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Hot Spots of Crime are Not Just Hot Spots of Crime: Examining Health Outcomes at Street Segments¹

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Abstract

In this paper we seek to identify whether the relationship between health disparities and crime occurs at a micro geographic level. Do hot spot streets evidence much higher levels of mental and physical illness than streets with little crime? Are residents of crime hot spots more likely to have health problems that interfere with their normal daily activities? To answer these questions, we draw upon a large National Institutes of Health study of a sample of hot spots and non-hot spots in Baltimore, Maryland. This is the first study we know of to report on this relationship, and accordingly we present unique descriptive data. Our findings show that both physical and mental health problems are much more likely to be found on hot spot streets than streets with little crime. This suggests that crime hot spots are not simply places with high levels of crime, but also places that evidence more general disadvantage. We argue that these findings have important policy implications for the targeting of health services and for developing proactive prevention programs.

Traditionally, research and theory in criminology have focused on individuals and communities (Nettler, 1978; Sherman, 1995). Over the last three decades, however, criminologists have begun to explore crime at micro units of geography (Eck & Weisburd 1995; Sherman, Martin, & Buerger, 1989). While concern with the relationship between crime and place is not new and indeed goes back to the founding generations of modern criminology (Guerrey, 1833; Quetelet 1831), the “micro” approach to places suggested by recent theories has only begun to be examined by criminologists. Places in this micro context are specific locations within the larger social environments of communities and neighborhoods (Eck & Weisburd, 1995). They are sometimes defined as buildings or addresses (e.g. see Green, 1996; Sherman et al., 1989), sometimes as block faces or street segments (e.g. see Smith, Frazee, & Davison, 2000; Taylor 1997), and sometimes as clusters of addresses, block faces or street segments (e.g. see Sherman & Weisburd 1995; Weisburd & Green 1995; Weisburd, Groff, & Yang, 2012).

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Perhaps the key finding in this area of study is that there is significant clustering of crime at places, irrespective of the specific unit of analysis that is defined (e.g. see Andresen & Malleson 2011; Braga, Papachristos, & Hureau, 2014; Brantingham & Brantingham 1999; Crow & Bull 1975; Curman, Andresen, & Brantingham, 2015; Gill, Wooditch, & Weisburd, 2017; Haberman, Sorg, & Ratcliffe, 2017; Pierce, Sparr, & Briggs, 1988; Roncek, 2000; Sherman et al. 1989; Weisburd, 2015; Weisburd & Amram 2014; Weisburd & Green 1995; Weisburd, Bernasco, & Bruisma, 2009; Weisburd, Maher, Sherman, Buerger, Cohn, & Petrisino, 1992). Such concentrations have been found not only across time within cities, but also across cities (Weisburd, 2015). Weisburd (2015) argued that the consistency of such concentrations is so strong that they suggest a “law of crime concentration at places,” where in larger cities about 50 percent of crime is concentrated at five percent of the addresses and 25 percent of crime at just one percent of addresses. This finding of strong concentrations of crime at micro geographic hot spots has become one of the key regularities of research on crime at place (Telep & Weisburd, 2018).

Criminologists, however, have seldom examined the co-occurrence of other social or health disadvantages at these crime hot spots. In the study of crime at larger geographic levels such as communities, such issues have been a key focus of study (see Bursick & Grasmick, 1993; Sampson, 2012; Shaw & McKay, 1942; Sullivan, 1989). Researchers frequently talk about the “concentrated disadvantage” found in such neighborhoods, recognizing that communities with high levels of crime are also communities with many other related social problems such as disorder, weakened social ties and informal social control, problems in adolescent development, and weak local institutions (Elliott, Wilson, & Huinzinga, 1996; Hipp, 2010; Morenoff, Sampson, & Raudenbush, 2001; Peterson, Krivo, & Harris, 2000; Sampson, Raudenbush, & Earls, 1997; Small & Newman, 2001).

High crime neighborhoods typified by structural disadvantage and poverty also suffer from high rates of health problems such as chronic diseases (Haan, Kaplan, & Camacho, 1987), adverse mental health outcomes (Kim, 2008; Mair, Diez Roux, Galea, 2008; Ross, 2000; Truong & Ma, 2006), asthma (Cagney & Browning, 2004), obesity and cardiovascular disease (Boardman, Onge, Rogers & Denney, 2005; Browning, Cagney, & Iveniuk, 2012; Chaix, 2009; Chang, Hillier et al., 2009), substance use (Stockdale et al., 2007), low infant birthweight (Ncube et al., 2016), and higher mortality rates (Fang, Madhaven, Bosworth, & Alderman, 1998; Haan et al., 1987; Jackson, Anderson, Johnson & Sorlie, 2000).

