WHERE IS OUR BATMAN?
Chicago Crime Throughout the Day

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Introduction
• Study analyzes changes in crime distribution in Chicago throughout the day, showing correlations and centers of crime at specific times
• Null hypothesis states no change in crime amount and distribution throughout the day in Chicago

Data
• Three categories of crime:
  • Category 1: Theft, burglary, robbery, motor vehicle theft
  • Category 2: Homicide, kidnapping, assault and battery
  • Category 3: Stalking, criminal sexual assault
• Five crime maps created, each representing a time period during the day:
  • 1 AM to 5 AM
  • 5 AM to 12 PM
  • 12 PM to 6 PM
  • 6 PM to 10 PM
  • 10 PM to 1 AM
• Data set contains all crime recorded in the city of Chicago from 2001 to April 2015
• Over 5 million observations in set
• Random sample of size 20,000 was made for each category

Materials
Maps were obtained from Google, R Studio and following R packages used to sequence and analyze data:
• datasets
• fields
• ggmap
• ggplot2
• graphics
• grDevices
• grid
• mapproj
• maps
• methods
• spam
• stats
• utils

Results
Category 1
• Greatest spread: 10 PM-1 AM
• Most concentrated: 12 PM-6 PM
• Downtown crime concentration highest from 12 PM to 6 PM
Category 2
• Greatest Spread: 1 AM-5 AM, 5 AM-12 PM, 6 PM-10 PM, 10 PM-1 AM
• Most Concentrated: 1 AM-5 AM, 5 AM-12 PM, 6 PM-10 PM, 10 PM-1 AM. There are high concentrations of crime in multiple areas.
• From 12 PM to 6 PM, this category is very concentrated in the downtown area
• The concentration and spread is very similar for each time frame in category 2.
Category 3
• Greatest Spread: 12 PM-6 PM
• Most Concentrated: 12 PM-6 PM

Discussion
• Light and dark hours may influence data, but daylight hours change throughout the year
• Usual business hours may affect crime distribution and amount (especially for category 1) but not including weekends
• Limits of each category, as shown by each legend, are different. Category 1 has a limit of 80 and categories 2 and 3 have a limit of 40
• Crimes on this map are only recorded for the City of Chicago, not any of the other surrounding areas. Therefore, maps do not represent all crime in all of the geographical areas shown

Conclusion
Spread and centers of crime are similar for each category, often highly concentrated in downtown area
Null hypothesis is not proven by the change in distribution and amount throughout day for all categories

References Cited

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