

Title: Establishing an EMS-Based Surveillance System for E-bike Injuries

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Background: In the United States, the popularity of electric bicycles (e-bikes) continues to rise, with a doubling in e-bike imports between 2021 and 2023. Despite increased reports of e-bike related injuries and deaths, there is little standardized surveillance for guiding protective strategies and policies. Marin County Public Health identified the need for more timely and complete surveillance of e-bike involvement in bike accidents and the risk factors associated with these accidents.

Methods: Starting October 10, 2023, Marin County Emergency Medical Services (EMS) administration added a supplemental checkbox field requiring crews to report whether bikes involved in accident responses involved e-bikes or conventional bikes. Demographic characteristics of victims, accident location, whether the accidents occurred in traffic, and treatment disposition were also recorded. Descriptive statistics were calculated to examine the distribution of risk factors for e-bike vs conventional bike accidents, and differences were tested using Two-Sample t-tests and Fisher's Exact tests.

Results: Marin County EMS responded to 55 bike accidents between October 10 and December 4, 2023. 24 percent (13) of these involved an e-bike. E-bike accident victims were on average 7 years younger than those involving conventional bikes (41 vs 47 years, respectively $t=-0.89$, $p=0.38$). Compared to accidents involving conventional bikes, those involving e-bikes were more often driven by a male (80% vs. 58%, $p=0.28$), and involved a teen driver (38% vs 7%, $p=0.01$). Youth aged 10-19 were 3.7 times more likely to be involved in an e-bike accident than residents aged 20 or older. E-bikes accidents were more likely to be involved in vehicle related crashes compared to non-traffic related accidents (38% vs 29%, $p=0.73$).

Conclusions: Emergency Medical Services records of responses to bike accidents can provide timely and specific description of e-bike related harms. In Marin County, e-bikes were involved in 24% of bike accidents, and young males appear to be at highest risk for e-bike accidents that prompt an EMS response. Epidemiology programs can engage local EMS providers to enhance e-bike accident surveillance with minimal required effort to capture this information on a newly emerging cause of injury. Data from this system provides timely insights to complement health systems and death data to focus public health policies and enhance e-bike safety.