



Statistical Analysis of Crime in American Higher Education Institutions

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Introduction and Motivation

Part of choosing a college involves checking its relative safety. Frequently this concerns parents more than the students, but it is a legitimate concern. Are there specific types of schools or specific areas of the U.S. that are more prone to crime? Should students be more concerned?

We examine trends in drug, liquor, and burglary arrests for U.S. colleges, looking specifically at

- The school's geographic location
- The gender ratio
- Whether a school is private or public

Percentage Increase in Various Crimes

Crime	Percent change	Average arrests
Rape	-0.016	0.311
Robbery	0.001	0.226
Drugs	0.184	3.221
Murder	1.143	0.001

Table 1: Table of percent change in various crimes.
There does not appear to be an even trend in crime growth.

As shown in this table, there was no even trend amongst various crimes.

- There was a decrease in rapes, although the total is still high.
- The robbery rate remained fairly constant.
- Arrests for drug use are high and increasing.
- Murders increased 100%, due to the Virginia Tech shootings and the extremely low number of murders otherwise.

Sources

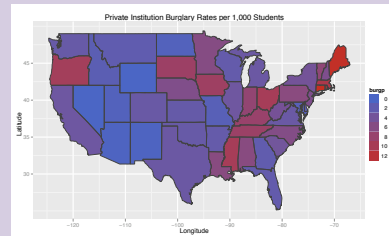
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List of U.S. states by population density. (2010). Retrieved from http://en.wikipedia.org/wiki/List_of_U.S._states_by_population_density

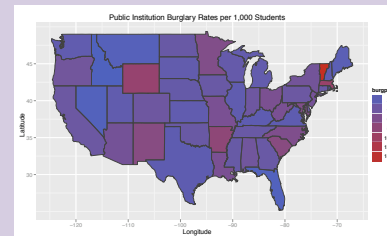
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Comparison of Private and Public Institution Burglary Rates with Geographical Focus



- Geographically the higher rates of burglaries occur at institutions in the Eastern half of the country.
- Private institutions feature many more universities with higher burglary rates than public institutions.

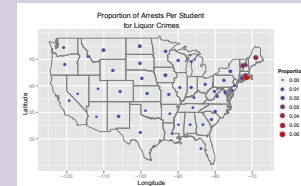
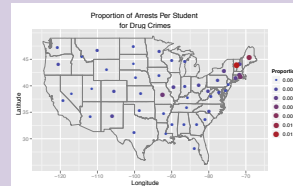


In comparing private institutions and public institutions, a subset was used that only contained four year institutions. Additionally, the private institutions that were used in the data were non-profit.

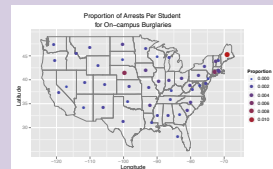
Drugs and Liquor in the Northeast

There appears to be a trend between geography and the proportion of arrests for drug and alcohol violations.

- There's a cluster in the Northeastern states.
- There's also a small relation between number of drug and number of alcohol violations.
- $r = 0.46$

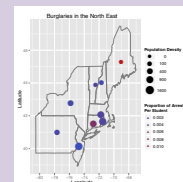


Lack of Effect of Population Density on Burglary Rates



A similar trend as above appears for burglary rates.

- There is another cluster of Northeastern states.
- Nebraska is an outlier. However, its proportion is in the middle of the spectrum.

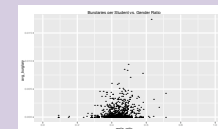


There is a common assumption that high population density leads to higher crime but as evidenced by this graph of burglaries and city population density.

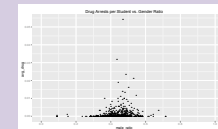
- The highest proportion of arrests occurs in the one of the least dense areas.
- The next highest proportion occurs in one of the densest areas.
- There does not appear to be a significant correlation ($r = -0.03$).

The Effects of Gender on the Frequency of University Crimes

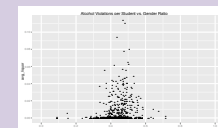
The overall distribution of schools over ten thousand students is centered at around .428 and is negatively skewed. This means there are more outliers in terms of ratio of males to females with a high percentage of females than a high percentage of males.



- Frequency of burglaries seems to be more prevalent in schools with higher male ratios.



- Drug citations have a similar distribution to alcohol violations, but show a much less pronounced peak and a flatter distribution.



- The distribution of alcohol violations shows that violation frequency is more prevalent in as the split between males and females becomes more even.

Conclusion

Our analysis of crime data from 2006 to 2008 of American higher education institutions supports conclusions that:

- Schools in the eastern part of the united states have higher burglary rates per student
- Schools with higher proportions of males have higher burglary rates
- Institutions in the northeast have much higher drug and liquor violations per student (violations resulting in arrest)
- The population density of cities does not appear to have a causal or correlated relationship with on-campus burglary rates
- Four year private institutions have much higher burglary rates per student than four year public institutions