



INSURANCE INSTITUTE  
FOR HIGHWAY SAFETY

HIGHWAY LOSS  
DATA INSTITUTE

[www.iihs.org](http://www.iihs.org)

## Profile of Fatally Injured Pedestrians and Bicyclists in the United States with High Blood Alcohol Concentrations

20<sup>th</sup> International Council on Alcohol,  
Drugs and Traffic Safety Conference

Brisbane, Australia • August 27, 2013

Angela H. Eichelberger, Ph.D.

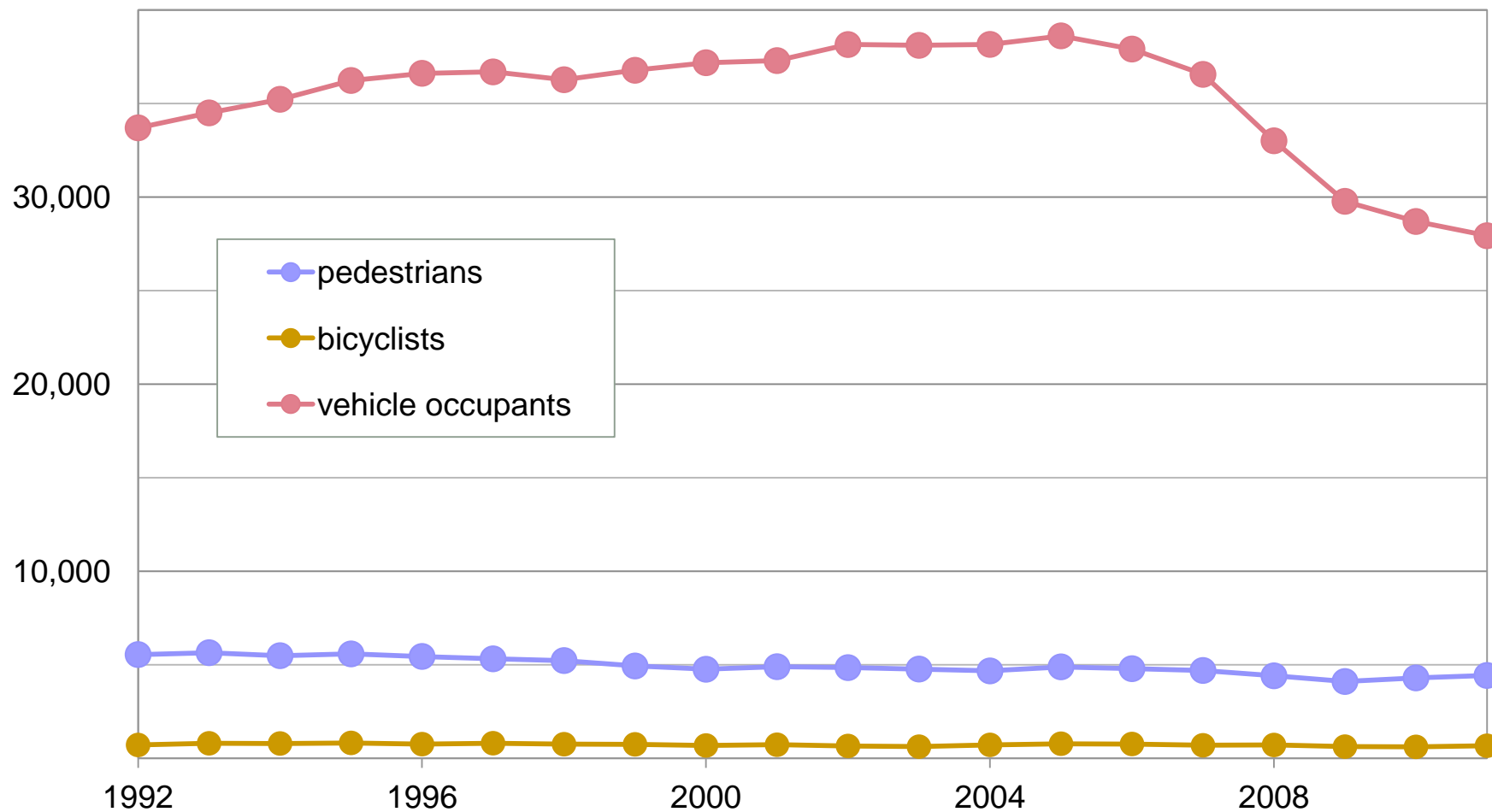
# Co-authors

Jessica B. Cicchino

Anne T. McCartt

# Deaths in motor vehicle crashes

United States, 1992-2011



# Previous studies on role of alcohol impairment in pedestrian and bicyclist deaths

- Alcohol impairment among pedestrians and bicyclists increases the risk of being seriously injured or killed in crashes
- Mechanisms by which alcohol impairment increases risk
  - Degraded psychomotor skills and cognitive functioning
  - Poor decision making
  - Difficulty integrating speed and distance information when selecting gaps in traffic
  - Bicyclists less likely to wear helmets
- Alcohol-impaired pedestrian and bicyclist deaths most likely to occur in young males and at night
- Previous studies are 10-20 years old

# Study objective

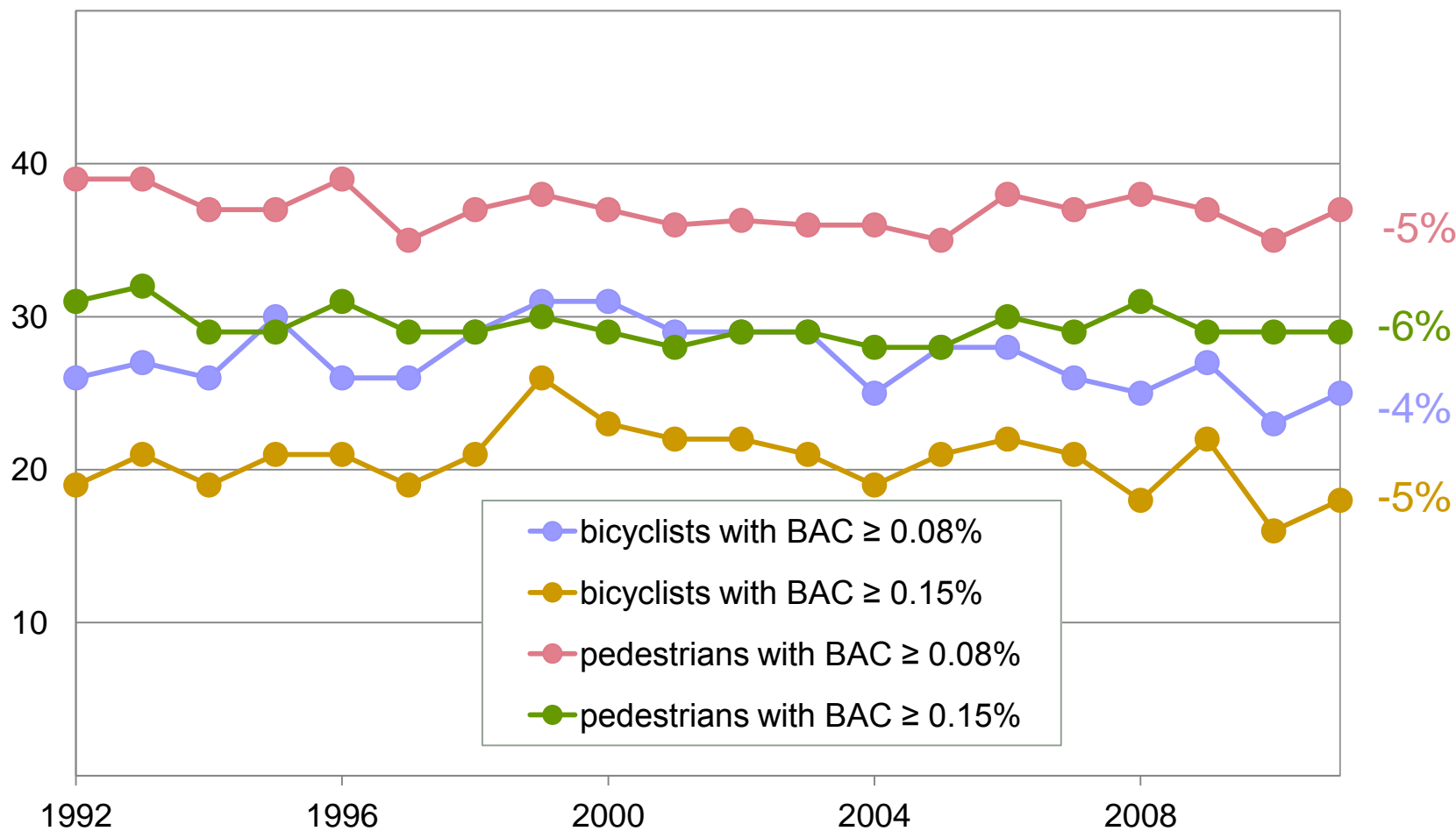
- Provide an up-to-date description of the prevalence, trends, and characteristics of fatally injured pedestrians and bicyclists with high blood alcohol concentrations (BACs) in the United States

