Investigating and validating methods of monitoring foot-traffic in night-time entertainment precincts in Australia

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Abstract

Background:
Assaults occur frequently in night-time entertainment precincts (NEPs), with rates typically reported using estimated resident population. However, this form of reporting does not accurately represent the number of people within the NEP at the time of an assault or potential fluctuations in density throughout the course of the night. As such, the aim of this study was to assess multiple methods of obtaining an accurate estimate of hourly foot-traffic within NEPs.

Methods:
The validity and reliability of three types of foot traffic counters were assessed. A passive-infrared sensor and two different types of smartphone sensor were installed at two sites in Australia from 2016 to 2018, ongoing (pilot phase: 2016–2017; validation phase: 2018). Researchers also manually counted the number of people walking past through the range of two of these sensors across the course of Friday, Saturday and Sunday nights between 8 pm to 2am.

Results:
Results show a similar trend between the smartphone counts, the sensor counts, and the manual counts; however there was notable variability (43%–267% compared with manual counts). Analysis showed that all measures were significantly positively correlated.

Conclusion:
Reliable counting of the number of people attending nightlife precincts is an important element of ongoing studies into nightlife settings and associated rates of harm. There are multiple methods of estimating fluctuations in foot traffic within a NEP, however, determining the most appropriate method to use requires consideration of the proximity of pathways in the area, budget constraints, and project aims. Of the methods tested, laptop WiFi traffic monitoring programs functioned the least consistently. Specifically designed smartphone sensors overcame this issue; however, they required dedicated power sources. The current study found infrared scanners appeared to be the most accurate across sites; additionally they functioned consistently, and were the simplest method to setup and maintain.

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