



Using the vulnerable localities index to identify priority areas for targeting fire safety services

Spencer Chainey*

University College London, Department of Security and Crime Science, 35 Tavistock Square, London WC1H 9EZ, United Kingdom

ARTICLE INFO

Available online 21 May 2013

Keywords:

Vulnerable Localities Index
Priority neighbourhoods
Analysis
Deliberate fires
Malicious false alarms
Fire prevention

ABSTRACT

The Vulnerable Localities Index (VLI) is a popular analytical method used by police agencies in England and Wales to identify residential neighbourhoods that should be prioritised for attention. The VLI uses data on crime, deprivation and socio-demography to form a single composite index value for small geographic areas, which when mapped can assist in determining where to target neighbourhood policing and crime prevention initiatives. Its use has also helped to prompt other public sector partners such as local municipal government agencies to recognise the collaborative role that they could play with the police in helping to address mutual issues of public safety. Fire safety agencies have also expressed interest in the VLI, but to date this has mainly involved offering a supporting role to the police and local community safety partnerships on crime specific matters of public safety, with a focus on fire safety often on the periphery. In part this is due to limited analysis into whether the priority areas identified by the VLI are also areas of key concern to fire services. This research explores this relationship, identifying that the priority neighbourhoods of interest to the police are also areas where there are significantly higher than expected levels of deliberate fires and malicious false alarm calls to the fire service. These findings suggest that in the spirit of partnership working, potential opportunities exist in achieving mutually beneficial gains in improving public safety through the collaboration of fire, police and other local public service delivery.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

An intelligence-led focus in policing and law enforcement has been a contemporary paradigm that has placed significant emphasis on an analytically driven approach for targeting resources [19]. This has included using a range of analytical methods for identifying and understanding features relating to offending behaviour, victimisation and vulnerability, and when and where crime problems take place. In contrast, while prevention is often at the heart of fire service delivery there has been very little focus in practice on the use of similar intelligence frameworks and the use of analysis to support this philosophy. The data features of incidents of crime are similar in content to fire incidents: someone commits the act, someone is on the receiving end of the act (e.g. is personally victimised or requires an emergency service response that addresses a matter of wider public safety concern, such as extinguishing a refuse fire), with the incident occurring at some place at some time. This suggests that analysis techniques used in policing can be replicated for fire prevention and support a more analytically driven approach to fire safety.

* Tel.: +44 20 3108 3203.
E-mail address: s.chainey@ucl.ac.uk

Hotspot analysis has become a popular method for identifying where crime incidents concentrate and assisting in directing the targeting of police responses to tackle these issues [7,20]. Whilst hotspot analysis is an effective tool for helping to determine where incidents may occur in the future [5], it is though singular in dimension in how it aims to identify areas that require attention. That is, it only uses data on previous incidents to determine where these future incidents may occur, rather than considering other variables. This can mean that within a landscape of increasing partnership collaboration between public agencies that work together to tackle public safety issues, a singular view of the problem using data from only one agency can limit engagement from a disparate range of agencies [8,16,13].

In England and Wales many police agencies use an analytical technique called the Vulnerable Localities Index (VLI) to identify neighbourhoods that require priority attention [3]. The VLI uses data on crime, deprivation and socio-demographics to form composite index values for small geographic areas, which when mapped can assist in identifying these priority neighbourhoods. Its use has not only supported the targeting of police resources, but also other local partners responsible for improving public safety, including the local municipal government and the probation/corrections service [4,21]. Its use has also been considered for supporting the fire service in its resource targeting (for example

see [1]), but to date its value has yet to be statistically tested with any rigour.

In this article we explore the value of the VLI in identifying areas that are of interest to fire safety services by exploring the relationship between the locations of a range of fire incidents with the priority areas identified using the VLI. Specifically, we test three hypotheses:

- The distribution of deliberate fires is not related to differences in VLI scores
- The distribution of malicious false alarms is not related to differences in VLI scores
- The distribution of accidental dwelling fires is not related to differences in VLI scores.

We begin by describing the VLI, including a discussion on the data it uses and how these are combined to form a single composite index. This is supported with examples to help illustrate its popular use for a wide variety of community safety interests. Section 3 then describes the method that was used to analyse comparisons between VLI scores for each small area and the spatial distribution of a range of fire incidents. Section 4 presents the results from the analysis, followed by a discussion and conclusions on the value of the VLI for supporting the targeting of fire safety initiatives.

