

A CAUSAL ARCHITECTURE EXPLAINING INCREASED RATES OF ALCOHOL-RELATED INJURIES IN LOWER INCOME AREAS

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Introduction/Issues: Previous studies have identified that (i) alcohol outlet density is spatially related to income, and (ii) alcohol-related injuries are spatially related to alcohol outlet density. We used a mathematical simulation to test the hypothesis that the economic geographic processes that shape alcohol markets partly explain the greater incidence of alcohol-related injuries in lower income areas.

Method/Approach: We constructed a spatial plane with three equidistant towns, each containing 25 spatial units arranged in a five-by-five grid, then uniformly assigned population (1,000 people) and income (\$50,000) to the spatial units. Using parameter estimates from previous studies and accounting for relationships between spatial units, we estimated the distribution of alcohol outlets relative to population and income, and then alcohol-related injuries relative to alcohol outlets. We held constant the income for all spatial units except one, which we increased from \$0 to \$200,000 in increments of \$10,000. For each increment we observed the number of estimated injury events in each spatial unit. We also repeated this simulation in a naturalistic plane representing towns in rural Victoria.

Key Findings: As income increased, the estimated incidence of alcohol-related injuries decreased locally, but increased in all other locations.

Discussions and Conclusions: The increased risk for alcohol-related injury in lower income areas appears at least partly due to outlets being excluded from higher income areas, and locating instead in lower income areas within the same town or in nearby towns. Thus the global economic geographic processes that shape alcohol markets affect local rates of alcohol-related injuries.

Implications for Practice or Policy (optional): The economic geographic processes simulated here represent very general effects likely to occur in most settings. In the absence of intervention that actively shapes distributions of alcohol outlets (e.g., limits to outlet density), alcohol-related injuries will invariably occur more commonly in lower income areas.

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