

## Original Article

# Exploring the relationship between drug and alcohol treatment facilities and violent and property crime: A socioeconomic contingent relationship

Travis A. Taniguchi<sup>a,\*</sup> and Christopher Salvatore<sup>b</sup>

<sup>a</sup>Redlands Police Department, 30 Cajon Street, Redlands, CA 92373, USA.

E-mail: ttaniguchi@redlandspolice.org

<sup>b</sup>Department of Justice Studies, Montclair State University, 1 Normal Avenue, Montclair, NJ 07043, USA.

\* Corresponding author.

**Abstract** Siting of drug and alcohol treatment facilities is often met with negative reactions because of the assumption that these facilities increase crime by attracting drug users (and possibly dealers) to an area. This assumption, however, rests on weak empirical footings that have not been subjected to strong empirical analyses. Using census block groups from Philadelphia, PA, it was found that the criminogenic impact of treatment facilities in and near a neighborhood on its violent and property crime rates may be contingent on the socioeconomic status (SES) of the neighborhood. Paying attention to both the density and proximity of facilities in and around neighborhoods, results showed that the criminogenic impact of treatment facilities depended largely on neighborhood SES. Under some conditions more treatment facilities nearby was associated with lower crime. Reasons why the presumed criminogenic impact of treatment facilities appears only under some conditions were suggested.

Security Journal advance online publication, 2 May 2011; doi:10.1057/sj.2011.8

**Keywords:** drug treatment facilities; place management; environmental criminology; land use; negative binomial regression

## Introduction

Drug use and its potential link with other criminal activities is a social problem occurring with increasing frequency in impoverished inner-city neighborhoods (Wilson, 1996; Simon and Burns, 1997; Anderson, 1999). Many have argued that drug treatment is essential for addressing the drug problem facing the United States (Belenko, 1998; Belenko and Dembo, 2003). Treatment center locations are largely restricted to socially disorganized inner-city communities, resulting in a network of facilities located in areas that have low levels of territorial control and high levels of drug use and crime,<sup>1</sup> a reality that has been shown to have a strong negative influence on treatment attrition and relapse (Boardman et al, 2001).

The importance of drug treatment to reduce the prevalence of drug crime is generally acknowledged, but communities are often resistant to hosting these facilities (Hornblower et al, 1988; Substance Abuse and Mental Health Services Administration, 1995; Ericson,



One limitation to the methodology used to quantify the facilities is the inability to account for differences in the size of the treatment providers. This difference, both across and within treatment centers, may impact these results. Future research should seek to disentangle the effects of treatment provider client size and the relationship on crime.

Given the cross-sectional nature of this investigation, we are unable to ascertain a causal ordering between treatment centers and crime. Future research using longitudinal models may be able to clarify this relationship. One difficulty to conducting such a study is the relative stability of the treatment facility locations. Numerous treatment facilities have been licensed at the same location for over 30 years. Collecting data, especially spatially referenced crime and environmental data, over such a long period of time presents substantial difficulties. Nevertheless, truly clarifying the relationship between treatment centers and crime would be best accomplished by longitudinal models.

## Conclusion

Drug and alcohol treatment facilities are widely thought to have negative impacts on the community in which they are located. That is, it is assumed that these facilities bring crime to the areas surrounding their location. The empirical basis for this assertion is tenuous at best. This analysis has not found a definitive relationship between treatment centers and crime. The relationship between treatment provider intensity and crime was found to be conditional upon the level of SES of the area. Areas of high SES and high treatment provider intensity had higher levels of violent and property crime. Conversely, areas of low SES and high treatment provider intensity had lower levels of violent and property crime. These models also suggest that socio-demographic characteristics, as well as land use may impact the effects of treatment centers on violent and property crimes. These findings may not sit well with people looking for clear cut answers regarding the criminogenic impact of treatment facilities. At best, it is possible to say that treatment providers are not unilaterally bad neighbors and that in the certain areas these facilities may be associated with lower crime in the surrounding areas. This must be balanced with the fact that these same facilities may, under certain circumstances, also be criminogenic. Further research would be wise to further investigate the dynamics that are underlying these results.

