Fighting property crime with legal aid

OPEN DOOR LEGAL

The effect of the availability of civil legal aid on property crime has been unexplored. In this study on behalf of Open Door Legal, data intelligence specialist HAL24K created a model to predict property crime using 26 parameters, including three tools to fight property crime: the availability of civil legal aid, attorneys and police. It revealed that legal aid is the highest ranked parameter of the three, indicating that it has greater potential than imagined when it comes to fighting property crime.

In the last three decades, property crime has fallen dramatically across the USA. Yet it still prevails in North America's poorest regions and the impact on society can be considerable. However many argue that property crime rates are not purely linked to macroeconomic conditions. To evaluate this argument, we examined the impact of available civil legal aid on crime rates per county.

To predict overall crime rates we built a multivariate regression model based on a large set of national and census data comprising 26 parameters with potential relevance to crime rates in 3,136 US counties. To train the model, a random forest machine learning technique was used on a subset of the data and tested on the remaining data.

Legal aid matters

The trained and tested model can predict 8 types of crime based on the 26 parameters where we concentrated on combined property crime (sum of 3 types of crime*) and violent crime (sum of 4 types of crime). The weights of the parameters in our best model can be interpreted as ranks in order of importance. The most important parameter in the model is population density, which is easy to understand. More densely populated areas have higher levels of property crime. Other high ranking parameters are also 'usual suspects' such as poverty rate, education level, household income and unemployment rate. This tells us that the distribution and census data on the population can, in a large part, explain the crime rates.

Data and parameters
As a basis for legal aid representation, we used the number of civil legal aid attorneys available per 10,000 people living in poverty, per state. To limit correlation without causation, we combined legal aid representation data with census data, crime rates, number of attorneys and the number of police officers per 10,000 population per county. To overcome the per state data with the per county data, we calculated the legal aid attorney 'density' per county to minimize the artificial positive correlation with the population and thereby give a better overview on how legal aid attorneys are distributed. A possible bias was introduced here using this approach, but until another dataset with legal aid attorneys is available, this is the best approach. Examples of the other parameters are: population density, rural-urban continuum code, poverty rates, Gini index, birth rate, death rate and several levels of education levels.
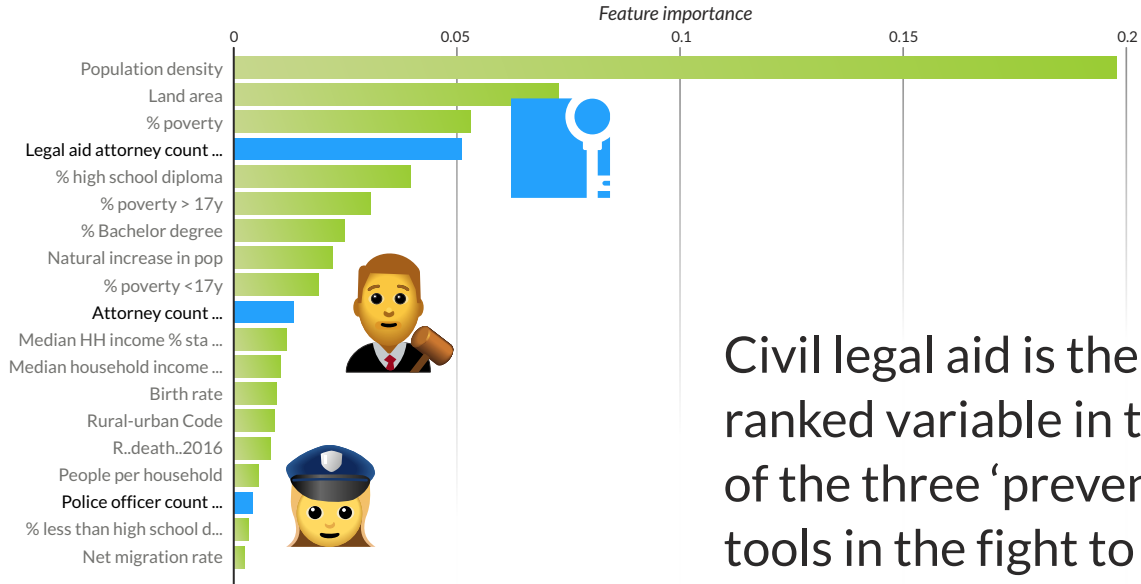
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The outcome of the combined property crime model shows that civil legal aid is the highest ranked variable in the model of the three 'preventative' tools in the fight to reduce overall property crime; the other two being attorneys at law firms and the police. Civil legal aid ranked 4th out of 26 parameters, while general attorneys ranked 10th and the police force ranked only 17th. Looking at the outcome of the violent crime model, this showed the importance of the police ranked 10th while legal aid and attorneys did not have a significant contribution to the model at all.

While the model does not answer how legal aid affects the fight against property crime, the underlying implication is that civil legal aid has a significant role to play beyond providing access to justice. It can contribute to reducing overall property crime and merits far greater investment.

Feature importance when predicting combined property crime

Feature importance

Population density
Land area
% poverty
Legal aid attorney count ...
% high school diploma
% poverty > 17y
% Bachelor degree
Natural increase in pop
% poverty <17y
Attorney count ...
Median HH income % sta ...
Median household income ...
Birth rate
Rural-urban Code
R..death..2016
People per household
Police officer count ...
% less than high school d...
Net migration rate

0   0.05   0.1   0.15   0.2

Civil legal aid is the highest ranked variable in the model of the three 'preventative' tools in the fight to reduce overall property crime

Footnote: * Property crime consists of larceny, burglary, motor vehicle theft and arson. In this study arson was not used in the model for combined property crime as the data set is likely incomplete.

About Open Door Legal
Open Door Legal is an award-winning nonprofit, pioneering the country's first system of universal access to civil legal representation. The organization is also committed to testing its work through systematic data collection and analysis and, to date, has demonstrated that poverty can be dramatically decreased when everyone has access to the law.

About HAL24K
HAL24K is a Data Intelligence scale-up based in San Francisco, Amsterdam and London, delivering operational and predictive intelligence to cities, countries and companies. It combines advanced data science techniques – such as machine learning and deep neural networks – with modelling, analysis and visualization through its SaaS-based Dimension platform, to enable real-time data-driven decision making in complex and multidimensional environments. This optimizes resources, avoids disruptions and saves costs.

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