Near-repeat Data and Analysis
Casey Hammond and John Klofas, Ph.D.
Center for Public Safety Initiative

Near-repeat Phenomenon
What is Near-repeat Victimization?
- Townsley et al. 2003 - Infectious Burglaries
  - Repeat victimization is an indicator for a period of higher risk during a short time in the same location with the same victim.
  - During that period of higher risk, clusters of crime can occur around the original event.
  - Near-repeat was coined as a term for this spreading out of victimization around a repeat victim.
  - These near-repeat crimes appear similar to the spread of diseases, and we can use some of those same principles of epidemiological research to observe patterns of near-repeats.

Near-repeats and Violence
Why do we expect to see near-repeats with violent crimes?
Lex Talionis
- Criminal justice term- Latin for “the Law of Retaliation”
  - Based on the idea that offenders should suffer similar type and severity of harm that victims experience
- Romantic disputes
  - Between romantic partners, the “lover’s triangle” scenario
- Criminal disputes
  - Drug dealers resort to violence to solve issues because they can’t use the criminal justice system
  - Gangs also tend to resort to violence as a way of solving territorial and interpersonal disputes

Visualizing Near-repeat Data for Rochester

<table>
<thead>
<tr>
<th>Distance</th>
<th>0 to 7 days</th>
<th>8 to 14 days</th>
<th>15 to 21 days</th>
<th>22 to 28 days</th>
<th>More than 28 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same location</td>
<td>55.11</td>
<td>0.28</td>
<td>0.23</td>
<td>0.12</td>
<td>0.19</td>
</tr>
<tr>
<td>1 to 100 feet</td>
<td>4.42</td>
<td>0.39</td>
<td>2.07</td>
<td>1.66</td>
<td>0.93</td>
</tr>
<tr>
<td>101 to 200 feet</td>
<td>1.97</td>
<td>1.87</td>
<td>0.68</td>
<td>0.79</td>
<td>0.98</td>
</tr>
<tr>
<td>201 to 300 feet</td>
<td>0.77</td>
<td>1.90</td>
<td>0.93</td>
<td>0.71</td>
<td>0.99</td>
</tr>
<tr>
<td>301 to 400 feet</td>
<td>0.69</td>
<td>0.86</td>
<td>1.39</td>
<td>0.70</td>
<td>1.01</td>
</tr>
<tr>
<td>401 to 500 feet</td>
<td>2.32</td>
<td>1.18</td>
<td>0.47</td>
<td>0.47</td>
<td>0.99</td>
</tr>
<tr>
<td>More than 500 feet</td>
<td>0.97</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Result of near-repeat analysis of violent crimes in Rochester from 2010-2012:
- 2207 incidents: murder, assault, robbery
- Bright Red means this incident has a p=0.001 value
- Dark Red indicates P=0.05 or better
- A score of 1.00 indicates the average background risk

Near-repeat Calculator
- Tool developed to analyze sets of geographical coordinates and time data of crimes to determine appearance of near-repeat patterns.
- Uses Monte Carlo iterations to compare the actual pattern of crimes to the expected pattern if there are no near-repeats. The expected pattern is created by randomly assigning dates in the set to locations multiple times and comparing it to the actual set.
- Calculator defaults to Manhattan distance as it is most likely to be a better estimation of distance for urban environments.

Map of police sectors in Philadelphia, PA
- Shows rate of near-repeat originating events to total shootings by sector, based on expected rate of 17% per sector

References

Contact Information
Center For Public Safety Initiatives
Building 1, Room 2183
Department of Criminal Justice
www.rit.edu/cla/criminaljustice/cpsi