

SPATIAL CONCENTRATIONS OF VIOLENCE IN TRINIDAD AND TOBAGO*

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The idea of spatial concentrations of crime – often referred to as “hot spots” – has had a fundamental influence on both theories of crime as well as the practice of crime prevention. Several criminological theories serve as an intellectual foundation for the hot spots literature, each suggesting causal pathways through which crime is likely to become spatially concentrated. These theories have been primarily established, tested, and refined in the United States and other developed nations. We begin by briefly reviewing theory and research on spatial concentrations of crime. Next we present findings on spatial concentrations of homicides in Trinidad and Tobago, a small-island developing nation in the eastern Caribbean. We then focus our analysis on a subset of high-crime police station districts, showing how even within high-crime areas, violence still tends to be concentrated in smaller, micro-level crime places. We conclude by discussing the implications of our analysis for theory, research, and policy.

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Introduction

*“Pay attention to the hot spots,
equalize the have and have nots.”*

- Singing Sandra and Maximus Dan (2005)¹

Social scientists from multiple disciplines have long focused on the characteristics that make some places more crime prone than others. Environmental criminologists and psychologists, behavioral geographers, social ecologists, and social scientists from other intellectual traditions have all contributed to a growing body of theory and research on crime and place.

Two basic conclusions are evident from this large and diverse body of scholarship. First, crime is not distributed evenly over space; instead it tends to be concentrated, sometimes intensely so. Second, the explanations for these concentrations in crime vary widely. Some explanations focus on the characteristics of the places themselves. For instance, one explanation suggests that “pockets of crime” emerge in places that offer offenders an ecological advantage (St. Jean, 2007). Other explanations focus on characteristics of people or groups who occupy crime-ridden places. For instance, scholars from the classic “Chicago School” of sociology focused, in part, on the inflows and outflows of populations living in those places (Aldrich, 1975; Shaw & McKay, 1942; Taub, Taylor, & Dunham, 1984). Other research examines the connections

¹ Singing Sandra and Maximus Dan are popular calypso artists from Trinidad and Tobago. These lyrics are from their song “Hands.”

or social networks between residents in high-crime locations (Sampson, Raudenbush, & Earls, 1997).

Although this diverse body of theory and research has produced some vital insights about distributions of crime over space, the majority of this work has emerged and been tested in developed nations like Australia, Great Britain, and the United States (Andresen, 2006; Doran & Lees, 2005; Perkins & Taylor, 1996; Ratcliffe, 2005; Sampson & Raudenbush, 1999; Sherman, Gartin, & Buerger, 1989; Sherman & Weisburd, 1995).

Previous scholarship has examined the applicability of criminological insights from the United States and other developed nations to problems in Caribbean nations specifically, and developing nations more generally (Bennett & Lynch, 1996; Bennett, Shields, & Daniels, 1997; Birkbeck, 1999). The question about whether separate theories need to be established or existing theories need to be modified is still open. But whether those theories need to be tested in Caribbean or other developing nations is not an open question; theories must have the potential to be falsified and must be tested across a wide range of contexts (Popper, 1959). This paper examines spatial concentrations of violence in Trinidad and Tobago, a small, two-island developing nation in the Eastern Caribbean.²

We begin by briefly reviewing theory and research on “hot spots” or spatial concentrations of crime. Next we present

² In some cases we prefer the more general term “spatial concentration” because a “hot spot” represents just one of many potential types of spatial concentrations taking on different sizes and shapes. Moreover, the term “hot spot” is regularly misused in the popular media in Trinidad and Tobago to refer to entire jurisdictions rather than specific “spots” like a street corner or an address, which is the more common use of the term. Later in the paper when we discuss spatial concentrations in micro-level places, we use the term “hot spots.”

nationwide findings on spatial concentrations of homicides in Trinidad and Tobago. We then narrow the focus of our analysis to a subset of high-crime police station districts, showing how even within high-crime areas, violence is still concentrated in smaller, micro-level crime places. We examine the characteristics of a handful of these micro-level places that have experienced a disproportionate share of violence. We conclude by discussing the implications of our analysis for theory, research, and policy.

Theories of Crime and Place

The criminological literature on hot spots or spatial concentrations rests on an intellectual foundation that is comprised largely of three theories of crime: social disorganization, collective efficacy, and routine activities. While these theories vary in substance, they are similar in that they describe how the characteristics of a place can influence the behavior of people who live there. Together they can be thought of as the theoretical “usual suspects” that scholars tend to rely upon for understanding spatial concentrations of crime and violence.

Social Disorganization Theory

Social disorganization theory stems from a human ecological approach to studying behavior. Just as plants and animals are dependent on and adapt to their environment, humans are attached to their surroundings, and both they and their environment exist symbiotically. In the early 20th century, this ecological approach was

applied to crime and social conditions by Robert Park, whose laboratory consisted of Chicago's neighborhoods.

Park (1952) noted that people in cities tend to adapt to their environments, forming communities based on spatial considerations like natural and manmade boundaries: railroad tracks, rivers, landfills, hills, and flatland all shape neighborhoods and what goes on in them. For instance, in developments located near rivers, bays, or oceans, people adapt in many ways – in the way they eat (seafood), the way they play (fishing, boating, etc...), and the way they work (as new businesses related to the water emerge to meet demand). Adapting to the environment is something humans share with the other members of the plant and animal kingdom.

Park also noted the dynamic nature of the uses of space, as new plant and animal species approach, invade, and succeed preexisting species in a given area. According to Park, humans adopt this pattern as well, with ethnic and racial groups sometimes taking over a community, gradually at first, but then passing a threshold or tipping point, eventually resulting in succession.

Working with Ernest Burgess and Roderick McKenzie, Park (1928) put forth a "concentric circles" model of succession, where inner city business districts represent Zone I; Zone II lies immediately outside it and includes the oldest structures (and is often called a "historical district"); Zone III is populated by middle-class families who escaped Zone II; Zone IV is more affluent and residential; and Zone V is suburban. Clifford Shaw and Henry McKay (1969) drew on Park's work in formulating a social disorganization theory of juvenile delinquency, noting a

direct relationship between the type of zone and the rates of delinquency. Zone II is the most problematic, with the highest delinquency rates, and is characterized by frequent racial and ethnic invasion and succession (high population mobility), economic disadvantage, and health problems.

Because these neighborhoods are so often in transition, as one ethnic group retreats to the next higher zone as another ethnic group invades, the communities are unhealthy: people often do not know each other and do not look out for one another, children are uncontrolled due to family disruption, and people from different cultures conflict with each other, sometimes criminally. This state of being is characterized as social disorganization. The most socially disorganized communities are likely to have the greatest spatial concentrations of crime and violence.

