UNDERSTANDING PHILADELPHIA’S VIOLENT LANDSCAPE

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CHAPTER SEVEN
It is widely thought that cities like Philadelphia contain pockets where violence occurs with disproportionate frequency. For Philadelphians and urban dwellers in general this begs the question, Does what you choose to do or where you find yourself place you at risk for violence? This chapter describes two Philadelphia-based research projects that investigate how the nature and whereabouts of peoples’ activities relate to the likelihood of being the victim of violence. Particular attention is paid to the challenging task of measuring “exposure” to elements of the surrounding environment. This chapter is motivated by research conducted in Philadelphia over the past century and describes new approaches to understanding today’s violent landscape in the hopes of a less violent Philadelphia tomorrow.

INTRODUCTION

Philadelphia has hosted some of the nation’s earliest and most influential studies of violence. In 1899, W.E.B. Du Bois reported that “murderous assaults on peacable citizens” were on the rise in Philadelphia, illustrating his statistics with numerous maps and case studies of fighting, assaults, and homicide (The Philadelphia Negro: A Social Study, 1899). Half a century later, Marvin Wolfgang, described as “the most influential criminologist in the English-speaking world,” studied hundreds of murders in Philadelphia (Cohn, 1994). He concluded that many were at the hands of habitual offenders and that victims and offenders were less distinct than previously thought (Wolfgang, 1958). A century later, other landmark Philadelphia studies continue to unravel the situations, weapons, and decaying conditions that are associated with street violence (McGonigal, 1993 & Anderson, 1999). These studies have been invaluable in helping Philadelphia, and in fact all major U.S. cities, understand and ultimately begin to reduce their violence problems.

The work outlined in this chapter builds on this tradition of Philadelphia-based studies of violence. It could not have been conducted without support from the National Institutes of Health (NIH), the largest public health research agency in the United States. This work is already pioneering with respect to firearm violence, the most prevalent form of fatal violence, and it accounts for nearly two-thirds of all the studies of firearm violence the NIH has ever funded. This is true despite the fact that firearm injuries are far greater threats to health than many of the other conditions in which NIH research dollars are more heavily invested (Branas, 2005).

Thus through the NIH and other supporters, most notably the Chicago-based Joyce Foundation, our work seeks to advance the understanding of violence in Philadelphia and other cities. This work has included two major studies, both of which rely heavily on geographic analysis to better understand the risk factors that lead to violence: the Philadelphia Gun and Alcohol Study (NIH grants R01AA13119, and R01AA016187) and the Space-Time Adolescent Risk Study (NIH grant R01AA014944).

THE PHILADELPHIA GUN AND ALCOHOL STUDY

The Philadelphia Gun and Alcohol Study (PGAS) is an epidemiologic investigation of the impact of factors related to the risk of being shot. These include personal factors, such as drinking alcohol or having a gun, and geographic factors, such as proximity to alcohol...
outlets or households with guns. Over thirty months, the PGAS enrolled more than 2,000 adult residents who were the victims of shootings in the City of Philadelphia along with residents of similar characteristics who had not been shot. This “case-control” approach is commonly used by epidemiologists to study diseases and is the same method that originally established the link between smoking and lung cancer.

The PGAS is a real-time research effort that has involved numerous academic, government, and industry partners. On a daily basis, the locations and activities of recent shooting victims were sent to the University of Pennsylvania from the Philadelphia Police Department and Medical Examiner’s Office. Each time this occurred, an age, race, and sex-matched adult Philadelphia resident who had not been shot was randomly selected as a control and interviewed over the telephone to establish their own location and activities at the time of the victim’s shooting (see Figure 1). As a testament to the seamless and invaluable cooperation of the study’s municipal partners, these victims and their matching controls were typically enrolled within one to two days of each shooting. Additional victim and geographic data were later obtained from a dozen local, state, and federal data partners.
Because information about what each person in the study was doing (Were they drinking?, Did they have a gun?) and where they were (Were they close to alcohol outlets or in an area where many people own guns?) was obtained at the time of each case’s shooting, several new and unique analyses were conducted. Most basically, these included the ability to determine if individuals were at greater risk of being shot by virtue of what they were doing or where they were at the time of a shooting.

We began by geographically coding victims and their controls according to where they were located at the time of each shooting. We then compared these points to the point locations of various geographic factors around them, including alcohol outlets, household gun ownership, perceived safety, social capital, median age, racial diversity, ethnic diversity, education, unemployment, family structure, poverty, crowding, and household income. Many of these geographic factors also included the amount of exposure at each of their point locations, such as sales volume of alcohol per outlet, number of households that owned a gun, etc. Point-to-point geographic exposure measures assigned each subject a unique neighborhood and were inversely weighted by distance, with more distant factors having less impact on risk (see Figure 2).

