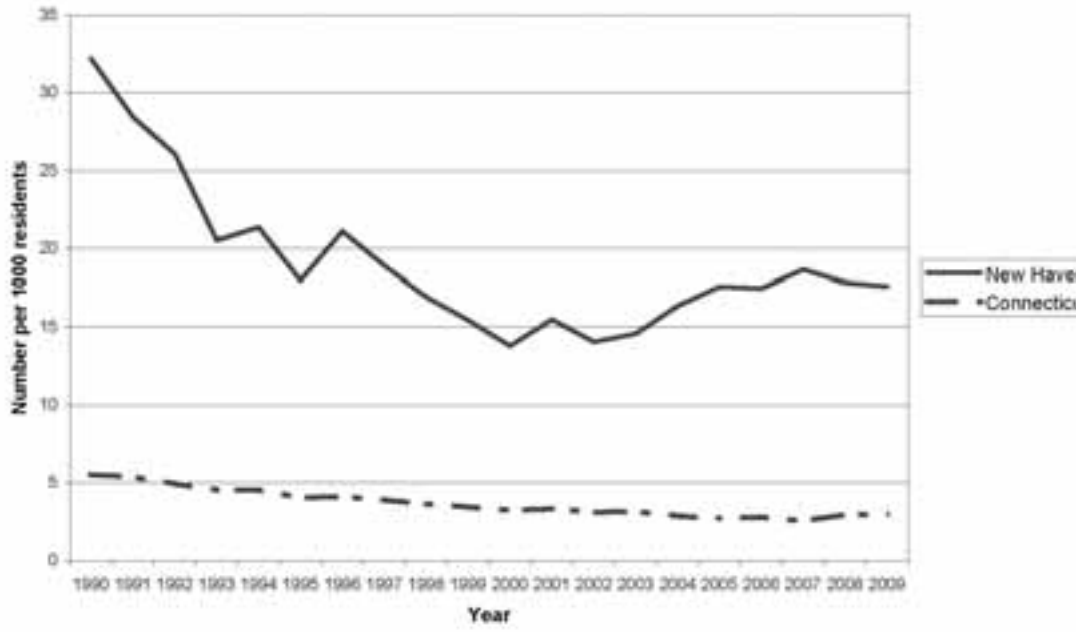
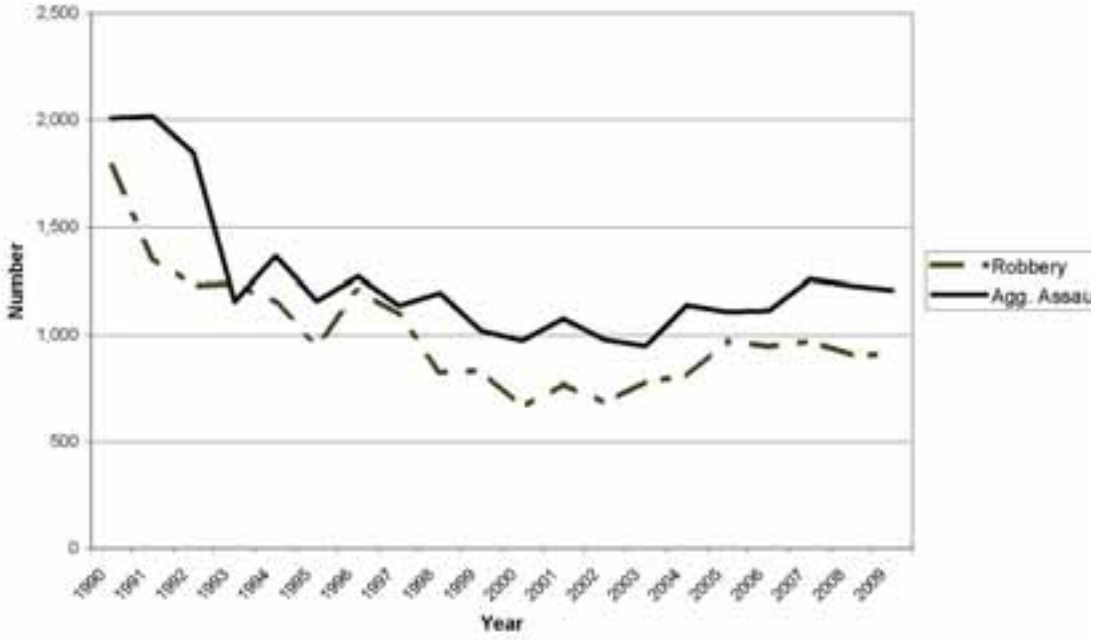


Figure 4 - Uniform Crime Report Part 1 - Robbery & Aggravated Assault
New Haven CT, 1990 to 2009



Trends. Time trends in UCR Part 1 Violent Crimes for New Haven and Connecticut overall can be seen in Figure 3[4]. Between 1990 and 2000 the rate of violent crimes declined considerably in New Haven, from approximately 30 crimes to 15 crimes per 1,000 residents. From 2000 to 2007, the annual number of violent crimes in New Haven appears to have increased although not to pre-2000 levels[4]. This upturn starting in 2000 was not seen in Connecticut[4] or in the United States as a whole.[5] There is some suggestion of a decrease in violent crimes since 2007. Similar patterns can be seen for robbery and aggravated assault (Figure 4)[4].

Murders. From 2005-2009, the number of murders occurring in New Haven were 16, 24, 13, 23 and 12, respectively, with about 17 reported within the first three quarters of 2010. The annualized incidence of murder for the 5 year period from 2005-2009 was 14.2 per 100,000 New Haven residents (95% confidence interval: 11.4-17.5) [4]. The annualized incidence of murder for this period in CT 3.1 per 100,000 CT residents (95% confidence interval: 2.9-3.4) [4].

Use of Firearms. Due to the potential for injury, communities often have heightened concerns about the use of firearms to commit crimes. In 2008 in New Haven, firearms were discharged or displayed in 87% of the murders, 81% of the aggravated assaults and 66% of the robberies reported in the Uniform Crime Report[6].

Table 1 - New Haven Independent Crime Log Data*

Year	Assault With A Firearm	Street Robberies With A Firearm	Unlawful Discharge of a Firearm
2006	117	259	480
2007	140	217	562
2008	137	254	654
2009	121	220	610
2010 (Jan-Oct)	78	119	473

* Unaudited New Haven Police Department Data

Unaudited NHPD data from the *New Haven Independent* Crime Log on firearm crimes can be seen in Table 1. Between 2006 and 2009, the annual number of assaults with a firearm (non-fatal shootings) was between 117 and 140. In the first 10 months of 2010 there were 78 assaults with a firearm reported in New Haven. This appears to be tracking towards a lower total than in previous years. The number of street robberies with a firearm ranged from 217 to 259 in the years 2006 to 2009, with 119 reported during the first 10 months of 2010. A lower total than for previous years may also be seen for street robberies with a firearm in 2010. From 2006 to 2009, there were between 480 and 610 unlawful discharges of a firearm (discharge of a firearm that does not result in a shooting), with 473 reported through October 2010 [7].

