TACKLING NEAR REPEAT CRIME

Using technology to formulate and evaluate crime prevention strategies

Introduction

This document is designed to assist law enforcement professionals in identifying and responding to near repeat patterns of victimization. Several open source tools are broadly discussed as they are necessary to quantify near repeat patterns and develop interventions; we encourage you to review those program's user manuals for more details. This report will help you:

1. Understand what near repeat patterns are and why they are useful to policing
2. Evaluate global and local patterns of near repeat
3. Formulate appropriate responses these patterns
4. Develop program metrics to understand the effect of the intervention
5. Evaluate a near repeat crime prevention program

Overview of near repeat victimization

Research has found that once a crime has occurred, additional crimes are more likely to occur in nearby areas within a short period of time. This pattern has been called "near repeat". Empirical research has clearly identified the existence of both a repeat (same target, another crime) and a near-repeat phenomenon for crimes such as burglary, robbery, weapons violations and other crimes. The exact spacing and timing of increased risk varies by the place. But we know that the increased risk level that occurs after a burglary is temporary (Johnson, Bowers, & Hirschfield, 1997) suggesting that police must act quickly to maximize the potential for reaping crime prevention benefits. This knowledge of the near repeat phenomenon provides police with a way to "shorten the odds of being in the right place at the right time to deflect or detect crime" (S. D. Johnson, Bernasco, et al., 2007; Pease & Laycock, 1999, p. 2). Such interventions require that additional police resources be sent to the specific locations most likely to experience further victimization and that agencies not only address the crime that has been committed but work to prevent future victimization.

Steps in tackling near repeat victimization

The following sections describe a set of steps that can be used to identify, address, and evaluate interventions designed to tackle near repeat victimization patterns. There are a number of technical and practical challenges to undertaking this kind of intervention. Several tools have been developed to assist with this work. General guidelines are provided to act as a starting point for understanding the unique patterns within a jurisdiction.

Step 1: Quantify the size of the near repeat problem in your jurisdiction

This section describes the process of identifying and quantifying the scope of the near repeat pattern. Two programs have been developed to assist with quantifying the size of the near repeat pattern. Both programs, the Near Repeat Calculator (NRC) and the Near Repeat Crime Prevention Potential Calculator (NR-CPPC), were funded by the National Institute of Justice and are freely available online.

Identify a crime type

The intervention should be designed around a specific crime type or crime types with similar characteristics. Existing research has found near repeat patterns among several types of crime in a variety of settings. Residential burglary, in particular, has been studied extensively in both the US and the UK. Knowledge about near repeat patterns for person-crimes is less robust but exists.

Gather historical data

There are no definitive rules on how much historical data should be considered to evaluate near repeat patterns. The volume of events will be the main consideration; a higher volume of events will require a shorter historical period for assessing near repeat patterns. In general, use of at least one year of historical data is recommended to smooth over any seasonal or transient effects. Try to include a month prior and a month after to get a better estimate of the originators that take place prior to the study period and the repeats that occur after the end of the study period.

Quantify the global near repeat pattern

The intensity of near repeat patterns can be established by the Near Repeat Calculator. Developed by Dr. Jerry Ratcliffe, and funded by the National Institute of Justice, the NRC is used to determine if a near repeat pattern exists, and if that pattern is significant. The user is responsible for setting a few parameters: the file location, identifying coordinates and date variables, and spatial and temporal bandwidths. Details on the use of this program can be found at: http://www.cla.temple.edu/cj/resources/near-repeat-calculator/. A reasonable starting point for analysis is to set the temporal bandwidth at 7 days and the spatial bandwidth at 400 feet (122 meters).

Quantify the number of preventable near repeats

The Near Repeat Crime Prevention Potential Calculator (NR-CPPC) is a tool to identify the proportion of a crime type that are "preventable". This tool answers the question: how much crime could be averted if all near repeat events were prevented? In conjunction with spatial analysis techniques, the output can be used to identify where within a jurisdiction near repeats are a problem. The tool uses historical data to provide a baseline for determining the crime prevention potential of an initiative aimed at addressing near repeat crimes. The program considers the spatio-temporal distribution of events and indicates how many events fall within the specified high-risk space-time window. This figure represents the maximum treatment potential if the intervention was 100% effective at eliminating all near repeat events.