# Methods

- Analyzed 1992-2011 data from Fatality Analysis Reporting System (FARS)
  - U.S. census of fatal motor vehicle crashes on public roadways
  - BACs from alcohol tests and imputed BACs when actual BAC not reported
  - Ages 16 and older
- Using most recent 5 years (2007-11), examined percent of fatally injured pedestrians and bicyclists with high BACs ( $\geq 0.08$  and  $\geq 0.15$ ) as a function of various characteristics
  - Characteristics of pedestrians and bicyclists
  - Crash and roadway characteristics
  - Driver characteristics in single vehicle crashes

# Percentage of bicyclists and pedestrians ages 16 and older in fatal crashes with high BACs

United States, 1992-2011



# Crash deaths among pedestrians 16 and older

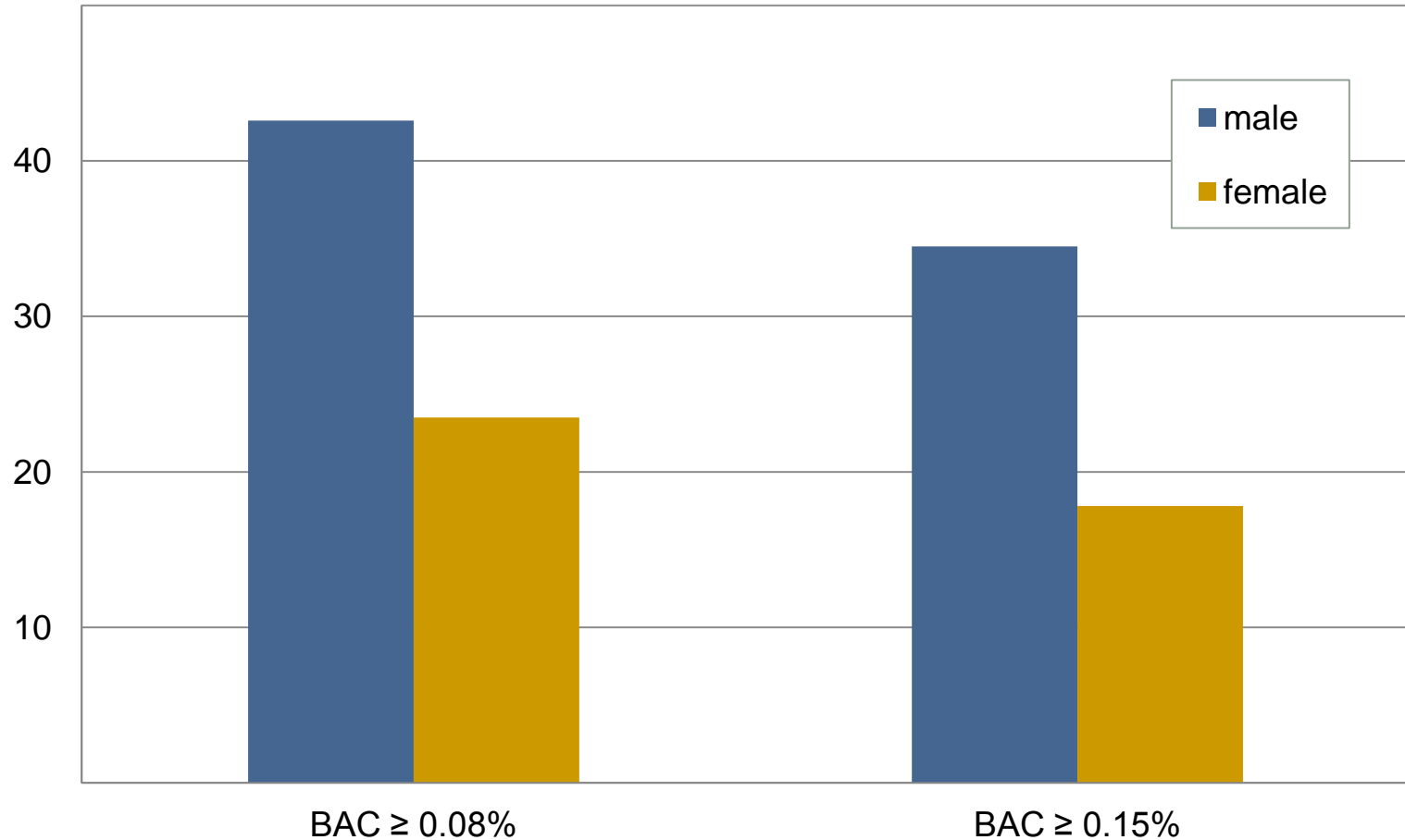
United States, 2007-11

|                                |        |
|--------------------------------|--------|
| total deaths                   | 20,326 |
| percent with BAC $\geq 0.08\%$ | 37     |
| percent with BAC $\geq 0.15\%$ | 29     |