New Haven Independent crime Log suggests that in the first 10 months of 2010, roughly 70% of the 119 reported street robberies committed with a firearm occurred between 7 PM and 4 AM.

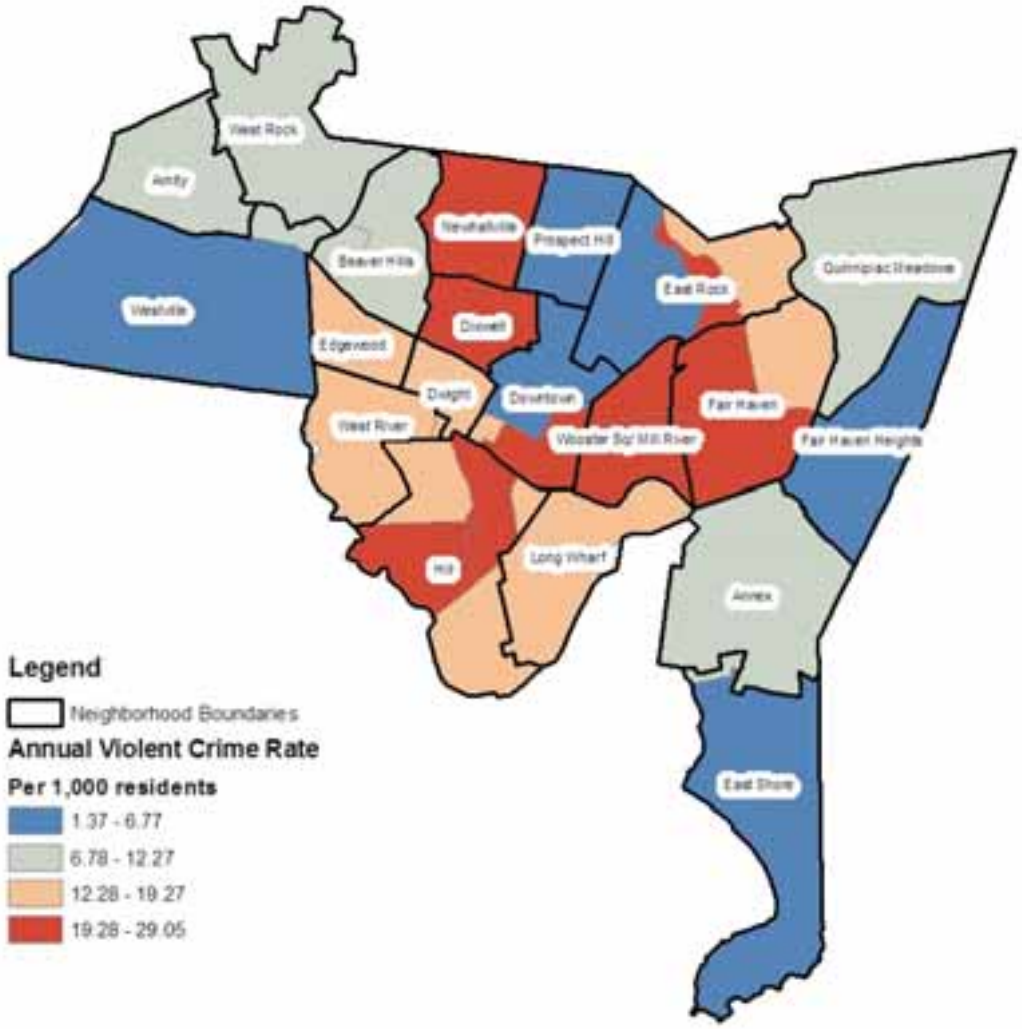
Arrestees. Arrests for violent crimes are most common among young adults and men. In New Haven in 2008, 100% of those arrested for murder were under 35 years, and half were under 25. In cases of robbery, 77% were under 35, and 64% were under 25. Sixty-five percent of those arrested for aggravated assaults were under 35, and 41% were under 25. All murder arrestees were male, as were 91% of those arrested for robbery and 65% of those who committed aggravated assault[6]. Data from victimization surveys suggest this pattern of age and sex is true for all perpetrators, not just arrestees[8].

Neighborhood Data. Mapping of the UCR Part 1 data within New Haven demonstrates that the risk of exposure to violent crime is not evenly distributed across areas of the city. Figure 5 [9] shows that the highest violent crime rates per 1,000 residents between 2000 and 2009 occurred in census tracts in Dixwelll, Newhallville, Wooster Square / Mill River and portions of Downtown, Fair Haven and the Hill. The rate of violent crime was also elevated in Dwight, Edgewood, West River, Long Wharf and other parts of the Downtown, East Rock, Fair Haven and the Hill.

Over this time period, Westville, Prospect Hill, East Rock, Fair Haven Heights, East Shore and a portion of Downtown had the lowest rate of violent crime.

The data in Figure 5 are crime rates that are calculated to allow comparison of neighborhoods of different sizes. A crime rate is the number of crimes committed in a neighborhood divided by the number of neighborhood residents. However, crime rates can be misleading since crimes may be committed against non-residents. This may, in part, explain the high crime rates shown within neighborhoods, such as Downtown, that have a large "daytime" (commuter and visitor) population relative to the total number of residents.

Figure 5 - Annual Violent Crime Rate By Census Tract
Uniform Crime Report Part 1 Data
New Haven CT, 2000 to 2009



When examining and comparing neighborhoods, it is important to note that the violent crime rate may not be uniform within a given neighborhood but rather may be concentrated in specific areas or even on specific city blocks. Also, although most census tracts correspond to a neighborhood area, there are some variations in these boundaries (for example, East Rock and Fair Haven share part of the same census tract).

4. The Health Effects of Violence - Physical injury

Death from assault. In order to better understand the burden of violence on a particular community, we often begin by looking at the specific circumstances of each crime. Death certificates that record assault as a cause of death of New Haven residents are an important source of information about murder. Methods for identifying these death certificates can be seen in Appendix 1.

In 2007 and 2008, assault was listed as a cause of death for 30 New Haven residents: 11 in 2007 and 19 in 2008. Assault was listed as the primary cause of death for 29 of these, which is equivalent to an annualized incidence rate of 12 per 100,000 New Haven residents.