Neighborhood crime levels in this context have been identified as an important risk factor in the development of health problems (Akers & Lanier, 2009; Curry, Latkin, & Davey-Rothwell, 2008; Diez Roux, & Mair, 2010; Franco, Diez Roux, Class, Caballero, & Brancati, 2008; Latkin & Curry, 2003; LaVeist & Wallace, 2000; O’Campo, Xue, Wang, & Caughy, 1997; Link & Phelan, 1995).

Part of the reason why examination of social and health disadvantage has not been a focus of micro geographic study of crime may be the traditional focus of crime and place researchers on crime opportunities and routine activities as explanations for the concentration of crime (e.g. see Eck, 1995; Sherman et al., 1989; Braga & Clark, 2014). Given the focus on situational context and crime, health outcomes have not been a central concern. Contributing to this failure to examine concentrated disadvantage and related social and health problems

at places is that data are generally not available on social or health features of places at this level. The smallest unit of analysis in which Census data are available is the census block group, which is generally 30 times or more larger than the street segments that have often interested researchers in this area (Weisburd et al., 2009; for a study that does have access to census data on social characteristics in Israel, see Weisburd, Shay, Amram, & Zamir, 2018). In turn, there are considerable confidentiality issues to be overcome in drawing upon public health data at micro geographic units where specific health problems may have very low base rates.

In this paper we seek to identify whether the relationship between health disparities and crime occurs at a micro geographic level. Do hot spot streets evidence much higher levels of mental and physical illness than streets with little crime? Are residents of crime hot spots more likely to have health problems that interfere with their normal daily activities? To answer these questions, we draw upon a large National Institutes of Health study of hot spots and non-hot spots in Baltimore, Maryland. This is the first study we know of to report on this relationship, and accordingly we present unique descriptive data. Our findings can be stated simply. Hot spots of crime are not simply hot spots of crime. They are places characterized by numerous adverse health outcomes.

Current Study

The current study takes advantage of a large residential survey at street segments (both block faces between intersections) in Baltimore, Maryland, to examine the relationship between self-reported health problems and crime at a micro geographic level. One of the primary foci of the residential survey was to collect measures on health outcomes, including quality of health, history of diagnosed diseases, depression and post-traumatic stress symptoms, and health impacts on daily life. The sample of residential street segments was also largely focused on crime hot spots, with over 300 street segments reaching the highest crime levels in the city for residential streets based on calls for service to the police. Thus, one of the central purposes of the project was to examine the relationship between living in crime hot spots and adverse health outcomes. This is the first project we are aware of that has the ability to explore health problems of residents in micro-geographic areas, allowing us to explore further the relationships between health, crime, and place. Below we provide a descriptive portrait of health outcomes across the different types of street segments studied—to assess whether residents of crime hot spots have more adverse health issues compared to residents living on street segments with little or no crime.

Sample and Data Collection

The specific data used in the current study comes from residential surveys collected on 449 street segments (both block faces on a street between two intersections) between September, 2013 and May, 2014. The sampling strategy involved a multi-stage cluster sampling procedure beginning with a sample of 25,045 street segments as the primary unit of analysis in Baltimore.² Police calls for service obtained from the Baltimore City Police Department in 2012 were used as the measure of crime and geocoded to the street centerline to create counts of crime for service for every street segment in Baltimore.³ Furthermore, since the

study was focused on residential streets, we only included street segments with 20 or more occupied dwelling units.⁴ This reduced the sampling frame to 4,630 streets segments.

We then identified hot spots of crime using violent and drug crime as the primary indicators. This led to three categories of hot spot street segments violent crime hot spots, drug crime hot spots, and combined hot spots that met the criterion for both types of crime—violent and drug. Street segments in the crime hot spots samples were found within the top 3% of all city segments for either violent or drug crime emergency calls.⁵ From there, we randomly sampled street segments from their respective crime hot spots group, as well as a group of non-hot spot street segments from those streets that did not meet the thresholds for crime hot spot.⁶ We further divided these “non-hot spot” streets into “cold” and “cool” spots based on the distribution of the non-hot spots. Cold spots were defined as streets with three or fewer crime calls for drug or violent crime, and the remaining non-hot spot streets are defined as cool spots.