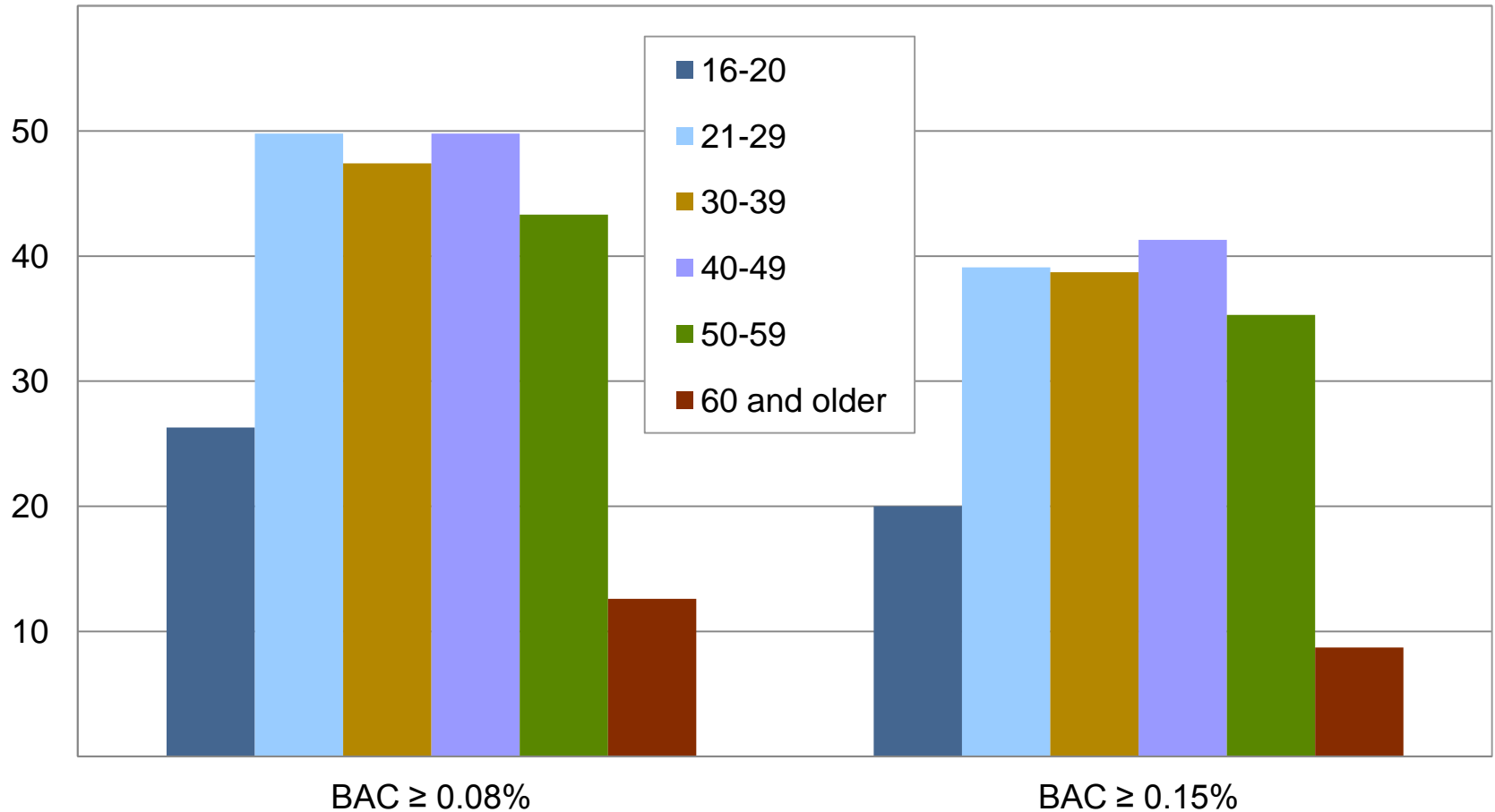
# Percent of pedestrian deaths 16 and older with high BACs by gender

United States, 2007-11



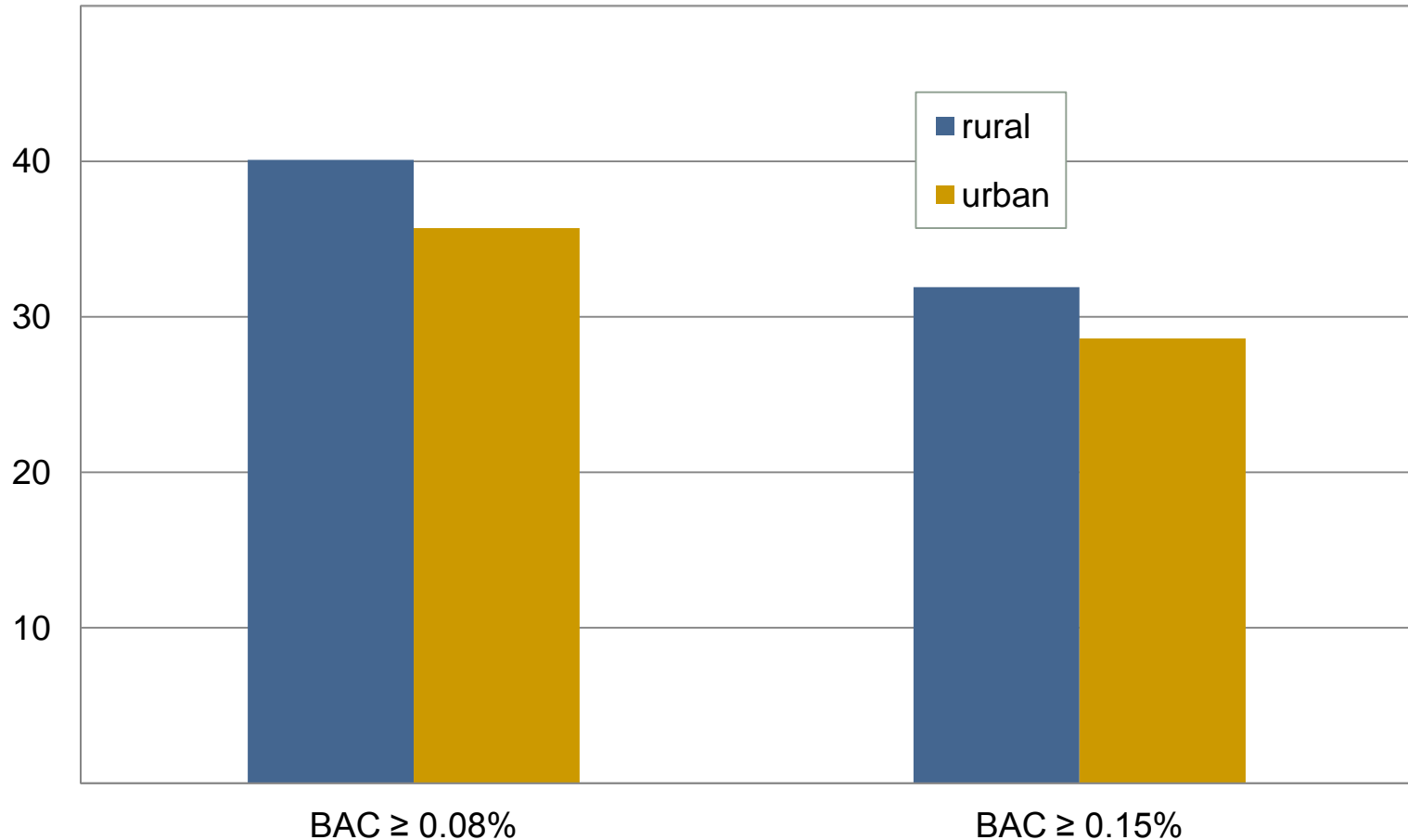
# Percent of pedestrian deaths 16 and older with high BACs by age