Firearms were the mechanism of assault for 87% (26/30), equivalent to an annualized incidence rate of 10 per 100,000 New Haven residents. Similarly, firearms were the most common method of homicide or legal intervention deaths in the 16 US states monitored by the US National Violence Death Reporting System in 2007. They accounted for 66% of murders (72% of males and 46% of females).

A description of the firearms deaths in New Haven can be seen in Table 1. Sixty-two percent of those murdered were Black and 38% where Hispanic. The

Table 2 - Description of deaths by firearms (N=26)

Characteristic		N	%
Race / ethnicity	Black	16	62%
	Hispanic	10	38%
	White	0	0%
Age	Less than 20	3	12%
	20-29	15	58%
	30-39	5	19%
	40+	3	12%
Sex	Male	24	92%
	Female	2	8%
State of birth	CT	14	54%
	Other US	5	19%
	Puerto Rico	3	12%
	Non US	4	15%
Highest level of	8th grade or less	1	4%
Education	9th-12th - no diploma	8	31%
	High school graduate	14	54%
	Some college - no degree	2	8%
	Unknown	1	4%
Occupation	Construction	4	15%
	Delivery	2	8%
	Small business owner / contractor	3	12%
	Manufacturing	2	8%
	Maintenance	2	8%
	Other service (sales, food service, beautician)	3	12%
	Student	2	8%
	Disabled	1	4%
	Not available	7	27%
Place of assault	Sidewalk	10	38%
	Street / Roadway	7	27%
	Residence	2	8%
	Parking lot	4	15%
	Vehicle	1	4%
	Bar / Nightclub	1	4%
	Other	1	4%

majority were males and under the age of 29. The oldest were in their forties. About half were high school graduates, while 36% did not graduate high school. Occupation information was not available for 7 people. It is not clear if this is because they were unemployed or the data were missing for some other reason. Three were small business proprietors/contractors, 2 were students and one was reported as disabled. Others were primarily employed in construction, manufacturing and service industries. The vast majority of assaults occurred outside, in the street, on the sidewalk or in a parking lot (81%). The deaths did not show a clear seasonality but were clustered in time. Half of the deaths occurred in 3 one-month periods: 6 in June 2007, 3 in April 2008 and 4 in September 2008.

Table 3 - Leading causes of death - New Haven - 2007 & 2008 combined

Group	Cause	N	%	PYLL 65*
All	Malignant Neoplasms	385	22.8%	1398
	Diseases of heart	377	22.4%	1440
	Accidents (unintentional injury)	86	5.1%	1688
	Dementia*	65	3.9%	0
	Chronic lower respiratory diseases	60	3.6%	122
	Cerebrovascular disease	57	3.4%	139
	Diabetes	57	3.4%	243
	Nephritis, neprhotic syndrome & neprhosis	50	3.0%	127
	Septicemia	44	2.6%	331
	Conditions originating the the perinatal period	35	2.1%	2275
	HIV	35	2.1%	461
	Pneumonia and influenza	35	2.1%	49
	Alzheimers	30	1.8%	13
	Assault	**29**	**1.7%**	1063
	Chronic liver disease and cirrhosis	23	1.4%	263
	Other	305	18.1%	
	All other causes	1685	100.0%	
Males 15 to 39	**Assault**	**23**	**30.7%**	909
	Accident	19	25.3%	733
	Diseases of heart	9	12.0%	330
	Intentional self-harm	6	8.0%	212
	Cancer	5	6.7%	165
	Other	13	17.3%	
	All other causes	75	100.0%	

* Potential years of life lost to age 65.

The leading causes of death to New Haven residents for 2007 and 2008 combined can be seen in Table 3. In 2007 and 2008, assault was the primary cause of only a small proportion of all the deaths that occurred to New Haven residents (29/1685 = 1.7%). It accounted for 3.3% of the deaths (27/816) among males. For some population groups, assault was a much more frequent cause of death. It was the leading cause of death for Males 15 to 39. In this group, it accounted for 31% of deaths (23/75). For Black and Hispanic males 15 to 39 it accounted for 38% of deaths (23/60).

Given that most murder victims were young men who would otherwise likely have many years of life ahead of them, assault was an important cause of premature death in New Haven in 2007-2008 (Table 3). Although

assault is a relatively uncommon cause of death for residents of the city as a whole, it accounted for 1,063 years of potential life lost to age 65, almost as many as for malignant neoplasms (cancer), heart disease, and accidents (unintentional injury).

The data presented here strongly suggest that assault is an important cause of premature death in New Haven particularly among Black and Hispanic men and that most of the deaths result from gunfire. However, the results should be interpreted with some caution. Given the relatively small number of deaths from assault in the city the data may vary from year to year.

Emergency Department visits for assault. Data on deaths from assault only provide a partial picture of the physical injury caused by violence. Many more people suffer non-fatal than fatal injuries from violence. Hospital emergency departments are one source of information on fatal and non-fatal assaults. The annualized incidence rate of emergency department visits for assault among New Haven residents from 2000-2004 was 669 per 100,000 residents (95%CI: 648-689). This is compared to the rates in Stamford, Bridgeport, Waterbury and Hartford of 302, 723, 731 and 1134, respectively[10].

Data on the age and sex of New Haven residents going to the Emergency Department for assault are not available. However, data for the State affirm that injury from assault like from fatal injury is more common for men, the young, and people who are Black or Hispanic. The highest assault rates were in those 20-24. The assault rate was 86% higher for males than females, and 5 times higher for non-Hispanic blacks and 4 times higher for Hispanics than for White non-Hispanics[10].

Information on emergency room visits for assault is intended to represent more severe injury from violence. However, it is likely to also include less severe injuries for people who use the emergency room for primary care. This could account for some of the variation between cities and demographic groups.

Although 87% of murders in New Haven were caused by gunfire in 2008, as described above, most of the injuries from assault seen within these emergency room visits do not appear to be as a result of wounds from gunfire. The Connecticut-wide emergency department visit data show that the most common mechanism of injury by assault was unarmed fight or brawl (48% of all assaults, 71% with a known mechanism of injury). Firearms accounted for only a very small proportion of these (1% of all assaults, 2% with a known mechanism of injury) [10].

Circumstance of fatal assaults. Information is limited on the circumstances of assaults in New Haven. Brief descriptions of the fatal assaults of New Haven residents in 2008 as presented in the New Haven media outlets are summarized in Table 4 [11],[12],[13]. These descriptions suggest many of the deaths were the results of disputes between people who knew or knew of each other. In 2008 only one of the New Haven deaths was a result of a stray bullet [11].

