

POLITICAL CULTURE, NEIGHBOURHOOD STRUCTURE AND HOMICIDE IN URBAN JAMAICA

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This study examines the structural correlates of homicide in Jamaica, a developing nation with one of the world's highest homicide rates. We extend existing theories on the ecology of lethal violence to account for the influence of electoral politics on homicide. Controlling for structural factors thought to be associated with violence, we examine the effect of voter turnout on homicides in urban communities located in the Kingston Metropolitan Area. We test the model using negative binomial regression. The findings help clarify the factors that explain variations in homicide across communities in urban Jamaica. The study also reveals how theories, concepts and measures used regularly in research in developed nations may require adaptation for use in developing nations.

Keywords: homicide, lethal violence, civic engagement, politics, defended neighborhoods, Jamaica

Introduction

Although research on the social and structural factors that influence lethal violence has expanded in recent years, important questions remain largely unanswered. For instance, little is known about whether the structural factors that influence homicide in developed countries have similar effects in developing countries. A more comparative body of research on homicide has the potential to reveal alternative explanations and advance (or possibly reshape) theoretical perspectives on the social ecology of homicide (Blazicek and Janeksela 1978; Pridemore 2002).

Much of the scientific evidence on the structural covariates of homicide is based on studies conducted in Britain, Canada and the United States (e.g. Sampson and Groves 1989; Land *et al.* 1990; Kennedy *et al.* 1991; Kovandzic *et al.* 1998; Morenoff *et al.* 2001; Kubrin 2003; Sampson and Morenoff 2004; Kubrin and Weitzer 2003b; Neilsen *et al.* 2005). The narrow range of cities in which this research has been carried out raises credible concerns about the potential for external validity problems. The scientific knowledge base on the structural covariates of lethal violence would benefit from more research in a wider variety of settings. For instance, little is known about homicide in developing nations, many of which have substantially higher homicide rates than the nations where most of the research takes place. Macro-level analyses of homicide in developing countries would not only allow for a more complete understanding of lethal violence but also expand the current state of knowledge about the relationships between social structure and homicide. The present study seeks to fill this gap in the literature by examining the structural factors that influence homicide in Jamaica, a developing country with one of the highest homicide rates in the world.

Data from the United Nations Office on Drugs and Crime (UNODC) show that certain nations, including Austria, Japan and Singapore, routinely report low annual homicide rates of less than 1 per 100,000 people (United Nations Office on Drugs and Crime 2010).

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At the same time, some developing countries in Latin America and the Caribbean—including El Salvador, Honduras, Jamaica and Venezuela—have significantly higher homicide rates of more than 50 per 100,000 people. A 2007 report by the UNODC and the World Bank notes that the Caribbean region has the highest homicide rates in the world (UNODC and World Bank 2007). Jamaica in particular is one of the world’s most violent countries. In 2008, with a population of approximately 2.8 million people, Jamaica had the highest homicide rate in the Caribbean region (59 per 100,000 persons). A 2011 report from the *Global Burden of Armed Violence* ranked Jamaica third in the world (El Salvador was first and Iraq was second; Geneva Declaration 2011). The bulk of criminological research on homicide comes from the United States, which has a high homicide rate relative to other developed nations. However, the homicide rate in the United States pales in comparison with the homicide rate in Jamaica. Figure 1 shows mean annual homicide rates from 2004 to 2013 in Jamaica and the G7 nations. While the United States has the highest homicide rate among the G7 nations, Jamaica’s homicide rate is more than ten times that of the United States. Scientific knowledge about homicide could benefit from research in a wider variety of settings, including nations where the problem is less severe than it is in the United States, and in nations like Jamaica where the problem is much more severe.

This study examines the structural correlates of homicide in urban Jamaica. We extend existing theories on the ecology of lethal violence to account for the influence of electoral politics on homicide. Controlling for a variety of structural factors thought to be associated with violence, we examine the effect of voter turnout on the distribution of homicides across urban neighbourhoods in the Kingston Metropolitan Area (KMA), Jamaica’s largest urban centre. Jamaica has a long history of violence. Over the past three decades, many neighbourhoods in the KMA have become the most feared and socially isolated places in the country. Some scholars argue that the high rates of crime and violence in Jamaica cannot be fully understood without reference to politics and partisan political practices (Clarke 2006; Headley 2002; Harriott 2003; Sives 2002). Because of the alleged linkages between politics and violence, coupled with the cultural significance and strong sentiments attached to politics, any credible explanation

