Analysis of Nominals' Schools and Violent Offences

Data Analytics Lab

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The purpose of this project is to undertake exploratory analysis of data held within WMP systems relating to school aged violent offenders and the offences they commit in order to inform the geographical focus of the Violence Reduction Unit's prevention activity in schools. It is concluded that there is not enough information to develop the originally intended origin-destination matrix.

1 Contents

2 Introduction

This project was requested by Project Guardian and the West Midlands Violence Reduction Unit (VRU).

The VRU is a collaboration of specialists from local government, health, education, police, and criminal justice who work alongside partner organisations and communities and whose remit is to reduce serious violence.

Project Guardian is the West Midlands Police (WMP) team aligned to the VRU. Both receive funding from the Home Office and the Office of the Police and Crime Commissioner (OPCC).

The VRU Strategic Needs Assessment[1] states that in the West Midlands:

> "Violence of all types is high compared to other parts of the country and some kinds, such as knife crime, are showing worryingly steep increases in recent years. In 2019, the West Midlands experienced the biggest annual increase in knife crime of any area in England – up 17% on 2018."

Reducing violence is a Force priority and therefore WMP is a committed partner in the VRU which promotes an evidence-based, public health approach to violence reduction[2]. Project Guardian also supports the Force's ambition to *Act with Precision* which means responding to identified threat and risk by deploying the right people, in the right place, at the right time.

Given the youthful demographic of the West Midlands and the prevalence of violence involving or affecting children, a key strand of the prevention activity undertaken by the VRU is situated within schools. Whilst violent hotspots may occur in the locations where children live, socialise or travel to and from school, the intervention activity needs to be located in the place where they attend school. Therefore this analysis aims to help the VRU identify the schools which educate relatively more children who are known to come from locations which suffer from higher than average levels of violence.

Currently, the VRU uses open source and some education data to prioritise which schools to focus its activities in. This exploratory analysis of police data is intended to complement this work by identifying the key locations for violent offending involving school aged children and to understand where violent young offenders live and attend school.

By sharing this data with the VRU the aim is to add value to strategic resourcing decisions by:

1. Identifying any schools appropriate for prevention activity which have **not** been captured in the current VRU list.

2. To assist in the prioritisation of which schools to focus on in order to **maximise the benefits of the preventative activity**.

This will contribute to providing a sound evidence base for long-term investment of resources by the VRU. It supports WMP's Violence Strategy to be an active partner within a whole system approach to preventing violence and collaborating to understand a problem from a range of perspectives.

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[1] West Midlands Violence Reduction Unit Strategic Needs Assessment April 2020 https://westmidlands-vru.org/data-insights/strategic-needs-assessment/

[2] West Midlands Violence Reduction Unit https://westmidlands-vru.org/about/

The results of this analysis will feed into the strategic decision making processes of the VRU Education Team. Examples of the types of initiatives that could be commissioned to support schools as a result of this analysis include[3]:

- Working in schools to deliver training which promotes resilience and reduces risks to vulnerable children and young people who experience violence in their lives.
- Supporting the training and development of education staff to promote a whole school approach to children and young people's emotional health and wellbeing.
- Helping schools adopt tried and tested methods to prevent young people being drawn into activities that may lead to violence. Examples include, virtual reality experiences which generate discussion about the real life situations faced by some groups of children who can be reluctant to engage; and the use of an educational package supported by families of knife crime victims and offenders in prison.
- Linking the support offered by schools, partners and communities to ensure all children get the support and opportunity they need to fulfil their potential and stay in mainstream education.
- Bringing together experts within education so they can share, develop and influence educational approaches that support social, emotional and mental health of young people at risk or affected by violence, for example by adopting trauma informed approaches.
- Using the Cadet and Youth Engagement Officers to enhance the youth voice within the Independent Advisory Groups (IAG) which provide community scrutiny of WMP activity.
- Expanding the provision of Mentors in Violence Prevention from secondary schools to further education; primary schools; faith settings and sports clubs.
- Leading nationally on targeted sports impact activity.