## Acknowledgements

The authors thank Ralph B. Taylor for his extensive assistance and guidance in the development and preparation of this manuscript. The authors also thank Elizabeth Groff and George Rengert and two anonymous reviewers for their helpful and insightful comments on earlier drafts. Finally, the authors are very grateful to Jerry Ratcliffe who provided the data and software needed to conduct this analysis.

## Notes

- 1 Davidson (1981) stated that there were three types of neighborhoods that did not resist having community-based treatment centers: those who tolerate deviant behavior, those who were members of the community





SES has a long established empirical relationship with neighborhood crime levels (Shaw and McKay, 1942; Sampson and Groves, 1989; Sampson et al, 1997). Speaking generally, and with due deference to the ecological fallacy, areas of low SES tend to have a greater level of crime than their higher status counterparts. This can be problematic because, as discussed previously treatment facilities are often relegated to the most disadvantaged neighborhoods, and as a result, we may expect to find a more complicated relationship between neighborhood SES, crime and treatment provider locations. Research suggests that community dynamics, such as the wealth of an area, can influence where offenders choose to commit crime (Taylor and Gottfredson, 1986). Higher income areas may provide high target attractiveness because of the superior quality items available (for example, top quality electronics, jewelry) in the area. Locating drug treatment facilities in higher income areas may, therefore, provide a legitimate reason for a potential offender to explore areas that are 'target rich', and which could lead to an expanded awareness space and higher levels of criminality. The converse may be true of low SES areas. Potential offenders may become aware of the relative presence of unappealing targets suggesting that crime may actually be lower in these areas.

Treatment facilities are not the only characteristics of the built environment that may spatially structure crime. Just as the presence or absence of treatment centers may increase or decrease crime, the presence of other commercial land uses may impact localized crime levels. Commercial land use may impact territorial control and also has the capacity to concentrate crime attractors and crime generators (Taylor et al, 1995; Kurtz et al, 1998; Kinney et al, 2008). Therefore, any attempt to quantify the impact of treatment facilities must also control the prevailing levels of other commercial land use.

## Data and Methods

The unit of analysis for these analyses was the census block group; the smallest unit of aggregation for which the relevant socio-demographic variables were available. Crime counts were aggregated to census geographies to provide a count of violent and property crime per unit.

### Drug and alcohol treatment facilities

Data on the location and type of drug and alcohol treatment facilities were obtained from the Pennsylvania Department of Public Health's Quality Assurance Database (Pennsylvania Department of Health, 2009). Treatment centers within the State of Pennsylvania must be licensed by the Division of Drug and Alcohol Program Licensure. These licenses provided specific details on the type of treatment undertaken at each facility. All treatment facility locations located within the City of Philadelphia were successfully geocoded ( $n=110$ ).<sup>3</sup>

### Quantifying drug and alcohol treatment facilities

Quantifying facility locations has proven to be a difficult task which has been approached from a number of directions. Perhaps, the simplest approach would be to simply count the

number of facilities falling within the boundary of the areal unit. This method, although easy to understand and computationally simple, has substantial limitations. These simple point-in-polygon techniques (Gombosi and Zalik, 2005) are highly sensitive to small changes in zoning (a subset of the modifiable areal unit problem), where small changes in the border of the areal unit produces substantially different results (Yule and Kendall, 1950; Openshaw and Taylor, 1979; Chainey and Ratcliffe, 2005). This method is also problematic from a more conceptual perspective. We would not, for example, expect a facility to impact crime up to the edge of a block group and then stop abruptly. Instead, we would expect the influence of a facility to decay over a distance with no clearly demarcated boundary.

A better measure of land use would be sensitive to both the density and proximity of the facilities to the area of interest. This can be achieved through an intensity measure such as that utilized by McCord et al (2007). We adopted a similar approach and used a program to calculate the intensity measure of treatment facilities (Ratcliffe, 2007). This program counts all events falling within a pre-specified distance (bandwidth) and weighs events such that events further away count less than events nearby. A 0.33 negative exponential weighting function was employed.<sup>4</sup> Under this regime, an event happening at the centroid to the block group would be assigned a value of 1 whereas events occurring at half the distance of the bandwidth would receive a value of 0.33.