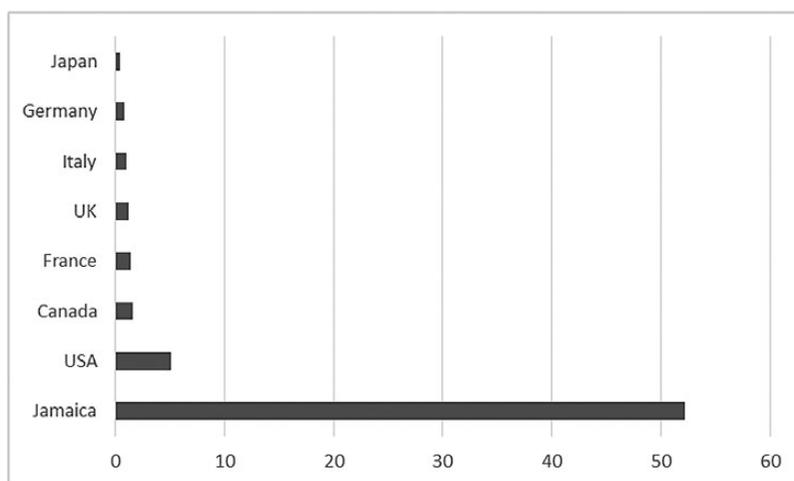


FIG. 1 Mean Annual Homicide Rates (per 100,000 persons) in Jamaica and the G7 Nations, 2004–2013. Data source: United Nations Office on Drugs and Crime (<http://data.unodc.org/>).

of homicide in Jamaica must account for politics in addition to other theoretically informed structural covariates of homicide.

The Ecology of Lethal Violence

A long tradition of research in criminology and sociology has examined the influence of social structure and other community characteristics on the spatial distribution of lethal violence. From a macro-level perspective, violence is thought to be the product of community-level characteristics rather than the individual-level characteristics of the people who reside there (Shaw and McKay 1942; Sampson *et al.* 1997; Kubrin and Weitzer 2003a). Scholars have examined why some neighbourhoods are more prone to high levels of violence than others (Shaw and McKay 1942; Messner and Tardiff 1986; Stark 1987; Bursik and Grasmick 1993; Sampson *et al.* 1997; Morenoff *et al.* 2001; Kubrin and Weitzer 2003a; Sampson 2006). Two leading theoretical perspectives—social disorganization theory and the defended neighbourhood perspective—offer different explanations for the concentration of high levels of crime and violence in certain neighbourhoods. Traditional and contemporary accounts of social disorganization theory share the notion that violence is more likely in neighbourhoods where residents are unable to maintain effective social controls, solve local problems and achieve common goals (Kubrin and Weitzer 2003a; Kubrin *et al.* 2009). The systemic social disorganization perspective further contends that social processes such as the level of informal social control, social ties, public control and collective efficacy are important for understanding neighbourhood variations in crime and violence (Kubrin and Weitzer 2003a; Kubrin *et al.* 2009).

In contrast to the social disorganization perspective, the defended neighbourhood perspective posits that high levels of violence in neighbourhoods do not result from weakened social controls but instead from heightened levels of informal social control. From a defended neighbourhood perspective, violence is connected with a neighbourhood's organized response to perceived external threats (Suttles 1972; Heitgerd and Bursik 1987; Lyons 2007). According to Suttles (1972), defended neighbourhoods, generally found in urban areas, are places with defined and restricted boundaries, where residents share a common plight and a contrived identity. In these places, residents make concerted efforts to retain neighbourhood boundaries and protect the identity and/or homogeneity of their neighbourhood (Suttles 1972; Heitgerd and Bursik 1987; Lyons 2007). The defensive postures used by residents to keep others out of their area result in greater violence in defended neighbourhoods (Suttles 1972; Lyons 2007). For instance, Suttles (1972: 35) argues that in defended neighbourhoods, cohesive groupings such as adolescent street gangs form sharp boundaries around their neighbourhoods and use defensive measures to protect their turf.

In addition to these two perspectives, scholars have also focused on the role of neighbourhood subcultures and the influence of subcultural norms and values that promote and facilitate crime and violence in disadvantaged neighbourhoods (Wolfgang and Ferracuti 1967; Kornhauser 1978; Krivo and Peterson 1996; Anderson 1999; Pridemore 2002; Warner 2003). Some theorists believe that residents in certain highly disadvantaged neighbourhoods become alienated and socially isolated from mainstream society, thus leading to the development of an oppositional subculture that promotes criminal and gang activities, including violence (Wolfgang and Ferracuti 1967; Anderson

1999). Others have argued that high levels of violence in some neighbourhoods result from a combination of social structural disadvantage and the development of subcultural norms conducive to violence (Sampson and Wilson 1995; Krivo and Peterson 1996; Pridemore 2002; Warner 2003; Kubrin and Weitzer 2003a). Warner (2003), for instance, theorizes that the combined effects of neighbourhood disadvantage (social disorganization) and an attenuated culture (cultural disorganization) give rise to low levels of informal social control and the perception among residents that their neighbours do not hold conventional values. This, in turn, facilitates high levels of crime and violence in these neighbourhoods. Similarly, Sampson and Wilson (1995: 38) argue that ‘macro-social patterns of residential inequality give rise to the social isolation and ecological concentration of the truly disadvantaged, which in turn leads to structural barriers and cultural adaptations that undermine social organization and hence the control of crime’.

There is some consensus among researchers that ‘in certain structurally disorganized communities it appears that a system of values emerges in which violence is less than fervently condemned and hence expected as part of everyday life’ (Sampson and Lauritsen 1994: 63). Research by Kubrin and Weitzer (2003b) supports this view. They argue that retaliatory homicides in disadvantaged neighbourhoods stem from the presence of cultural norms that influence how a person reacts to and interprets situations deemed disrespectful or damaging to oneself or to one’s significant other.