United States, 2007-11



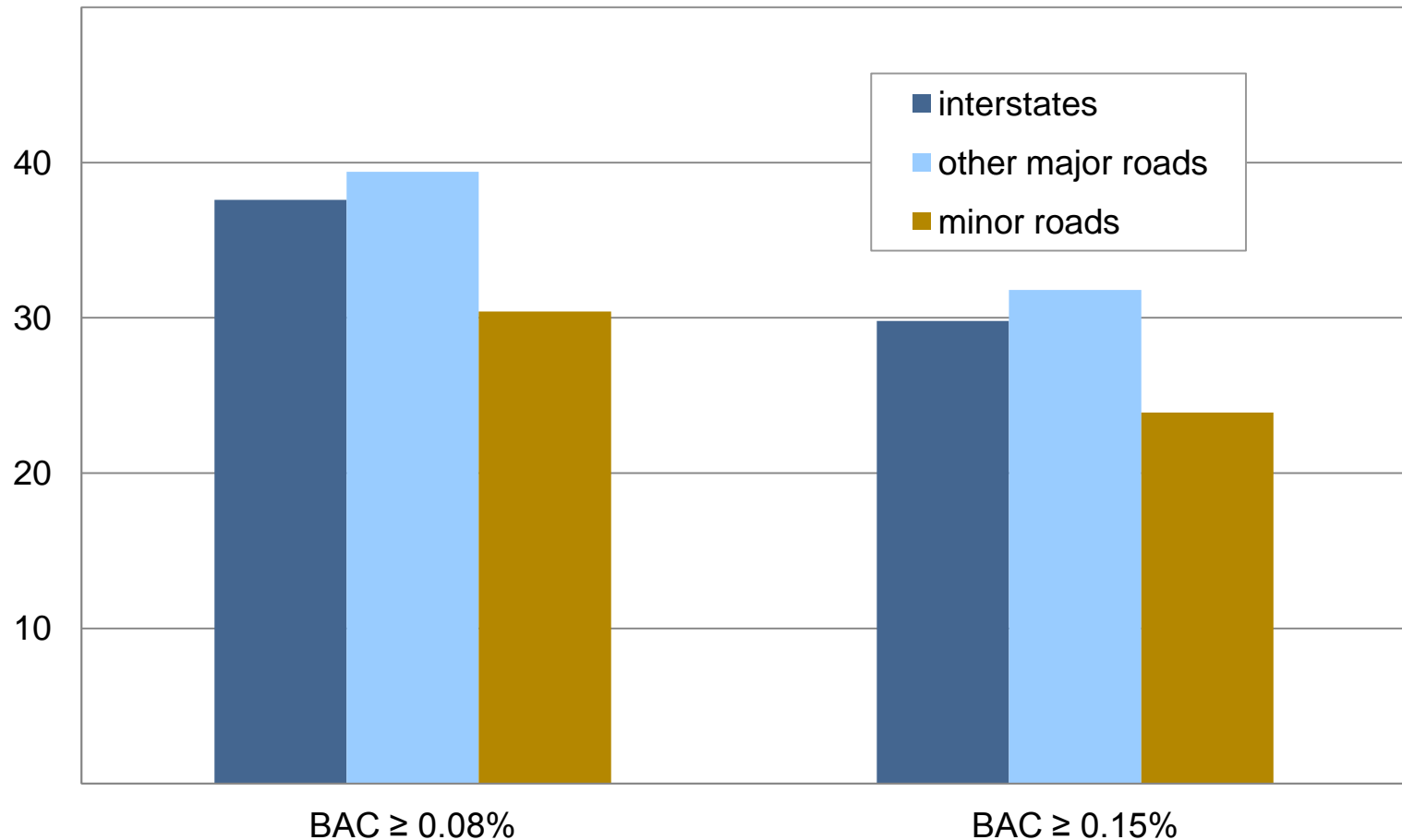
# Percent of pedestrian deaths 16 and older with high BACs by rural vs. urban location of crash

United States, 2007-11



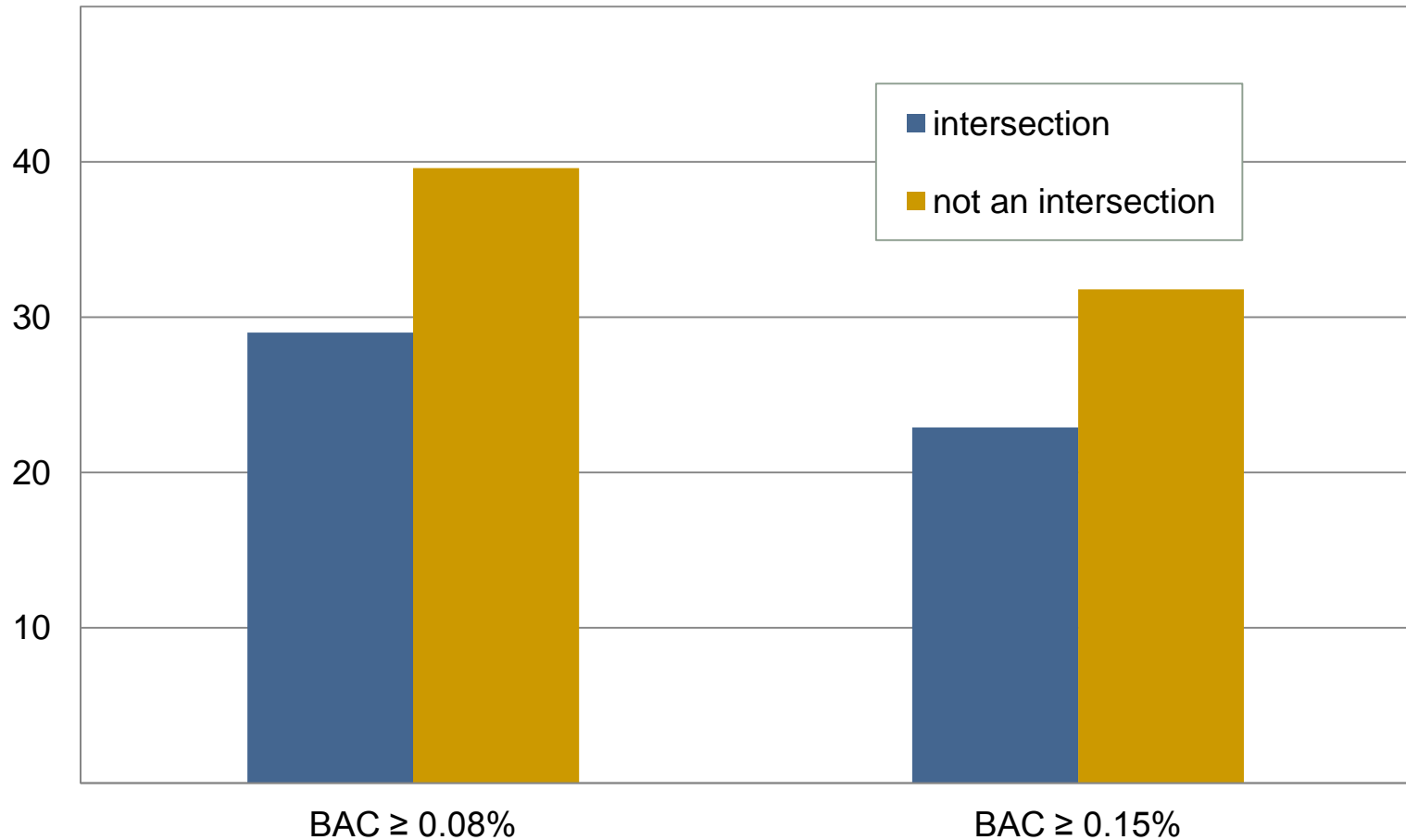
# Percent of pedestrian deaths 16 and older with high BACs by roadway type