Most shootings that resulted in fatal injury among New Haven residents in 2007 and 2008 occurred outdoors. 81% (21/26) happened in this setting: 10 on the sidewalk, 4 in a parking lot and 7 in the street. The remainder of firearm injuries occurred in a residence (2), a bar (1), a vehicle (1) and an unspecified setting (1).

Table 4 - 2008 deaths by assault - circumstances of death

Number	Age	Race/ Ethnicity	Sex	Firearm?	Circumstances	Location
1	5m	Black	Male	No	In care of teenage father and uncle when found with multiple blunt force trauma injuries.	
2	23m	Black	Male	No	Deprived of water by caregivers. Died of dihydration.	
3	18	Hispanic	Male	Yes	Shot during a personal dispute	Emerson Street
4	20	Black	Male	Yes	Drive by shooting	Exchange Street
5	22	Hispanic	Male	Yes	Shooters walked up and opened fire while he was outside family home.	Atwater Street
6	22	Hispanic	Male	Yes	Shot while being robbed while in a car.	Grand Avenue
7	23	Hispanic	Male	Yes	Result of ongoing dispute with the shooter.	Woolsey and Lloyd
8	24	Black	Male	Yes	At least 15 shots fired. Killers may have been waiting for him at basketball court after he returned from clubs (with #15).	Goffe and County Streets
9	25	Black	Male	Yes	Unknown	105 Scranton Street
10	25	Black	Male	Yes	Died in hail of bullets shortly after being released from prison.	Kensington Street
11	26	Black	Male	Yes	Shot during a shoot out after a bar closing.	109 Church Street
12	27	Black	Male	Yes		
13	27	Hispanic	Male	Yes	Shot while coming to the aid of neighbhor being robbed in a common hall way.	515 Ferry Sreet
14	29	Black	Male	Yes	Killer walked up and shot him in the back outside a club.	320 Ashmun Steet
15	31	Black	Male	Yes	At least 15 shots fired. Killers may have been waiting for him at basketball court after he returned from clubs (with #8).	Goffe and County Streets
16	34	Black	Male	Yes	Unknown. Had testified against gang members in the past.	50 Grand Avenue
17	46	Black	Male	No	Killed by punch. Resulted from dispute over money.	
18	53	Black	Female	Yes	Shot by stray bullet while sitting on porch during street shoot out between youths from rival neighborhoods.	Winthrop Avenue
19	53	Hispanic	Male	Yes	Unknown	Chapel and Hotchkiss

5. The Effects of Violence – Beyond Physical Injury

As demonstrated above, premature death from violence results in many potential years of life lost in New Haven. Each premature death represents a tragedy. Moreover, violence can potentially have effects on health and wellbeing that go far beyond the physical or psychological injuries to those who were assaulted.

Psychological morbidity and bereavement. Exposure to crime can cause psychological as well as physical harm. Children who are victims of community violence are at increased risk of post-traumatic stress disorder[14]. Available literature also suggests that children who are victims of violence are at increased risk of depression and anxiety. Witnessing violent crime can also have psychological ramifications. Children who witness criminal victimization also appear to be more prone to depression and anxiety [14]. Violent exposure can be interpreted by a child to mean, not only that his/her world is unsafe, but also that he/she is unworthy of being kept safe. This situation can contribute to negative self perceptions and depression [14].

When a violent event occurs in a community it is often discussed widely. Margolin et al suggest that even children who do not directly witness community violence often hear repeated accounts of a specific incident and may form their own mental image [14]. In support of this idea, Horowitz et al found that among urban adolescent girls Post Traumatic Stress Disorder (PTSD) was associated with hearing about violent crime[15]. Youth living in violent communities may experience 'psychological adaptations' including hopelessness and desensitization to violence[16].

Data on the mental health consequences of exposure to community violence in adults are scarce[17]. In a sample of women, Kilpatrick et al found that experiencing a completed rape, life threat or sustained injury predicted

PTSD[18]. The findings of Bordeaux et al suggest that women rarely suffer PTSD alone as a result of criminal victimization. As a result of the PTSD they suffer other psychological disorders including major depression. Clark et al found witnessing community violence in urban neighborhoods increased the likelihood of clinically significant anxiety and depression in a group of White women and Latinas in the Northeastern United States [17].

Finally, bereavement for families and loved ones who are directly impacted by violence has been shown to be particularly traumatic. One study found that twice as many mothers and fathers whose children were murdered met PTSD (full diagnostic) criteria when compared with accident and suicide bereavement[19].

Safety and physical activity. People concerned about their safety may not feel comfortable going outdoors within their neighborhoods and therefore may get less physical activity. Limited physical activity is among the contributors to the nation's growing problem of obesity.

Two major survey efforts of over 2,400 New Haven residents, the 2009 CARE survey and the 2010 Community Management Teams' Neighborhood Quality of Life Survey, included questions about neighborhood safety. These surveys demonstrated that 66% and 61% of residents, respectively, either strongly or somewhat agreed that they felt unsafe to walk in their neighborhood at night; 31% and 15%, respectively, felt unsafe to go on walks during the day. Perceptions that residents' neighborhoods were "free of drugs, gangs and prostitution" ranged from more than 80% in the East Shore and East Rock neighborhoods, to less than 50% in Dixwell, Dwight, and Fair Haven.

Some studies have found an association between neighborhood safety and physical activity but the findings have not been entirely consistent. Gomez found that among 7th grade Mexican-American girls living in barrios in San Antonio, Texas, violence (perceived and objectively assessed) were associated with decreased outdoor physical activity. This, however, was not the case for boys[20]. In a nationally representative sample of adolescents in grades 7 to 12, those who lived in neighborhoods with high levels of crime were somewhat less likely to participate in frequent moderate to vigorous physical activity. Two other studies of perceived neighborhood violence and physical activity did not find an association (among adolescent girls in urban Baltimore and adults in urban St. Louis, MO and Savannah, GA[21,22]). It is not clear the extent to which the mixed results seen are a function of the substantial challenges of measuring both violence and physical activity. However, safety considerations do appear to affect parents' decisions to allow their children to play and walk outside[23]. Also, with a slightly different way of looking at the topic, Fish et al reported that, in a sample of adults in Los Angeles, perceiving your neighborhood as unsafe was associated with a higher self-reported body mass index[24].

In its recommendations to reduce obesity, the CDC researchers cited above suggest monitoring the number of abandoned buildings within neighborhoods to develop hyper-local indicators of neighborhood safety and walkability. They point out that interventions to improve safety could include increasing police presence, decreasing the number of abandoned buildings and homes, and improving street lighting. Other cities have developed pedestrian environmental quality indices (PEQI) that can target specific, block-by-block improvements to general environmental conditions and safety for the city's many residents who choose to walk.