Collective Efficacy and Social Capital

Robert Sampson expanded social disorganization theory in some important ways. Reviewing research on neighborhoods and crime, Sampson (1995) affirmed the strong relationship between crime rates and residential mobility, family disruption (characterized by high divorce rates and female-headed households), and poverty. Socially disorganized communities are often unable to achieve their common values (such as safe neighborhoods) because they lack social capital, or networks of relationships that help people realize their common goals. Socially disorganized neighborhoods are populated by people who lack the capacity or the opportunity to enter

into or sustain enduring and socially beneficial networks (such as friendship networks with positive adult male role models for children) and pro-social institutions (such as good schools or community centers). Race and ethnicity are directly correlated with crime, a relationship due in part to the fact that minorities are more likely to live in socially disorganized neighborhoods.

Collective efficacy is the extent to which communities are able to maintain order and control over public areas, like parks, streets, and sidewalks (Sampson, Raudenbush, & Earls, 1997). A neighborhood's ability to maintain this level of control depends on trust between residents and shared expectations of support (e.g., "I know I can count on my neighbor to tell me if my child is acting up"). Sampson and his colleagues found that greater disorder was associated with high levels of concentrated poverty and mixed commercial and residential land use, but that neighborhoods with greater collective efficacy could counter the effects of structural disadvantage.

The greatest contribution of collective efficacy theory is its notion that neighborhoods characterized by high levels of social disorganization are not necessarily doomed. Although poverty and mobility make them more vulnerable to crime, interventions designed to increase social capital and trust among neighbors can mitigate the risk. Research on collective efficacy and social disorganization teaches us that diagnosing crime often means digging deeper than crime itself. It means understanding the social and structural contexts in which crime takes place.

Routine Activities Theory

Routine activities theory posits that crime is more likely when three elements converge in time and place: motivated offenders, vulnerable victims, and the absence of capable guardians (of people or property) (Cohen & Felson, 1979). Offenders may be more or less motivated depending on the nature of their criminal career and its trajectory. Victims may be more or less vulnerable, depending on their status (e.g., elderly) and behavior (e.g., tourism). Guardians can include formal protective mechanisms such as police or security guards, or informal guardians such as neighbors, friends and family, citizen patrols, and community organizations (Felson, 1994). In routine activities theory, the interaction of these three elements – offenders, victims, and lack of guardianship – explains crime.

Routine activities theory has been used to explain a broad variety of criminological phenomena. For example, Kennedy and Forde (1990) examined victim behavior, showing that people who stay at home at night (as opposed to going out at night) are less vulnerable victims and more capable guardians. Routine activities theory has also been used to explain variations in crime after a major disaster, such as Florida's Hurricane Andrew. Victims, and especially their property, become immediately more vulnerable; motivated offenders flock to disaster zones to capitalize on the opportunity; and formal guardians are busy dealing with problems other than crime and looting.

However, immediately following such a disaster, crime rates might actually go down temporarily, due to a sudden surge in informal guardianship, with citizens helping protect each other in a time of need. This temporary effect may dissipate and crime rates may eventually go up in the area suffering most from the disaster (Cohen & Felson, 1979). Routine activities theory can also be used to explain variations in crime across places and time periods. For example, crime rates may have been influenced over the decades during which women increasingly entered the work force, by leaving a greater number of homes unguarded (Cohen & Felson, 1979).

Routine activities theory is often used to explain why crime is concentrated in specific locations (Sherman, Gartin, & Buerger, 1989). The convergence of motivated offenders, vulnerable victims, and the absence of capable guardians may explain why some places become hot spots and not others. For this reason, policy implications of routine activities theory frequently involve altering structural conditions or environmental design in places where these factors converge and where crime is concentrated (Newman, 1996). For example, street lights might be installed to improve visibility, or park benches might be designed to discourage sleeping.

The crime prevention implications of the theory extend well beyond these simple environmental adjustments, however, to include exercising greater social control (e.g., juvenile curfew laws), expanding mechanisms by which citizens can look out for one another, and educating the public and especially vulnerable victims about crime patterns and how to defend themselves from victimization (Felson & Clarke, 1997).

Criminological Theory and Spatial Concentrations

The three theories we have just reviewed constitute the standard theoretical explanations for spatial concentrations of crime. All three theories attune us to some of the various pathways through which crime ends up becoming spatially concentrated. While this paper does not provide a formal “test” of these theories, they do serve as a useful lens through which to view spatial concentrations of violent crime in Trinidad and Tobago. Similarly, focusing on these concentrations in a developing nation that is different in many ways from the developed nations where these theories were formulated and tested also results in some useful insights.

Data and Methods

This study relies primarily on three sources of data. The first is official records on all 1,958 homicides from 2001-2007 that we gathered from the Homicide Bureau of Investigations (HBI) in the Trinidad and Tobago Police Service (TTPS). The HBI records all homicides in a handwritten register, including such information as victim name, age, sex, address, corresponding suspect information (when available), weapon type, and a brief description of the facts of the case.

Due to limitations in the official homicide data collected by the TTPS, it was necessary to gather other types of supplemental data. For instance, existing records did not accurately identify those homicides that were gang related,

nor did they provide information on the gangs that were involved in homicides.

Initial interviews with police investigators and task force officers highlighted the role that gangs may have played in the increase in homicides, so we knew it was important to gather more focused data useful for understanding the connection between gangs and homicide. Since gangs in Trinidad typically claim certain territory as their “turf,” understanding the spatial dynamics of violence meant we needed to pinpoint gang involvement in homicides.

Thus our second data source was based on a recordkeeping system that we instituted in three high-crime police station districts (Besson Street, Morvant, and Belmont) to capture homicide intelligence information from criminal investigators and task force officers working most closely with gangs. We found that even when officers most familiar with gangs lack sufficient evidence to file charges against a suspect in a gang-related homicide, they typically know the identity of the suspect (or at least of the gang) as well as the motive for the offense. Therefore, the premise of this homicide intelligence database was to capture “unofficial” intelligence data that might be useful for diagnosing trends and patterns in violence.

Official homicide records are sometimes not clear about the location of homicide incidents, a problem that is partly attributable to the lack of a standardized street address system in many parts of Trinidad and Tobago. For instance, houses in disadvantaged communities rarely have street numbers and streets sometimes have conflicting names or no official name at all. As a result,

information in police reports about the location of the offense is often either missing or vague. Thus we accompanied police officers familiar with homicide incident locations in the field to pinpoint the location of each offense.