United States, 2007-11



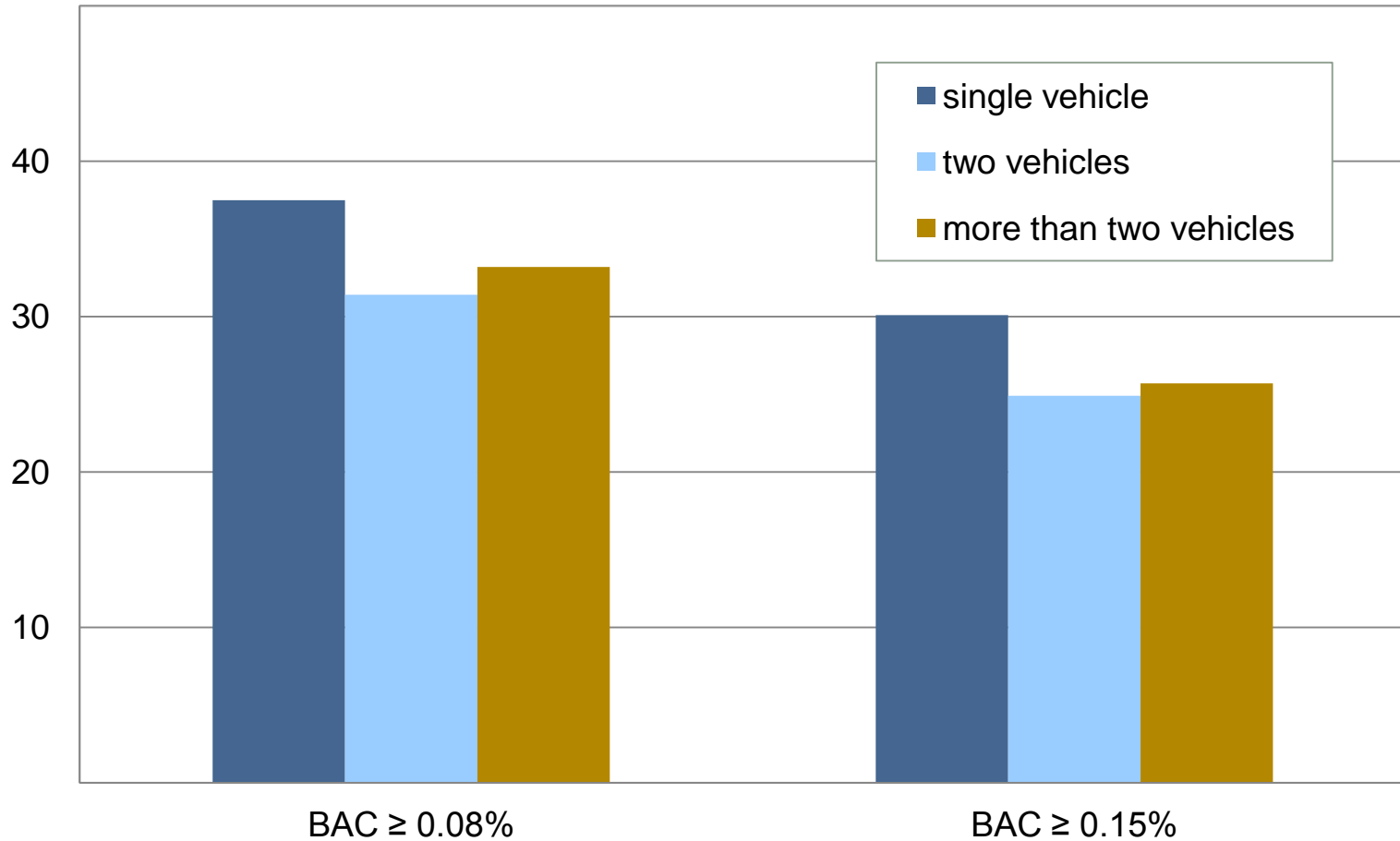
# Percent of pedestrian deaths 16 and older with high BACs by whether crash occurred at intersection

United States, 2007-11



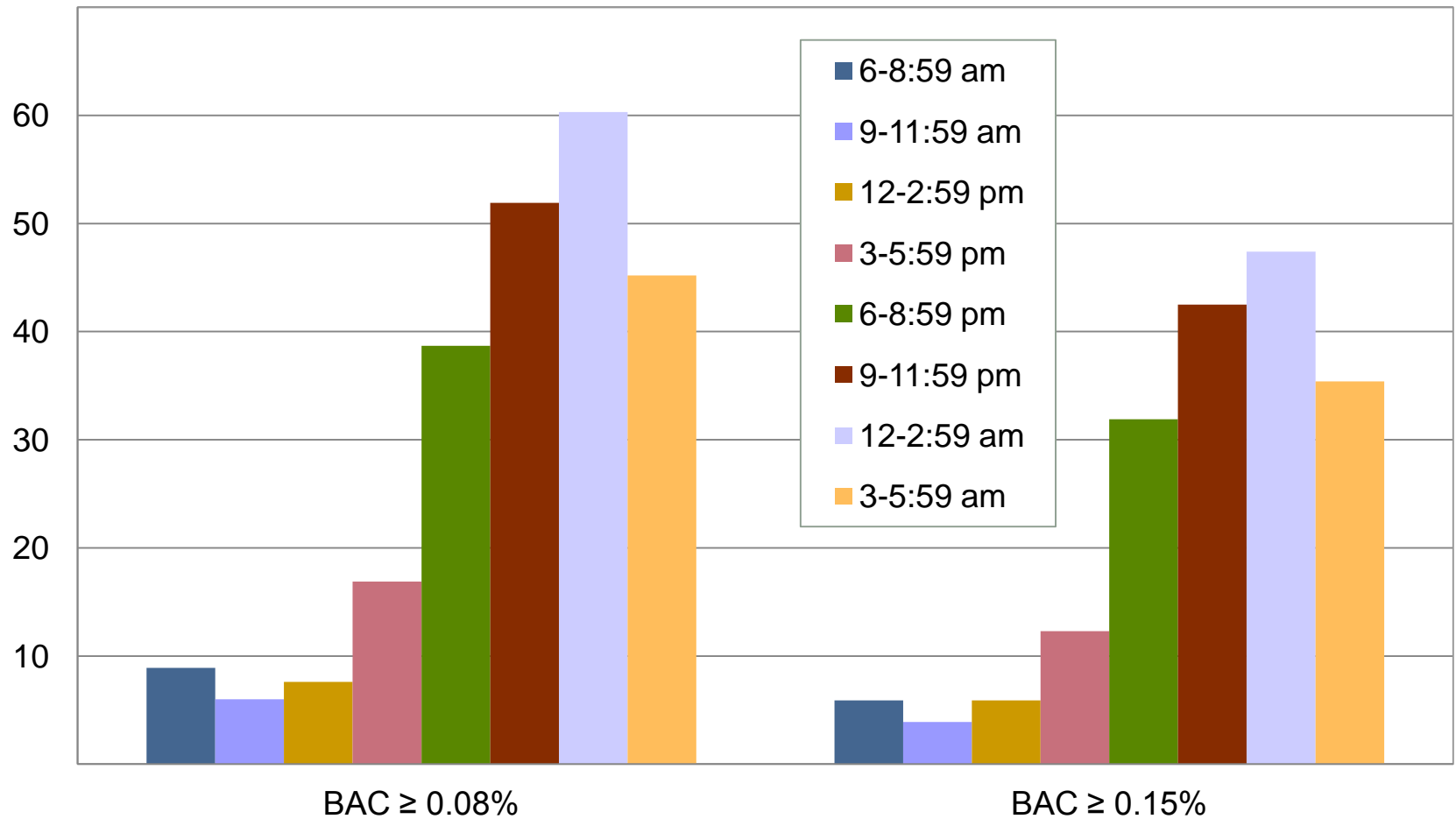
# Percent of pedestrian deaths 16 and older with high BACs by number of vehicles involved in crash