2. The Vulnerable Localities Index

The VLI was created in 2004 as a means for helping police agencies in England and Wales to identify residential neighbourhoods that required priority attention. This was in response to a series of riots in Bradford, Oldham, Wrexham and Burnley in 2001 and the UK Government reviews that followed. These reviews identified the requirement for community cohesion to be a central aim of government, reflected in all policy making, and requiring closer working between local government, police and community leaders in order to counter the rise in social, economic and cultural polarisation [10].

The VLI uses six variables: burglary to a dwelling, criminal damage to a dwelling, income deprivation, employment deprivation, population of young people and educational attainment. These data were chosen following research into variables that would help to identify residential areas where there was likely to be issues of community breakdown, driven by an undercurrent of crime and poor socio-economic conditions [3]. This included drawing from the UK Government reviews of the riots in 2001 [10–12,14] and a history of research into social disorganisation [2,26,6,27,15,17,18,29,25]. That is, which variables could accurately identify neighbourhoods that would warrant further prioritised attention by police agencies? The findings from the riots that took place in England in 2011 [22] also validate the choice of variables that form the VLI.

It is for similar reasons that the VLI has gained interest by Fire and Rescue Services in the UK for identifying areas for prioritised attention. That is, rather than working solely in a response manner, and using retrospective data on fire incidents, can the VLI help fire services identify areas of strategic interest for directing fire safety and prevention programmes, particularly to residential communities? And also, are the areas the VLI identifies that are of strategic interest to the police and other local agencies also of strategic interest to the fire service? Shaw and MacKay [26] and more recently Sampson [25] have helped spirit a research agenda that has shown that the areas that draw heavily from fire response services (and other emergency services) are also places of social disadvantage and social disorganisation. This paper aims

to identify whether the VLI, built on several of the principles illustrated by Shaw and McKay [26] and others, is of practical use to fire services and whether it offers an easy to apply analytical tool that could help promote strategic fire safety and prevention programmes.

The selection of the six VLI variables also had to fit a criteria that would ensure a consistent national approach to determining vulnerable localities, including consistency in the definition of each variable (e.g. the police practice for recording a burglary to a dwelling needed to be consistent in all police areas in England and Wales), the data were available for small areas (including the requirement for any crime data to be accurately geocoded and not suffer significantly from issues of under-reporting), and the data were easy to access by the agency that was calibrating the VLI. In addition, the focus of the VLI to identify residential areas rather than city centres and shopping malls meant that the crime data associated with retail, entertainment and commercial centres were not included as this would bias the identification of these non-residential areas. The two crime variables included in the VLI are available from police crime recording systems, the two deprivation variables can be sourced from the UK's Index of Deprivation, and educational attainment and the population of young people can be sourced from the UK's Census. More details on each data and their specific sources can be found in Chainey [3] and even though it was developed for application in England and Wales, the VLI has been replicated in several other countries where similar crime recording, deprivation measurement and a census of the population exist.

Output Areas (OAs)¹ form the smallest standard form of geographical unit in England and Wales for which population and administrative data are collected, and in many cases form the building blocks to determine neighbourhood areas. Each of the two Census variables for each OA in England and Wales are available to freely download from the UK's Office for National Statistics (ONS) online Neighbourhood Statistics Service (<http://www.neighbourhood.statistics.gov.uk>). The Census in England and Wales is conducted every 10 years, and while there have been some concerns that the accuracy of these data decays as time passes between Census dates, the evidence suggests that the characteristics of the population in these areas remain broadly similar as time passes and that the Census data continues to be the best and most legitimate measure of socio-demography at the small area level [3]. Deprivation data are recorded at Super Output Area level (SOA)², are available for free download from the ONS Neighbourhood Statistics Service, but require these data values to be assigned to the OAs within each of their respective SOAs. Crime data are available as geocoded point data, therefore require an operation in a geographical information system that aggregates these data as a count of crime for each OA. Once these data have been sourced they can be loaded into a freely available VLI Microsoft Excel template for calculation [28].

In order to aggregate these six variables to form the VLI, each variable has to be converted into some normalised form. This requires the crime counts for each OA to be converted to a crime rate, and educational attainment and young population counts to be converted into percentage representations. To do this requires data on the number of households in each OA and data on the total resident population in each OA to also be sourced from the Census and included in the VLI Excel template to calculate these rate and proportion values. Deprivation data in the UK is made available as index values and do not require this normalisation treatment.

¹ An Output Area has an average of 125 households. There are 175,434 OAs in England (165,665) and Wales (9,769).

² Super Output Areas have an average population of 1500. SOAs are built from groups of OAs (typically five)

Download English Version:

<https://daneshyari.com/en/article/10287863>

Download Persian Version:

<https://daneshyari.com/article/10287863>

[Daneshyari.com](https://daneshyari.com)