Project synopsis: Spatial analysis of gambling-related harm in Northern Australia

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Project aims
This project measures the spatial relationships between electronic gaming machine (EGM) venues and gambling-related harm in Northern Australia. We investigate, using Geographic Information Systems (GIS), the catchments (i.e. the spatial range serviced by the venue) of a range of venue types (i.e. casinos, clubs and pubs), the social characteristics of those catchments, and the level of social vulnerability within them. The identification of vulnerable social catchments will provide an evidence-base for EGM licensing across Northern Australia.

Geographic scope of the project
We measure the catchments of EGM gambling venues in several case-study regions across Northern Australia (Figure 1). We selected this region because the relationships between gambling venues and local communities are likely to differ from those found in major metropolitan areas for a number of reasons. In particular, Northern Australia is characterised by:

- seasonal climatic extremes that affect the accessibility of venues;
- vast distances between population settlements;
- a high rate of non-Indigenous population turnover;
- a set of highly mobile subgroups within the workforce (e.g. mining and tourism);
- high levels of relative socioeconomic disadvantage in the rural and remote regions, especially among the large Indigenous population.

Figure 1: Northern Australia
Modelling the distribution of gambling related-harm

We have created a spatial model of gambling-related harm that predicts the locations of hotspots of vulnerability based on the accessibility of EGMs and the socio-economic status of communities (Figure 2).

Figure 2: Gambling vulnerability surface (Doran & Young 2010)

As the accuracy of this model is untested, we will calibrate our predictive model using survey data. A calibrated model will enable us to estimate venue catchments, empirically weight the EGM accessibility and socio-economic status components of the vulnerability model, and assess the accuracy of the model’s predictions (Figures 3 and 4). The calibration process will also allow us to gauge the necessity of introducing additional elements to the model such as venue licensing and the relative locations of other facilities such as shopping centres and bus routes.

Data collection

To accurately identify venue catchments in urban areas we conducted a mail survey of all households in the Geocoded National Address File (G-NAF) in the NT to which Australia Post will deliver unaddressed mail (n = 46,263). In addition, we hand-delivered 2,300 questionnaires to households in Darwin and Alice Springs’ peri-urban fringes. Because G-NAF contains the latitude and longitude of each listed address we were able to precisely geocode the 7,044 responses we received. The questionnaire included questions on demographics, gambling behaviour, gambling venue used and a measure of gambling-related harm (the Canadian Problem Gambling Index or CPGI).

Although the G-NAF has excellent coverage of urban areas, the remote periphery of Northern Australia is not well represented, necessitating the use of other methods. In order to identify venue catchments in remote Northern Australia we conducted qualitative cognitive mapping exercises with social service providers, public servants and Indigenous stakeholders to gauge their perceptions of gambling use for members of specific communities. Responses were mapped using participatory GIS techniques and digitised for further analysis.

Applications

A calibrated, predictive model will enable us to identify communities at high risk of gambling-related harm, potentially enabling treatment resources to be targeted to those groups. Our model will also enable the social impacts of EGM license trading or the opening or closing of EGM venues to be estimated using a tested and replicable evidence base. Testing the model in other locations in urban Australia will allow it to be applied in other jurisdictions.
Publications to date


Young, M., Markham, F., & Doran, B. (in press). Too close to home? The relationships between residential distance to venue and gambling outcomes. *International Gambling Studies*.

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