These theories provide a useful backdrop for thinking about the sources of community variations in homicide. However, they were developed and have been tested primarily in the United States and other developed nations that are different in many important ways from developing nations. We draw on these theories in seeking to explain community variations in homicide in a developing country with different social and ecological characteristics. However, given the well-known associations between politics and violence in urban Jamaica, these theories provide a somewhat incomplete explanation because they do not contain a clear mechanism for linking politics and violence. To address this concern, we extend the defended neighbourhood’s perspective to account for the role of electoral politics in stimulating violence at the neighbourhood level. This idea may be novel in developed nations in which the rule of law is more firmly entrenched. However, links between partisan politics and violence are common in some developing nations, including several Caribbean nations.¹

Politics and Violence in Urban Jamaica

Jamaica is the largest English speaking country in the Caribbean. It is a democratic nation with a parliamentary system and is a part of the British Commonwealth, with the Queen of England serving as the ceremonial head of state. The Queen is represented by a Governor General, and the Prime Minister is the head of government. Kingston is Jamaica’s capital city; the KMA consists of the parish of Kingston and the urban parts of St. Andrew. For decades, the KMA has had the highest homicide rates in the

¹ While a more expansive discussion of the links between partisan politics and violence in developing nations is beyond the scope of this article, most of the literature on electoral violence is focused on developing nations (e.g. Laakso, 2007; Bratton, 2008; Höglund, 2009). The best evidence on the links between partisan politics and violence in the Caribbean comes from Jamaica (e.g. Figueroa and Sives, 2002; Headley, 2002; Sives, 2002; Charles, 2004; Clarke, 2006; Harriott, 2008). However, concerns about these issues have also been raised in several other Caribbean nations (Erickson and Minson, 2005; O’Brien, 2014).

country. Official crime statistics from the Jamaica Constabulary Force (JCF) show that between 2000 and 2005, there were approximately 7,186 homicides in Jamaica, almost half of which (3,151) occurred in the KMA. This number is exceptionally high for an area with a population of about 700,000. Violence in the KMA has been linked to partisan politics and the development of politically segregated neighbourhoods (Levy 2001; Figueroa and Sives 2002; Headley 2002; Harriott 2003; Sives 2002; 2003; Henry-Lee 2005; Clarke 2006).

The two major political parties in Jamaica are the People's National Party (PNP) and the Jamaica Labour Party (JLP). These political parties compete at least every five years for electoral votes, power and control over government. Formed in the 1930s and early 1940s, both political parties have, since their inception, engaged in highly competitive and partisan political practices. For decades, both parties have fought fierce and deadly political battles for state control. One partisan strategy used by both political parties to enlist voters was to construct housing complexes allocated only to those who voted for their respective party. This began in the 1960s and continued for many years, eventually forming clusters of neighbourhoods with residents who voted only for one particular political party (Stone 1989; Chevannes 1992; Sives 2002). These areas, which are known as garrison communities because of their one-political party dominance and control over residents, typically have a designated leader who is popularly referred to as the Don. The Dons and their groups of mostly armed men would govern their respective neighbourhoods in order to ensure political homogeneity (Stone 1989; Levy 2001; Figueroa and Sives 2002). Over time, residents were resorted to the use of violence and were encouraged by elected officials to fight to protect their neighbourhoods from invasions by rival political supporters. This sort of violence persisted throughout the years and resulted in politically segregated neighbourhoods with clearly defined political boundaries. Gray (1991: 120) notes that the two major political parties 'began to legitimize the role of the gunman as an enforcer in their rivalry', thus elevating the status of violent gangs and solidifying their role in politics. During national elections over the past 30 years, politically segregated garrison neighbourhoods in the KMA are reputed to have generated high voter turnout and high levels of support for the same political party.

Previous macro-level studies of homicide have found a strong negative relationship between neighbourhood civic engagement (measured using voter turnout) and homicide rates (Rosenfeld *et al.* 2001; Lee and Bartkowski 2004; Lee 2008). In these studies, most of which were based in the United States, voter turnout is used as a proxy for civic engagement. According to Rosenfeld and colleagues (2001: 286), 'high levels of civic engagement should strengthen social organization and promote informal social control, thereby yielding low levels of crime and violence'. Likewise, Lee and Bartkowski (2004) argue that active engagement in civic activities, such as voting in presidential elections, is associated with lower homicide rates because 'communities with high levels of voluntary participation create a civic infrastructure that is characterized by durable social networks, normative consensus, and a social climate in which trust can flourish' (p. 31). In essence, this body of research suggests that neighbourhoods with high levels of voter turnout should have lower homicide rates because this form of civic engagement is indicative of shared commitments to community values, strong social networks and strong interpersonal ties among residents (Rosenfeld *et al.* 2001; Lee and Bartkowski 2004; Lee 2008).