In some cases, safety fears have led neighborhoods to conduct successful community organizing campaigns, for example, for improved lighting or police presence on bridges referred to as "mugging alleys"[25]. Related to the issue of unsafe walking corridors, dozens of comments on SeeClickFix in which residents detail their neighbors' or their own experiences being mugged within blocks of their homes, on a formerly dark bridge, are a clear indication of the level of concern[26].

Resident comments on Visioning a Healthier New Haven survey. The New Haven Health Equity Alliance recently conducted a campaign asking residents how they would envision a healthier city. Urban environmental quality (e.g., clean sidewalks, walkability) and public safety were the two most common themes among the approximately 800 written survey responses and 50 video-recorded interviews. Creating the link between living in a violent environment and stress, one New Haven resident wrote that a healthy New Haven would look:

> *more civil, with fewer gangbanger types. The stress of living in such a coarse environment, with so much " frontin' " is going to give me a heart attack (not kidding--blood pressure has risen significantly since moving here). Too many muggings, too much disrespect between and within communities.*

Another person who works in New Haven and has thought about living in the city wrote:

> *It's a great city but everytime I think about moving into downtown, there's another incident of robbery or worse. Fear of crime is a tremendous source of stress. And, stress is not good for health.*

Another made the link between violence and reduced physical activity by saying:

> *There are some great resources in the city for outdoor recreation - East Rock Park, Edgewood Park, streets with great sidewalks like Whitney and Prospect. But when I go out for a run in Dixwell/Newhallville, the sidewalks are in poor shape; I've ran a few times in the Dwight neighborhood, but it's poorly lit at dawn/dusk and I don't feel safe. I think that a healthier New Haven needs (1) a better infrastructure for people who want to be physically active, and (2) better safety measures, like lighting and those blue boxes you can call in an emergency, to make those people who are outside feel safe.*

Another wrote of a vision for a healthy New Haven by saying that:

> *A Healthy New Haven has clean and safe parks where kids can play and attend nature and sports activities without fear.*

6. Risk and Protective Factors for Being Involved in Violence

Public health seeks to improve community safety by implementing strategies to prevent injury and other adverse health effects of community violence. The development of these strategies should be rooted in an understanding of the factors that increase the risk of or protect against involvement in violence. This section will consider community- and society-level characteristics of the environment of New Haven and other similar urban American environments that may perpetuate violence.

As shown in Figure 2, risk and protective factors may occur on the individual, relationship, community and societal level. Individual risk factors for committing violence include a history of violent victimization, substance use antisocial beliefs/attitudes. Protective characteristics include doing well in school, having a positive social orientation and being religious. Relationship-level risk factors that have been identified include low level of parental involvement and peers that are involved in violence. Protective factors on this level include connectedness to family, commitment to school and involvement in constructive social activities[27].

Economic Opportunity. Data from the Health Equity Index (HEI) show that measures of economic well being are poor for New Haven when compared to the State of Connecticut as a whole [2]. Since economic opportunity has been identified as a risk factor for violence [27], this may be contributing to the challenge of violence in New Haven.

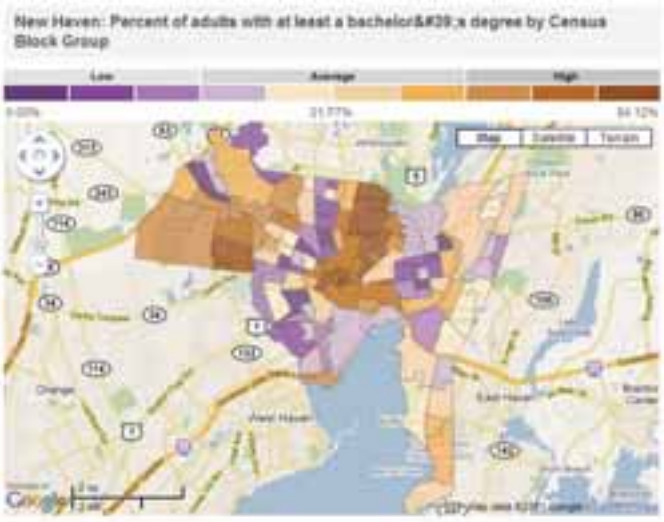
Table 5 – Health Equity Index Social Determinant Scores – New Haven compared to Connecticut

Social Determinant	Indictor	Score *
Economic Security	Overall	2
	Percent of population living in poverty	1
Employment	Overall	3
	Full time employment as a percent of males ≥16 years	1
	Labor force participation as a percent of males ≥ 16 years **	2
	Food service workers as a percentage of total employment	3
	Management workers as a percentage of total employment	3
Education	Overall	3
	Percent of adults with at least a bachelor's degree	3

*Scale of 1 (poor) to 10 (excellent) comparing New Haven to Connecticut towns and cities overall.
**Labor force participation reflects the number of males over the age of 16 who are formally employed, self-employed, or actively seeking work out of all males age 16 and over in the area.

Table 5 presents the Health Equity Index economic well being score for New Haven compared to the rest of the State. Composite scores for economic security, employment and education would all be considered poor. These scores suggest that opportunities for full time jobs, or other legitimate ways of making a living and education are limited compared to other parts of the state. These data also suggest that available jobs may have limited potential for economic advancement and security. Food service workers represent a higher percentage of the total workforce in New Haven than in Connecticut overall, whereas management workers represent a smaller percentage of the workforce. Food service jobs are among the lowest paid positions when ranked by annual earnings and often come with minimal benefits and little job security.

Figure 6



Data from the Health Equity Index [2] also demonstrate that poor economic well being is specific to certain neighborhoods within New Haven. Moreover, it appears that areas of the city with high levels of violent crime, as presented in Figure 5, also tend to be areas with lower socioeconomic status. Figures 6-8 present maps of the percent of the adults with a bachelor's degree, labor force participation and median owner occupied house value. These maps compare socioeconomic status of census block groups within New Haven.

Limited economic opportunity and violence. The findings of a photovoice project conducted by the Robert Wood Johnson Clinical Scholars Program and the New Haven Family Alliance may shed some light on how a lack of economic opportunity may lead to involvement in violence. The project used a community-based participatory research method to identify the root causes of gun violence for New Haven young people. The photovoice method used gave participants (19 people aged 14-19 years) cameras and asked them to photograph scenes from their community relevant to different aspects of violence and its root causes in their community. These images were used as the stimulus for focus group discussions. The contents of these focus groups were analyzed to identify themes concerning the root causes of gun violence[28].