We used handheld global positioning system (GPS) devices to capture the locations of 209 homicide incidents that occurred in these three police station districts between January 2006 and December 2007. We were unable to gather location information on earlier homicides due to problems with officer recall of the specific incident locations. The GPS data on homicide locations constitutes our third primary data source. In addition to these three sources of data, our analysis also draws on various qualitative data sources, including field observations of high-crime communities; unstructured interviews with police officers, citizens, and gang leaders; and photographs and videotapes of hot spot locations.

Findings

We present the findings of our analysis in three sections. First, we examine the nation as a whole to identify regional concentrations of violence. Second, we focus on seven high-crime station districts that account for more than half the nation's homicides. Finally we present the findings from a more detailed analysis of violence in three station districts. Thus our analysis moves from the macro to the micro, from the nation as a whole, to police station

districts, to smaller hot spots or “pockets of violence.” At each level we observe spatial concentrations of violence.

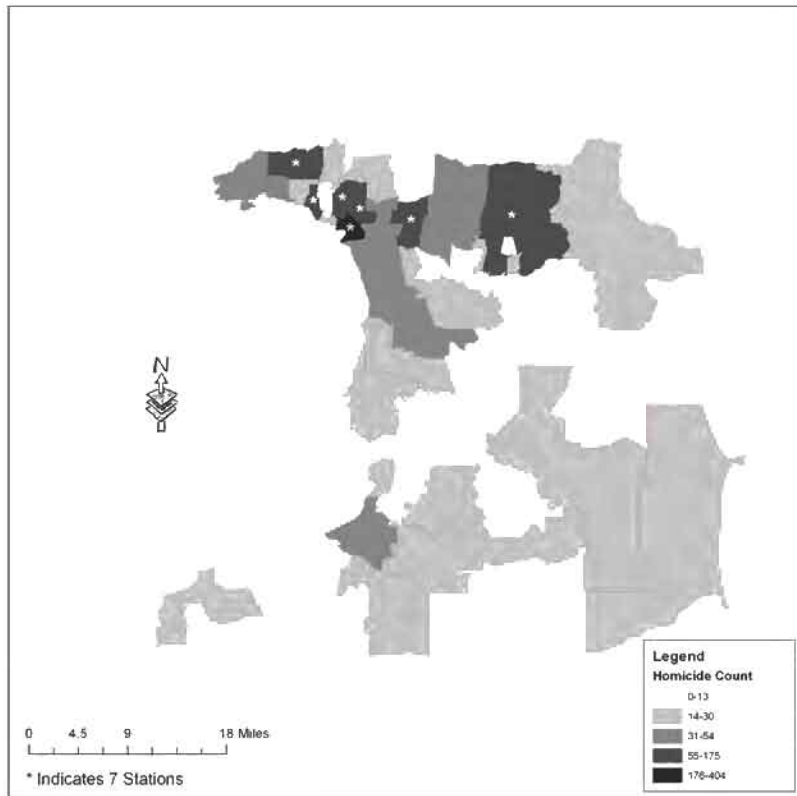
Our initial finding of spatial concentrations in violence resulted from preliminary analyses of official homicide data from 2005. While the overall homicide rate in Trinidad and Tobago was approximately 34.5 per 100,000 persons in 2005,³ seven of the nation’s 71 police station districts had substantially higher homicide rates. The most extreme case was the Besson Street station district, with a homicide rate of 249 per 100,000 persons, or about seven times the national homicide rate. About 23.8% of homicides in the nation took place in the Besson Street station district, followed by 8% in Morvant, 7.8% in West End, 6% in Belmont, 5.4% in Arima, and 4.4 % in both St. James and Carenage.

The remaining 40.2% of homicides were distributed throughout the nation’s other 64 station districts. Together, these seven station districts had about 60% of the homicides, though they constituted only 9.9% of the station districts in the nation, 39.7% of the population, and 6.1% of the land mass. The significant concentration of homicides occurring in the Besson Street station district (almost ¼ of the nation’s homicides) is even more striking when considering that this area constitutes only .25% of the nation’s land mass and houses only approximately 3%

³ Trinidad and Tobago’s homicide rate in 2005 was 34.5 per 100,000 persons, a rate significantly higher than most other nations in the region. Jamaica, with a homicide rate of 50.5 per 100,000 population, is usually thought of as the homicide capital of the Caribbean. Trinidad and Tobago’s homicide rate in 2005 was about six times higher than that of the United States, which had a homicide rate of 5.6 per 100,000 in 2005 (U.S. Department of Justice, 2005).

of the population.⁴ This initial discovery of spatial concentrations in violence at the station district level is what led us to supplement official police data with other data sources and to carry out the more intensive study of spatial concentrations reported here. Figure 1 illustrates homicide counts in Trinidad and Tobago by station district from 2001-2007.

Figure 1
Homicides in Trinidad from 2001-2007



⁴ Population data were obtained from the Central Statistical Office of Trinidad and Tobago.

The seven station districts with the most homicides during that time are marked with asterisks. Six of the seven stations are the same as in the snapshot we just provided using data from only 2005. One of the seven most violent station districts included in the 2005 analysis drops off the list when we take a longer view from 2001-2007 (Carenage is replaced by St. Joseph). None of the seven stations had fewer than 55 homicides from 2001-2007; six of the seven had had at least 90 during this period. Besson Street was a clear outlier with 404 homicides during this period, more than twice the number of the second most violent station district, Morvant. Also noteworthy is that three of the seven stations (Besson Street, Belmont, and Morvant) share a jurisdictional border.

Table 1 shows the number and proportion of homicides in the seven most violent station districts in Trinidad and Tobago from 2001-2007.