However, voter turnout has a more complex meaning in Jamaica, given the nation's history of political culture, partisan political practices and the use of violence as a means to maintain political power. In garrison communities, voter turnout is heavily intertwined with Jamaica's patronage politics. Voting behaviour in garrison communities is influenced by a number of social forces. People living in these communities may vote because Dons apply direct or indirect pressure on them to vote; they may feel a sense of obligation to vote as a result of their relationships with the Don or other influential community members; or importantly, they may vote out of fear. Thus, high voter turnout means something very different in this context than it does in many developed nations where it is often treated as a pure indicator of civic engagement.

We view voter turnout patterns in this context as more consistent with the social dynamics represented by the defended neighbourhood perspective. While the conceptualization of defended neighbourhoods in developed nations tends to focus on collective efforts to achieve *racial and ethnic* homogeneity, in this case defended neighbourhoods in Jamaica actively seek to achieve *political* solidarity. The ability of Dons to deliver blocs of votes provides them with access to state resources. This likely connection between voter turnout and the defended neighbourhood phenomenon leads us to hypothesize that voter turnout in Jamaica is associated with *more* violence, not less (Levy 2001; Figueroa and Sives 2002; Sives 2002, 2003; Clarke 2006; Morris and Graycar 2011). The direction of the voter turnout effect we hypothesize is opposite to the findings reported in the literature from developed nations.²

Data and Methods

This study draws on three primary sources of data: 2001 census data; homicide counts from the JCF for four years (2002–05); and voter participation data for the 2002 national elections from the Electoral Office of Jamaica (EOJ). The unit of analysis is the enumeration district, which is similar to a census tract elsewhere. Previous studies have relied on census tracts to understand community variations in lethal violence (Avakame 1997; Kubrin 2003; Hannon 2005; Nielson *et al.* 2005). We use data from the 2001 census for 107 enumeration districts in the KMA. The populations of these districts ranged from a low of 1,008 to a high of 18,042, with a mean of 5,322 and a median of 4,460.

Homicide and voter participation data are not ordinarily aggregated to the enumeration district (ED) level in Jamaica. We geo-coded the homicide data and assigned each incident to the ED in which it occurred. For the voter turnout data, the EOJ collects voting data, which includes the number of votes received by each party, and aggregates them to the political constituency-level. The political representative with the highest number of constituency-level votes becomes a member of parliament. Since constituencies are larger than enumeration districts, we had to disaggregate the voting data. There are 13 political constituencies in the KMA, and each constituency has numerous polling divisions where individuals go to cast their vote. We geo-coded the boundaries

² Although voter turnout is often used as a proxy for civic engagement, voting constitutes just one aspect of civic engagement. Another key aspect is community-based civic engagement. For instance, Keeter *et al.* (2003) describe in detail their development of an index for measuring non-political civic participation using survey items that ask about the extent to which respondents work with others informally to solve community problems, volunteer regularly for non-electoral groups and participate actively in civic groups or organizations. Although we argue that voter turnout is not a valid measure of civic engagement in this context, it may be possible to measure other aspects of civic engagement that are not expressly political.

of the polling divisions and then aggregated the data from each of them to the ED level. This enabled us to match voting data to enumeration districts.

Dependent variable

The dependent variable is the total number of homicides in each ED from 2002 to 2005. We obtained the homicide data from the JCF, Jamaica's national police agency. We summed homicide counts over four years to control for yearly fluctuations in homicide (e.g. [Krivo and Peterson 1996](#); [Kovandzic et al. 1998](#); [Sampson and Morenoff 2004](#)). The 107 neighbourhoods included in this study experienced a total of 2,022 homicides from 2002 to 2005. The homicide counts by neighbourhood ranged from 0 to 101, with a mean of 18.9 and a median of 14. Only four neighbourhoods had homicide counts of zero. These figures place the average annual homicide rate in the KMA during this period at just over 88 per 100,000.

Voter turnout

One way to understand the impact of politics on neighbourhood-level homicides is to examine levels of engagement in the electoral process ([Chamblin and Cochran 1995](#); [Rosenfeld, et al. 2001](#)). Recent research has examined the influence of political civic engagement (measured using voter turnout) on levels of violence across ecological units ([Lee and Bartkowski 2004](#); [Lee 2008](#)). As noted by American political scientist [Alan Monroe \(1977: 71\)](#), 'voter turnout is undoubtedly the most widely studied and substantively important measure of [political] participation'. In developed countries, high voter turnout is viewed favourably as a sign of active community involvement in the political process ([Chamblin and Cochran 1995](#); [Rosenfeld et al. 2001](#); [Coleman 2002](#)). In some developing countries, including Jamaica, high levels of voter participation in government elections are sometimes an indicator of partisan-based competitive politics among the poorer classes in disadvantaged neighbourhoods ([Stone 1985](#); [Figueroa and Sives 2002](#); [Sives 2002](#)).