The final sample of street segments consisted of 47 cold spots, 100 cool spots, 121 drug hot spots, 126 violent hot spots, and 55 combined drug and violent crime hot spots. Descriptive data on crime and disorder call counts for the sample of street segments are reported in Table 1. This table demonstrates the high levels of crime in the hot spots. Combined spots had the highest levels of crime, with an average of more than 30 violent crime calls in the selection year, almost 75 drug crime calls, and about 250 crime and disorder calls all together. This may be compared with the cold spots which have only a mean of 1.45 violent crime calls, and .19 drug crime calls. Violent and drug hot spots have on average fewer than half as many crime calls as combined hot spots, but six or seven times as many calls as cold spots. Finally, cool spots have on average more than twice as many calls as cold spots, but less than half as many calls as the drug or violent crime hot spots.

Once the street segments were selected for the sample, trained field researchers visited the streets to conduct a census of the building and dwelling units on the street to develop the sampling frame for residential surveys. Face-to-face surveys were then conducted at a random sample of residences on each street with a goal of at least 7 surveys per street segment. The first adult resident, over 21 years of age, who also had resided on the street for

²We used data obtained from the Baltimore City Mayor’s Office for year 2010 to identify occupied households on city streets. We sought to identify 125 streets for the violent and drug crime hot spots; and 50 combined drug and violent crime hot spots. We also sought to include 150 non-hot spot streets in our sample (see fn. 4). The final sample numbers depart slightly from these because of one street dropped from the study during data collection, and cases where street segments were reclassified when street boundaries were corrected. The methodology for the project is available online. For more detail see: <http://cebcp.org/wp-content/cpwg/NIDA-Methodology>.

³Calls for service that occurred on the street intersections and could not be located on the segment were not included in the crime counts for the street segments

⁴The criterion was used in order to allow a large enough sampling frame to achieve a goal of 7–10 survey respondents on each street examined.

⁵The initial threshold for violent and drug crime was 18 drug calls and 19 violence-related calls, respectively (approximately the top 2.5% of segments in the city for each category). Although this was the final threshold for the combined violent and drug crime hot spots, and for violent crime hot spots, to meet sampling goals for streets that were hot spots of violence (but not hot spots of drug crime) the threshold was reduced to 17 violent calls (approximately the top 3% of all city street segments in that category). We also required that streets evidence drug or violent crime throughout the year by setting a criterion that calls be spread across at least 6 months. In our sampling frame of residential streets (4,630), 284 were classified as violent crime hot spots, 248 as drug crime hot spots, 98 as combined drug and violent hot spots, and 4000 were comparison street segments.

⁶A random sampling procedure developed in Model Builder (in ArcGIS) prevented any two sampled streets from being within a one block buffer area.

at least 3 months was eligible for participation. After accounting for abandoned houses and documented vacancies, the contact rate during the first wave was 71.2% and the cooperation rate was 60.5%.⁷ The final sample consisted of 3,738 individuals from the 449 street segments.

Sample demographics are provided in Table 2. As expected the populations living on the hot spot streets are more disadvantaged than those on streets with lower levels of crime. For example, residents of cold spots were almost five times more likely to have a graduate or professional degree than residents of combined violent and drug crime hot spots. They were about twice as likely to be employed full-time, and much more likely to report higher incomes. The differences among the hot spot samples are often not large, and the cool spots generally fall in between the hot spots and cold spots samples.

Health Measures

A number of measures were included in the survey to assess whether residents in crime hot spots experienced adverse health outcomes compared to residents of non-hot spot streets. Several items asked about diagnosed diseases in their lifetime. Specifically, the survey asked, “Have you ever been diagnosed with the following health conditions?” The health conditions included: asthma or respiratory problems, diabetes, high blood pressure, heart disease, lung disease, arthritis or rheumatism, breast cancer, a different type of cancer, depression, and any other mental illnesses. We examine below the percentages for those that responded “yes” to the different health conditions.

