

Syndromic surveillance for bicycle-related injuries in Boston, 2007–2010

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Objective

To quantify the injury burden and to identify possible risk factors using bicycle-related injury (BRI) visits at Boston emergency departments (EDs).

Introduction

In May 2001, Boston released a strategic transportation plan to improve bicycle access and safety (1). According to the Boston Transportation Department, ridership has increased 122% between 2007 and 2009 (2). A collaborative public health and public safety task force was initiated in 2010 to foster a safe and healthy bicycling environment.

Methods

The Boston Public Health Commission (BPHC) syndromic surveillance system receives information from ED visits from all 10 acute care hospitals in Boston every 24 hours. Data received include visit date, demographics, ZIP code of residence, chief complaints and ICD-9 CM-coded final diagnosis. Disposition information was reported from 9 of these hospitals in 2010. BPHC collaborated with CDC's BioSense Program to specify a BRI syndromic case definition that combined chief complaint and ICD-9 CM-coded information and excluded motor cycle only related events. Subsyndromes were used to assess the type of injury and severity based upon 47 standard BioSense subsyndromes and 21 subsyndromes developed for this study.

The data sample used for this study included over 2 million visits between 2007 and 2010. Injury visits were categorized at the neighborhood level using a standard ZIP code of residence-to-neighborhood mapping. Results were stratified by age, patient neighborhood of residence, race/ethnicity, gender and disposition (2010 data only).

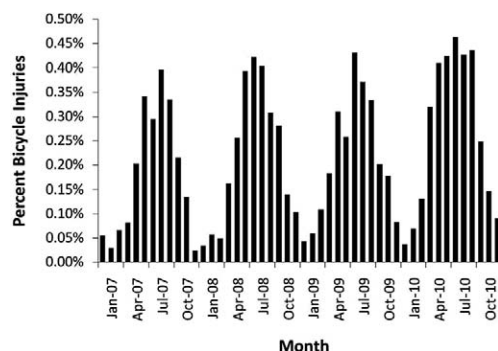


Fig. 1. Percentage of visits at Boston EDs involving bicycle injuries: 2007–2010.

Results

Over the study period, a total of 4510 ED visits were classified as BRIs (0.22%). The percentage of BRI visits increased from 0.18% in 2007 to 0.27% in 2010. The majority of injuries (69%) occurred between May and September (Fig. 1) and likely corresponds to increased bicycling activity during those months.

Seventy-five percent of persons presenting with BRIs were male and 60% reported race/ethnicity as white. Persons aged 18–25 years represented 28% of visits and those aged 6–17 years accounted for 17%. Boston residents accounted for 52% of BRI visits; 15% were from bordering communities. One Boston neighborhood with the highest BRI rate by patient residence also has a large college student population.

Throughout the entire study period (2007–2010), nearly one quarter (1082) of BRI visits were associated with fractures and dislocations; whereas less than 10% of visits were for sprains or strain injuries. Head injuries were associated with 84 (1.9%) of BRI visits.

In 2010, 149 (11%) of the 1411 BRI visits resulted in admission, most commonly for fractures and dislocations. Twenty-two percent were among individuals aged between 50 and 59 years; 21% were among persons aged 18–24 years. Fifty-four percent of all BRI admissions were associated with fractures and dislocations. Thirty-one (2.2%) BRI visits in 2010 were associated with head injuries; of which 11 (35%) were admitted for care. For BRI visits involving falls, 8% were admitted versus 17% for BRI visits associated with a motor vehicle.

Conclusions

Syndromic surveillance can be used to monitor and track BRI and to inform targeted prevention activities such as education and outreach to select at-risk populations (e.g., college students). Presently, information on the environmental context of injuries, such as the precise location of the accident, is limited. As bicycle use increases, improved methods to combine syndromic surveillance, emergency medical services and public safety information are needed to identify accident 'hot spots' to guide implementation of preventive measures.

Keywords

Injury; prevention; emergency; bicycle; syndromic surveillance

References

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