

# Toronto's entertainment district 'hot-spot' for violence-related injuries

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Each day people living in large urban centres are injured as the result of violent acts such as physical assault. While existing research tells us where such events are most likely to happen, a new study by Canadian scientists has gone one step further.

"While studies have been done on the geography of violent crime, few researchers have looked at what we call the spatio-temporal patterns of violent injury -- not just where these are most likely to occur, but also when," says lead author Dr. Michael Cusimano, a scientist at St. Michael's Hospital in [Toronto](#).

Toronto has a single ambulance service serving the emergency needs of its 2.4 million residents, he adds. Each ambulance dispatch is precisely geocoded by longitude and latitude and also time-stamped, providing unique information about the "where" and "when" of injury.

The researchers analyzed data from EMS, Toronto's ambulance service, which oversees and collects data on approximately 260,000 dispatches per year. The study looked at 4,587 injury-related ambulance dispatches and 10,693 emergency room admissions during 2002 and 2004. Only assault-related injuries -- those caused by a gun, knife, sharp or blunt object, or a body part such as a fist -- were included in the analysis.

Based on data from the EMS, hospitals, and census information, the researchers generated time and location maps for both 24-hour and four-hour daily time periods. The maps recorded the locations of ambulance

dispatches; the land use and socioeconomic characteristics of these locations; and the home addresses of injury victims. Several trends were observed:

- Violent injury events were most likely to take place in areas with more bars, social housing units and homeless shelters, as well as lower-income households. The highest concentration of ambulance calls was for events in the eastern downtown area, followed by calls to neighbourhoods in the west-end, mid-town, and northwest and east of the downtown core.
- Between midnight and 4 a.m., the most prominent "hot spot" for ambulance dispatches for assault injuries shifted to a southwest downtown area, known as the 'Entertainment District. This part of Toronto has relatively few residents with a high density of bars and social clubs.
- Assault-related injuries peaked during the night and early morning hours. One-quarter of all ambulance dispatches happened between 8 p.m. and midnight, another quarter between midnight and 4 a.m.
- The location of violent injury which occurred during the day was generally close to the victim's home address. But this changed later on, when injury locations shifted to "nightlife districts" that did not correspond with the victims' home addresses.

"One of the most interesting things we discovered is that patterns of urban assault-related injury are always changing," says Dr. Cusimano.

"The location of injuries shifted over time—from low income areas during daylight and early evening hours to areas of higher income, lower residential density and higher densities of drinking establishments at

night."

The researchers think the observed shift to night-life districts has implications for preventive interventions such as policy, law enforcement and strategies aimed at alcohol and drug use not only in Toronto but in large cities all over the world that have "entertainment districts".

**More information:** The new study, "Patterns of Urban Violent Injury: A Spatio-Temporal Analysis" was published recently in *PLoS One*, a journal of the Public Library of Science.

Provided by St. Michael's Hospital

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