Crime Rates in Massachusetts

Introduction:

Over the past decade, crime rates have dropped nationally and locally. The decrease, however, has not been uniform. A series of risk factors believed to be associated with regionally elevated crime rates will be examined in relation to a variety of crime rates from the early and late 1990's across Massachusetts. The risk factors to be assessed are as follows:

1.) Median Income - Poverty is understood to be one of the most volatile risk factors that drives people to crime. Higher crime rates are typically associated with low-income regions.

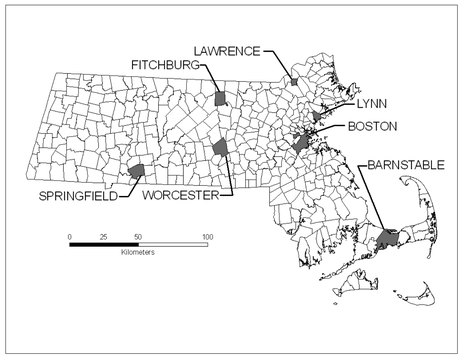
2.) Police Staffing - By the logic of ratios, the more police are employed per capita in a city, the lower the crime rate should drop. The complications associated with isolating this factor will be addressed in a pair of corollary questions.

A.) The relationship between median income and police employed in a district.

B.) The temporal relationship between crime rates and police employment.

3.) Population Change - High population density is another indicator of poverty. It is understood that crime rates are higher in densely populated urban regions compared to more sparsely populated suburbs.

To best illustrate the differential crime rates, I will examine key cities that illustrate the most drastic crime rates and compare the acknowledged risk factors. The cities to be discussed will be Boston, Springfield, Worcester, Barnstable, Fitchburg, Lynn and Lawrence, as well as smaller cities that illustrate the relationships discussed.

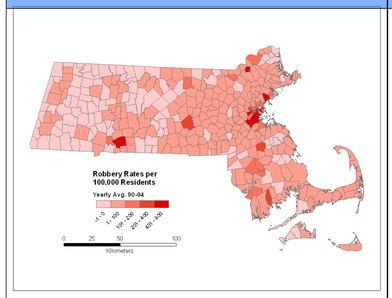


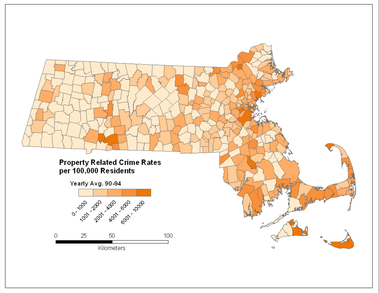
Methods:

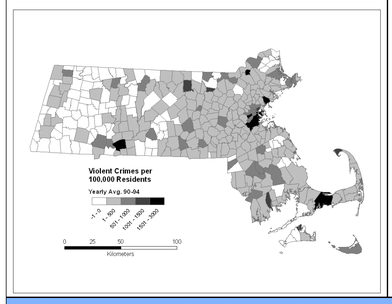
To qualitatively analyze the risk factors for crime in Massachussetts, data was downloaded from MassGIS with town specific values for a series of crimes - violent crimes (murder, rape, aggravated assault), robberies, and property crimes (burglary, larceny, motor vehicle thefts). All crime statistics are mapped as ratios (sum counts of crime per 100,000 residents) in efforts to more accurately map crime prevalence in communities, whereas total crime counts would ignore small communities regardless of crime rate. These data layers were available by year, so in efforts to provide a temporal relationship, a decade of data was compressed into two sets of maps illustrating yearly averages of the first and second halves of the ten year period (1990 - 1994, 1995 - 1999).

Data for the risk factors was obtained both from MassGIS and the U.S. census TIGER© data layers. Police employment (by municipality per 1,000 residents) data from MassGIS was manipulated into two maps the same way the crime statistics were, previously mentioned. Population change is presented on a single map as a yearly average within the decade, derived from the population data (given for 1990 and 2000) contained in the MassGIS crime stats layers. Socioeconomic status (illustrated through median household income by census tract, not town) was retrieved from U.S. census data for 2000, and is assumed to have not changed drastically over the course of the decade. The disparity between town boundaries and census tract boundaries still allows qualitative comparisons between median income and the other factors examined, but must be explained as regional as opposed to city specific.