We measure voter turnout using levels of voter participation in the 2002 national elections. Although three political parties participated in the 2002 national election, Jamaica has been dominated by two political parties since achieving independence in 1962: the PNP and the JLP. We used only the votes cast for the two dominant political parties. Together they accounted for 99.5 per cent of the nation's votes in the 2002 elections. Scatter plots revealed a somewhat curvilinear relationship between voter turnout and homicides. A natural log transformation of the voter turnout variable linearized this relationship; thus, our models used a log-transformed measure of voter turnout.³

Control variables

In line with previous studies that have examined the relationship between neighbourhood structure and homicide rates, we included as controls nine structural covariates

³ In addition, the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) values were both lower for model specifications in which a log transformation was applied to the voter turnout variable.

derived from the 2001 Jamaica census data: (1) population; (2) population density; (3) residential instability, as measured by the proportion of people who have lived in their homes for five years or less; (4) low educational attainment, as measured by the proportion of people aged 15 and older with only a primary school education or less; (5) poverty, as measured by the proportion of households without a kitchen, (6) without a bathroom, and (7) without indoor plumbing; (8) young male population, defined as the proportion of males aged 15–29; and (9) the proportion of female-headed households. Though our measures of poverty are non-traditional, access to luxuries often taken for granted in developed nations (such as kitchens, bathrooms and indoor plumbing) is not nearly as widespread in many developing nations, including Jamaica. The types of poverty indicators used here are among those used by development economists to compute measures of multidimensional poverty in developing nations (Alkire and Foster 2011). This is another example of how research outside of the developed nations where most concepts and measures tend to be established and tested may require scholars to rethink traditional approaches.

We used principal components analysis (PCA) to combine all but the first three of these structural covariates into a smaller number of components.⁴ We chose to use PCA rather than entering the individual covariates in the model for two reasons. First, consistent with the bulk of previous macro-level research on homicide, significant correlations between these covariates generate multicollinearity problems in multivariate models (Land *et al.* 1990). Second, the small sample size in this study, combined with the use of a maximum likelihood estimation technique that is based on asymptotic (large sample) theory, places limits on the number of covariates that can reasonably be included in the multivariate models. The analysis revealed that the six structural covariates are best represented by two dimensions, which account for 79.7 per cent of the variation in the observed variables. Four variables load strongly on the first dimension, which we interpret as an *economic disadvantage* component. Two variables load strongly on the second, which we interpret as a *population composition* component.⁵ Table 1 contains descriptive statistics for all variables in the model, and Table 2 contains results from the PCA.

Analytic Strategy

Research often finds that homicide count data are positively skewed, with a concentration of low or zero counts. Analysis of the univariate distribution of homicide counts in this study confirms that they are positively skewed (skewness = 2.18, standard error = 0.234). This is to be expected given that there are many neighbourhoods with zero or few homicides and a much smaller number of neighbourhoods with many homicides. Homicide counts, not rates, are widely considered more suitable for regression analysis (Kubrin

⁴ We originally attempted to include residential instability in the PCA, but it did not load cleanly on any component; therefore, we removed it from the PCA and entered it into the regression model as a stand-alone independent variable. We chose an oblique rotation method (promax) for the PCA, which allows the resulting components to be correlated. Orthogonal rotation forces the components to be uncorrelated, which is an unrealistic constraint for measures that are thought to be at least moderately related to one another.

⁵ Consistent with previous research, we used PCA and included the resulting component scores in the regression analyses that follow. We did this primarily for methodological purposes, because it enabled us to ‘simplify the geometric space spanned by these covariates’ and therefore to minimize the effects of multicollinearity (Land *et al.* 1990: 943). This approach is not meant to suggest the existence of substantively meaningful or theoretically derived latent variables that account for the correlations between these covariates.

TABLE 1 *Descriptive statistics*

Variables	Min	Max	Median	Mean	Standard deviation
Murders, 2002–2005	0	101	14	18.90	20.05
Voter participation	3%	82%	21.9%	25.5%	13.3%
Economic disadvantage component					
Primary school education or less	10%	53%	36.6%	33.8%	8.9%
Households without a kitchen	1%	96%	22.6%	24.7%	18.5%
Households without a bathroom	1%	98%	24.3%	29.9%	23.7%
Household without indoor plumbing	0%	98%	23.9%	28.5%	25.0%
Population composition component					
Males, 15–29	8%	25%	12.7%	12.7%	2.4%
Female headed households	7%	21%	14.4%	14.7%	2.6%
Population	1,008	18,042	4,460	5,322.2	3,737.5
Population density	.27	27.03	6.20	7.31	5.69
Residential instability	13%	63%	24.7%	25.8%	6.8%
Spatial lag	.00	47.30	11.50	13.44	9.08

TABLE 2 *Principal components analysis results*

Variables	Economic disadvantage	Population structure
% primary school education or less	0.829	0.178
% households without a kitchen	0.947	0.064
% households without a bathroom	0.965	0.040
% household without indoor plumbing	0.865	0.118
% males, 15–29	0.040	-0.872
% female headed households	0.250	0.836
Eigenvalues	3.34	1.44
Variance	55.7%	24.0%

Component loadings greater than $|\lambda_{.40}|$ are shown in bold.

