Near-repeat Data and Analysis

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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

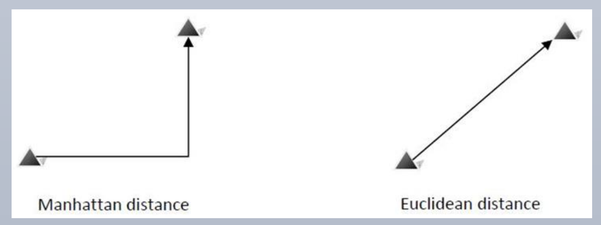
	0 to 7 days	8 to 14 days	15 to 21 days	22 to 28 days	More than 28 days
Same location	**55.11**	0.28	0.23	0.12	0.19
1 to 100 feet	**4.42**	0.39	2.07	1.66	0.93
101 to 200 feet	**1.97**	**1.87**	0.68	0.79	0.98
201 to 300 feet	0.77	**1.90**	0.93	0.71	0.99
301 to 400 feet	0.69	0.86	1.39	0.70	1.01
401 to 500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

Result of near-repeat analysis of violent crimes in Rochester from 2010-2012:

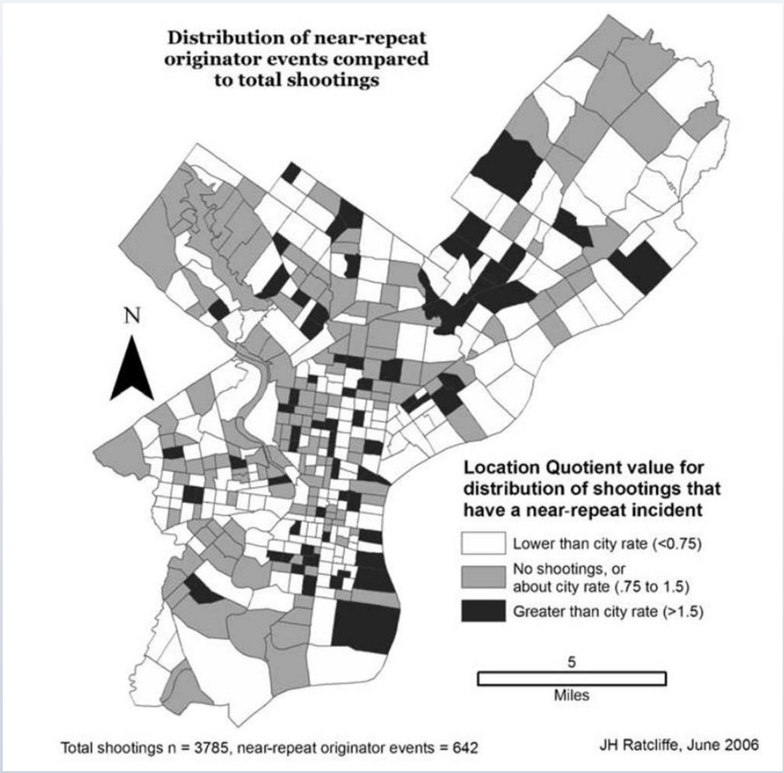
- 2207 incidents: murder, assault, robbery
- Bright Red means this incident has a p=0.001 value
- Dark Red indicates P=0.05 or better
- A score of 1.00 indicates the average background risk

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.



Visualizing Near-repeat Data for Philadelphia



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

Townsley, M. "Infectious Burglaries. A Test Of The Near Repeat Hypothesis". British Journal of Criminology 43.3 (2003): 615-633.

Ratcliffe, J. H., & Rengert, G. F. (2008). Near-repeat Patterns in Philadelphia Shootings. Security Journal, 21(1-2), 58-76.

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