Figure 7

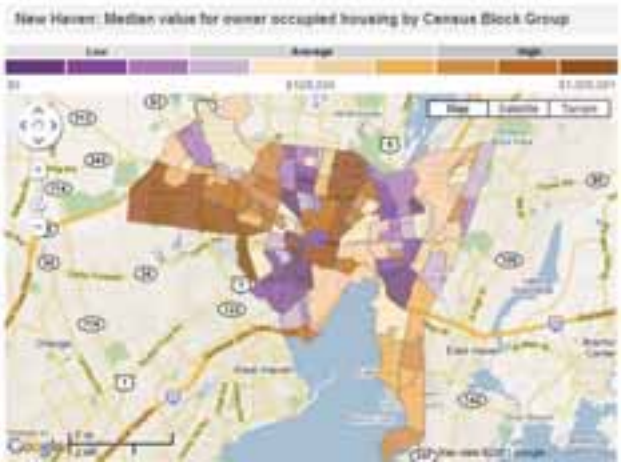
Adolescents and young adults seek to find respect and a place of status in the world. An important theme to emerge from the photovoice projects is that the young people involved saw limited legitimate opportunity for establishing that respect and status. In some cases, youth viewed the economic system with suspicion due to discrimination against their parents, cheating or white collar crime. In this context, some young people turn to 'The Game' (illegal drug trade and gangs) to achieve respect. Therefore the lack of opportunity encouraged youth to participate in activities associated with violence. Since status and respect can be considered a protection against violence, the situation is self perpetuating. One focus group participant wrote:

> *Its' like, OK, if I'm out in society, you know, working and stuff, OK, I'd rather have respect than fear... When you outside on the streets, you'd rather be feared than respected. You'd rather be feared than respected in the streets, but in society, of course, you would want respect.*

Another said:

> *Kids turn to the streets for two reasons: one, it's easy to get the money. You don't need a job application, you just need a little cash and you can start hustling. Two, they're scared to fail. They don't see role models who are succeeding off the street, and they are scared that if they move past their comfort zone, they won't get anywhere.*

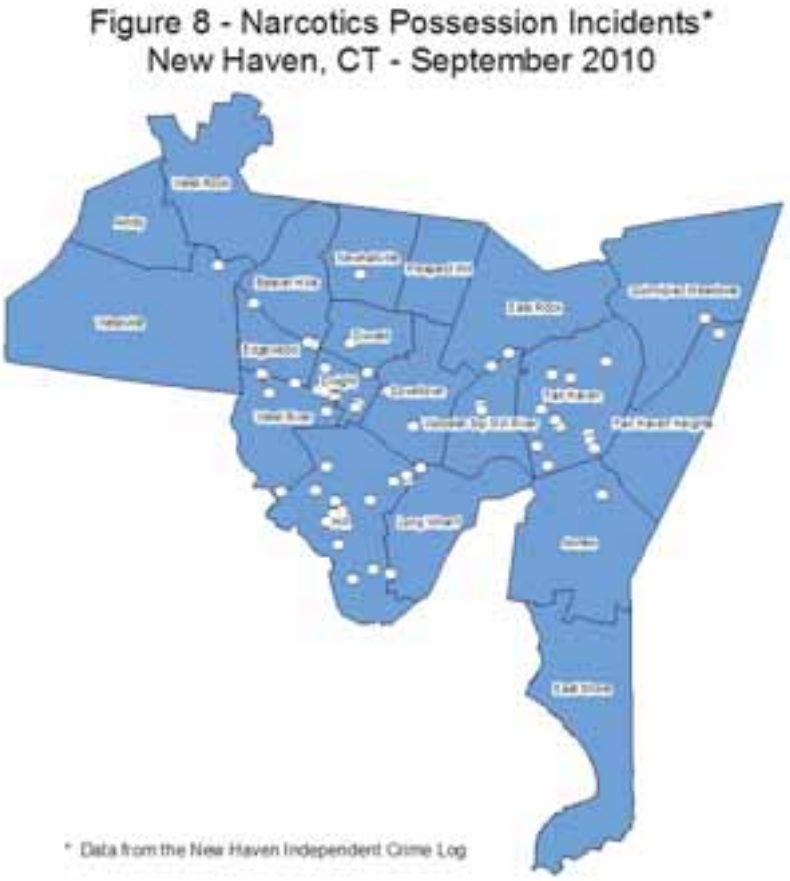
Figure 8



Violence and the neighborhood environment. In New Haven, the Police Department has examined neighborhood level factors that are associated with violent crime. Department analyses have found that a combination of infrastructure services (convenience stores, restaurants/cafes, bars, liquor establishments, gas stations, banks, etc), residences of parolees and released prisoners, drug markets and locations of drug violations in certain localities have strong spatial relationships to violent crime. Based on this analysis, about 20% of the area of New Haven is considered high risk for violent crimes. In the

years 2003 to 2010 at least 75% of the violent crimes that occurred in the City happened in these areas.

What explains the findings of the New Haven Police Department on neighborhood factors, than when taken together, predispose an area to crime? It is well established that illegal drug use and drug trafficking fuel violent crime in many cities[29]. Figure 8 shows the distribution of narcotic incidents for September 2010 as reported in the *Haven Independent* Crime Log. The geographical distribution is similar to the distribution of violent crime rates as shown in Figure 5.



A number of ecological studies have found an association between violence and the density of businesses that sell alcohol[30]. Gruenewald et al [30] examined the relationship between neighborhood characteristics and the rate of hospital discharge for violent assault in 1,637 zip codes in California. Assaults were more likely in densely populated poor minority areas with unstable residential populations. After controlling for the effects of these powerful factors, assaults were still more likely as the density of off-premises alcohol outlets increased in an area. Bars, however, were only associated with an increase in the risk of assault in particularly poor unstable neighborhoods .

Branas et al [31] identified all shootings in Philadelphia from 2003 to 2006 and then examined the characteristics of each person and the place s/he was shot. They matched each person who was shot with a control who was not shot and also studied that person and his/her location at the time of the shooting. They also observed that being in a place with a high density of outlets that sold liquor for consumption elsewhere (e.g. liquor stores, convenience stores) doubled the risk. People who were both heavy drinkers and were in areas with a high density of off-premises liquor outlets had over 9 times the risk of being shot. Bars were not found to increase the risk.

A high density of alcohol outlets could increase the level of violence because alcohol is more available in these areas. Alcohol appears to disinhibit aggression increasing the likelihood that someone will commit an assault [30]. Intoxication could also increase the risk of being assaulted if it reduces a person's awareness of a potentially violent situation or increases his/her likelihood to instigate violence or over-react to a perceived threat [31]. If intoxicated people congregate near liquor stores this may increase the likelihood of violence in the area. The

tendency toward violence may be accentuated if the outlets are in areas of weaker social guardianship [30] as a result of limited police involvement, retail concentration and / or neighborhood instability caused by illegal activities such as the drug trade and economic disadvantage.