Table 1
Homicides in Seven (7) Station Districts in Trinidad
2001-2007

Station District	# of Homicides	% of Homicides	% Area	% Population
Besson St.	404	20.4%	0.25%	3.05%
Morvant	175	8.9%	0.29%	2.24%
Arima	107	5.5%	3.29%	3.05%
West End	97	5.0%	0.69%	2.50%
Belmont	91	4.6%	0.33%	1.79%
St. Joseph	90	4.6%	0.56%	2.24%
St. James	55	2.8%	0.13%	1.33%

Homicide Case Characteristics

Data from the HBI are useful for generating a profile of homicide victims. The mean age of homicide victims dropped from 35.8 years old in 2001 to 33.0 years in 2007, for an overall average of about 33.4 years. Homicide victims are overwhelmingly male (88.6%). About 72.4% of victims are of African descent, 18.6% are East Indian, 7.6% are of mixed race, and 1.4% are other races. Africans constitute only 37.5% of the population; therefore they constitute a disproportionate share of homicide victims.⁵

Data from the HBI are not very useful for generating a profile of suspects. Of the 1,958 murders recorded in Trinidad and Tobago between 2001 and 2007, only 522 case files (26.7%) contain either the legal name or the "street name" (alias) of one or more suspects. Moreover, since domestic homicides are typically the easiest to solve, those kinds of cases have more suspect information available than other case types. Because official homicide data are missing so much suspect information, we also cannot draw inferences about the relationships between victims and offenders. From 2001-2007, at least 90% of cases are missing information on victim offender relationships each year, with 2004 containing the most missing data at 94% of cases. While data on suspect gender are only available for 46.2% of cases, the available data show that 96.5% of

⁵ According to Trinidad and Tobago's Central Statistical Office, 37.5% of the population is African, 40% are East Indian, and 20.5% are of mixed descent.

suspects are male.⁶ Similarly, while data on suspect race are only available for 15.6% of cases, 69.6% of suspects are African, 20.3% are East Indian, and 9.8% are mixed. Unfortunately, there is insufficient data on offenders to carry out meaningful spatial analyses of offender characteristics.

Data on offender motives also suffer from problems of both reliability and validity. Among the motive categories with more than just a handful of cases, the officially recorded motives are probably most accurate for robberies and domestic homicides, since these types of cases are the most straightforward. But for four other motive classifications (drugs, gangs, altercations, and revenge), the data are simply unusable. Our homicide intelligence interviews with task force officers and criminal investigators knowledgeable about these cases provide a very different picture of homicide motives than the official classifications used by the HBI.

For example, among the homicides classified by the HBI as altercation, drug, or revenge, 48.8% were classified during the intelligence interviews as gang-motivated.⁷ Similarly, roughly half of the homicides in which the HBI listed the motive as “pending” or “unknown” were classified during

⁶ Only 37 female homicide suspects were listed in the homicide case files between 2001 and 2007. Of these cases, 43.2% were domestic homicides, 24.3% were altercations, 10.8% were robberies, 5.4% were revenge motivated, 13.5% were unknown, and one case was classified as motivated by personal gain. Of note, none of the cases with female suspects were classified as drug or gang motivated.

⁷ The homicide intelligence database contained two classifications for gang involvement. Incidents were classified as “gang-motivated” if they “furthered the interest of the gang.” They were designated as “gang-related” if either the victim or the offender was a gang member or the incident was ordered by or carried out on behalf of the gang. All gang-motivated homicides are gang-related, but not all gang-related homicides are gang-motivated. For a discussion of these types of definitional issues, see Maxson and Klein (1996).

the intelligence interviews as gang-motivated. In our crude analysis of the motive data, we collapsed these four problematic motive categories into one catch-all category that we termed "street homicides."

From 2001-2007, 11% of homicides with known motives were classified as domestics, 21% were robberies, and 64.3% were "street" homicides.⁸ Our reading of the homicide case files suggests that the majority of cases ending up in the "street homicide" category tend to be based largely in conflicts over turf, respect, drugs, girls, or previous offenses carried out against either the offender or the offender's friends or loved ones (Hughes and Short, 2005). The robbery-based homicides, though they may have occurred on "the streets," appeared to be much more instrumental; the domestic homicides were also clearly in a category of their own.

Data on weapon type provide one of the most useful pieces of information in the official homicide records. The raw number of homicides by sharp instrument, blunt instrument, asphyxiation, and other modalities all remained fairly constant while the nation's increase in violence was unfolding. Yet, gun homicides rose more than 959% from 1999 to 2007 (from 27 gun homicides in 1999 to 286 in 2007). During the period of interest for this study (2001-2007), 68.9% of homicides were committed

⁸ This classification system is primarily concerned with high-volume offense types and therefore does not address several other categories of homicides (such as sexually-motivated murders or kidnappings) containing only a handful of cases.

using guns, 17.6% with sharp instruments, 2.8% by asphyxiation, 5.5% with a blunt object, and 5.2% by some other means.

One of the most ignored elements of routine activities theory is time. Victims and offenders do not come together in places at random times – concentrations of crime tend to occur at specific times or on different days, weeks, months or years. These concentrations are often referred to as “temporal signatures” (Ratcliffe, 2004). We already discussed changes in homicides by year, with a dramatic growth in homicide by gunfire in recent years. We were unable to detect any clear monthly or seasonal pattern in homicides during the year. Some of the police officials we interviewed expressed a belief that violence is more common during the weeks/months spanning Trinidad and Tobago’s well known annual Carnival season.

Our analysis (not reported here due to space limitations) rejected that hypothesis using homicide data, though there is still the possibility that forms of violence other than homicide (such as minor assaults) may peak during Carnival season. While there were some fluctuations in the number of homicides by day of the week, they were not remarkable. We did, however, find significant variation in homicides by time of day. The majority of homicides (65.4%) occurred from 4 p.m. to 4 a.m., with 18.0% occurring from 4 p.m. to 8 p.m., 30.9% from 8 p.m. to midnight, and 16.5% from midnight to 4 a.m.

When combining day of week and time of day (for 42 four-hour time blocks per week), we found that the six time blocks with the highest frequency of homicides were Monday through Saturday nights from 8 p.m. to midnight.⁹

One important question is whether the various homicide incident characteristics we have just discussed are equivalent in areas with concentrations of homicide and in areas where homicide is less frequent. Some evidence suggests that in areas with concentrations of violence, violent incidents may not only be more numerous, they may also be qualitatively different than violent incidents occurring elsewhere.

Table 2 uses data from the HBI to determine whether there are differences in the nature of homicides between the seven most violent station districts and the other 64 station districts in the nation. Four case characteristics are examined: victim demographics, motive, weapon type, and time of day. Statistical tests are presented for every comparison (z-tests for differences in proportions and t-tests for differences in means). What is striking is that for

⁹ One reviewer questioned why time of day is more important than day of week. A common finding from research on temporal patterns is for violent crime to be higher on weekends than on weekdays. That same pattern is evident here. We do not have direct evidence to answer with confidence why time of day appears more important than day of week, thus we can only speculate. One possibility is that unemployment is endemic in the neighborhoods in Trinidad with the greatest amount of violence, thus for many residents there may be very little real difference in routine activities between weekends and weekdays. It is also common for people in these neighborhoods to "lime" or hang out with friends outside in the evening. This common practice means that potential victims can easily be found outside in public spaces by those wishing to do them harm. We should note that the temporal patterns observed here are similar to those found in some American cities (e.g., Harries, 1989).

most of the contrasts (except some time-of-day variables), the differences between the seven stations and the other stations are statistically significant. Homicide victims in the seven stations are significantly more likely to be black and male. Homicides in the seven station districts are much more likely to be what we have classified as “street” homicides rather than the result of a domestic altercation or a robbery. Homicides in the seven stations are also committed with firearms more often than in the comparison stations.

