The Impact of Incarceration on Violence

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Abstract
When someone is arrested in Chicago, several things could happen: they could be released on their own recognizance, they could be placed on electronic monitoring, or they could go to jail until they post bail or stand trial. Jail cells are a scarce resource—Cook County cannot afford to keep every arrestee in jail until trial. However, some arrestees may pose a serious risk to their community, such that releasing them could significantly increase the probability of future conflict. We used data from the Cook County Jail to identify classes of inmates whose release from jail was a leading indicator of criminal violence. We find evidence that the release of inmates charged with violent crimes (such as aggravated battery or unauthorized use of weapons) is correlated with future violence, while the release of inmates charged with other offenses is less so.

The Problem
Each arm of the criminal justice system can affect the others. For example, connections made in jail or prison can reorder criminal networks on the street, longer sentences handed down by judges can lead to prison overcrowding, and policing priorities can alter the mix of defendants who come before the court. These interactions all come into play at the county jail, which is operated by the Cook County Sheriff’s Office. It can be thought of as sitting in between the police and the circuit court: the population of jail inmates is determined primarily by who the police arrest, and on those arrestees’ progress through the court system. However, the Cook County jail is under court order to reduce overcrowding, and therefore the Sheriff has been granted some limited power to release inmates on electronic monitoring.

The Sheriff’s decisions about who to release, as well as the court’s decisions about whether to offer bail, take into account the risk to the community of future violence. However, bond hearings are very brief, sometimes less than a minute per defendant; and the Sheriff’s options are limited by the outcome of those hearings. One might wonder how well this process does at making sure the jail’s beds are being filled by the highest-risk individuals.

Most previous attempts at answering this question have focused on recidivism. The DSSG fellows, motivated in part by the fact that so much criminal violence in Chicago is gang-related, also considered the case where arrestees’ reappearances in their communities reignite rivalries or start cycles of retribution. Using data from the Cook County Jail and the Chicago open data portal, the fellows identified classes of inmates based on charge code whose release was a statistically significant leading indicator of violence near their self-reported home address. The hope is to identify types of inmates who can be released on bond or electronic monitoring with minimal risk to the community.

The Project
The fellows chose to implement a one-sided bivariate version of the Knox test (Knox 1964) to search for correlations between releases and criminal violence. The location of each jail release is defined by the inmate’s geocoded home address, and the location of violence is defined by the longitude and latitude of the crime report. Releases from jail into prison were disregarded. Denoting the releases as \(p\) and crimes as \(p'\), the Knox test statistic \(X\) is given by the number of pairs of points \((p_i, p'_j)\) where the spatial difference is less than \(d_s\) and the time difference falls within \(0 < t' - t \leq d_t\). Based on their exploratory analyses, the fellows chose a spatial scale of 1/8 mile and a temporal scale of 1 week, and varied these cutoffs to ensure that the results were robust.

The results of this analysis suggest that a correlation exists between some jail releases and violence. The release of inmates arrested for violent crimes—robbery, burglary, homicide, unauthorized use of weapons—is correlated with subsequent violence with > 99% confidence. For drug offenses, the correlation is less significant (97% confidence) but still detectable. For the subset of drug offenses related to cannabis, the correlation is not statistically significant (under 90%). This technique can be extended by including inmate age and criminal history, and by using more powerful statistical tests (e.g., Flaxman et al. 2013). By prioritizing the jail’s limited capacity in favor of classes of offenders who pose the highest risk, it may be possible to chip away at Chicago’s ongoing epidemic of violence.

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