Step 1 Summary: Begin by identifying a crime type. More research has been done on the near repeat victimization of certain types of crimes, but many crimes have been found to demonstrate this pattern. Gather sufficient historical data (at least one year) to produce reliable estimates. Evaluate near repeat patterns at the global level. If results are positive, calculate the number of "preventable" near repeats that occurred.

Step 2: Identify where near repeat patterns are most prevalent?

As described above, a first pass at exploring near repeat patterns occurs at the global level. Further refinements can then be made to better understand the amount of near repeat crime that is actually involved in creating those global patterns. A next consideration is identifying where these near repeat patterns are strongest. Data from the NR-CPPC can be exported and brought into a mapping application. Originator and repeat events can be plotted on a map for visual inspection and analysis. Creating a kernel density (e.g., hotspot) map of these events will allow for a more complete understanding of their spatial distribution. Depending on how these events are distributed, the intervention may be limited to a subset of the entire jurisdiction.

Step 2 Summary: The Near Repeat Calculator produces a global (i.e., jurisdictional) estimate of near repeat patterns. The NR-CPPC can be used to better understand the spatial distribution of near repeat patterns. Output from the NR-CPPC can be used to develop a more targeted intervention.

Step 3: Design a near repeat crime prevention program

In theory, a wide variety of strategies could be used to disrupt near repeat victimization. In general, research has found place-based crime prevention strategies to be more effective than other kinds of strategies such as those that focus on individuals. Research specifically designed to disrupt near repeat patterns of crime are few and have generally focused on burglary. Ultimately the intervention will be based on the specific crime issue, resources available, and community needs. Nevertheless, speed is key. Near repeat patterns often diffuse rapidly. An effective intervention must be designed in such a way that it is possible to get field personnel in a treatment area quickly.

Develop an evaluation plan

An evaluation plan should be decided in advance. Three areas are worthy of consideration: the effect on crime, the effect on the community, and the effect on the agency. A multifaceted approach to evaluating the impact of a program can provide a more comprehensive understanding of program impact.

Tracking the impact of an intervention on crime tends to be the most straightforward method of evaluating programmatic success. There are a variety of ways to asses change in crime with varying levels of scientific rigor. The generally recognized gold standard approach is to use random assignment to achieve treatment and control groups. Other approaches may be less rigorous but may be more feasible to implement. Quasi-experimental pre- and post-evaluations may provide a reasonable test of program effectiveness in reducing crime.

Understanding the impact of the intervention on the community should also be a key goal. Two questions are worth considering. First, did the intervention have the intended behavioral changes

There has recently been a burglary near your home. Research shows that there is an increased risk of additional burglaries occurring within a short time and distance of the first crime.

Burglary Prevention Tips
- Lock all outside doors and windows before you leave.
- Leave lights on when you go out. Connect a lamp to timers that will activate in the evening. Install motion sensitive exterior lighting.
- Make it easy to observe what is happening on the street by keeping the view from windows and doors unobstructed. Trim hedges and plants that may obstruct the view.
- When you are away for a longer period of time, stop mail, newspapers, packages, or any other deliveries.
- Keep valuables out of sight.
- Mark property with an identification code – such as your driver's license number.
- Install deadbolts on exterior doors.
- Consider installing a burglary alarm system.
- Form a neighborhood watch group. This can help protect everyone in the neighborhood from crime.

If you are the Victim of a Burglary
- Do not enter your home
- Notify the Police
- Preserve evidence by not touching or cleaning anything until the police have concluded their investigation

If you have Information on a Crime
IN-PROGRESS OR EMERGENCIES SHOULD BE CALLED INTO 911
- Contact the Redlands Police Dispatch at (909) 798-7681
- Text 274637 "REDTIP"
- Use the Redlands Police app (available for iOS/Android)

Other Resources
- Receive notifications about crime in your neighborhood: www.crimemapping.com
- Learn more crime prevention techniques: www.cityofredlands.org/police/crimeprevention

Burglary Crime Prevention Tips (Hang Tag)

on individuals in the treatment area? Many crime prevention strategies rest on the assumption that the public should take steps to ensure their own safety. For example, a crime prevention strategy to reduce vehicle burglary may instruct residents to secure their vehicles and remove or hide valuables. A key question then becomes whether or not the program actually prompted any changes in actions. Second, were there any unintended consequences of the program? Geographically focused policing initiatives have been criticized because of their disproportionate impact on minority communities. Other kinds of interventions may cause unnecessary fear of being victimized. Understanding how the community might experience the intervention should be a key component of the evaluation.