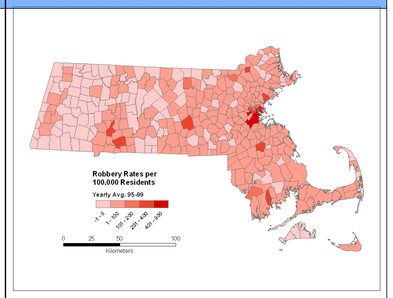
Crime Statistics by Town: 1990-1994

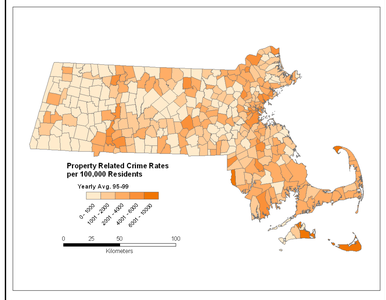


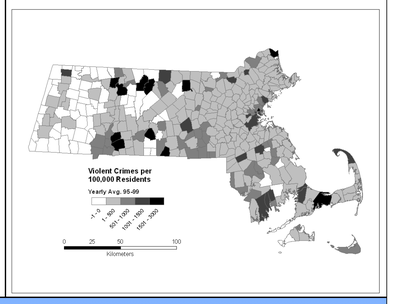




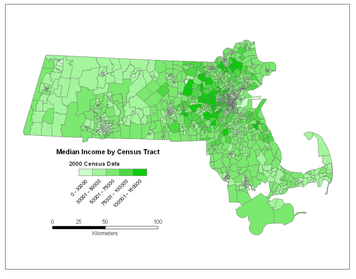
Crime Statistics by Town: 1995-1999

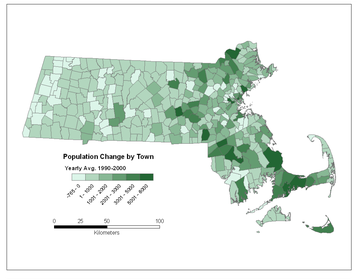


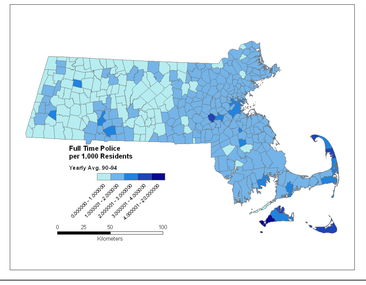


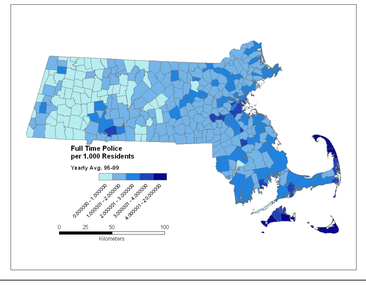


Risk Factors









Results:

Examining the risk factors in each of the highlighted areas, the relationships become apparent. The map of median income by census tract points glaringly toward poverty as the source of crime. All of the crime hot-spots occur in low income regions. These are urban municipalities with high population density (as observed by the relative small size of census tract clusters comprising the city, excluding Fitchburg and Barnstable, which include fewer, larger census tracts indicating a lower population density than the other highlighted cities.

Police staffing does not provide great insight into crime rates as a static quantity. The shift over the decade, however, yields some interesting conclusions. As could be assumed, higher income municipalities such as those on Martha's Vineyard and Nantucket and the wealthier suburbs of Boston (often associated with lower crime rates) employ a higher rate of police officers per 1,000 residents than lower income municipalities, purely as a function of city taxes providing the resources for a relatively large police force. There is a shift, however, in poor crime ridden areas (Springfield, Worcester, Fitchburg, Barnstable, Lynn, Boston) over the decade to a higher ratio of police to residents. This trend is a reaction to high crime rates, as the most notable police-force growths appear in the crime hotspots, as well as in several of the smaller, richer towns. Examining the crime maps temporally, those high-crime cities with increased police force show a slight decrease (or no change) in both robbery and property crimes, which agrees with the hypothesis that increased police force decreases crime rates. Violent crimes also decreased in the eastern crime cities (Boston, Lynn, Lawrence), but in the southern and central/western crime cities, violent crime rates have increased. This disparity between violent crimes and others leads to the understanding that premeditated crimes rooted in individual need (which can be achieved through accumulation of wealth, in otherwords, poverty crimes) is quelled by increased police, whereas violent crimes committed without thoughts of punitive measures, are committed regardless of amount of police.

Finally, the relationship between population and crime rates must be addressed. As previously stated, the relative small size of the census tracts collectively forming the larger, poorer cities is evidence of overall higher population. The map of population change over the decade, however, indicates communities reactions towards their communities elevated crime rates. First acknowledging an overwhelming eastward trend throughout the state (population decrease in the west, and increase in the east), the crime hotspots discussed here have either decreased population (Springfield, Fitchburg) or increased only slightly (Boston, Worcester, Lawrence). Decreased population leads to less taxable income to fund police departments and an overall shift towards city desolation. Only Lynn and Barnstable showed large population increases.

Conclusions:

After assessing the risk factors' relationships to crime rates, a ranking of the risk factors presents itself. First and foremost, low socioeconomic status proves to be the defining characteristic of crime hotspots. Crime is poverty driven, and is not merely a defect of the guilty party. Second, police force size as compared to community size shows a trend for decreasing the majority of crimes. Finally, in that high population density is strongly correlated with low income, population change can best be described as a resultant factor of high crime rates. Citizens tend to move out of dangerous, crime ridden areas if they can, which over time would lead to the abandonment

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Sources: MassGIS - Crime Statistics by Municipality (UCR)
Police Employment by Municipality
U.S. Census TIGER© Files - Median Household Income by Census Tract in MA