

# Research Findings

---

## Links in space and time between firearm arrests and shootings

Brian R. Wyant, PhD

---

### Executive summary

The project sought to understand the relationship in space and time between shootings and arrests for illegally carrying firearms. The connection was viewed in two ways: links between earlier shootings and later arrests for illegally carried firearms (VUFAs); and links between earlier arrests and later VUFA arrests. Philadelphia data from the incident database provided by the Police Department to Professor Jerry Ratcliffe were analyzed using the years 2004 through 2007. Looking at the first question, results showed more firearm arrests following a shooting. The police response was targeted close to the original incident and was most extensive in the couple of days immediately following. For the second question, results showed that shootings did decline significantly following a firearm arrest up to a couple of blocks away, for a short period. The shooting decline took about a week before it became evident within a block of the original arrest location, and lasted for a couple of days. Significant but short-term declines in shootings were also evident up to about two blocks away. Results suggest two points: that police firearm arrests generally represent targeted responses to specific incidents where people got shot; and firearm arrests can force down the number of later nearby shootings for a limited period.

### Purpose

Two questions were investigated. (Question 1) How quickly and precisely do police respond to shootings, where the response in question is an arrest for illegally carrying firearms, i.e., violating the Pennsylvania Uniform Firearms Act? These arrests are called VUFA arrests. If this form of police response is taking times and places of shootings into account, the number of VUFA arrests in areas near shootings in the period immediately following shootings should be higher than expected. (Question 2) The second question was the impact of police VUFA arrests on later shootings. Do these arrests suppress later shootings in the nearby locale, in the period immediately following the arrest?

### Method

Using all confirmed shootings and all VUFAs for calendar years 2004-2007, event pairs were constructed. Earlier shootings were linked to later VUFAs to address Question 1, and earlier VUFAs were linked to later shootings to address Question 2. An earlier software program (Professor Ratcliffe's Near Repeat Calculator) was modified to conduct the analysis.

## Findings and implications

Police response in the form of a VUFA arrest after a shooting incident was quick and spatially targeted. Greater than expected VUFA arrest counts persisted for up to about a fifth of a mile away from the initial shooting, and for up to about a week after. The arrest response was strongest immediately after and closest to the shooting. The pattern of police response was relatively uniform across different police divisions.

Following a single VUFA arrest, shooting incidents were significantly suppressed anywhere from 28 to 47 percent. The suppression, however, was limited in time and space. Citywide, the suppression was significant between a block and two blocks away from the initial arrest for three to six days after the arrest, and significant within a block for five to six days after the arrest. The pattern of offenders' responses was more variable across different police divisions.

Police are responding quickly and in a geographically targeted fashion to shootings when the police response in the form of a VUFA arrest is considered. Of course, police also are responding in many other ways not captured in this study. Further, it appears that single VUFA arrests can have some significant suppression effects on later nearby shooting incidents. These suppression effects are sizable, extend up to two blocks away from the shooting, but do not endure over time. The study did not examine what the suppression effects would be of multiple VUFAs clustered in space and time.

## Notes

This is a summary of the dissertation research by Dr Brian Wyant. June 2<sup>nd</sup> 2010. Dissertation Committee: Ralph B. Taylor (chair), Jerry Ratcliffe, Jennifer Wood. Opinions and conclusions stated here are solely the author's and do not necessarily reflect the opinions of Temple University or Temple University's Department of Criminal Justice. For further information, contact Brian R. Wyant at [bwyant@temple.edu](mailto:bwyant@temple.edu) or 215-204-9183.