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Using geography to prevent crime

The use of geographic information systems (GIS) has emerged as one of the most important developments in crime analysis and investigation in recent years. By combining geographic principles and geocoded (spatial) location data with crime data and criminological theories, GIS allow the analysis of crime incidents across time and space. Crime maps developed using GIS have typically been used for hot spot mapping at a local or jurisdiction level, such as to determine policing priorities and allocate crime prevention resources (Weir & Bangs 2007). Geographic profiling uses the location of a related series of crimes to help investigators identify the likely residential locations of serial killers, rapists and arsonists (Rossmo 2000).

While crime mapping has mainly been used to retrospectively analyse crime patterns, a recent UK study examined the use of prospective mapping to forecast residential burglary (Johnson et al. 2007). The authors drew on earlier findings that the risk of burglary is not evenly distributed but is clustered in time and space. Burglary follows a similar model to communicable disease and when a home is burgled, the risk of burglary to nearby homes increases quickly. The risk spreads rapidly, but then decays over a period of four to eight weeks, returning to a level of risk that is normal for the particular location (Johnson et al. 2007). Merely extrapolating from past patterns will not necessarily help to forecast areas of short-term elevated burglary risk. The authors compared a pilot prospective mapping method with an optimised version of descriptive hot spot mapping already in use across the study area. They found that prospective mapping identified the locations of 78 percent of burglaries that occurred within seven days after a forecast, compared with 51 percent for the retrospective model. Prospective mapping also yielded hot spots that were more solid, defined and able to be translated into patrol areas.

The results from this study suggest that prospective mapping could apply to a variety of other crime types such as assault or motor vehicle theft, be used in conjunction with other forms of intelligence to optimise policing operations and used to identify longer-term patterns that could inform crime reduction partnerships (Johnson et al. 2007).

The utility of GIS for crime prevention in Australia remains strongly contingent on the availability of accurate geocoded data and sound conceptual models. While the ability to construct maps is becoming increasingly available to crime analysts, much remains to overcome problems with inconsistently collected, wrongly coded and non-comparable data, and arbitrarily constructed areas of aggregation (McCarthy & Ratcliffe 2005).

References

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