United States, 2007-11



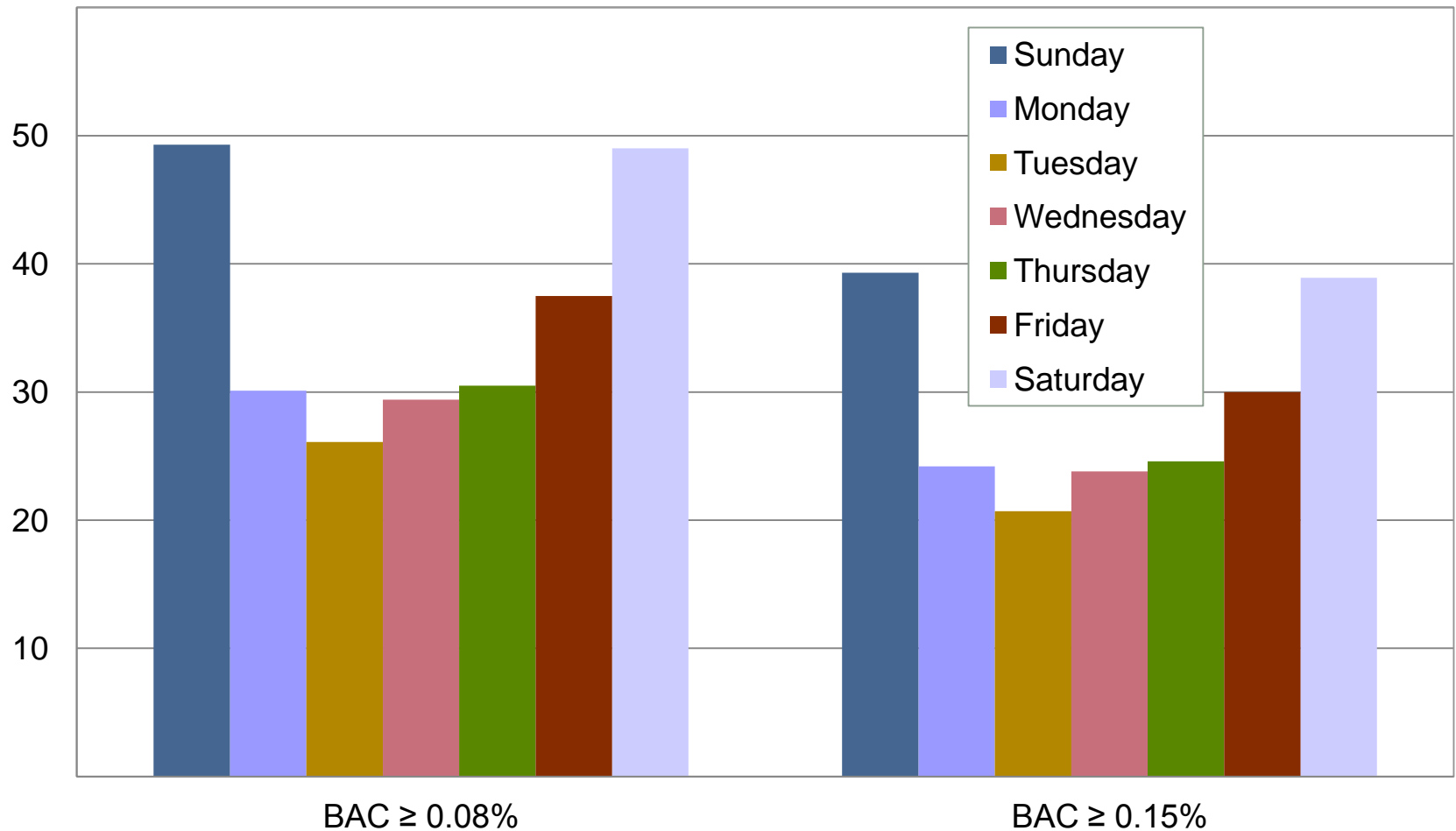
# Percent of pedestrian deaths 16 and older with high BACs by time of crash