Statistical analyses were then conducted to account for the time-matched and geographic nature of our data (Breslow, 1996). After adjusting for the personal characteristics of victims and controls (such as their education, occupation, marital status, prior arrests, etc.) and various geographic factors (such as those mentioned above) several key relationships became apparent. With respect to alcohol, heavy drinking beforehand is a risk factor for being shot, while light drinking is not. Being near bars and taverns, businesses where patrons purchase and consume alcohol on the premises, on average appears to pose little if any risk of being shot. However, being near so-called stop-and-go outlets, where patrons purchase and are supposed to consume alcohol off-premise is a risk factor for being shot, possibly because there is much less monitoring of intoxicated patrons. With respect to firearms, personal possession of a gun is a risk factor for being shot, although being in an area where more people report owning guns appears to be neither a strong risk nor protective factor.

THE SPACE-TIME ADOLESCENT RISK STUDY

Adolescents typically travel in and around their home neighborhoods in a manner consistent with their daily routines as students, employees, family members, and friends. Their movements through space and time are therefore influenced by the locations of schools, jobs, homes, and places of recreation. Because daily routines influence activities in space and time, they also have a large influence on time spent in places where adolescents might be exposed to factors affecting their health.

Now consider how the environment can influence how adolescents spend their time and, therefore, the risks they face in terms of being victims of violence. The extent to which
an adolescent is exposed to environmental risk factors for violence can be dynamic, varying widely as an adolescent simply walks from one location to another and, in doing so, encounters variations in street lighting, neighborhood dilapidation, outdoor drug markets, and/or general social milieu. Proximity to a liquor store or a bar during business hours, for example, may suggest that an adolescent will be more likely to obtain alcohol or encounter intoxicated persons and a volatile environment outside a liquor store or bar. To learn more about injury risks, it is therefore important not only to measure what adolescents do in terms of their behavior patterns and activities, but also to study those activities in context and measure exposure variables that are characteristics of the environment.

Through the Space-Time Adolescent Risk Study (STARS), we are currently using geographic information systems (GIS) as a way to better understand how daily routines and social interactions create windows in space and time that place adolescents at risk of being violently assaulted. By recording and analyzing the routines of adolescents, our use of GIS enables us to accurately measure their exposure to environmental risk factors and to isolate factors that serve to either increase or decrease the likelihood of assault. In an effort to more precisely measure such risk factor exposures, inverse-distance-weighted gravity measures are calculated relative to an adolescent’s location in space at several points in time (see Figure 3).

To do this, we are conducting a population-based case-control study in Philadelphia. The case subjects are adolescents requiring emergency room treatment for an assault-related injury (e.g., gunshot, stab wound), and the control subjects are adolescents recruited from the community using random-digit telephone dialing. The data collection process involves sitting down with each subject and conducting an interview using a portable computer and GIS software. Sitting side-by-side, the interviewer and the subject view a customized street-level map of the subject’s neighborhood. Starting at the time they woke up, the subject sequentially reports his or her daily activities by location and time on the day the injury occurred (or, for control subjects, on a recent day). Using the mouse and a pen-like stylus to draw a line on the neighborhood map, the interviewer creates a graphic that provides a minute-by-minute record of how, when, where, and with whom the subject spent time over the 24 hours he or she walked or otherwise traveled from location to location and from activity to activity. At the same time, the subject is asked to describe his or her activities that day (including use of alcohol and firearms) as well as those of other people in the vicinity. A street map and a satellite photograph can also be switched on and off in order to help the subject identify locations and communicate them to the interviewer (see Figure 4).

As part of the data management process conducted later, the points along the path of each
subject are linked to environmental information including characteristics of streets, buildings, and neighborhood populations. Empirical methods are then used to analyze the data in an attempt to quantify the assault injury risk associated with specific characteristics of the environment. Although the STARS is only partly complete and results are not yet available, it will very likely provide a new and richer understanding of the risks for violence that adolescents face as they go about their everyday lives.

**CONCLUSIONS**

The understanding of Philadelphia’s violent landscape has evolved over more than a century. Several landmark works have contributed to this understanding, and ongoing studies continue to add to our knowledge base. These studies have been a boon to Philadelphia and many other cities. Unfortunately, Philadelphia’s violence problem persists, and a re-evaluation of conventional approaches to prevention may be in order. The time has come to make better use of more recent, and sometimes unusual, ideas coming out of new geographic research aimed at reducing violence in the City of Brotherly Love.

**REFERENCES**