Finally, a history of prior crimes or arrests is a risk factor for committing a future felony. Among felony defendants charged with violent offenses in large urban counties in 2006, 71% had a prior arrest, 62% prior multiple arrests, 53% at least one prior conviction, 41% prior multiple convictions and 35% prior felony convictions. A third of violent crime defendants were involved with the criminal justice system at the time of their arrest (8% on probation, 11% on pretrial release, 3% on parole and 6% other)[32].

In 2007, over 1,200 people were returned from the Connecticut Department of Corrections to New Haven on parole or other form of early release and over 2,800 probationers lived in New Haven [33]. In New Haven, recidivism among ex-offenders is a large contributing factor to crime in New Haven. In 2008, about three quarters of homicide victims and suspects in New Haven had at least one prior felony conviction[34].

Certain characteristics are associated with an increased likelihood of recidivism. Among those released from Department of Corrections in CT in 2005 greater substance abuse problems and mental health needs predicted an increased likelihood of recidivism within 3 years of release. About a quarter those released in CT in 2005 had reached the 'end of sentence' and did not receive any supervision from parole or probation[35] . This group was more likely to recidivate than those who did receive community supervision . Recidivism can be reduced by initiatives that assist ex-offenders with reentry into the community. The initiatives include facilitating access to job training, addiction treatment and identification cards [34].

7. Conclusions and Next Steps

Violence takes a large toll on the health and quality of life of New Haven residents. It is a city-wide public health issue that requires the attention of all. However, the experience and effects of violence are not equally manifest across the city.

Fatal injury by assault is an important cause of premature mortality in the city. Among New Haven residents in 2007 and 2008, almost as many potential years of life to age 65 were lost to murder as to cancer, heart disease and accidents. Murder was a leading cause of death from men 15 to 29 years of age. Most of the fatal injuries were caused by gunfire and occurred in outdoor spaces (street, sideways, parking lots). There was also a substantial burden of injury from assault that did not prove to be fatal.

There are significant disparities in New Haven, with certain neighborhoods, communities of color, and young people bearing a hugely disproportionate burden of the costs. The impact on young Black and Hispanic males is particularly pronounced. In 2007 and 2008, murder accounted for 39% of the deaths of Black and Hispanic males age 15 – 29. All those killed by gunfire during that period were Black or Hispanic males. The incidence of non-fatal injury from violence was also higher for Blacks and Hispanics and for males.

It is increasingly recognized that where we live is an important determinant of our health status, more so than many other factors. This holds true in New Haven. In the years 2003 to 2010 at least 75% of violent crime occurred in 20% of the area of the city. Areas of the city with high rates of violent crime also have low economic status including poor job opportunities as indicated by low labor force participation. More limited economic opportunity, in particular, is a known risk factor for violence. Reversing the preponderance of violence

in these neighborhoods will therefore require a decided focus on the underlying social and economic conditions that lead to instability and conflict.

Examples of programs to reduce violence. Blueprints for Violence Prevention is a project that identifies evidence-based youth violence and drug prevention programs. To date, it has assessed more than 800 programs from which eleven model violence programs have been identified. These programs address violence primarily on the individual- and relationship-level through techniques such as school-based curricula, individual and family therapy, youth mentoring and home visits. For example, the Big Brother / Big Sister program mentors youth typically from single parent homes. The Nurse Family Partnership provides home visits to at-risk pregnant women. The Functional Family Therapy program provides counseling to the families of youth with maladaptive and acting-out behaviors[36].

There is a dearth of research on the effectiveness of community- and society-level interventions on violence prevention[37]. In one example, the RAND Corporation evaluated the impact of business improvement districts (BIDs) on youth violence in Los Angeles [37]. The BIDs were self-organizing local public-private organizations that collected assessments and invested in local-area service provisions and activities such as place promotion, street cleaning and public safety. While the intervention did appear to decrease robbery rates it had only a marginal effect on reducing the total violent crime rate.

The CeaseFire Chicago program is an example of a violence prevention program that includes individual-, relationship- and community-level components [38]. The program focuses on identifying a small number of individuals who were at high risk of 'shooting or being shot'. Outreach workers provide counseling and service referrals to the individuals. Other outreach workers, referred to as violence interrupters, use their knowledge of the community to identify conflicts and provide mediation. Much of their time is spent working to prevent retaliatory violence. Additionally, the project had community mobilization and public education components that aim at changing community norms concerning the acceptability of using violence to resolve conflicts. The intervention actively involves the police in the outreach and community mobilization efforts. The evaluation of this program has concluded that it does significantly decrease the incidence of shootings and the intensity of shooting hotspots. However, an evaluation of the One Vision One Life program in Pittsburgh, which was modeled after the CeaseFire Chicago project, did not find it to be effective in reducing violence. [39]

Working toward a Healthier New Haven: Next Steps. The Health Equity Alliance and Health Matters! seek to identify, develop and advance policies that address the root causes of violence. However, as described above best practices in community- and society-level changes have not been identified. In this context, this issue brief points to numerous areas for policy change and structural intervention that are worthy of exploration:

- Policies to expand job opportunities for youth and adults and continued education opportunities to enable people to access better paying and safer less stressful jobs;

- Policies to support physical improvements to sections of the City, including retail areas, experiencing high incidence of violence such as better street lighting, reduced blight and improvements to transportation facilities (sidewalks, bus stops). Also, policies to increase community stewardship in these areas such as the expansion of community policing programs.

- Policies that enable access to positive social activities for youth and adults by opening up schools and other local venues for community use.

- Increasing deterrent to handgun use in the commission of crime.

- Further enhancement of prisoner reentry programs.

Finally, we recommend that:

- A systematic review be undertaken of community- and society-level violence prevention strategies implemented in US cities.

- The City of New Haven adopt a process, such as health impact assessment, to help guide decisions around the design and development of neighborhoods that support safe neighborhoods with physically active residents.

These are just some examples of steps that New Haven might pursue to eliminate disparities for residents who are unduly exposed to violence in their neighborhoods, and to institutionalize preventive measures that lead to changed social norms around violence, and improved social and environmental conditions in all neighborhoods. Some of these actions are already underway, and listed in Appendix 2. What we need next is to identify those areas that are still lacking, and to target additional policy interventions to enhance the work that is presently occurring.

Our community's efforts to eliminate violence will not only impact one of the major causes of premature death in our city, they will also address a broad range of public health consequences including the mental health implications of experiencing violence and/or living in an area that is perceived as unsafe, and the negative effects of living in unsafe neighborhoods on physical activity levels of residents.

