

Using National Incident-Based Reporting System Data for Strategic Crime Analysis

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The utility of the National Incident-Based Reporting System (NIBRS) for strategic crime analysis has yet to be explored. The NIBRS represents an advancement over existing reporting systems and possesses considerable utility to frontline law enforcement with respect to strategic crime analysis. This paper discusses the utility of the NIBRS for identifying local and regional trends in narcotics related offenses. As an example, we selected four localities from the 1997 Virginia NIBRS data to examine trends in the sale/distribution and possession of narcotics. Our analysis shows that the NIBRS provides significantly more incident-related detail than has heretofore been available for strategic crime analysis at the regional or state level. Moreover, the NIBRS provides neighboring communities the opportunity to compare information on emerging crime patterns and criminal enterprises which extend beyond local boundaries. Finally, enhancing local reporting compliance by highlighting the strategic utility of the data to local law enforcement will ultimately ensure the quality of the data set, which can then be employed by larger entities as well as criminal justice researchers for policy development and planning.

KEY WORDS: NIBRS; crime strategy; narcotics enforcement; drugs; crime analysis.

1. INTRODUCTION

The utility of crime analysis techniques for identifying patterns of crime over time and location is well documented. Maltz *et al.* (1991) note that “information is the lifeblood of the police” (p. 12). While information may be the lifeblood of the police, a well-designed incident-based data system provides the infrastructure that maintains the information for analyzing emerging or ongoing crime problems. A primary objective of the FBI’s

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National Incident-Based Reporting System (NIBRS) is to serve as a basic foundation for a crime analysis information system. The intent is to provide a crime information tool with standardized data elements that has utility at the local law enforcement level for tactical crime analysis.

Unfortunately, the NIBRS has not achieved immediate and widespread acceptance. In part this may due to misunderstandings surrounding the uses of NIBRS data by local and state law enforcement officials. A Joint Document of the Bureau of Justice Statistics (BJS) and the Federal Bureau of Investigation (FBI) outlines seven impediments to the implementation of NIBRS (BJS, 1997). Second on the list of impediments, just below funding, is uncertainty of benefits. Through a series of national focus groups, the FBI and BJS study found that the participants of these groups felt that the NIBRS was useful only for macro-level analysis and had no practical utility for local law enforcement. Analysis of the NIBRS system, however, reveals that it possesses significant and immediate utility for local agencies.

The NIBRS data system is designed to provide basic, standardized incident-level information that is consistent across law enforcement jurisdictions. The resulting data set represents an invaluable asset to local law enforcement, as well as other governmental organizations and criminology researchers. The specific aim of the current paper is to provide an example of how NIBRS data can be useful for strategic crime analysis and criminal investigative analysis at the local and regional levels.

The analysis focuses on identifying local and regional trends in the sale/distribution and possession of narcotics. Narcotics-related offenses have been selected for the present study for three reasons. First, narcotics-related offenses affect most communities: large and small, urban and rural. Second, the NIBRS permits the opportunity to analyze specific types of narcotics-related offenses (e.g., possession and selling/distribution), which significantly enhances the potential utility of the NIBRS data to local law enforcement. Finally, narcotics-related offenders have the ability to be relatively mobile in their criminal activity. With some geographic constraints, drug users and sellers may conduct their transactions in a wide variety of locations of varying levels of convenience and risk to either party, irrespective of established community boundaries. Drug-selling and illegal drug markets also have the potential to be "franchised," moved, established, and reestablished. Dealers may bring their product to the user or may elect to sell in their home community. While user prevalence and preference may impact the establishment and location of illegal drug markets, it is also likely that local tolerance of drug crimes and local law enforcement practices may impact these decisions as well. Therefore, data pertaining to patterns and trends for narcotics-related offending across localities would be especially useful in developing law enforcement tactics and strategies.

2. VIRGINIA NIBRS DATA

Virginia is still in the developmental stages of establishing the NIBRS. The data for the current analysis were provided by the Virginia State Police (VSP) and include 133 (48.9%) certified NIBRS agencies out of 272 total agencies in Virginia. As with most U.S. localities reporting NIBRS data in 1997, the Virginia localities are heavily skewed toward rural and small agencies. The VSP certifies local law enforcement agencies for NIBRS compliance, which then submit their NIBRS data on a monthly basis. The VSP check the reliability of the local reporting prior to submitting the data to the FBI's Uniform Crime Reporting Section. The data for this analysis are the same data the VSP submits to the FBI.