The impact of VRU initiatives are subject to academic evaluation.[4] The University of Wolverhampton's Institute of Community Research and Development (ICRD) has been appointed as the lead evaluator of the West Midlands Violence Reduction Unit, in partnership with the University of Wolverhampton, Birmingham Voluntary Service Council, and the University of Birmingham.

Overall therefore, the aim of the project is to not miss out any children / teenagers who may be at risk of perpetrating violent crimes for the school based prevention activity because they attend a school that is far away from their home location and not located in areas that suffer from relatively high levels of violent crime.

In order to identify such schools it was considered that an origin-destination matrix could be developed. This is essentially a matrix with (for example) wards on the rows, schools forming the columns and proportions of the relevant population in each cell (therefore it indicates the probability of a child / young person living in ward A going to School X).

Such an origin-destination matrix would then enable an assessment of which schools could receive the prevention activities.

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[3] https://westmidlands-vru.org/education/
[4] https://westmidlands-vru.org/evidence-evaluation/evaluation/

3 Data and Analysis

There is a dearth of publicly available data as to the numbers of children / young people who live in a location and attend which schools, therefore only WMP data could be assessed.

For this analysis, nominals aged 17 years or younger were brought into scope if they had committed or were victims of violence against the person.

Two approaches were examined; firstly assessing the wards in order of their relative amounts of violent crime and secondly assessing the relative numbers of young people who had committed violent crimes. Both of these approaches, when compared to the origin-destination matrix, would allow for comparison and prioritization of schools for Project Guardian.

The locations of the relevant nominals' schools were taken from the crimes and compact systems (for recording missing persons). Recording of a nominal's school on a crime report or compact record is at the officer's discretion.