Although bandwidth selection is less critical because of the inverse distance weighting there is still a need to select an appropriate distance. A geographic information system (ArcGIS 10.0) was used to calculate the minimum distance necessary for all census block group centroids to have at least one facility. In other words, this program calculated the largest distance between a census block group centroid and the closest facility to that centroid. This census block group would then receive a value of 0 on the intensity measure for that facility whereas all other census block groups would receive positive values. The bandwidth was set to 16182ft. While these distances may seem large, it is important to remember the strong distance decay function applied to the weighting algorithm. The 0.33 weighting function would allocate a score of 0.33 to facilities occurring at half the bandwidth distance. The treatment intensity measure was calculated from the centroid of the census block group. This procedure was sensitive to both the density of the facilities, as well as their proximity while reducing the impact of artificial borders and arbitrary methodological decisions. Figure 1 displays facility intensity.

Facility intensity is strongest in the North Philadelphia region, an area that has a long-standing high concentration of poverty.

## Recorded crime

Crime data from 2008 were sourced directly from the Philadelphia Police Department's (PPD) records management system. This data set contained point-level information on the type of crime and the location of the event. The locations of the crimes were geocoded (with a hit-rate in excess of 97 per cent) by the PPD and were stored as X-Y coordinates. Crimes were separated into two dependent variables. The first was constructed from Uniform Crime Report (UCR) Part 1 violent crimes: homicide, rape, robbery and aggravated assault (hereafter referred to as violent crime;  $n=19491$ ). The second dependent

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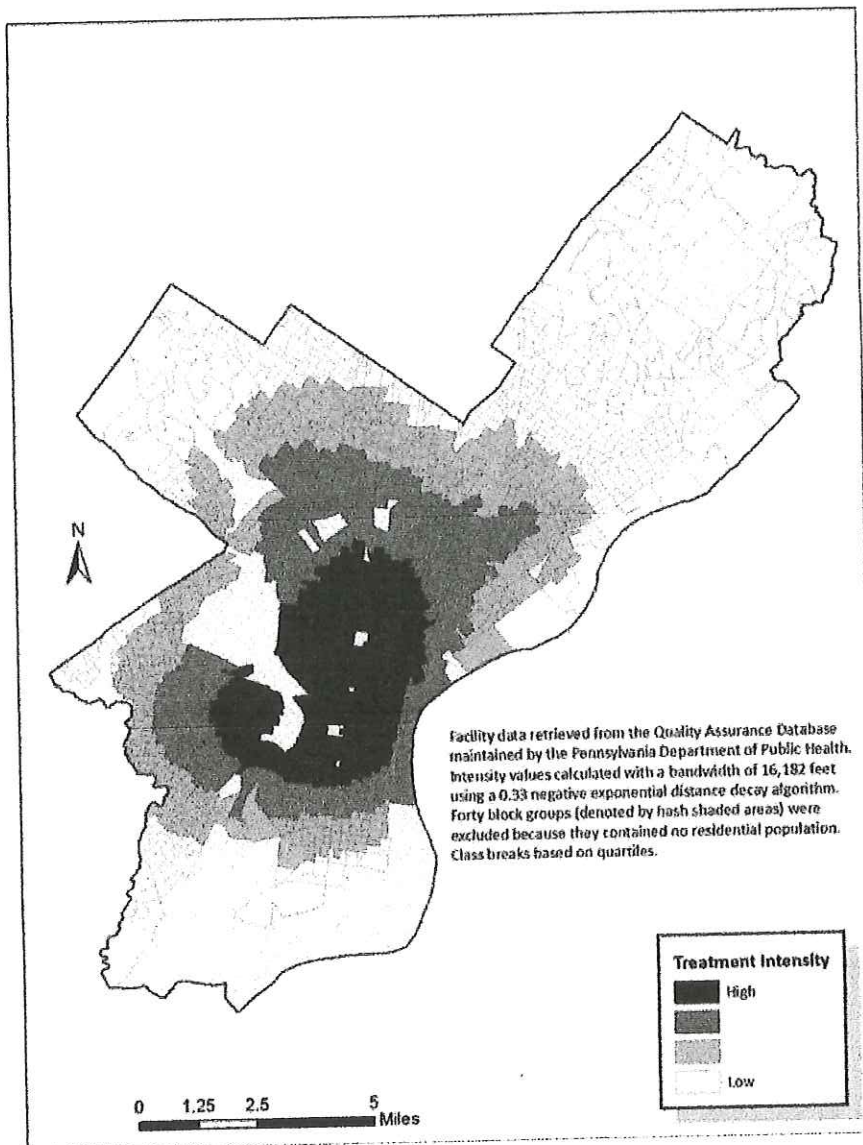


Figure 1: Treatment facility intensity.

variable was constructed from UCR Part 1 property crimes: burglary, theft, auto theft and arson (hereafter referred to as property crime;  $n=65152$ ). Serious crimes were selected because they leave the responding officers less discretionary powers in recording and reporting the event (Klinger, 1997) and, therefore, it is possible to rely on these crime measures to be a more accurate indicator of criminal activity and less of an indicator of discretionary police actions.