For the current project the data were structured to allow for multiple unit analysis within one file. The data include all incidents in which a narcotics-related offense was charged, even if the narcotics-related offense was not the most serious offense in the incident.⁴ For example, in an incident involving a motor vehicle theft and a narcotics possession offense, the motor vehicle theft would be reported as the most serious offense in the incident. Further selections were made to limit the analysis to all narcotics (except marijuana) offenses where the type of drug was known. In addition, we limited the analysis to criminal acts of sell/distribute and possess. The linkages between the various NIBRS segments provide detail on drug type, criminal act (sell/distribute or possess); and drug quantity (including how the quantity is measured), as well as other offenses that might be involved in the incident such as weapon offenses or theft. To minimize problems with compliance and sampling frames, only agencies certified to report NIBRS data on or before January 1, 1997, and reporting data for all 12 months of 1997 were selected. In all, 57 local agencies met these criteria. To provide focus for our discussion we selected four localities, three of which appear to have emerging or ongoing problems with narcotics offenses.

It is important to emphasize that the Virginia localities represented in the present study are skewed heavily toward rural and small agencies. This can have a significant impact on the ability to generalize the outcomes of any analysis to larger populations. Moreover, although actual data are used, differences in sampling frames and levels of compliance significantly limit the ability to draw firm conclusions from the results. As such, any results drawn from this analysis must be viewed as preliminary. The intent was to examine the use of the NIBRS for strategic crime analysis, not draw statistical inferences from the data. In light of these caveats, the names of the communities represented in this study have not been provided in an effort

⁴Seriousness of the offense is based upon the FBI's UCR offense hierarchical rule as specified in the *Uniform Crime Reporting Handbook* (1991).

to prevent the misinterpretation of these preliminary results or embarrassment to the locality.

3. TACTICAL CRIME ANALYSIS

Crime analysis techniques which help investigators identify patterns of crime over time and location are extremely useful. Tactical crime analysis can provide investigators extensive detail on offenses occurring in specific areas at specific times. At the local agency level tactical planning can be enhanced significantly through effective utilization of NIBRS data. Comparison of incident and arrest rates for specific patterns of offending has the potential to reveal emerging patterns or trends. Moreover, the use of the NIBRS for surveillance purposes affords the opportunity for routine monitoring of local conditions. Any departure from established "baseline" conditions might serve as an effective early warning system for local law enforcement. Consequently, the ability to monitor and anticipate local and regional changes in patterns of offending provides local law enforcement the opportunity to engage in proactive prevention strategies rather than the reactive strategies often required. Analysis of arrest rates also provides the opportunity to compare and contrast local law enforcement strategies between communities, a strategy that can be useful to multijurisdictional or regional drug task forces. Patterns of offending open to "franchising" in rural communities may be effectively monitored and, perhaps, anticipated through NIBRS data.

Comparison of incident to arrest rates may provide insight into factors including local tolerance for certain patterns of offending. For example, high arrest rates for narcotics-related offenses may suggest an emerging drug problem. On the other hand, high arrest rates may indicate a low tolerance for substance use in the community. This information coupled with street-level intelligence may yield insight into the relative attractiveness of a community to criminal enterprise. Communities with high levels of known narcotics activity but low overall arrest rates may indicate a degree of tolerance for certain patterns of offending. Differences in aggressiveness of law enforcement may make certain communities particularly attractive to offenders. Communities not responding to patterns of offending with aggressive sanctions may appear as open territory to offenders.

NIBRS data provide the ability to analyze specific types of offending not previously possible with the aggregate data provided through UCR reports. For example, distinguishing narcotics possession from sale/distribution offenses (possible with the NIBRS) significantly enhances surveillance. Differences in the rates of these types of offenses may have very different implications for the community. High rates of possession offenses

compared to sale/distribution offenses may indicate differential disposition of cases or community tolerance. On the other hand, it may suggest local interest in a certain drug or an increased preference for a particular pattern of substance use. In response to changes in demand, local users may establish a distribution network to meet their needs. The community also may become attractive to larger distributors from outside the area. Therefore, increases in possession offenses may foretell the creation of new drug markets or precede the establishment of an illegal distribution network, either from within or outside the community.

