Predictors of illegal weapon-carrying in England and Wales: A social-ecological analysis of risk factors (one-page summary)

These results are preliminary analyses and have not yet been peer-reviewed. The R code on which these results are based is available on request: i.brennan@hull.ac.uk

Background: More than any other behaviour, reducing weapon carrying will have the greatest impact on the global burden of violent harm. This paper seeks to inform the prevention of weapon-carrying by describing risk factors for carrying a gun or knife among a large sample of young people in England and Wales between 2003 and 2006 who were surveyed as part of the Offending, Crime and Justice survey. Despite the age of the data set, no comparable contemporary data set exists and risk factors for weapon-carrying in England and Wales have not previously been modelled using a large sample of the general population of young people.

Theoretical rationale: This paper takes an exploratory approach to modelling weapon-carrying behaviour by including a range of factors at each level of the social-ecological model. Informed by existing theory and evidence, the analysis models the impact of demographics, personal attitudes and disposition; personal victimisation; peer characteristics; area disorder and societal change on weapon-carrying.

Methods: Creating a pooled cross-sectional data set from four waves of the Offending, Crime and Justice Survey (2003-2006; https://discover.ukdataservice.ac.uk/series/?sn=2000042), the study uses a series of logistic regression models to identify predictors of self-reported weapon-carrying among 10 to 25 years-olds in England and Wales. The data set contains 19,710 completed surveys by 8,003 unique respondents. The list of variables in the model are detailed in the appendix. The variables were modelled as independent sets, then as a full model and, finally, a refined model that used the fewest possible variables to explain the most variance (described below).

Results: 5% of respondents reported carrying a knife or gun at least once in the past year. Each of the variable sets had moderate to large predictive ability (McFadden pseudo-R^2: 0.05-0.46). The weaker sets were interpersonal, personal victimisation and area disorder. Demographic and personal attitudes and disposition were relatively strong. The full model using 14 variables, including all the variables explained 53% of the variance in weapon-carrying behaviour. A refined model, retaining only the seven strongest predictors explained 48% of the variance and correctly classified 80% of individuals in a comparison test data set as weapon-carriers or not-weapon carriers.

	Odds ratio (95% confidence interval)
Male (vs Female)	2.7 (2.12–3.45)
Age	Peak at 15 yrs
Committing violence in the past year (vs Not)	3.1 (2.46–3.29)
Any drug use in the past year (vs Not)	2.6 (2.06–3.29)
Ever been arrested (vs Not)	1.9 (1.39–2.58)
Lack of trust in the police (vs "A lot")	1.2 ("a fair amount") to 3.8 ("Not at all")
Area disorder (linear: 0–6)	1.2 (1.11–1.30)

Discussion:
- As lack of trust in police in the respondent's area increased, likelihood of carrying a weapon increased steeply. Arguably, this is the factor most targetable at a Force or societal level.
- Likelihood of weapon-carrying was much greater in males. It increased steadily until age 15 and then rapidly after age 20 (Figure 1). Ethnicity did not predict weapon-carrying.
- Violence and drug use in the past year or any arrest were all strong, independent risk factors for weapon-carrying. Criminal peers was a weak predictor of weapon-carrying.
- Despite research literature placing a heavy emphasis on fear of victimisation or recent victimisation being the main driver of weapon-carrying, history of offending far outweighed history of victimisation. While fear of victimisation is likely to be one motivator of weapon-carrying, at the population-level, offending-related risk factors are more indicative of weapon-carrying than victimisation-related risk factors.

Iain Brennan, University of Hull (pre-peer review summary)

Appendix 1: Variable sets and *variables*

Demographic: *Sex; Age (and Age-squared); White ethnicity*
Attitudes and disposition: *Recent violent behaviour*; *Drug use in the past year*; *Trust in local police; Ever arrested*
Personal victimisation: *Acquisitive victimisation*; *Violent victimisation*; *Threat victimisation*
Interpersonal factors: *Proportion of peers who have been in trouble with the police*
Area: *Perceived area disorder; Perception of neighbourhood safety*
Societal: *Year of survey*

Figure 1: Relationship between age and likelihood of carrying a weapon