Table 2
Characteristics of Homicides, 2001-2007

	7 Stations	Other Stations
Victim Demographics		
Mean Age	31.14 years	34.96 years
% Male **	93.3%	83.6%
% Female **	6.7%	16.4%
% East Indian **	7.4%	33.6%
% Black **	85.5%	54.7%
Motive (includes only cases with known motives)		
% Domestic **	4.9%	17.6%
% Robbery **	15.0%	27.5%
% Street **	77.7%	49.8%
Weapon Type		
% Firearm **	83.5%	53.0%
% Sharp Instrument **	8.7%	27.2%
% Asphyxiation **	1.3%	4.5%
% Blunt Object **	3.6%	7.6%
% Other (a) **	2.8%	7.9%
Time of Day		
% 12 a.m. – 4 a.m.	16.6%	16.4%
% 4 a.m. – 8 a.m. *	6.8%	10.7%
% 8 a.m. – 12 p.m.	12.0%	13.3%
% 12 p.m. – 4 p.m. *	11.4%	15.6%
% 4 p.m. – 8 p.m.	18.7%	17.2%
% 8 p.m. – 12 a.m. **	34.6%	26.9%

(a) Includes cases classified as fire, body force, run over, poison, other, and unknown. * $p < .05$; ** $p < .01$.

Conversely, homicides committed with a sharp instrument, asphyxiation, a blunt object or some other means are more frequent in the comparison stations than in the seven stations. Of the six time-of-day contrasts we examined, only three had evidence of a statistically significant difference at the .05 level, and only one of these at the .01 level. Homicides occurred between 8 p.m. and midnight 34.6% of the time in the seven stations, and only 26.9% of the time in the comparison stations.

Taken together, the results of this analysis suggest that homicides occurring in areas where violence is spatially concentrated are qualitatively different than homicides occurring in areas where violence is less frequent. The results of our analysis so far are consistent with the interpretation that the spatial concentrations are due largely to gang violence carried out by and against young men, primarily of African descent, using guns. We will explore this interpretation further as we drill down to explore more micro-level dynamics.

The official homicide data are useful for detecting some important patterns and trends in homicide in Trinidad and Tobago, but the data also have limitations; much of the information is missing from the case files and other potentially valuable information is not routinely collected. The two supplemental data sets that we gathered allow us to examine spatial concentrations in violence in much more detail.

*Is Homicide Concentrated Spatially
Within High-Crime Station Districts?*

In this section we explore spatial concentrations of homicide within three station districts using two different methods. The major question we examine is whether there are smaller concentrations of violence *within* high-crime communities, or whether violence tends to be more endemic or diffuse throughout these communities. To do this, we begin by carrying out statistical tests of the extent to which homicides are spatially clustered. Next we use spatial analysis methods to identify a handful of micro-level homicide hot spots. Finally, we explore the nature of those hot spots using both quantitative and qualitative data.

The first step was to test the hypothesis that homicides in the three station districts are spatially clustered (against the null hypothesis that homicides are distributed randomly in space). We relied upon two spatial statistical methods: Nearest Neighbor Analysis (NNA) and a Ripley's K analysis. NNA "tests whether the average neighbor distance is significantly different than what would be expected on the basis of chance." Levine (2004: p. 5.5) cautions that the significance test used in NNA "is not a test for complete spatial randomness, it is a test of first-order nearest neighbor randomness." It only examines the mean distance between *nearest* neighbors; it ignores other higher-order effects. The mean distance between homicide incidents in these three station districts is 138.8 meters, compared with an expected distance (if homicides were distributed randomly) of 247.1 meters ($z = -12.7$, $p < .0001$). The results of this analysis support the hypothesis that homicides in these three station districts are spatially clustered.

While NNA only focuses on the mean distance between nearest neighbors, Ripley's K takes into account "the complete distribution of all distances in the point pattern" (DiMaggio, et al., 2008, p. 451). We ran a Ripley's K analysis using 100 simulations and no border correction. The L values for homicides fall outside of the "randomization envelope," thus providing a second form of evidence that homicides in these three station districts are spatially clustered rather than randomly dispersed.

The second step in our analysis was to identify micro-level places with a disproportionate number of homicides. We use the term "micro-level place" to refer to smaller locations within larger geographical units such as communities, neighborhoods, or police beats (Eck & Weisburd, 1995). In studies of micro-level places, the size of the place can vary from something as large as a street segment or a group of block faces (Sherman & Weisburd, 1995; Weisburd, et. al., 2004) to something as small as a single building, address, or street corner (Sherman, Gartin, & Buerger, 1989). Micro-level places with concentrations of crime are often referred to as "hot spots" (Sherman, Gartin, & Buerger, 1989) or "pockets of crime" (St. Jean, 2007). Rather than focusing on hot spots of crime in all of its various forms, here we limit our focus to hot spots of homicide. These are micro-places with disproportionate numbers of homicides relative to other similarly sized areas.

The first step in the analysis confirmed that homicides in three high-crime station districts are spatially

concentrated. The second step was to identify those concentrations. Our search for spatial concentrations of homicide required us to begin by deciding on the proper unit of analysis. Since homicides are rare relative to other offense types, we elected to use something similar in scope to a street block – one of the larger types of micro-places reported in the literature – as our unit of analysis.

The typical notion of a street block in a developed nation is somewhat tenuous in the three high-crime station districts under study here. These stations are nestled in the foothills of Port-of-Spain, the capital city of Trinidad and Tobago. People travel through these communities on a serpentine network of winding streets, alleys, and footpaths, some paved and some unpaved, with dramatic changes in elevation from one spot to the next. Public staircases carved into the hillsides connect areas with different elevations.