Conversely, high rates of selling with respect to possession offenses may reflect local discretion, suggesting harsh sanctions or “zero tolerance” for drugs in the community. These findings also may indicate that this community serves as a local distribution center for the surrounding localities. A large increase in sale/distribution incidents may suggest the targeting of a community by drug sellers or the attempt to create a new market. Knowledge of offender characteristics may enhance the ability to track and monitor these individuals, suggest the source of the drugs (e.g., high school students), or indicate the involvement of outside criminal enterprises. Analysis of the relative quantities seized would provide local analysts the opportunity to answer many of these questions while plotting and anticipating local trends.

Analysis of local data in conjunction with data from surrounding communities provides localities the opportunity to analyze trends and patterns that extend beyond their jurisdiction. Offenders and criminal enterprises are not constrained by the same jurisdictional lines that constrain law enforcement. Therefore techniques that permit the expansion of criminal intelligence beyond jurisdictional lines may be critical to the effective identification, monitoring, and apprehension of these individuals and groups. In addition, relative differences in criminal activity will provide localities the opportunity to compare their crime rates. Lower rates may suggest effective law enforcement techniques that could be shared with neighboring communities. Communities with higher rates could examine what makes their community attractive to this pattern of offending. Again, the identification of outside criminal elements could cause a locality to examine what makes their community attractive to outside criminal elements.

4. ANNOTATED EXAMPLE

As an illustration of how NIBRS data might be used to evaluate local trends in narcotics-related offenses, offense data from four communities within the Commonwealth of Virginia have been compiled. Analysis of

Table I. Sale/Distribution and Possession of Narcotics by Locality

Community	Population ^a	Possession incidents (% total)	Possession rate ^b	Sale incidents (% total)	Sale rate ^c	Total
A	17,890	18 (35%)	100.6	34 (65%)	190.1	52
B	88,300	37 (95%)	41.9	2 (5%)	2.3	39
C	22,800	39 (29.3%)	140.4	94 (70.7%)	416.7	133
D	34,000	294 (66.1%)	850.0	151 (33.9%)	423.5	445

^aPopulation data are 1997 estimates provided by the Weldon Cooper Center for Public Service, University of Virginia.

^bSale and possession rates are per 100,000 population.

these data reveals areas where additional qualitative intelligence on local criminal activity is not only useful, but essential in the analysis of these incident-based data.

Table I shows the 1997 narcotics⁵ sale and possession rates for four localities in Virginia. The offender is the unit of analysis and the data include all offenders identified in all incidents in which a narcotics sale and/or possession offense was charged. The narcotics offense may not have been the most serious offense or the only offense and the offender may or may not have been arrested. Review of the narcotics offenses in Table I revealed large differences in incidents rates between communities. For example, comparison of the per capita rates for communities A and B suggested a large difference in narcotics-related offenses. Further analysis of the data, possible with NIBRS, revealed qualitative differences in the type of offending. In community A, the preponderance of incidents was for the sale/distribution of narcotics, while the majority of incidents in community B were for possession offenses.

The differences in incident rates may be interpreted in at least two ways. As described above, an increased incident rate for narcotics-related offenses may be suggestive of an established or emerging drug problem in the community. Conversely, an increased rate may indicate aggressive policing or diminished community tolerance for substance use and/or drug selling in the community. Knowledge of the data at the community level would provide further insight into the meaning behind the numbers.

⁵For the purposes of this analysis we operationalize narcotics as crack cocaine, powder cocaine, heroin, and all other illegal hallucinogens, stimulants, and designer drugs. Marijuana and other cannabinoids (e.g., hashish) are not included.

Table II. Drug Type by Activity and Locality

Community	Type of drug	Activity		
		Sell, distribute, manufacture	Possession	Total
C	Crack cocaine			
	Number	43	14	57
	(% total)	(45.7%)	(35.9%)	(42.9%)
	Cocaine			
	Number	50	13	63
	(% total)	(53.2%)	(33.3%)	(47.4%)
	Heroin			
D	Number		2	2
	(% total)		(5.1%)	(1.5%)
	Other ^a			
	Number	1	10	11
	(% total)	(1.1%)	(25.7%)	(8.2%)
	Crack cocaine			
	Number	144	291	435
	(% total)	(95.4%)	(99.0%)	(97.8%)
	Cocaine			
	Number		2	2
	(% total)		(0.7%)	(0.4%)
	Heroin			
	Number	7	1	8
	(% total)	(4.6%)	(0.3%)	(1.8%)
	Other ^a			
	Number			
	(% total)			

^aIncludes hallucinogens, stimulants, and designer drugs.