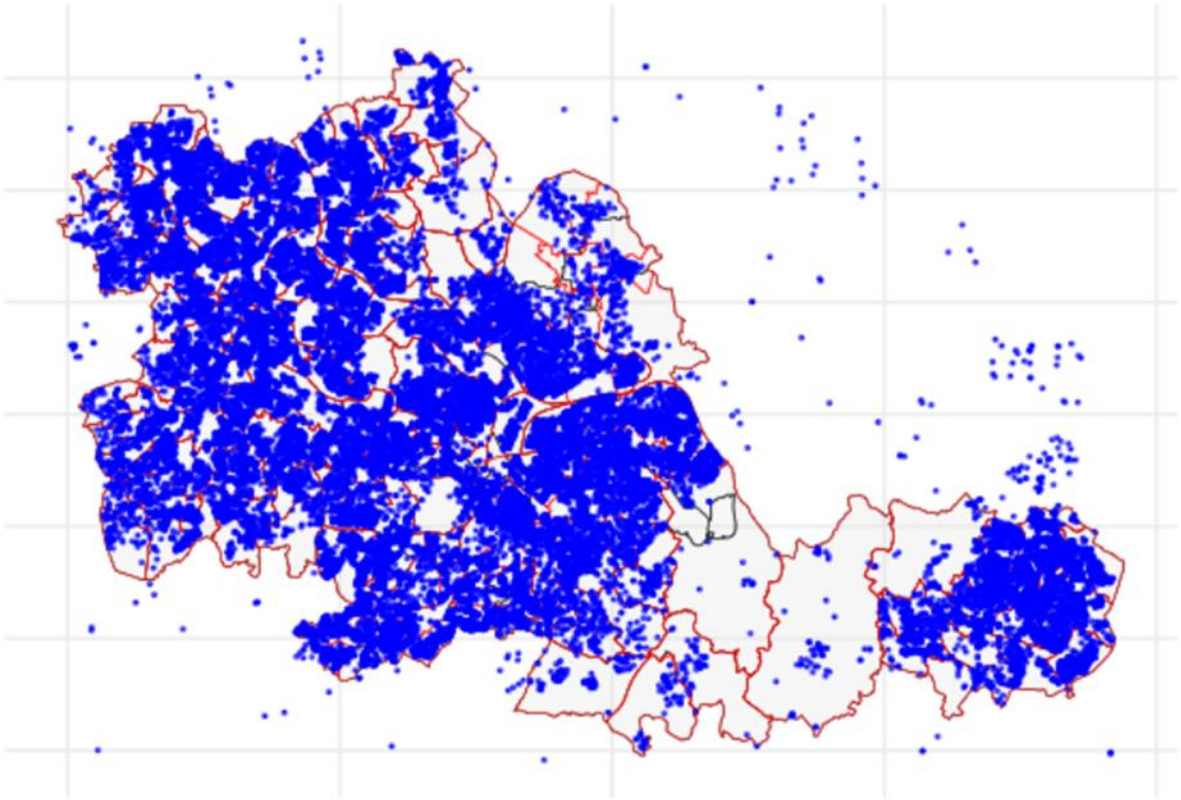

Figure 1: Locations of addresses of young nominals

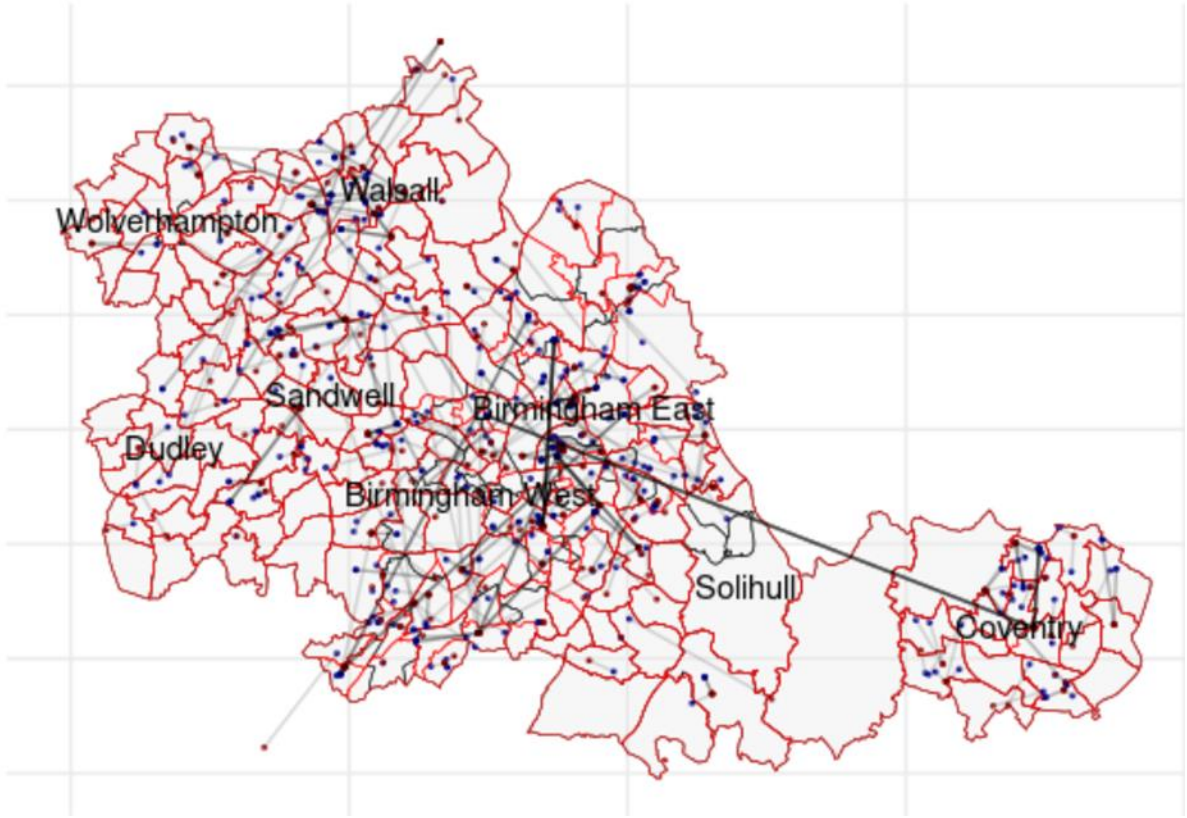

Figure 2: Journeys to school of some nominals

4 Is there enough information?

It is apparent that in terms of the amount of information available regarding the school(s) that young nominals (or indeed, anyone) attend, there is not a large amount. Whilst there is some information relating to the schools attended by nominals who have been involved in violent crimes, the question is whether there is enough information to generate a robust origin-destination matrix.