Due to the unique geography and terrain, including the absence of a grid-like street layout, we defined a micro-level place differently from the standard definition of a city block, but roughly comparable in size. For purposes of this study, we defined as a homicide “hot spot” any ellipse 600 feet or less in length where at least 5 homicides occurred during the two-year period from January 2006 to December 2007 (these were the only homicides for which GPS data on the location of the incident were available). We selected this distance because 600 feet is the approximate length of a street block in downtown Port-of-Spain, the largest city in Trinidad and Tobago. We identified these ellipses using nearest neighbor hierarchical clustering in CrimeStat, a spatial statistics software program (Levine, 2004).

Only two of the three high-crime station districts contained hot spots meeting our definition. We excluded one homicide hot spot in the Morvant station district because four of the victims were killed in a single mass-murder incident. Our goal here was to examine places with multiple separate incidents of homicide. The remaining four hot spots are all located within the Besson Street station district. Each of the four hot spots experienced six homicides between January 2006 and December 2007. Three of them (hot spots 1, 2, and 4) are within one square mile of each other. One of them (hot spot 3) is somewhat isolated and rests just below the border of the Besson Street and Belmont Station districts. We provide a brief description of each hot spot, drawing on homicide intelligence data, interviews with police officers, and photographs and video footage of the areas. We conclude by appraising the extent to which the criminological theories we reviewed at the start of this paper are useful for understanding these micro-level spatial concentrations of violence.

Hot Spot 1

Hot Spot 1 is controlled by a violent street gang that has occupied the area for many years. All of the housing consists of four-story government subsidized apartment buildings known locally as “plannings.” They are similar to what would be referred to as “projects” in the United States. There is a vibrant street life in the area, with people liming (hanging out) at all hours, listening to music, drinking liquor, and walking through the labyrinth of alleyways between and around the many building units.

“Pipers” (drug users) stand around, ducking into concealed areas to smoke ganja or use other drugs. Laundry and rugs hang out to dry on the balcony railings. When we first began our work in Trinidad in early 2005 (before we began mapping homicide incident locations), the area had experienced several homicides in just a few days. A neighboring gang leader had approached the local gang leader about forging an alliance. When the local leader refused, the neighboring gang began murdering drug dealers in the area. The local leader relented and a fragile partnership was born, but it only lasted until the neighboring gang leader was murdered. Six homicides occurred in the area during the time period covered by this study; police intelligence information was available for five of them. All five were gang-related and in each case, the victim was also an offender of some type.

Hot Spot 2

Hot Spot 2 is situated at the top of a steep hill in a densely populated area crowded with shanty houses dotted along the side of narrow, winding roads. Footpaths and staircases carved into the hillsides link the area to other nearby neighborhoods. According to police, these pathways provide offenders with an easy way to enter and exit the neighborhood to carry out shootings, robberies, and other offense types. There are very few street lights or lamp posts. It is easy to see how a murder could occur in the area because it is so secluded from “public” view and it is difficult for police to carry out routine patrols or to respond to calls for service in the area. Six homicides occurred in the area during the time period covered by this study; police intelligence information was available for four of them. Two were gang members killed by an outside gang as part of an ongoing gang war, one was a

serial rapist who was likely killed as a result of the rapes he carried out, and one had gotten drunk and had an altercation with a group of men earlier in the day. Police warned him not to go into the area because of his drunken, disorderly behavior; he ignored the warning and was later killed. Although the area is controlled by a gang, the motives for violence here are mixed, with some incidents not gang-related.

Hot Spot 3

Hot Spot 3 is located at the top of a steep hill overlooking Port-of-Spain and the sea. It was home to one of the most violent street gangs in Trinidad and Tobago until most of its leadership was killed; vestiges of that gang still occupy the area but it is quieter since its former leaders were killed. In a separate social network analysis, we discovered that this gang was involved in violent conflicts with several other gangs. It was responsible for a number of murders and several of its members were murdered themselves (Katz and Maguire, 2006). The area is hilly and has dense vegetation. The majority of homes are small, makeshift shanties. These squatter properties are not organized like traditional residential areas; many of them have no street frontage and are only accessible from the road by footpaths. The roads are paved, but once again the area is navigated by footpaths or "tracks" that provide offenders with easy means of entry and exit, especially at night when these areas are not lit. There are few street lights in the area and only on the main road.

Six homicides occurred in the area during the time period covered by this study; limited police intelligence information was available for all of them. One was a taxi-driver with no gang affiliation. The incident was classified as gang-related, but we were unable to access any more specific information on motive. One common scenario in Trinidad is for taxi-drivers to be killed by gangs because they drive in other areas controlled by rival gangs. All of the remaining victims were either members or associates of the gang who were killed by other members as a result of infighting within the gang. Thus, most of the violence in hot spot 3 during the study period can be attributed to internal fissures within the gang and subsequent battles for control.

Hot Spot 4

Hot Spot 4 is located in an area dominated by government owned apartment complexes (known as “plannings”). The main road in the area cuts between the buildings with some located on each side of the road. Although the area can sometimes get quite busy, there is not nearly as much street traffic as in Hot Spot 1, which is located in a busier area with more foot and vehicular traffic. There are fewer pipers hanging out on the streets. There is more vegetation and grass and both the main road and the housing complex in the area appear to be better lit (although the police pointed out that people like to break the light bulbs and repair personnel are afraid to come into the area to replace streetlights because they are sometimes shot at).

As a side note, a local gang worker reported to us that he coaches the gang members not to shoot at repair personnel anymore because it is better for the community if workers

are allowed into the community to do their work. Behind the apartment complexes are shanty homes accessible by footpaths. While the roadways are fairly well lit in the area, the footpaths are not. Once again the officers pointed out how difficult it is to pursue suspects in the area because there are so many different paths and tracks available that are neither well lit nor accessible by vehicle.

Six homicides occurred in the area during the time period covered by this study; police intelligence information was available for all of them. Four of the victims were members or associates of the gang that controlled the area and all were killed (in separate incidents) by rival gangs. The two remaining victims were both also killed in gang-related homicides involving *other* gangs. One was from an outside gang and he was killed by a rival gang member while passing through the area. Another was not in a gang, but he beat up two gang members and they later returned and killed him. All six of the homicides in this area during the project period were gang-related.

Patterns of Homicide

Several themes are prominent in our analysis of recent homicides in these four hot spots. First, all 24 victims were killed with guns. Second, of the 21 homicides with sufficient intelligence information, 19 (90.5%) were gang-related in some way (though not all gang-motivated). Third, although drugs are often blamed for the homicide problem in Trinidad, only three of the 21 cases with sufficient information were drug-related. Moreover, all of the drug-

related incidents occurred in one hot spot known for its drug activity. Fourth, with the exception of two women killed due to their relationships with gang members, most of the victims were young men ranging in age from 17 to 45 (with a mean age of 29 and median age of 28). The record of violence in these hot spots is largely a story about armed young men in gangs killing other young men who may or may not be in gangs but are typically involved in some type of criminal offending. Truly “innocent” or non-criminal victims in these areas are rare, though we are familiar with several tragic exceptions to this pattern.