Health scales were drawn from the RAND 36 Item Health Survey and the HCSUS Baseline Questionnaire (Berry et al., 1998; Hays & Morales, 2001) to assess overall quality of health, the extent to which health has limited the ability to complete normal daily activities, the impact of health on normal social and work activities. We also included a question on whether the respondent believed their health problems resulted from living on their current block. First, to measure *overall health status*, respondents were asked to describe their health as “very good,” “good,” “average,” “poor,” and “very poor.” For the current analysis, the findings are reported for the combined category “poor/very poor.” Additionally, a four-item measure was used to assess quality of health, perceptions of their health compared to others and expectations for health. The items for *quality of health* included “you seem to get sick more than other people,” “you often feel worn out,” “you expect your health to get worse” and “your health is excellent.” The response options included, “mostly true,” “definitely true,” “mostly false,” and “definitely false.” The variable is recoded into a binary variable, 1=definitely/mostly true and 0=definitely/mostly false for the current paper.

To assess the extent to which respondents’ health affects their daily activities, respondents were asked the question: “The following activities are things you might do on a typical day. Please tell me if your health has limited your ability to do these activities ‘a lot,’ ‘a little’ or ‘not at all’.” The activities included bathing or dressing yourself, bending down or kneeling,

⁷The contact rate was calculated by dividing those households with contact/eligible households, and the cooperation rate was calculated by dividing households with a completed survey/households with contact. The average number of visits to households was 4, but we visited as many as 25 times in order to achieve a high contact and cooperation rate.

doing housework such as moving furniture or using a vacuum, carrying groceries, doing strenuous activities such as running or lifting heavy objects, climbing one flight and several flights of stairs, and walking for one block, several blocks, and more than a mile. We report the percentages for the individuals who responded “a lot” in the current analysis.

Two questions were also included to measure whether health has affected social and work activities more generally. Specifically, respondents were asked, “In the past month, how often has your physical or emotional health gotten in the way of your normal social activities with family and friends,” and the same question was asked for “normal work activities.” The response options included “all the time,” “most of the time,” “some of the time,” or “not at all.” Once again we combined responses to create a dichotomous variable, 1= all the time/most of the time and 0= some of the time/not at all. Lastly, we wanted to get sense of whether residents perceived their health problems were attributable to where they lived, specifically their street. The respondents were asked, “Do you think you have any health problems that have resulted from living on your current block?” with response options “yes” or “no.”

Finally, to capture recent mental health problems, two symptomology scales were included to measure symptoms of depression and symptoms of post-traumatic stress disorder (PTSD) in the past 30 days. The depression symptomology measure was the well-established PHQ9 often used for depression screening due to its brevity. The scale included nine items to assess affect or mood including behaviors such as social withdrawal, trouble concentrating; physical symptoms such as eating or sleeping too much or too little; and cognitive symptoms like difficulty concentrating (Kroenke, Spitzer, & Williams, 2001). The response options, based on experience of symptoms in the past 30 days, included 0= not at all, 1= several days, 2= more than half the days, and 3= almost every day. The scores were summed across the nine items to create a scale ranging from 0 to 27. Finally, following guidance on scaling depression symptomology, which creates five levels of depression (Kroenke et al., 2001),⁸ the current study used a binary measure for those with moderate depression or higher compared to those with minimal or mild depression.

The measure for PTSD was also a screening scale based on the DSM-IV (Breslau, Peterson, Kessler, & Schultz, 1999; Kimerling et al., 2006). It began with a filter question that asked, “At any time in your life, have you experienced a traumatic life event such as abuse, an act of violence, or a serious accident?” If the respondent answered positively, seven follow-up questions were asked to measure symptoms of PTSD in the past month such as avoidance behavior, lack of interest in activities, numbing, and hyperarousal, with “yes” or “no” response options. Once again, these items were summed to create a 7-point scale, and those with a score of 4 or higher were identified as persons with PTSD (Breslau et al., 1999; Kimerling et al., 2006). We used this binary measure of PTSD for the current analysis.

Data Analysis

The purpose of the current study is to assess differences in health measures across different types of crime hot spots, as contrasted with cold and cool spots. Given the categorical level

⁸Minimal depression (score 1–4), mild depression (5–9), moderate depression (10–14), moderately severe (17–19) and severe (20–27).

of variables examined, we performed chi-squared tests to identify significant differences in the health outcomes specified above across the different types of street segments. Our findings are accordingly correlational and we cannot draw causal conclusions from our statistical analyses.