United States, 2007-11



# Percent of pedestrian deaths 16 and older with high BACs by day of week of crash

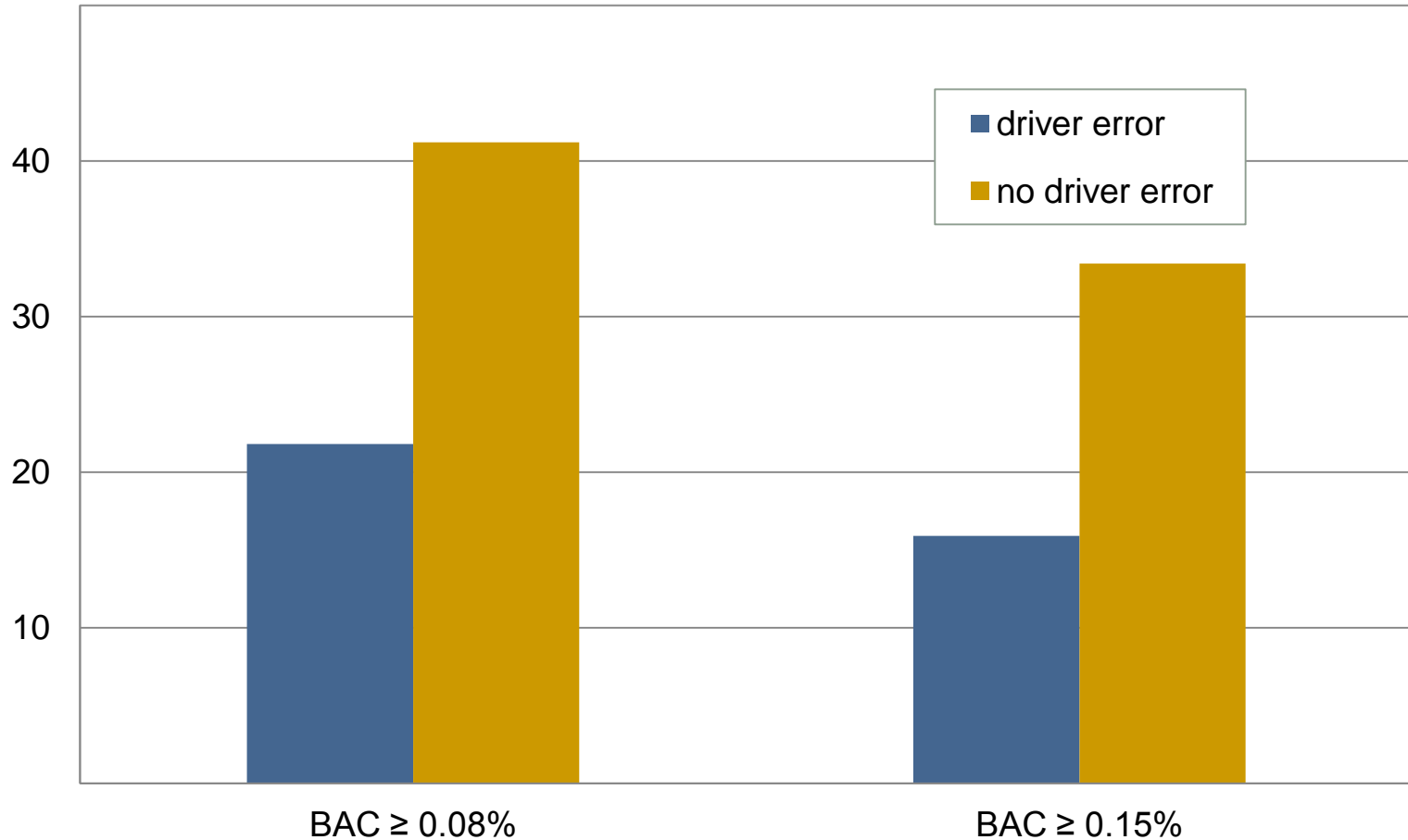
United States, 2007-11





# Percent of pedestrian deaths 16 and older with high BACs in single vehicle crashes by presence of driver error

United States, 2007-11



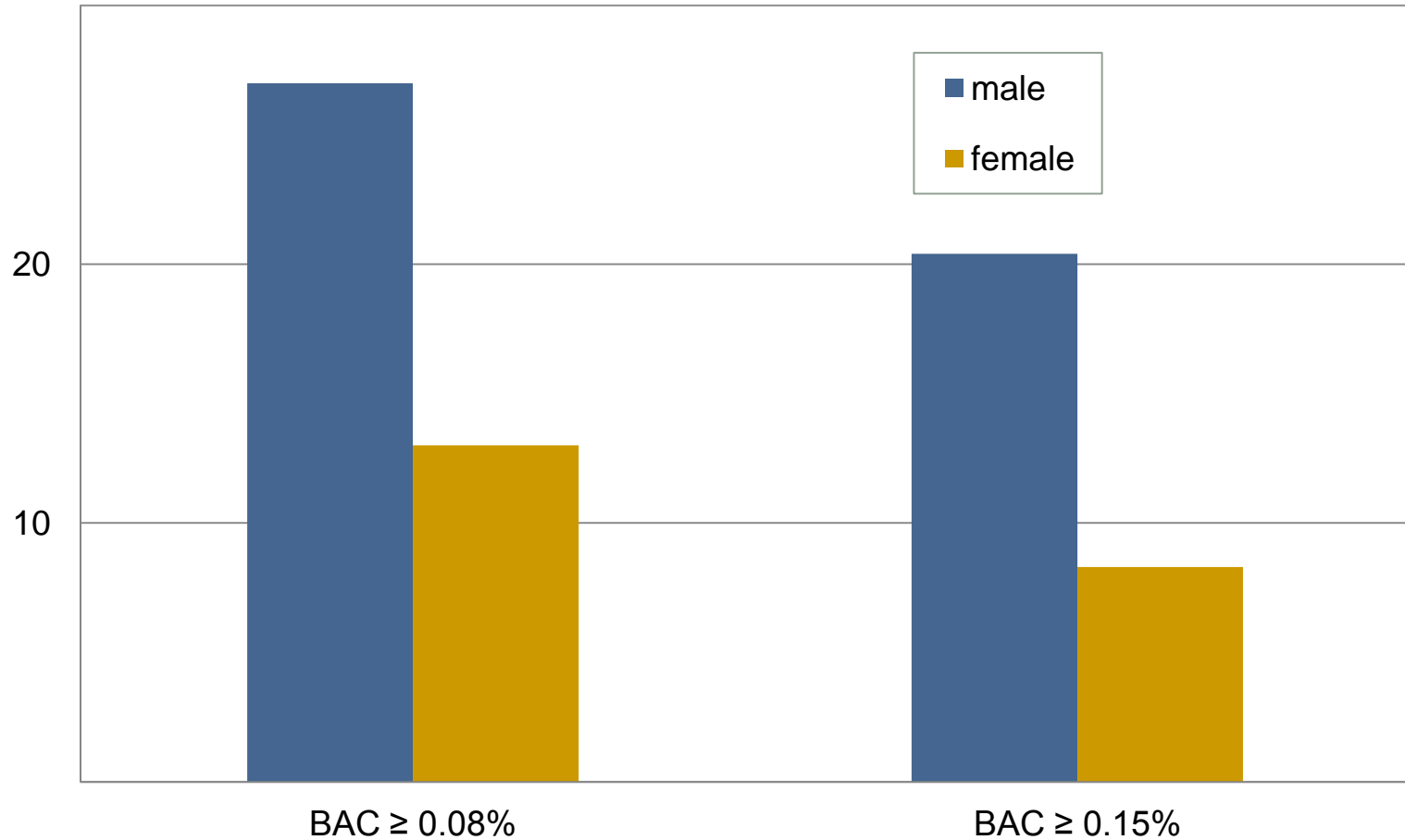
# Crash deaths among bicyclists 16 and older

United States, 2007-11

|                               |       |
|-------------------------------|-------|
| total deaths                  | 2,907 |
| percent with BAC $\geq$ 0.08% | 25    |
| percent with BAC $\geq$ 0.15% | 19    |