Discussion and Conclusion

We began this paper by reviewing three popular criminological theories useful for thinking about why some areas develop spatial concentrations of crime while others do not. Although we lack the data to carry out a definitive test of these theories, we are able to form some impressions about the extent to which these theories explain spatial concentrations of violence in Trinidad.

Routine activities theory teaches us that crime results from the intersection in time and space of suitable victims, motivated offenders, and a lack of capable guardianship. In the spatial concentrations we have identified, street gangs provide a readily available pool of motivated offenders. Since the victims in many of these cases appear also to be involved in crime, each hot spot also seems to offer a ready pool of suitable victims (Katz and Maguire, 2006). Guardianship in these areas is provided by a mix of formal and informal social controls. The police are responsible for formal social control, but their capacity to control crime and violence in these neighborhoods is weak.

Informal social control is provided by a number of institutions, like families, the faith community, schools, and a variety of social programs run by both government and nonprofit institutions. Unfortunately, one of the most potent forms of informal social control in the communities we studied is the gangs themselves.

Our interviews with gang leaders and police officials who work closely with gangs in Trinidad suggest that gangs play a role in regulating the types of offenses occurring within their neighborhoods. We heard numerous anecdotes about gang leaders punishing both members and nonmembers, in regularly scheduled disciplinary sessions, for carrying out unauthorized offenses or violating gang or community norms. Several gang leaders bragged to us during interviews that they had forbidden rapes and robberies within the neighborhoods under their control, though these offense types are permitted if they are carried out in other areas. Thus the very groups responsible for much of the violence are simultaneously responsible for regulating some forms of crime and violence in their communities (Klein, 1995; Manwaring, 2005).

Routine activities theory is a useful way of thinking about why certain areas become hot spots and not others. Its principal limitation is that it is a largely situational theory; it explains how certain situations might lead to criminal outcomes, but it does not explain how those situations emerge. In this case, it does not provide any explanation for how offenders and victims come together in time and

place – instead it treats the existence of these offenders and victims, as well as their confluence (or the lack of confluence), as a given. Moreover, the notion of guardianship takes on a new level of complexity when the guardians who sometimes prevent violence and the offenders who sometimes carry it out are one and the same. Routine activities is a useful but incomplete theory for understanding spatial concentrations of violence in Trinidad.

Social disorganization theory is also somewhat useful for thinking about why some places develop concentrations of violence and not others. All of the hot spots we identified in this paper are socially disorganized. Two common forms of housing in these hot spots, as well as the communities where they are situated, are makeshift “squatter homes” (or shanties) and government subsidized apartments. Trinidad (and the third world more generally) is home to many impoverished, socially disorganized communities, many of which do not become hot spots of crime and violence.

Unfortunately, the current census data available in Trinidad are insufficient to enable us to demonstrate empirically that the hot spots are no more socially disorganized than other locations in the communities where these hot spots are situated. However, our experience in visiting these areas dozens of times provides anecdotal support for this conclusion.

Social disorganization may be responsible for the emergence of gangs and other types of offenders in general, but since many communities in Trinidad have levels of social disorganization that likely equal or exceed

those of the hot spots we have examined here, social disorganization theory appears to be an incomplete explanation for spatial concentrations of violence. If social disorganization alone were responsible for homicide, we would observe a very different pattern; homicide would be distributed much more evenly throughout the socially disorganized communities examined in this study.

Collective efficacy emerged as part of the cure for the weak explanatory power of social disorganization theory. Collective efficacy theory combines ideas from social disorganization and social capital theories (Kubrin and Weitzer, 2003). It suggests that neighborhoods can buffer themselves from the effects of social disorganization and extreme disadvantage by forming prosocial networks built on mutual trust to exert informal social control over the behaviors that are tolerated there (Morenoff et al., 2001). The types of data we examined here are not very useful for drawing direct inferences about the effects of collective efficacy.

Our interviews with police officers, gang leaders, and residents suggest that gangs occupy an ecological niche in these hot spots. Gang leaders perceive themselves as community leaders and some residents appear to have the same perspective. Funerals of popular slain gang leaders have been heavily attended and testimonials at these ceremonies suggest that at least some residents appear to view gang leaders as "Robin Hood" figures who provide jobs and other opportunities for their communities. Media appearances by some gang leaders confirm that this is also

how they view (or at least portray) themselves. At the same time, the results of citizen surveys in these communities show that there are very high levels of fear as well (Johnson, 2008).

Our interviews with police investigators, as well as discussions we have had with witnesses at homicide scenes, both suggest that witnesses are frequently unwilling to cooperate with police or testify in court in gang-related cases. A number of witnesses have been killed by gang members to prevent them from testifying. In an environment characterized by such intense levels of fear, generating sufficient collective efficacy to reduce crime may be difficult. Moreover, to the extent that some residents also view gangs (or at least gang leaders) in a positive light, improving collective efficacy may do little to prevent gang violence. These are ultimately empirical questions that must be answered using types of data that were unavailable in this study.

Recent evidence from the US suggests that these questions are worth exploring in more detail. Symbiotic relationships often develop between gangs and neighborhood residents (Browning, Feinberg, and Dietz, 2004; Patillo-McCoy, 1999; Venkatesh, 2000). According to Browning and his colleagues (2004, p. 503), "while social networks may contribute to neighborhood collective efficacy, they also provide a source of social capital for offenders, potentially diminishing the regulatory effectiveness of collective efficacy." The same dense neighborhood ties used to transmit prosocial attitudes and behaviors in social capital and collective efficacy theories can also transmit antisocial attitudes and behaviors. Little is known about the complex relationships between gangs and residents in Trinidad's poorest and most socially disorganized

communities. Given the results of research elsewhere on the potential for neighborhood social networks to generate both crime-preventing and crime-enhancing effects, filling this considerable gap in the research would seem to be a worthwhile criminological investment.