Localities C and D both appear to have very high overall offender rates for narcotics offenses. However, locality C reported an extraordinarily high per capita rate for sale/distribution incidents (416.7) and a much lower rate for possession incidents (140.4). Locality D, on the other hand, has a very high total rate but the pattern of sale (423.5) vs possession (850.0) is opposite that of agency C.

Analysis of the NIBRS data for agencies C and D provides further insight into the problems in these communities. Table II provides a breakdown on the drug types involved in the incidents for these two localities. As in Table I, in Table II the offender is the unit of analysis. Table II shows that narcotics-related offenses in locality D are almost exclusively crack cocaine-related offenses. Locality C, on the other hand, shows a different pattern. Narcotics-related offenses are almost evenly split between powder cocaine and crack cocaine. Other narcotics offenses represent only a small

overall percentage of the offenders in both localities. However, this is one area that should be followed closely, as many of the larger cities in the United States are beginning to report increases in their heroin markets. Although relatively small, the number of offenders charged with the sale or distribution of heroin in locality D may be an indication of a small but possibly emerging heroin distribution market. On the other hand, locality C does not appear, at least in 1997, to have a problem with the sale or distribution of heroin.

Unlike the standard UCR program, NIBRS provides detailed information on the incident. Traditional research on narcotics offenses at the community level has been limited to the FBI's UCR summary level data. Detailed information on narcotics sale and distribution generally has come from extensive research efforts such as Goldstein (1985), where specific information is gathered for limited areas within large cities. NIBRS offers crime analysts and researchers the opportunity to expand their knowledge of drug offenses as well for a wide range of other offenses.

Additional analysis using UCR⁶ data for these two communities shows that locality D experienced significant increases in violent crime beginning in the late 1980's. By 1994 the locality's violent crime rate began to decline. Locality C had a low violent crime rate throughout the 1980's. Around 1990 the crime rate in community C began to increase. By 1997 the violent crime rate in community C was 171% higher than the 1987 level. The nexus between violent crime and drugs has been explored elsewhere (e.g., Goldstein *et al.*, 1992). The intent here is to provide a context for the differences between the sale and possession rates reported by agencies C and D.

Locality D had an emerging drug and violence problem in the late 1980s. However, the 1997 NIBRS data for this community reports an overall clearance rate⁷ of 76% for incidents involving a narcotics offense that are known to the police. The numbers reported for 1997 would be consistent with a community that is coming to grips with a serious problem. Overall the community appears less tolerant of both drugs and violence and it may be paying off with higher arrest rates for drug offenses and an overall lower violent crime rate.

UCR data show that community C has had an ongoing problem with narcotics-related arrests dating back to the mid-1980s, while their violent crime rate was relatively low throughout the 1980s. Around 1991, however, community C began to show a steady increase in reported violent crime that

⁶It is not our intent to conduct a comparison between the UCR summary data and NIBRS data. UCR data are used to provide background for the analysis.

⁷For the purposes of this discussion, a clearance is any incident involving a narcotics offense in which there was at least one arrest.

has continued through 1997. Relative to the clearance rate for locality D, locality C's 1997 narcotics-related incident clearance rate is low. The question becomes are the low arrest rate and high rates for sale of narcotics a sign of an emerging or ongoing problem. The pattern of increasing violent crime and low arrest rates for sale of narcotics may indicate that the community has become the target for expansion by outside drug dealers.

The intent of the above scenario is to provide an example of how the NIBRS would be useful for tactical crime analysis. The knowledge of crime patterns and trends that can be extracted from a NIBRS data system can prove beneficial to all law enforcement agencies. However, the NIBRS can provide information only on patterns of criminal activity. The NIBRS can provide a great deal more information on each of the narcotics incidents in this analysis. For example, 41% of the crack cocaine arrests in community D were at a residence, compared to 57% of the arrests in community C. It is also possible to determine the time of day and day of the week when the offenses occurred. Additional analysis on the part of local law enforcement will be necessary to answer the questions and find solutions. The key is that the NIBRS provides an opportunity for strategic crime analysis that heretofore was unavailable.

