

# Impact of Rising Gasoline Prices on Bicycle Injuries in the United States, 1997-2009

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## Background

The trend towards higher gasoline prices over the past decade in the U.S. has been associated with higher rates of bicycle use for utilitarian trips. This shift towards non-motorized transportation should be encouraged from a physical activity promotion and sustainability perspective. However, gas-price induced changes in travel behavior may be associated with higher rates of bicycle-related injury. Transportation-related injury data are needed to anticipate injury prevention strategies.



## Our Questions

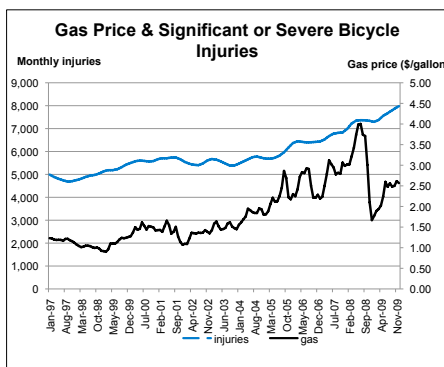
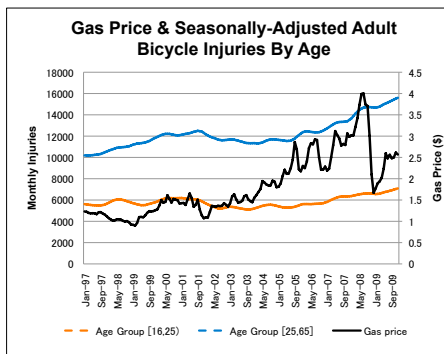
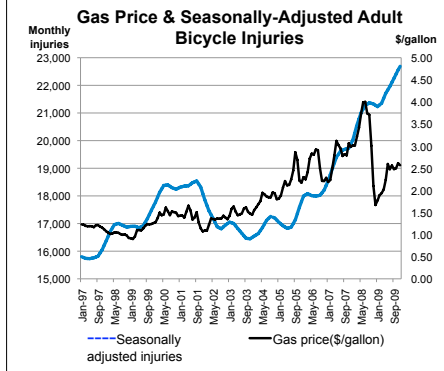
How can bicycle injuries treated in US Emergency Departments be characterized, especially with regards to age and injury severity, and what is the relationship between these injury patterns and gas prices over time?

## Methods

Bicycle injury data for adults (16-65 years) were obtained from the National Electronic Injury Surveillance System (NEISS) database for emergency department visits from 1997-2009. Injury rates were adjusted for seasonal variation using a seasonal decomposition method. The relationship between national seasonally adjusted monthly rates of bicycle injuries, obtained by a time series model, and average national gasoline prices, reported by the Energy Information Administration, was examined using a linear regression analysis. A dummy variable accounted for the unusual increase in gas price in October 2008.

## Results

NEISS records 170,000-250,000 adult bicycle injuries seen in emergency departments annually between 1997 and 2009. National seasonally adjusted rates of bicycle injuries requiring emergency care among adults increase significantly as gas prices rise ( $p < 0.0005$ ). Injury severity also increases during periods of high gas prices (R square 0.8872), with a higher percentage of injuries requiring admission ( $p = 0.0001$ ). An additional 1,149 adult injuries (95% CI, 963-1,336) can be predicted to occur each month ( $> 13,700$  annually) for each \$1 rise in gas price.



## Conclusions

Increases in adult bicycle use in response to higher gas prices are accompanied by higher rates of significant bicycle-related injuries. Supporting the use of non-motorized transportation will be imperative to address public health concerns such as obesity and climate change. However, the results of this analysis highlight that consideration and resources must also be dedicated to improving bicycle-related injury care and prevention to prepare for higher rates of bicycle use in the future. Further research will need to focus on providing specific guidance for trauma care, policy requirements, and built environment design measures necessary to ensure safety in an era of increased non-motorized travel.