Results

We begin with presenting the health conditions respondents reported being diagnosed with at some point in their life. The results are presented in Table 3. There were significant differences across the street segment types for asthma, high blood pressure, lung disease, and other types of cancer, while differences were not significant for diabetes, heart disease, arthritis, and breast cancer.⁹ More specifically, 28.7% of residents of combined hot spots reported being diagnosed with asthma, compared to 16.6% of residents in cold spots. Similarly, 35.8% of residents in combined hot spots reported high blood pressure compared to 23.7% in the cold spots, and 3.6% of residents of combined hot spots reported lung disease compared to 1.4% in the cold spots. The drug and violent hot spots had similar, but slightly lower rates compared to the combined hot spots. Contrary to the general pattern, residents of cold spots had higher rates of other types of cancer at 6.3% compared to 2.7% of residents in the combined hot spots. This does not seem to be due to residents of combined hot spots seeing doctors less often, since our data suggest that these residents go to physicians more often.¹⁰ Of course this may relate to the quality of health care received, but we think it important to note that in observing a large number of outcomes, it is likely just by chance to find one that does not fit the pattern. Accordingly, we do not think that strong inferences should be drawn from this result.

The findings from the various health scales are presented in Table 4. In general, these data reinforce the results from Table 3. First, significantly more residents from combined hot spots reported their overall health as poor or very poor compared to residents from cold spots, 7.3% compared to 2.7%, respectively. In regard to the quality of health measures, there were significant differences in the expected direction for getting sick more than other people, feeling worn out, and thinking one's health is excellent. Notably, 16.1% of residents of combined hot spots reported that they seem to get sick more than other people, compared to 7.0% of residents in cold spots, and 39.3% of residents of combined hot spots reported often feeling worn out compared to 27.1% of residents in cold spots. Moreover, 79.1% of residents of cold spots reported their health as excellent compared to 63.0% of residents of combined hot spots.

In addition to having health problems, it is important to understand how health impacts daily life. Even if health conditions were similar among residents of different types of places, which they do not appear to be, the impact of those health conditions may be greater among residents of high crime streets. When looking at all the measures of daily activities someone

⁹These other variables were statistically significant when we simply compared cold spots to combined spots (and drug and violent hot spots for heart disease and arthritis).

¹⁰Residents of hot spots were significantly more likely to visit a hospital for illness or injury in the past year (40.5% of residents in combined hot spots) compared to residents of cold spots (30.5%). Additionally, the mean number of months since last doctor's checkup was 7.65 months for residents of combined hot spots compared to 12.26 months for residents of cold spots.

may do on a typical day, each one was significantly different across the types of street segments. Significantly more residents of crime hot spots reported that their health impacted their ability to carry out daily activities *a lot*, generally 3 to 4 times higher, but almost 10 times higher for some activities, compared to the cold spots. For instance, 1.4% of residents of cold spots reported a lot of trouble climbing one flight of stairs. This compared to 12.0% of residents of combined hot spots. Additionally, 1.1% of residents of cold spots indicated their health impacted their ability to walk one block a lot, compared to 10.1% of residents of combined hot spots.

Concerning the more general questions about whether respondents' physical or emotional health impacted his or her normal social or work activities, both were significantly different across the types of street segments. Specifically, 11.8 % of residents of the combined hot spots reported their health got in the way of their normal social activities *all the time or most of the time* compared to 3.3% of residents of cold spots. Similarly, 9.6% of residents of the combined hot spots reported their health impacted their normal work activities compared to 2.5% of residents of the cold spots. Lastly, significantly more residents of combined hot spots reported that they thought their health problems resulted from the block they lived on, 6.6% compared to 4.1% of residents of cold spots.

Finally, the findings on the mental health measures are presented in Table 5. We found significant differences in the expected direction for all the measures with significantly more respondents of the crime hot spots reporting mental health problems. For depression, 23.9% of residents of combined hot spots reported having ever been diagnosed with depression in the past, and 11.2% of residents met the symptom criteria for moderate depression or higher. This compares to percentages of 13.1% for diagnosed depression and 3.3% for moderate depression or higher symptoms, respectively, in the cold spots. Regarding PTSD, 4.4% of residents of cold spots met the symptomology score for PTSD compared to 8.9% in the violent hot spots and 9.1% in the combined hot spots. Finally, having been diagnosed with another mental illness was also significantly different across the street segment types in the expected direction, except that the violent hot spots had the highest rate.