In summary, effective utilization of NIBRS data can enhance significantly tactical crime analysis and planning at the local level. Analysis of specific patterns of offending, and comparison and contrast of incident and arrest rates within as well as across jurisdictions, affords the opportunity to effectively monitor and anticipate local and regional trends. This approach permits the evaluation of local law enforcement strategies and provides the opportunity to initiate proactive crime prevention strategies.

5. CRIMINAL INVESTIGATIVE ANALYSIS

Block's (1993) research on homicides has shown that the risk of becoming a victim and the risk of being an offender can vary by demographic groups, location, time, and type of homicide. The NIBRS offers the opportunity to identify the victim, offender, and interaction risk levels for all offenses reported to the FBI.

One of the primary advantages of NIBRS is that each incident can be analyzed independently, and interactions between hierarchical units within the data set can be analyzed with linkages between the different units. For example, these linkages allow the victim to be linked to the offenders and the offenders to the offenses. The ability to establish these linkages between victim, offender, and offense is critical to analyzing criminal events and behavior within the context of larger trends. This becomes important when defining profiles of victim or offender types, and when examining victim–

offender relationships. This feature can be used to identify particularly vulnerable segments of the community, establish victim risk, and track serial crime. Again, the ability to cross jurisdictional boundaries with this approach may enhance the ability to track offenders and analyze crimes not constrained by the same boundaries imposed on law enforcement.

6. SUMMARY AND CONCLUSIONS

The NIBRS represents an exciting opportunity for researchers and practitioners to interact through the use of a common tool. The wealth of detail available in the NIBRS will permit scientists and practitioners to interact and exchange information through a common medium. The structure provided by a common NIBRS data system also transcends the needs of the local agency, permitting neighboring communities the opportunity to compare like information on emerging crime patterns and on criminal enterprises which extend beyond local boundaries. Access to data from neighboring communities would permit agencies to cross jurisdictional lines with respect to intelligence without requiring complicated interagency agreements for collaboration. Data from neighboring communities could then be used to follow, as well as anticipate, trends. The NIBRS will also be an important tool for providing policy-relevant information across jurisdictions and across levels of government, giving police administrators as well as state planners the ability to develop or redirect policies. Promoting local participation by highlighting the strategic utility of the data to local law enforcement will ultimately enhance the quality of the data, which can then be employed by larger entities (e.g., counties, states and multijurisdictional task forces) for policy development and planning.

Unfortunately, as the BJS/FBI report (1997) indicates, state and local officials envision limited utility of the NIBRS data for local law enforcement. However, accurate data collection from this same group is essential to effective implementation of the NIBRS system. In light of this discrepancy, perhaps the true challenge to NIBRS lies in promoting the collaboration and alliance with local law enforcement or the provision of incentives for accurate and complete compliance with the data collection requirements.

These incentives may be limited to a description of the tactical crime analysis functions embedded within the data set or may extend to include the availability of analysis programs and/or technical assistance for front-line users. The NIBRS represents a huge advancement over existing reporting systems and possesses considerable utility to frontline law enforcement with respect to tactical crime analysis. A brief description of the advantages of the NIBRS and their relation to tactical crime analysis may

be sufficient to effect compliant data collection. Development of a user-friendly interface which could be utilized by an investigator in the field to access NIBRS data would facilitate the development of local crime prevention strategies and may also be useful in case investigations. These potential benefits are well within the realm of NIBRS capabilities and would be particularly useful to smaller jurisdictions that lack crime analysis capabilities.

The availability of technical support from those familiar with and using the NIBRS database would further enhance the ability of a community to utilize the data effectively. The opportunity to utilize a common data set and interact with the individuals who have firsthand knowledge of the crimes and trends included in the data may be an invaluable resource for researchers and analysts using NIBRS data for research purposes. Regardless of the form, however, the provision of incentives may represent the difference between the type of data set resulting from mandatory compliance or an "enhanced" compliance where the data are collected and meticulously maintained by the frontline user who has a vested interest in the success of the product.

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