2003; Nielsen *et al.* 2005). When the dependent variable is a count measure (consisting of only non-negative integer values), ordinary least squares (OLS) regression is a sub-optimal choice (Osgood 2000). For a number of reasons, the negative binomial regression model is often a better option.⁶ Because the statistical estimator used in negative binomial regression can sometimes generate problematic estimates with small samples, we present results from both negative binomial and OLS regressions.⁷

There are often strong correlations among structural covariates in ecological studies of crime (Land *et al.* 1990; Kubrin and Weitzer 2003b; Wooldredge and Thistlethwaite

⁶ Given the well-known problems with using conventional linear regression when the dependent variable is a count measure (such as the number of homicides), researchers typically choose from a family of regression models based on the Poisson distribution. The basic Poisson regression model performs poorly when the data are over-dispersed (where the conditional variance of the outcome exceeds the conditional mean), as is often the case with homicide counts. One of the most frequently used methods for dealing with over-dispersed count data, and the one used here, is the Poisson-based negative binomial regression model (Osgood 2000; Kubrin 2003; Nielsen *et al.* 2005).

⁷ Negative binomial regression relies on maximum-likelihood estimation. The desirable properties of maximum likelihood estimates are asymptotic, which means they are only operative with large samples. With small samples, maximum likelihood can sometimes produce inflated standard errors, leading to an increased rate of Type II errors (Hart and Clark 1999). To balance this concern, we also provide estimates derived from an OLS model with a natural log transformation of the dependent variable. Because the logarithm of zero is undefined, we add one to the value of the dependent variable for every case before computing the natural logarithm. This is not an ideal strategy, but it does provide some useful context for our negative binomial regression findings. Osgood (2000: 36) points out that this approach can bias the coefficient estimates, but in his study, the selection of different constants 'had minimal consequence for significance testing because standard errors grew proportionately with the coefficients, with the result that t values were essentially unchanged'.

2003). As a result, multicollinearity is a common concern in this genre of research (Land *et al.* 1990; Kovandzic *et al.* 1998; Kubrin 2003). One method for diagnosing multicollinearity is to examine variance inflation factors (VIFs) for all independent variables. Though statisticians recommend different thresholds for diagnosing a multicollinearity problem, two of the most common are VIFs that exceed 5 or 10 (Belsley, Kuh, and Welsch 1980; O'Brien 2007). None of our models contained VIFs exceeding two, suggesting that multicollinearity is not problematic. Correlations between all variables included in the model are shown in Table 3.

The concept of spatial dependence refers to spillover effects that may occur in adjacent or proximate ecological units. As applied here, the idea of spatial dependence acknowledges the possibility that homicides in one neighbourhood may be related to homicides in nearby neighbourhoods. This possibility is consistent with research that shows that homicides are not randomly distributed in geographic space but instead are spatially interrelated across neighbourhoods (Morenoff *et al.* 2001). Moreover, since homicides tend to be interpersonal in nature and based on social interactions that are likely to cut across census boundaries, it is reasonable to expect that they may be subject to spatial diffusion processes (Morenoff *et al.* 2001; Kubrin and Weitzer 2003a). Positive spatial autocorrelation exists when similar values of a variable (like number of homicides) are clustered together in space (Eck *et al.* 2005). An important assumption in regression analysis is that the observations are independent of one another. The presence of spatial autocorrelation violates this assumption; thus, spatial dependence in the data must be accounted for in the model (Collins *et al.* 2006). We included a 'spatial lag' variable as a covariate in the regression model to capture the spatial dependence of homicides in a given neighbourhood on homicides in nearby neighbourhoods.⁸

Results

Table 4 displays fully standardized estimates from the negative binomial and OLS regression models. The results are reasonably consistent across models, which we interpret as a sign of their robustness. We discuss the findings below.⁹ Note that the dispersion parameter is statistically significant, confirming the appropriateness of our decision to use a negative binomial model instead of a Poisson model.

The results reveal interesting findings about the structural correlates of homicide in urban Jamaica. Consistent with our hypothesis, the relationship between voter turnout and homicides in the KMA is positive and statistically significant. This effect is consistent in both the negative binomial model and the OLS model. Neighbourhoods in urban Kingston with higher voter participation in government elections have *more* homicides, an effect that is opposite what would be expected based on traditional theories of social capital and civic engagement (Rosenfeld *et al.* 2001; Lee and Bartkowski 2004; Lee 2008). Consistent with findings from previous

⁸ Common methods for addressing spatial autocorrelation involve constructing a spatial lag or spatial error model to control for spatial dependence in the regression analysis. The spatial lag model is more compatible with notions of diffusion processes because it implies that neighbourhoods are interdependent, and homicides in one neighbourhood may increase the likelihood of homicides in adjacent neighbourhoods (Baller *et al.* 2001; Kubrin 2003). The spatial lag variable is the sum of the spatial weights multiplied by the values of observations at neighbouring locations (Anselin 2004).

⁹ To ensure that these results were not overly influenced by one particular year of data, we also estimated the models using two- and three-year subsets of the data. The findings resulting from these analyses were consistent with those obtained from using the full data set.