Overall, there is a sequential pattern with more residents reporting health and mental health problems when levels of crime increased, going from the cold spots to cool spots, to drug spots, violent spots, and combined hot spots. However, the frequencies of health problems and impact of those health problems on residents of cool spots sometimes are more similar to cold spots, while in other instances, they are more similar to levels reported in the hot spots. The largest differences emerge when comparing the cold spots to the combined hot spots.

Discussion

Our goal in this paper was to examine the extent to which health problems were concentrated in micro geographic crime hot spots. Our study is the first to present data on such concentrations, and our findings reinforce the basic premise that crime is related to a host of other social problems. People living in hot spots are much more likely to evidence chronic diseases such as asthma, high blood pressure, or lung disease. Sometimes the rates

of these health outcomes were two to three times higher in crime hot spots compared to those of people who live on streets with little or no crime. Measures of quality of health and overall health status were also much lower in the crime hot spots. And these health problems were found to impact upon daily activities of residents. Finally, we find that mental health problems are also concentrated at crime hot spots.

These findings reflect studies at higher levels of geography and the more general literature on concentrated disadvantage (Akers & Lanier, 2009; Browning & Cagney, 2002; 2003; Curry et al., 2008; Diez Roux & Mair, 2010; Franco et al., 2008; Latkin & Curry, 2003; O'Campo et al., 1997). Communities with high crime rates have also been found to be communities with high levels of social disadvantage, and adverse health outcomes. In discussing our findings we want to point out why confirmation of the idea of adverse health outcomes at the street-segment level might have important policy implications. We also want to discuss the problem of selection and causality in considering negative health outcomes at crime hot spots.

We think a key implication of our findings relates to the targeting of health services in cities. People who live on hot spot streets have much worse health outcomes than people who live on cold spot streets. While there is evidence of clustering of crime hot spots in areas, in general the research shows that there is tremendous street by street variability in crime levels (Groff, Weisburd, & Yang, 2010; Weisburd et al., 2012; Weisburd, Groff, & Yang, 2014). And in turn, even in communities with high crime rates, most streets have little crime. The implication of this is that it may be time to consider focusing public health interventions to provide services to those in need not at the community-level but at the micro-geographic level, particularly hot spots of crime, which may be seen as an important locus for providing services. Indeed, gaining street by street data on other social outcomes, particularly health problems, is generally not possible. Given that most city police agencies have adopted geocoding capabilities to identify crime hot spots, the ease of geocoded crime data can be a means for efficiently identifying streets with potentially high levels of health problems in communities with little additional work or cost.

This lowering of scale in terms of focusing on public health interventions may also make programs that seek to increase access to health more realistic. It is one thing to attempt to provide health services broadly to an entire neighborhood or city. It is another to try to provide those services to specific blocks. In turn, we might speculate that programs aimed at large areas like communities are not concentrating resources efficiently. It may make more sense to concentrate on a few hot spots of crime with more precise or even higher dosages of intervention. Given the close relationship between place, crime, and health (Fitzpatrick & LaGory, 2003), it is equally likely that health-related prevention activities might be more effectively implemented at street segments.

More generally, we think that our findings of strong negative health outcomes on hot spot streets should inform police and other policy makers interested in crime control. We need to recognize that crime hot spots are not simply places with a good deal of crime, but also places with evidence of strong social and health disadvantages. We have documented the strong differences in physical and mental health outcomes across street segments with

different levels of crime in this paper. When developing crime control programs for hot spot streets, police and others should be sensitive to the health problems of people who live on such streets.

Such problems might impact upon the ability of people to cooperate and collaborate with police in problem solving. Our paper points to the degree to which health issues impact upon daily activities. Such impacts may simply make it difficult or impossible for citizens to work with the police on a regular basis. Additionally, residents with mental health problems may be apprehensive to work with the police due to the growing concern with police treatment of mentally ill individuals (Steadman, Deane, Borum, and Morrissey, 2000; Teplin, 1984; Wood & Watson, 2017). The development of Crisis Intervention Teams has improved police crisis response and training (Teller, Munetz, Gil, & Ritter, 2006; Watson, Morabito, Draine, & Ottati, 2008), but a pilot study conducted in Baltimore suggests that police can partner with mental health professionals to proactively visit crime hot spots in attempt to connect residents to health services (White & Weisburd, 2017). This may serve as a bridge to build relationships with residents living in crime hot spots, improve health, and enable partnerships and community involvement among residents. Furthermore, the police should also consider possible negative consequences that their practices can have on the health of residents. For example, public health researchers have argued that as a consequence of zero-tolerance drug enforcement, drug users have resorted to methods that increase risk of transmitting diseases and exposing communities to associated health concerns (Kerr, Small, & Wood, 2005).