Whilst the population of young people within the WMP area is some 700,000[5], data regarding the school of nominals in WMP systems relates to a very small fraction of this.

4.1 Measuring Evidence

In order to assess the degree of evidence available regarding the schools attended by relevant nominals, we have made use of Jaynes' (2003) decibels of evidence[6]; details of this are in the appendix.

Using this, the amount of evidence available is $-33.17 dbEv$. The costs of the school based prevention activity is circa £2,022 (essentially teacher training, hiring of equipment and officers' time).

The estimated benefits of preventing violent crime are somewhere between £1,038 (the estimated average cost of violent crime to WMP) and £14,050 (the total unit cost of violence with injury as estimated by the Home Office (2018)).

At the cost to WMP level, the evidence required to reach a break-even point (where the potential benefit – the cost = 0), to prevent the average amount of cost of the violent crime committed by young nominals would be $8.39 dbEv$, considerably more than the amount of evidence available. At the higher end of the potential benefit, the amount of evidence required would be $-11.61 dbEv$ (because the potential benefit is higher, the amount of evidence required is lower).

As noted in Russel (2021), Wilson and Lipsey (2007)[7] synthesised the results of 249 studies that examined the impact of social, emotional and life skills development programmes on aggressive and disruptive behaviours and noted that these programmes reduced violent outcomes in young people by 25%.

If it is assumed that the potential of the intervention programme to reduce violent crime is 25% of the total costs of such crimes examined then the level of evidence required

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[5] Population estimates for 2020, ONS via NOMIS.

[6] There are various means of assessing the amount of uncertainty present in estimates, samples, proportions, etc. available. The usual measure of uncertainty for estimates would be credible / confidence intervals. These are not particularly useful in this case because the number of records available is relatively large (for statistical purposes) which means a relatively low standard error and therefore relatively tight intervals. The question however is not how many records are available, but how many are available in the face of how many juveniles there are in the WMP area.

[7] This is noted in the main reference as Wilson and Lipsey (2017).

would be between $-27dbEv$ and $-15.59dbEv$; again, higher than the amount of evidence available.

It should be emphasized that this analysis is not to equate costs and benefits of the prevention activities *per se*, but as the basis of a decision making process as to whether there is enough information / evidence available regarding school attendance to develop an origin-destination matrix to feed into a prioritization of schools at which to undertake these activities.

The conclusion is no, there is not enough information / evidence available.

Should WMP which to undertake analysis of which schools are attended by which nominals, the mandatory recording of such information may be required (or aggregated information be provided by the local authorities).

Appendix

In this instance, Jaynes' decibels of evidence (dbEv) are calculated as:

$$10\left(log_{10}\left(P(a)/1-P(a)\right)\right)$$

In short, they are 10 times the log to base 10 of the odds of a occurring. In this instance therefore the dbEv can be thought of as a measure of the uncertainty of picking a young person at random from a ward and knowing which school they go to.

The advantage of using this measure of the amount of evidence available is that it contains in one number the uncertainty surrounding knowledge and that it more easily delineates between numbers that if provided in probability would be very difficult for people to appreciate the difference (for example, see the table below).

Prob	0.01	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.99	0.999	0.9999
Odds	0.0101	0.1111	0.25	0.4286	0.6667	1	1.5	2.3333	4	9	99	999	9999
dbEv	-19.956	-9.542	-6.02	-3.679	-1.7601	0	1.7609	3.6798	6.0206	9.5424	19.956	29.996	39.999

References

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