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a 2 per cent increase in violent crime (Table 2, Model 2). After controlling for demographics and land use, however, these effects are substantially altered. The relationship between treatment intensity and crime becomes negative with a one unit increase in treatment intensity associated with a modest 0.08 per cent decrease in violent crime (Table 2, Model 4).<sup>6</sup> After including the treatment intensity/socioeconomic interaction the main effect of treatment intensity was not significant (Table 2, Model 5).<sup>7</sup>

#### Demographic and land use impacts

Commercial land use was consistently positively linked to violent crime. A 1 per cent increase in the percentage of land within a block group zoned as commercial was associated with a 1.7 per cent increase in the count of property crime after controlling for treatment intensity, demographic characteristics and spatial effects (Table 2, Model 3, 4 or 5).

SES was also consistently related to property crime. Areas of higher SES were associated with lower violent crime, on average, after controlling for land use, other demographic characteristics, and treatment facility intensity (Table 2, Model 3, 4 or 5). The only other demographic characteristic that linked to violent crime was the percent of the block group population that was African American. A block group that was comprised of 100 per cent African American residential population would, on average, have a violent crime count 35 per cent to 40 per cent higher than a block group that had 0 per cent African American residential population. Neither stability nor the race/ethnicity scales attain statistical significance in these of the models (Table 2, Model 3, 4 or 5).

#### Spatial lag and population

Population was significantly related to violent crime. On average, a 1000 person increase in the residential population was associated with a 0.5 per cent increase in violent crime count after controlling for demographic characteristics, land use, spatial effects and treatment facility intensity (Table 2, Model 5). The spatial lag variable was also positive and significant. A one unit increase in the lagged crime variable was associated with a 6 per cent increase in violent crime in the target block group.

#### Treatment facility intensity and socioeconomic interactions

Comparing Model 2 to Model 4 suggests that treatment intensity–crime link is altered by the inclusion of socio-demographic characteristics (Table 2; Model 2 versus Model 4). This relationship was further explored through the use of interaction terms. On average, areas of high treatment intensity and high SES (top 25 per cent on each variable) had 26 per cent more violent crime than areas of more moderate treatment intensity or SES. These results were opposite when considering the interaction between high levels of treatment intensity and low SES. This interaction term indicated that areas of high treatment facility (highest 20 per cent of block groups) and low SES (lowest 20 per cent of block groups) actually had about 16 per cent less crime (Table 2, Model 5).

#### Property crime

##### Treatment center impacts

When not accounting for demographic characteristics and land use, the intensity of outpatient treatment facilities was associated with higher levels of property crime (Table 3,



Model 2). After controlling for demographic characteristics and land use, the strength of the relationship between drug treatment intensity and crime was reduced but was still significant (Table 3, Model 4).<sup>8</sup>

#### Demographic and land use impacts

Commercial land use was associated with higher levels of property crime regardless of model specification. A 1 per cent increase in the level of land zoned commercial within a block group was associated with a 1.8 per cent increase in property crime, net of demographics, spatial effects and treatment intensity (Table 3, Models 3, 4 or 5). SES also consistently linked to property crimes. A one unit increase in the SES scale was associated with about 14 per cent less property crime after controlling for other relevant variables (Table 3, Model 5). Unlike violent crime, the stability scale was also significantly associated with property crimes. A one unit increase in the stability scale was associated with an 8 per cent reduction in property crime after controlling for other environmental and demographic characteristics (Table 3, Model 5). Finally, the percent African American linked differently to property crime than violent crime. When looking at property crime, a block group that was 100 per cent African American would have an expected property crime count about 18 per cent lower than a block group with 0 per cent African American residential population (Table 3, Model 5).