Appendix 1. Methods for identifying deaths from assault.

Connecticut Department of Health supplies New Haven Health Department with datasets of electronic death records from the Connecticut Death Master Files for New Haven residents. The 2007 and 2008 datasets were used in this analysis.

Deaths with an ICD 10 code for assault in the underlying cause of death field or any of the 20 multiple cause of death fields were considered assault deaths. These codes were X85 to Y09 and Y87.1. If one of these codes was in the underlying cause of death field assault was considered the primary cause of death.

Appendix 2. Existing Programs & Strategies in New Haven.

Many programs have been developed to improve community safety. School-based and family-based prevention programs are able to reduce youth violence. Programs in which former offenders mentor youth at high risk for violence have shown success in many urban areas. Cognitive behavior therapy may reduce the psychological harm that children endure due to exposure to violence. Progressive urban traffic engineering, education and enforcement programs have reduced injuries caused by traffic collisions, while greatly improving safe access to walking, mass transit and bicycling. Environmental design (lighting, physical code enforcement, improved visibility, etc.) has been shown to significantly reduce opportunities for criminal activity and improve neighborhood sense of security.

- New Haven Police Department programs
- Block Watches and Community Management Teams (CMTs)
- Livable City Initiative
- Youth@Work
- Street Outreach Workers Program (City of New Haven / New Haven Family Alliance)
- NHPS Social Development Programs
- New Haven Safe Streets Coalition
- City of New Haven Complete Streets Legislation
- New Haven Early Childhood Council – Family Engagement
- Domestic Violence Task Force
- Citywide Youth Coalition member programs
- Community Mediation / Peer Mediation in Schools
- Mentoring programs
- New Haven Collaborative for Youth (behavioral health)
- Community Foundation for Greater New Haven Neighborhoods of Choice (e.g., traffic calming in Chatham Square)
- Yale Child Study Center Community Policing Partnership and National Center for Children Exposed to Violence (NCCEV)
- Clifford Beers Guidance Clinic
- United Illuminating “Light the Night”

Appendix 3. Health Equity Alliance / New Haven Health Data Workgroup

Amanda Durante, Epidemiologist, City of New Haven (Chairperson)

Mark Abraham, Executive Director, Regional Data Cooperative of Greater New Haven (DataHaven)

Thomas Butcher, Project Director, Ryan White, New Haven Health Department

Beth Comerford, Deputy Director, Yale-Griffin Prevention Research Center

Shanta L. Evans, Director, New Haven Health Equity Alliance

Lewis Madley, Laboratory Director, New Haven Health Department

Elaine O'Keefe, Executive Director, Office of Community Health, Yale School of Public Health

Jesse Reynolds, Data Analyst, Yale-Griffin Prevention Research Center

David Savage, Network for Community Engagement Coordinator, Community Mediation, Inc.

Contact Information

As part of this work, the Health Equity Alliance actively seeks community feedback and questions about the information within this report. We also welcome participation in our efforts. Please contact Shanta Evans, the Health Equity Alliance Director, via email at HealthMattersNH@newhavenct.net or by calling (860) 869-8779.

Appendix 4: New Haven Uniform Crime Report Statistics

UCR PART 1 CRIMES - 1990 THROUGH 2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Murder	31	34	30	22	32	20	21	21	15	12	18	16	9	8	15	16	24	13	23	12
Rape	168	118	131	130	102	98	120	93	66	56	63	62	79	72	70	87	86	74	55	58
Robbery	1,784	1,355	1,227	1,238	1,150	953	1,207	1,094	825	831	659	769	680	782	806	972	945	970	906	906
Agg. Assault	2,008	2,018	1,845	1,154	1,364	1,157	1,269	1,136	1,194	1,018	973	1,075	977	947	1,138	1,106	1,112	1,257	1,228	1,207
Buglary	4,476	4,146	3,672	3,417	2,961	2,965	2,936	2,510	2,147	1,962	1,488	1,359	1,516	1,517	1,485	1,317	1,533	1,507	1,688	1,430
Larceny	9,086	8,041	7,852	7,719	7,439	7,465	7,139	7,348	7,510	6,762	5,269	5,256	5,002	4,817	5,244	5,323	4,901	4,478	4,994	4,533
MV Theft	3,459	3,780	2,726	1,873	3,167	2,515	2,345	1,748	1,497	1,368	1,315	1,412	1,264	1,245	1,394	1,597	1,267	1,493	1,373	1,080
Total	21,012	19,492	17,483	15,553	16,215	15,173	15,037	13,950	13,254	12,009	9,785	9,949	9,527	9,388	10,152	10,418	9,868	9,792	10,267	9,226

Source: City of New Haven Audited Data

UNIFORM CRIME REPORT PART 1 CRIMES BY CENSUS TRACT - NEW HAVEN - 2000 THROUGH 2009

Tract Number	Neighborhood(s) in which tract falls	Population in 2004	Total number of violent crimes	Average annual violent crimes	Annualized rate of violent crimes
1401	Downtown	2169	627	63	29.1
1402	Long Wharf / The Hill	1834	327	33	18.0
1403	The Hill	2545	641	64	25.2
1404	The Hill	3274	528	53	16.2
1405	The Hill	3385	763	76	22.5
1406	The Hill	4879	938	94	19.3
1407	Dwight / Downtown	6757	1158	116	17.2
1408	West River	4428	806	81	18.3
1409	Edgewood	4816	910	91	18.9
1410	Westville	3656	113	11	3.0
1411	Westville	2910	41	4	1.4
1412	Amity	4728	579	58	12.3
1413	West Rock / Beaver Hill	5169	567	57	11.0
1414	Beaver Hill	5064	570	57	11.3
1415	Newhallville	6621	1412	141	21.3
1416	Dixwell	4979	1112	111	22.3
1417	Downtown	6072	237	24	4.0
1418	Prospect Hill	4282	286	29	6.8
1419	East Rock	4831	205	20	4.1
1420	East Rock / Downtown	3203	198	20	6.2
1421	Wooster Square / Mill River	1455	352	35	24.1
1422	Wooster Square / Mill River	1548	321	32	20.7
1423	Fair Haven	4607	984	98	21.3
1424	Fair Haven / East Rock	4738	1174	117	24.7
1425	Fair Haven / East Rock	5688	845	84	14.8
142601	Quinnipiac Meadows	5452	560	56	10.3
142602	Fair Haven Heights	6782	431	43	6.3
1427	Annex / East Shore	5451	508	51	9.4
1428	East Shore	4655	89	9	1.9

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