Finally, the experiment may an effect on the functioning of the agency and/or its personnel. At a minimum level it may be worthwhile to track outputs such as the number, type, or amount of time spent in treatment areas. This information provides essential information to understand the true cost-to-implement of a program and allows for better understanding of return on investment. Additional concerns may also warrant evaluation. Programs may impact the treatment providers.

Step 3 Summary: Developing an evaluation strategy should be an integral part of program development. Consider the impact of the program on crime, residents, and the agency to develop a holistic understanding of the program's effectiveness.

Step 4: Implementation

Implementation of a near-repeat focused crime prevention strategy can be difficult. Quick action is needed and treatment providers need guidance on identification of the targets at risk. Furthermore, evaluation concerns may necessitate assigning areas to treatment or control groups. The Near Repeat Area Identifier Tool (NRAIT) was built to assist with the process of area identification and treatment deployment. The NRAIT can support randomized controlled experiments or quasi-experimental designs. The program can be run manually daily or triggered for automatic analysis at a set time. The NRAIT evaluates all new crimes for that day. It establishes if the event should be an outcome event of a previous event or if it should generate a new high risk near repeat zone. If a new zone is generated it can be randomly assigned to treatment or control conditions. One additional function to consider is whether zones can be retreated at a later date. This would allow zones to renter the treatment pool in order to provide follow-up treatments (e.g. the agency may be willing to provide treatment to a zone if there is another crime six months later).

Track outcomes

The NRAIT will count all events occurring in treatment/control areas during a specified time period. For example, you may be interested in understanding how much crime has occurred in these zones in the four weeks after they are created. These data can be exported for use in any statistical analysis software. The NRAIT also produces a daily output file that tracks the status of each individual event run through the program. This output, for example, tells the user if an event was allocated to treatment or control, or if the event could not be set to treatment/control why it was left unallocated. A new burglary can be disqualified for use in the experiment for a variety of reasons and the specific reason is important in understanding the spatio-temporal pattern of residential burglary. These logs are useful for diagnostics and for understanding how events are being allocated (i.e. to treatment, control or being discarded because a new zone would overlap an existing one).

Step 4 Summary: Quick action is needed. The Near Repeat Area Identifier Tool has been developed to streamline the identification of near repeat high risk zones and facilitate deployment of resources to those zones. The NRAIT also tracks outcome measures that may be useful for evaluation purposes.

Step 5: Analysis

Evaluation of a near repeat intervention can be complex and an in-depth discussion of this issue is outside the scope of this summary. In general, the evaluation will be dictated by the design established in Step 3. If the intervention has been run as an experiment, a t-test using the outcome tracker of the NRAIT can be sufficient to understand effectiveness in preventing crime. Quasi-experimental designs may require more complex evaluations like pre-post or time series analyses. Evaluation of community or agency data may be simple descriptives such as averages and percent change.

Step 5 Summary: With proper setup, the analysis component of the project should be straight forward. Experimental designs often lend themselves to simple statistical approaches. Other data, such as resident surveys or administrative data, require additional consideration.

Contact for More Information:

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References

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Johnson, S. D., Bernasco, W., Bowers, K. J., Elffers, H., Ratcliffe, J. H., Rengert, G., & Townsley, M. (2007). Space–time patterns of risk: A cross national assessment of residential burglary victimization. Journal of Quantitative Criminology, 23(3), 201-219. doi:10.1007/s10940-007-9025-3
Pease, K. & Laycock, G. (1996). Revictimisation: Reducing the Heat on Hot Victims. NIJ Research in Action. Washington, DC: U.S. Dept. of Justice.

Additional Resources:

Full report:
Groff, E. R. & Taniguchi, T. (2018). Micro-Level Policing for Preventing Near Repeat Residential Burglary: Final Monograph. Washington, DC: Police Foundation.

Another guide for practitioners:
Chainey, S. (2012). Predictive mapping (predictive policing). JDI Briefs. Retrieved from Jill Dando Institute of Security and Crime Science website: http://discovery.ucl.ac.uk/1344080/3/JDIBriefs_PredictiveMappingSChaineyApril2012.pdf

Software:
Near Repeat Calculator (NRC) is located at http://www.cla.temple.edu/cj/resources/near-repeat-calculator/
Near Repeat Crime Prevention Potential Calculator (NR-CPPC) is located at https://policefoundation.app.box.com/s/z5aacqanf4o1xyz0fl-4rei021goi3qa7