Trying to identify the direction of causality between crime and health problems is complex and beyond the scope of this paper. At the same time, we want to speculate on some of these relationships before concluding. Many of the negative health outcomes we observed could be due to selection processes into disadvantaged, high crime streets. For example, such streets are generally less desirable, and in this context larger proportions of disadvantaged populations are settling there (see Table 2 for evidence of this relationship). Such populations may be more prone to illnesses such as heart disease or diabetes (Barber et al, 2016; Browning et al., 2012; Dubay, 2014). And such impacts may be indirect. For example, we find that roughly 75% of residents of hot spot streets smoke cigarettes, while only 47.9% of people on cold spot streets report doing so. This clearly would exacerbate problems such as asthma, which showed much higher incidence on hot spot streets. Did living on the street impact smoking behavior, or was this a factor related to the types of people who “select” to the street due to limited alternative options? In the case of mental health, we found elsewhere that depression and PTSD could not be explained by selection factors (Weisburd et al., 2018). However, more generally, the relationship between negative health outcomes and living on hot spot streets is likely multifaceted, reflecting the realities and influences of the streets as well as the selection of people onto those streets. These are questions which should be examined more carefully in future study.

Conclusions

In this paper, we present the first major description of adverse health outcomes at crime hot spots. Our findings show that both physical and mental health problems are much more

likely to be found on hot spot streets than streets with little crime. We argue that these findings have important policy implications. For example, it may be that hot spots of crime provide an avenue for more effectively and efficiently focusing health services. In turn, in targeting crime hot spots we must recognize that residents of these places are more likely to have serious mental or physical health problems—which may impact the responses of citizens to proactive prevention programs, and their ability to cooperate with police or other prevention practitioners. Whatever the implications for public health and crime prevention, it is time for crime and place researchers to recognize more generally that hot spots of crime are not just hot spots of crime, but places evidencing more general social disadvantages. Recognition of this reality will improve our understanding of crime hot spots, and our ability to successfully target prevention resources.

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Table 1.

Crime calls for service in sampled street segments

Type of Segment	N	Violent Crime	Drug Crime	Other Crime and Disorder	Total Crime
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Cold Spot	47	1.45 (1.04)	0.19 (0.45)	15.72 (8.67)	17.36 (9.34)
Cool Spot	100	6.30 (3.59)	2.86 (3.28)	33.10 (15.58)	42.26 (18.58)
Drug Spot	121	10.05 (4.36)	34.03 (21.58)	65.45 (27.77)	109.53 (40.18)
Violent Spot	126	25.43 (9.99)	6.45 (4.73)	88.33 (45.30)	120.21 (51.72)
Combined Spot	55	31.24 (12.76)	74.75 (157.56)	145.27 (112.98)	251.25 (204.10)

Notes:

*
 $p < 0.05$ **
 $p < 0.01$ ***
 $p < 0.001$

Table 2.**Demographics**

	Street Segment Type				
	Cold %	Cool %	Drug %	Violent %	Combined %
Gender [*]					
Male	46.8	42.3	43.5	40.3	36.4
Female	53.2	57.7	56.5	59.7	63.6
Race ^{***}					
White	48.6	17.9	7.8	15.0	7.6
Black	43.1	74.4	84.9	75.0	83.7
Other	8.4	7.7	7.3	10.0	8.7
Age (Mean, SD)	44.8 (15.8)	44.6 (15.9)	45.1 (16.0)	43.8 (15.2)	44.2 (15.3)
Education Level ^{***}					
Some middle school or high school	6.5	16.8	20.4	21.3	26.1
High school diploma	15.4	31.9	38.6	37.4	37.8
Some college	20.9	26.0	24.2	24.2	23.7
Associates degree	5.4	6.0	5.4	5.3	4.4
Bachelor's degree	24.7	11.8	6.7	7.7	5.3
Graduate or professional degree	27.1	7.5	4.6	4.1	2.7
Employment Status ^{***}					
Full-time	56.6	41.2	32.1	33.3	27.6
Part-time	13.3	12.2	11.4	14.5	13.6
Not working	15.4	29.2	39.3	37.0	40.8
Retired	12.7	13.3	13.9	11.2	10.9
Other	1.9	4.1	3.1	3.8	6.5
Income ^{***}					
Less than \$10,000	6.7	19.9	29.8	31.7	36.9
\$10,001-\$25,000	11.6	20.4	25.0	27.1	29.4
\$25,001-\$40,000	12.7	22.7	22.6	19.9	16.6
\$40,001-\$60,000	20.6	15.8	10.6	10.8	9.6
\$60,001-\$80,000	15.7	8.8	6.6	6.3	4.1
\$80,001-\$100,000	10.9	6.7	3.1	2.1	2.3
More than \$100,000	21.7	5.7	2.3	2.0	1.2