Three dominant theories used to explain community differences in crime and violence all appear to be at least partially incomplete explanations for the spatial concentrations of violence we have observed in this study. They appear unable to account for why some micro-level places become hot spots of homicide while other similar places, some in close proximity, do not. The spatial concentrations we have identified are all located in areas controlled by street gangs, but the three station districts we examined in detail are home to at least 30 street gangs.¹⁰

Our previous research in Trinidad has demonstrated clearly that these gangs vary widely in the extent to which they use violence or have violence used against them (Katz and Maguire, 2006). We suspect that social disorganization and collective efficacy may provide potent explanations for the level of gang membership and possibly even the level of gang violence across *larger* spatial aggregates like communities or police jurisdictions in Trinidad, but both explanations seem to be much less potent at explaining variation in homicide across smaller ecological units like

¹⁰ Our estimate of the number of gangs in the area depends on the definition of a “gang” that is used. Unfortunately, the available journal space does not permit us to provide a full explanation of the definitions and classifications of gangs used in Trinidad and Tobago.

streets, blocks, or the ellipses that we relied upon in this study.

The factor that is seemingly responsible for most of the violence in the hot spots we examined here is not the mere *presence* of street gangs, since gangs are ubiquitous throughout the communities we studied. Instead, the major explanatory factors appear to be the degree to which these gangs are immersed in conflict with other gangs and are willing to use violence to resolve disputes or defend their boundaries.¹¹

Neither social disorganization nor collective efficacy theory seems able to explain differential involvement in gang conflict or differential willingness to use violence across micro-level places with similar levels of social disorganization and collective efficacy. Similarly, routine activities theory provides useful insights about the genesis of violent events, but it is silent about the factors leading to these events (such as gang conflict, cycles of retaliation, or a predisposition to solving disputes using violence). Thus, ultimately, all three theories appear to offer incomplete explanations for neighborhood variations in violence, particularly gang-related homicides. Since gang homicide is such a ubiquitous phenomenon in many urban areas throughout the world today, expanding these ecological theories to account for outbreaks of violence in micro-level

¹¹ Here we use the term "boundaries" in a general sense to refer to the many types of boundaries that organizations establish as part of their identity (e.g., Aldrich, 1999). For instance, behavioral boundaries provide a set of norms or rules for what types of behaviors are acceptable. Membership boundaries serve to distinguish between members, affiliates, and nonmembers. Spatial boundaries represent an organization's claims about its geographic territory. All of these boundaries represent potential sources of conflict and gangs, like other organizations actively seek to maintain and defend their boundaries. Unlike many other types of organizations, however, violence serves as a defining feature of gang life. As Decker (1996: 254) points out, violence can "reinforce the ties of membership and maintain boundaries between neighborhood gangs and those in 'rival' neighborhoods."

places represents a new frontier for criminologists in the Caribbean and elsewhere.

The major theories used to explain ecological variations in crime appear to be insufficient to explain the spatial distribution of homicide in Trinidad's most high crime communities. For instance, they do not account for why some gang-related areas become hot spots of violence while others do not. One such explanation may be that some micro-level places provide offenders with an ecological advantage such as greater protection from police and rival gangs (e.g., St. Jean, 2007; Tita et al., 2005). These theories also do not explain why some gangs are more willing to engage in violence than other gangs or criminal groups. Moreover, they do not account for the cycles of retaliation and revenge that tend to accumulate into spatial concentrations of violence in micro-level places.

In short, all three theories are silent about the group dynamics that result in the spatial clustering of gang violence. As Tita and his colleagues (2005, p. 273) argue, "even within high crime neighborhoods, crime exhibits non-random patterns of highly localized concentration in crime 'hot spots'... gangs are spatially concentrated among disadvantaged neighborhoods, but gang set space represents a sub-neighborhood phenomenon, with gang members hanging out in relatively small, geographically defined areas within a neighborhood." Understanding the distribution of violence across micro-level places, particularly violence carried out by criminal groups,

represents a fertile opportunity for theory development in criminology.

Moreover, because the theories were formulated and tested in developed nations, they rest on assumptions that may not be consistent with the reality of life in the developing world. Confidence in the police and courts in developing nations is often much lower than in the developed world. Low clearance and conviction rates are among a number of reasons for the failure of formal social control, thus opening the door for criminal gangs and other antisocial entities to exert their own breed of informal social control. As illegitimate forms of informal social control begin to take on legitimacy in the eyes of the public, they challenge the basic authority and sovereignty of the state in many developing nations (Manwaring, 2005).

These theories also sometimes fail to account for the unique historical and cultural differences between developed and developing nations. For instance, as Villareal and Silva (2006, p. 1726) point out, "because of the pattern in which low-income areas in Latin American cities were settled, as well as the prominent role of the informal sector in local economies, disadvantaged neighborhoods in these cities are often characterized as having dense social networks." These social networks are more problematic than often portrayed by collective efficacy theorists. Villareal and Silva (2006) found that social cohesion among residents in a Brazilian *favela* (a low-income squatter community) resulted in greater perceptions of risk and greater tolerance for criminal behavior.

Thus, the findings in this paper suggest at least three opportunities for theoretical development. First, theories of violent crime must be adapted to account for variations across micro-level places, particularly since criminal gangs often claim control over these places. Some evidence from the U.S. suggests that this shortcoming in existing theory will benefit knowledge in both developed and developing nations (Tita, et al., 2005). Second, theories must be adapted to account for environments in which formal social control mechanisms (such as police or criminal courts) function at levels that are insufficient to generate even modest amounts of deterrence. Finally, before they can be applied to developing nations, ecological theories of crime must be adapted to account for the unique historical and cultural environments in these communities.

The results of our analysis also have implications for policy and practice. Concentrations of violence represent opportunities for police and other community agencies to focus their efforts and implement targeted interventions.¹² One useful approach is for police agencies to identify hot spots of violence, particularly gang violence, and then assign personnel to become expert in those areas. These localized experts can gather intelligence, carry out operations, and put crime prevention measures in place. They could be called upon by investigators to assist in investigations in those areas. They could anticipate

¹² The Trinidad and Tobago Police Service (TTPS) has invested heavily in recent years to improve its crime analysis capacity. In 2005, the TTPS established a Crime and Problem Analysis (CAPA) Unit that now has the resources to carry out geographic analysis of crime patterns (we are grateful to CAPA for providing much of the data used in this study).

impending violent events, such as retaliation shootings, and mobilize community resources to prevent violence before it happens. They could anticipate other key events in the community like offenders returning home from prison. They could act as individual “fusion centers” for making sure that other police units know what they need to know about the area and the offenders operating there. Once hot spots of violence have been identified, it is time for police and other officials to think creatively and act decisively, putting in place a suite of both preventive and responsive measures meant to reduce violence.

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