

## **Evaluating the impact of individual alcohol licensing decisions on local health and crime using natural experiments with synthetic controls.**

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### **ABSTRACT (300 words)**

**Background:** Local authorities in England can influence the local alcohol environment by contributing to the licensing process and control the enforcement of existing licenses. However, there remains a gap in the availability of quantitative evidence of effectiveness and impact of these local interventions, including a lack of public health evidence around individual premises. Natural experiments offer the opportunity to evaluate these interventions where formal randomization is not possible. The aim of this project is to evaluate whether it is possible to quantitatively evaluate three natural experiments of alcohol licensing decisions at small spatial scale.

**Methods:** Three natural experiments were identified in different English Local Authority areas by public health or licensing practitioners: (i) the closure of a nightclub and (ii) closure of a restaurant/nightclub following reviews, and (iii) implementation of new local licensing guidance (LLG). Monthly numbers of reported incidents of emergency department admissions for alcohol, ambulance call-outs, and various crimes were obtained at lower/middle-super-output-area level.

Bayesian structural timeseries were used to compare trends to their counterfactuals; approximated by synthetic controls based on other comparable areas.

**Findings:** Closure of the nightclub was associated with temporary reductions in anti-social behaviour (-18%; 95%-Bayesian Credible Interval (BCI) -37%, -4%). Closure of the restaurant/nightclub was not associated with measurable changes in outcomes. There was some evidence that the LLG introduction was associated with a reduction in drunk and disorderly behaviour (-42% (95% BCI -109%, +23%)), while the unplanned end of the LLG may have contributed to an increase in domestic violence (+11% (95% BCI -10%, +35%)).

**Interpretation:** It is possible to evaluate the impact of local alcohol policies, even at the level of individual premises, using this methodology. We provide quantitative evidence that local government actions to influence the local alcohol environment can have a positive impact on health and crime in the area.

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