TABLE 3 *Bivariate correlations*

Variables	1	2	3	4	5	6	7	8
1. Murders, 2002–05	1.0							
2. % Voter participation (logged)	0.256	1.0						
3. Economic disadvantage component	0.527	0.268	1.0					
4. Population composition component	-0.053	-0.304	0.146	1.0				
5. Population (logged)	0.477	-0.196	0.191	0.070	1.0			
6. Population density	0.350	0.128	0.336	-0.126	0.434	1.0		
7. Residential instability	-0.015	-0.279	-0.284	0.131	-0.005	-0.180	1.0	
8. Spatial lag	0.349	0.431	0.496	-0.131	-0.047	0.314	-0.200	1.0

TABLE 4 *Regression models predicting homicide in the KMA, Jamaica*

Independent variables	Negative binomial			Ordinary least squares		
	β	SE	<i>t</i>	β	SE	<i>t</i>
Population (logged) ¹⁰	0.766	0.075	10.27***	0.616	0.066	9.31***
Economic disadvantage component	0.472	0.094	5.04***	0.388	0.073	5.35***
Population composition component	-0.069	0.080	-0.86	-0.050	0.063	-0.79
Population density	-0.182	0.080	-2.27*	-0.117	0.069	-1.70
Residential instability	0.123	0.055	2.22*	0.098	0.061	1.60
% Voter participation (logged)	0.247	0.104	2.39*	0.197	0.069	2.86**
Spatial lag	0.266	0.093	2.86**	0.197	0.072	2.72**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

macro-level studies of homicide (Loftin and Parker 1985; Messner and Tardiff 1986; Curry and Spergel 1988; Parker 1989; Land *et al.* 1990), the results from both models reveal significant positive effects of economic disadvantage on homicide levels in the KMA. The population composition component did not have statistically significant effects on homicide in either model. Population density exerted a significant negative effect on homicide in the negative binomial model and a non-significant negative effect in the OLS model. Residential instability exerted a significant positive effect on homicide in the negative binomial model and a non-significant positive effect in the OLS model.

The results also suggest the presence of spatial dependence in the models. In earlier models that did not include a spatial lag variable, the Moran's I coefficient revealed significant spatial autocorrelation ($p < 0.05$) in the residuals (see also Kubrin 2003). In the subsequent models reported here, we included a spatial lag variable to control for spatial dependence. Table 4 reveals that the spatial lag variable is statistically significant in both the negative binomial and linear model specifications. Moreover, comparisons of fit between models that included and excluded the spatial lag variable revealed that the inclusion of the spatial lag variable did not reduce model fit.¹¹ The results demonstrate clearly that in urban Jamaica, neighbourhoods with more homicides tend to be spatially clustered. Even after controlling for neighbourhood structural characteristics,

¹⁰ As is common in Poisson-based models, in the negative binomial model we treat population as an 'exposure variable' by computing its logarithm and including it in the model with a fixed unstandardized coefficient of one (see Osgood 2000). For the OLS model, the logged population variable is entered into the model as a standard covariate.

¹¹ The AIC and the BIC values were both lower for the negative binomial model that included the spatial lag variable as a covariate than for an otherwise identical model that excluded the spatial lag variable.

we find that the number of homicides in one neighbourhood is associated with the number of homicides in adjacent neighbourhoods.

In sum, controlling for the influence of several structural correlates of homicide, voter turnout is a significant predictor of homicide in the KMA, and the effect is in the opposite direction of that found in research from developed nations like the United States. These findings ought to be tempered by the limitations of the study. First, the overall number of communities included in the study is small, which limited some of our statistical modelling options. Second, due to the unavailability of relevant data in Jamaica, we were unable to obtain measures of some structural and cultural covariates of homicide discussed in our literature review. Third, while our quantitative analysis takes advantage of a unique data set and offers numerous insights, it does not provide the kind of textured knowledge about these communities that can only be discovered through qualitative research. Nonetheless, the quantitative findings from our unique data set are consistent with qualitative research about the sources of violence in urban Jamaica.

Discussion

A relatively unexplored area in homicide research is whether or not the structural factors that predict homicide in wealthy developed countries like Britain, Canada and the United States also predict homicide in poorer developing countries. This study attempted to fill a gap in the research by examining the structural correlates of homicide in urban Jamaica. Extending this body of research to developing nations increases its external validity, opening up the possibility of challenging or complementing prevailing theoretical assumptions and empirical evidence. The findings from this study have important theoretical implications for research on the ecological correlates of lethal violence. Proponents of the social disorganization perspective contend that crime and violence rates will be higher in structurally disadvantaged neighbourhoods with low levels of informal social control. According to this perspective, higher levels of crime and violence occur because social controls are weak and residents are not able to adequately solve chronic problems (Kornhauser 1978; Kubrin and Weitzer 2003a). In socially disorganized communities, there is usually little solidarity and a lack of community integration and social cohesion among residents (Kubrin *et al.* 2009).