*
 $p < 0.05$ **
 $p < 0.01$ ***
 $p < 0.001$

Table 3.

Health Diagnoses

	Street Segment Type				
	Cold %	Cool %	Drug %	Violent %	Combined %
Asthma ***	16.6	20.0	23.7	21.9	28.7
Diabetes	9.8	11.4	11.6	10.7	14.4
High blood pressure ***	23.7	31.1	34.7	32.6	35.8
Heart Disease	3.8	6.2	6.5	6.4	6.7
Lung Disease ***	1.4	0.9	3.2	3.8	3.6
Arthritis	14.9	21.4	20.7	21.0	22.1
Breast Cancer	1.6	1.6	1.5	1.5	2.1
Other type of Cancer *	6.3	2.9	4.3	4.1	2.7

*
 $p < 0.05$

**
 $p < 0.01$

 $p < 0.001$

Table 4.

Health scales

	Street Segment Type				
	Cold %	Cool %	Drug %	Violent %	Combined %
Overall Health Status *** 'Very poor/Poor'	2.7	5.5	5.9	7.3	7.3
Quality of Health					
'Mostly true/Definitely true'					
You seem to get sick more than other people ***	7.0	11.7	10.4	13.2	16.1
You often feel worn out ***	27.1	35.5	36.2	38.7	39.3
You expect your health to get worse	13.6	14.0	17.2	17.9	17.4
Your health is excellent ***	79.1	69.7	64.3	64.8	63.0
Daily Activities Impacted by Health					
'A lot'					
Bathing or dressing yourself ***	0.5	1.5	2.3	2.5	5.0
Bending down or kneeling ***	3.0	7.6	8.6	9.9	13.7
Doing housework ***	3.5	5.7	8.4	7.3	10.9
Carrying groceries ***	3.3	5.1	6.8	7.4	12.4
Doing strenuous activities ***	8.7	14.1	16.0	16.2	20.6
Climbing one flight of stairs ***	1.4	5.5	7.1	8.5	12.0
Climbing several flights of stairs ***	4.6	11.3	16.2	16.3	18.9
Walking one block ***	1.1	4.1	5.2	5.3	10.1
Walking several blocks ***	4.6	7.9	10.8	11.3	17.6
Walking more than a mile ***	6.8	13.5	17.8	16.3	21.9
Physical or emotional health in way of normal social activities *** 'All the time/Most of the time'	3.3	6.2	9.0	9.2	11.8
Physical or emotional health in way of normal work activities ** 'All the time/Most of the time'	2.5	6.7	7.6	8.7	9.6
Resident thinks health problems have resulted from living on current block **	4.1	2.6	5.4	5.3	6.6

Notes:

*
 $p < 0.05$ **
 $p < 0.01$ ***
 $p < 0.001$

Table 5.

Mental health problems

	Street Segment Type				
	Cold %	Cool %	Drug %	Violent %	Combined %
Diagnosed					
Depression ***	13.1	17.4	20.9	22.2	23.9
Other mental illness *	4.1	7.7	8.8	9.8	9.0
Symptomology (past 30 days)					
Percent with Moderate Depression or higher ***	3.3	6.1	9.7	10.6	11.2
Percent with Post-Traumatic Stress Disorder *	4.4	6.7	8.1	8.9	9.1

Notes:

*
 $p < 0.05$ **
 $p < 0.01$ ***
 $p < 0.001$