**Correlation between Murder and poverty rate in the United Stated**

**Introduction**

It is often assumed that poverty and murder are strongly related. This paper focuses on the rate of murder and poverty in the United States for a period of 12 years. In order to make the study more efficient a sample of 21 states was taken. The states included in this study are New Jersey, Minnesota, Colorado,Alaska,Florida,Ohio,Michigan,California,NewYork,Tennessee,Alabama,Texas,Kentucky,Georgia,Pennsylvania,North Carolina, South Carolina, Arizona, Montana, Virginia, New Mexico.

**Methods**

Data were collected on murder and poverty rates in the United States from 1999 to 2011. The data was collected from Table 1 Crime in the United States 1992-2011 published by the FBI. We decided to calculate the correlation coefficient and the linear regression of the 21 states to see if poverty and murder rates were related.  
 In order to see if there is a comparison, we decided to centralize our study in three states, California, New York and New Jersey. The data for poverty was collected for Los Angeles, CA, New York, NY and Pleasantville, NJ from index mundi for the years of 2006-2009. The data for murder was collected from city-data for the same three states for the years ranging from 1999 to 2011. We did the p-value test to see if poverty rates and murder rates are similar to each other in the individual states.   
  
  
  
**Results**

The results for poverty and murder rates in the 21 states showed a weak positive correlation.

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| Country | Poverty Rate | Murder Rate |
| New Jersey | 9.5% | 3.7% |
| Minnesota | 11.1% | 1.5% |
| Colorado | 12.4% | 3.2% |
| Alaska | 12.1% | 3.2% |
| Florida | 14.6% | 5.5% |
| Ohio | 13.5% | 5.0% |
| Michigan | 14.2% | 6.3% |
| California | 15.5% | 5.4% |
| New York | 15.9% | 4.0% |
| Tennessee | 16.7% | 7.4% |
| Alabama | 16.8% | 7.1% |
| Texas | 17.4% | 5.4% |
| Kentucky | 17.1% | 4.3% |
| Georgia | 18.5% | 6.0% |
| Pennsylvania | 11.2% | 5.4% |
| North Carolina | 17.0% | 5.4% |
| South Carolina | 13.8% | 6.7% |
| Arizona | 21.3% | 5.5% |
| Montana | 13.5% | 3.2% |
| Virginia | 10.8% | 4.7% |
| New Mexico | 17.9% | 10.0% |
|  |  |  |
| Sum | 310.8% | 108.9% |
| Mean | 14.8% | 5.2% |
| Sxy | 0.005924 |  |
| Sxx | 0.018032 |  |
| Syy | 0.006640571 |  |
| r | 0.541365249 |  |
| b | 0.328527063 |  |
| a | 0.003235138 |  |

The correlation coefficient shows that r is 0.541, which shows that there is a positive correlation, but it isn’t as strong as expected. As the linear regression line displays, the rates are not scattered far away from the line, but they aren’t that very close to the line either. The linear regression line has a positive slope, which proves the positive correlation.   
  
After calculating the p-value test we saw that New York and Los Angeles as well as New York and New Jersey they are the same at 1% level of significance but it is not the same at 5% level significance. On the other hand, New Jersey and Los Angeles aren’t the same at neither 1% nor 5% level of significance.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| People of all ages in poverty - percent, 2006-2010 - (Percent) | | | | | |  |  |
| New York | |  | Los Angeles, California | | | New Jersey | |
| County | Value |  | County | Value |  | County | Poverty Rate |
| Albany | 12.60% |  | Alameda | 11.40% |  | Atlantic | 11.80% |
| Allegany | 16.50% |  | Alpine | 13.10% |  | Bergen | 5.80% |
| Bronx | 28.40% |  | Butte | 18.40% |  | Burlington | 5.50% |
| Broome | 15.50% |  | Calaveras | 8.30% |  | Camden | 11.20% |
| Cattaraugus | 16% |  | Colusa | 15% |  | Cape May | 9.20% |
| Cayuga | 12.10% |  | Contra Costa | 9% |  | Cumberland | 15.50% |
| Chautauqua | 17.10% |  | Del Norte | 22% |  | Essex | 14.60% |
| Chemung | 15.20% |  | El Dorado | 7.90% |  | Gloucester | 7.10% |
| Chenango | 13.60% |  | Fresno | 22.50% |  | Hudson | 15.10% |
| Clinton | 13.30% |  | Glenn | 17.50% |  | Hunterdon | 4% |
| Columbia | 9.50% |  | Humboldt | 17.70% |  | Mercer | 10.10% |
| Cortland | 14.10% |  | Imperial | 21.40% |  | Union | 9.10% |

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| P-test for New York and Los Angeles | 0.494834 |
| P-test for New York and New Jersey | 0.011341 |
| P-test for New Jersey and Los Angeles | 0.006745 |

If the p-value test is less than the level of significance, we reject the null hypothesis. If the p-value is greater than the level of significance, then we accept the null hypothesis. In this case, the null hypothesis was that the 2 states had the same rates for poverty. 0.49 and 0.01 are both higher than 1% but they are both less than 5%. 0.006 is less than both 1% and 5%.  
  
  
After calculating the p-value test we saw that New York and Los Angeles are not the same since they are both less than 1% and 5% level of significance. New York and New Jersey they are the same at both 1% level of significance and at 5% level significance. New Jersey and Los Angeles are the same at 1% and at 5% level of significance.

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| --- | --- | --- | --- |
| Year | New York, New York | Los Angeles, California | Pleasantville, New Jersey |
| 1999 | 9.0% | 11.6% | 6.0% |
| 2000 | 8.7% | 14.8% | 0.0% |
| 2002 | 7.3% | 17.1% | 5.2% |
| 2003 | 7.4% | 13.4% | 20.9% |
| 2004 | 7.0% | 13.4% | 15.7% |
| 2005 | 6.6% | 12.6% | 5.2% |
| 2006 | 7.3% | 12.4% | 5.3% |
| 2007 | 6.0% | 10.2% | 15.9% |
| 2008 | 6.3% | 10.0% | 5.3% |
| 2009 | 5.6% | 8.1% | 21.2% |
| 2010 | 6.4% | 7.6% | 15.8% |
| 2011 | 6.3% | 7.7% | 14.8% |

Murder rates for New York, NY; Los Angeles, California; Pleasantville, NJ

Murder rate graph

|  |  |
| --- | --- |
| NY & LA | 2.57003E-05 |
| NY & NJ | 0.053525218 |
| LA & NJ | 0.406294318 |

The p-value for New York and Los Angeles was 2.057003E-05 showing that it’s less than 1% and 5%. The p-value for New Jersey and New York shows that 0.053525218 is greater than 1% and 5%. Lastly, the p-value for Los Angeles and New Jersey shows 0.406294318 is greater than 1% and 5%.

**Conclusion**

This shows that murder can be due to other factors than just poverty. Many other factors, such as unemployment, population density, minority population, age distribution, and locality in the US, are correlated with crime and affect poverty as well. Another reason is that different states have distinct police force; therefore crime is controlled more efficiently in some states. Some of the ways in which this problem can be solved are by creating more jobs, and creating intervention programs to prevent teenagers from getting in to gangs or participating in illegal activities.