Proponents of the defended neighbourhood perspective argue that crime and violence may be higher in neighbourhoods where residents feel the need to ward off outsiders, defend the identity of their neighbourhood and maintain neighbourhood boundaries (Suttles 1972; Heitgerd and Bursik 1987; Lyons 2007). Residents in defended neighbourhoods share a common identity and make concerted efforts to maintain and defend neighbourhood boundaries and protect the identity and/or homogeneity of their neighbourhoods (Suttles 1972; Heitgerd and Bursik 1987; Lyons 2007). According to Suttles (1972: 43): ‘The inner city is also the area where one finds most of the other obvious earmarks of the defended neighbourhood. It is here that street-corner gangs claim a ‘turf’ and ward off strangers or anyone else not a proper member of the neighbourhood’. Drawing on the literature on political violence in Jamaica, we treat voter turnout as a proxy for the social dynamics described in the defended neighbourhoods thesis. Thus, we extend the idea of defended neighbourhoods beyond its roots in ethnic and racial homogeneity to include political homogeneity in communities.

In the KMA, certain neighbourhoods with defined political boundaries provide a haven where organized criminal elements flourish and where residents are controlled by criminal and political forces. The social dynamics through which garrison communities defend their boundaries and maintain political homogeneity among residents are consistent with the processes underlying the defended neighbourhood thesis. In the most extreme garrison communities, political and criminal gangs, as well as residents who follow their lead, use a variety of mechanisms to protect the neighbourhood identity and secure neighbourhood boundaries from invasion by political gang rivals and the police. Since the 1970s, residents have formed strong, cohesive networks, developed mutual trust and maintained high levels of informal social control in order to protect their neighbourhood's political identity (Morris and Graycar 2011). Residents are bonded and identified by their political affiliation, and as a result of the need to defend one's political turf and a place to call home, residents band together and form tight cohesive social networks. In the most politically homogeneous neighbourhoods, inner-city residents share a common goal—to defend and protect their neighbourhood (Charles 2004; Morris and Graycar 2011). During elections, garrison neighbourhoods mobilize to demonstrate their collective party loyalty by delivering the vote, therefore securing the continued flow of resources from a dysfunctional and corrupt political system. The results of the present study provide tentative support for our extension of the defended neighbourhood perspective.

Though somewhat beyond the scope of our analysis, there is also some evidence that violence is influenced by a cultural system that supports and resorts to the use of violence to solve disputes and problems. According to the subculture of violence perspective, in some structurally disadvantaged neighbourhoods, because of social alienation and isolation from mainstream society, residents develop an oppositional subculture that condones violence and gang activities (Wolfgang and Ferracuti 1967; Anderson 1999). Others have also posited that this subculture of violence tends to persist and is transmitted from one generation to another (Shaw and McKay 1942; Anderson 1999). In neighbourhoods with extreme levels of voter turnout, violence is largely used to settle internal and external disputes, avenge the death of community residents, defend neighbourhood boundaries and gang turf and protect political identities (Stone 1985; National Committee on Political Tribalism 1997; Jamaica Gleaner 2000; Johnson 2005). Though we did not have access to data containing direct measures of subcultural phenomena, our quantitative findings with regard to voter turnout are consistent with qualitative evidence on life in Jamaica's garrison communities.

Recent research from developed nations suggests that neighbourhood crime is also associated with a combination of two factors: subcultural forces that promote violence and social structural disadvantage (Kubrin and Weitzer 2003a). These ideas are consistent with the limited body of research on lethal violence in Jamaica. In the early 1950s, Jamaican politicians began establishing strong ties with poor residents in need of government funded housing. In these areas, residents continuously engaged in political battles with neighbouring rivals to maintain their neighbourhood's political homogeneity and protect against invasion from political rivals. By the 1990s, battles with rival political party supporters from neighbouring communities gradually became more deadly as young men armed with guns fought over gang and drug turf with rival neighbourhoods. Certain neighbourhoods were transformed into 'captive constituencies' where 'intimidation, among other strategies, ensured party loyalty' (Gray 1991; Brown-Glaude

2011: 8). The most extreme garrison communities are closed, restricted spaces in which entry and exit are monitored by local gangs, and Dons are able to deliver blocs of votes. Residents developed their own system of justice, and an oppositional subculture in which a designated community leader and his gang are regarded as important agents of social control and defenders of the community (Chevannes 1992; National Committee on Political Tribalism 1997; Harriott 2000; Johnson 2005). As a result, violence is closely linked to political culture and neighbourhood structural dynamics.

Conclusion

Jamaica is faced with a challenging situation as top government officials are known to be involved in illegal activities in certain neighbourhoods (Munroe 1999). Moreover, strong connections between politicians and known criminal offenders fuel speculation about corruption. For instance, in a 2010 survey, 57.8 per cent of Jamaican residents agreed that politically connected criminals go free (UNDP 2012). Although partisan political violence and political corruption have slowly declined, the links between politics and violence continue to be a problematic sore in Jamaica's attempt to heal its deep political wounds. This study finds quantitative evidence of a link between partisan politics and violence in Jamaica, one of the world's most violent nations.

The findings from this study reinforce the need for a greater investment in criminological research in the developing world. Most existing theories, concepts and measures used in the study of violence were established and tested in developed and highly industrialized nations. Their relevance to developing nations is largely untested (Bennett and Lynch 1990; Maguire *et al.* 2008). Homicide is a global phenomenon and establishing a more generalizable body of research from a wider variety of settings will allow researchers to accumulate a deeper, more finely textured understanding of its causes and correlates.

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