#### Spatial lag and population

Higher levels of residential population were associated with higher levels of property crime. On average, a 1000 person increase in the residential population was associated with a 0.3 per cent to 0.4 per cent increase in property crime with only small variations across model specification (Table 3). The spatial lag variable was also positive and significant. A one unit increase in the lagged crime variable was associated with an increase in property crime between 0.8 and 1.6 per cent depending on model specification.

#### Treatment facility intensity and socioeconomic interactions

Interaction terms between the areas of highest SES and the highest drug treatment facility intensity showed some differences than what was found with violent crimes. The variable representing areas of high treatment intensity and high SES, while in the same direction as found for violent crime, was not significant. Areas of high treatment intensity and low SES were associated with 23 per cent less property crime than areas that scored more moderately on these variables. These relationships persisted net of other demographics, land use, spatial effects and the main treatment variable (Table 3, Model 5).

### Discussion

The relationship between treatment intensity and crime demonstrated minor differences between violent and property crime. Recall that treatment facility intensity was positively associated with violent crime when failing to control for other relevant environmental characteristics (Table 2, Model 2). After controlling for demographics, land use and spatial effects, however, this same variable was negatively associated with violent crime (Table 2, Model 4). In the violent crime models, the interaction terms indicated that areas of high SES





and high treatment provider intensity tended to have significantly higher levels of violent crime, net of controls for land use, demographics and spatial effects (Table 2, Model 5). This interaction term in property crime models was in the same direction but did not attain significance (Table 3, Model 5). Conversely, for both violent and property crimes, areas of low SES and high treatment provider intensity tended to have significantly less violent and property crime, net of land use, demographics and spatial effects (Tables 2 and 3, Model 5). These interaction terms indicated that the relationship between treatment intensity and crime was different at different levels of SES.

Three explanations may help to explain this seemingly counterintuitive finding. First, it may be that drug treatment facilities are acting as nodes of routine activity that facilitate the expansion of both awareness space and opportunity space. In other words, the person in treatment becomes familiar with the neighborhood in which the facility is located. If the facility is located in a high socioeconomic neighborhood the individual may become aware of many attractive targets such as residential homes and businesses that are of high monetary value (Brantingham and Brantingham, 1995; Lopez and Van Nes, 2007). Put more succinctly, locating treatment facilities within high socioeconomic neighborhoods may increase a potential offender's awareness space and provide familiarity with the area that could lead to new avenues for criminal activity (Rengert and Wasilchick, 2000). This new-found understanding of the high socioeconomic area could help to explain why crime would be higher in these locals. The same dynamic applies to the other side of this finding. Offenders attending treatment in low socioeconomic neighborhoods may be dissuaded from committing crime, if conditions in the surrounding local are sufficiently unappealing.

Alternatively, treatment centers may be having a differential impact on the level of territorial control in the surrounding area. In low socioeconomic areas, treatment facilities may be increasing territorial control because treatment center staff acts as capable guardians. In the absence of resident-based territorial control, these treatment facilities may be acting as the default territorial control mechanism. By contrast, high socioeconomic areas may not suffer from the same lack of resident-based territorial control. Under these conditions, treatment facilities may be acting to disrupt the territorial control of the residential population in the area. This disruption may lead to higher levels of crime in higher SES areas.

Finally, the relationship between treatment intensity and socio economics may be because of differences in 'other' land uses displaced by the treatment facility. It may be that in low socioeconomic areas, treatment centers are displacing other businesses that are even more criminogenic. For example, treatment centers may be 'better' neighbors than other facilities traditionally considered crime generators (for example, bars and pubs). This would create lower levels of crime in areas of high treatment intensity and low SES. However, treatment centers may not be displacing 'bad' neighbors in high socioeconomic neighborhoods. In higher socioeconomic neighborhoods, drug treatment centers may be the 'bad' neighbor. By this way, we would expect to see higher crime around treatment facilities in areas of high SES. These theoretical models help to explain the potentially counterintuitive finding demonstrated by these interaction terms. The exact process whereby community and environmental characteristics interact with treatment centers and crime remains an important avenue for future research.

Given that we can only speculate as to the intervening process linking treatment providers to crime levels any policy recommendations must be undertaken with caution. It appears that, at least at this level of spatial aggregation in this urban setting, treatment facilities are