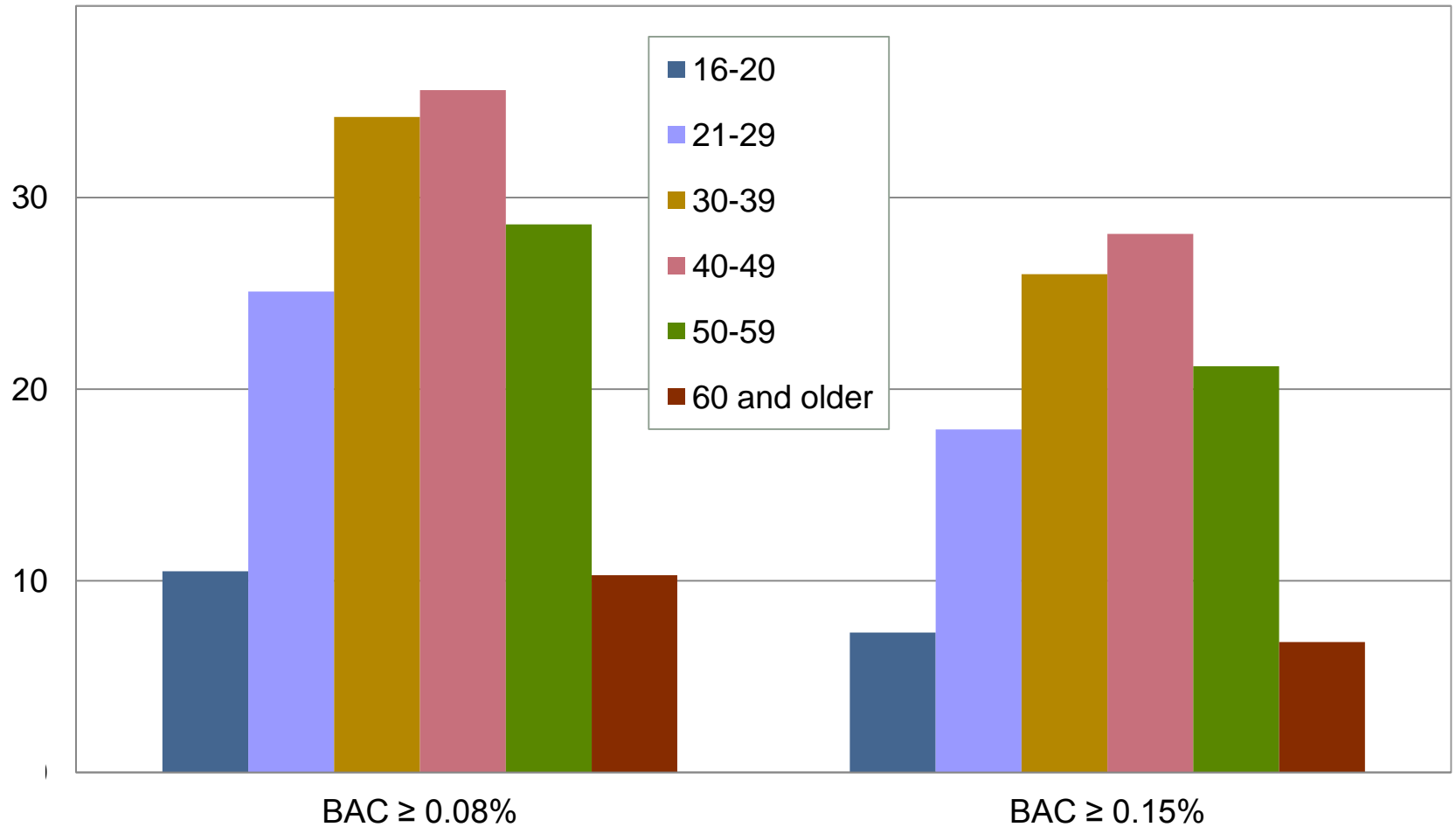
# Percent of bicyclist deaths 16 and older with high BACs by gender

United States, 2007-11



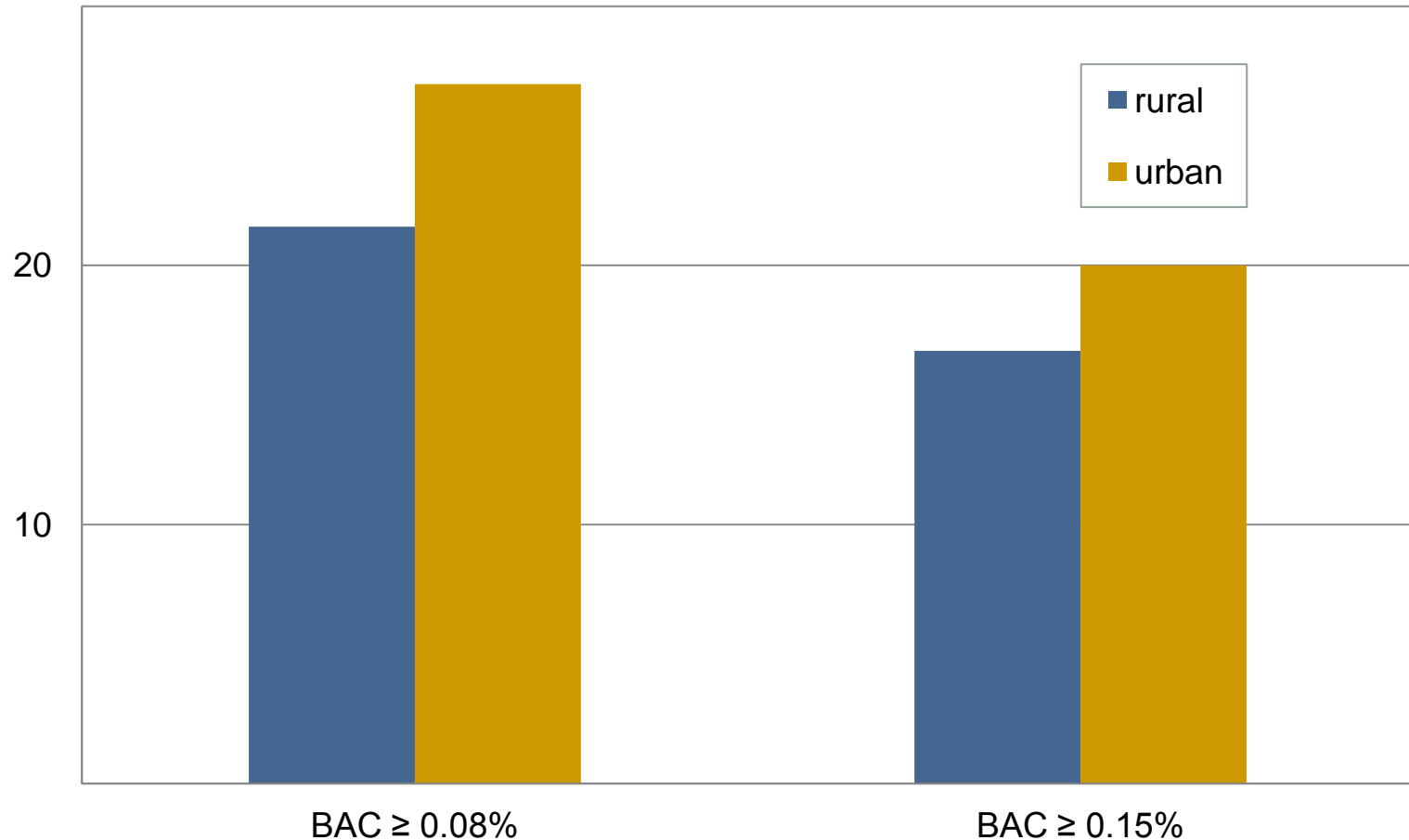
# Percent of bicyclist deaths 16 and older with high BACs by age

United States, 2007-11



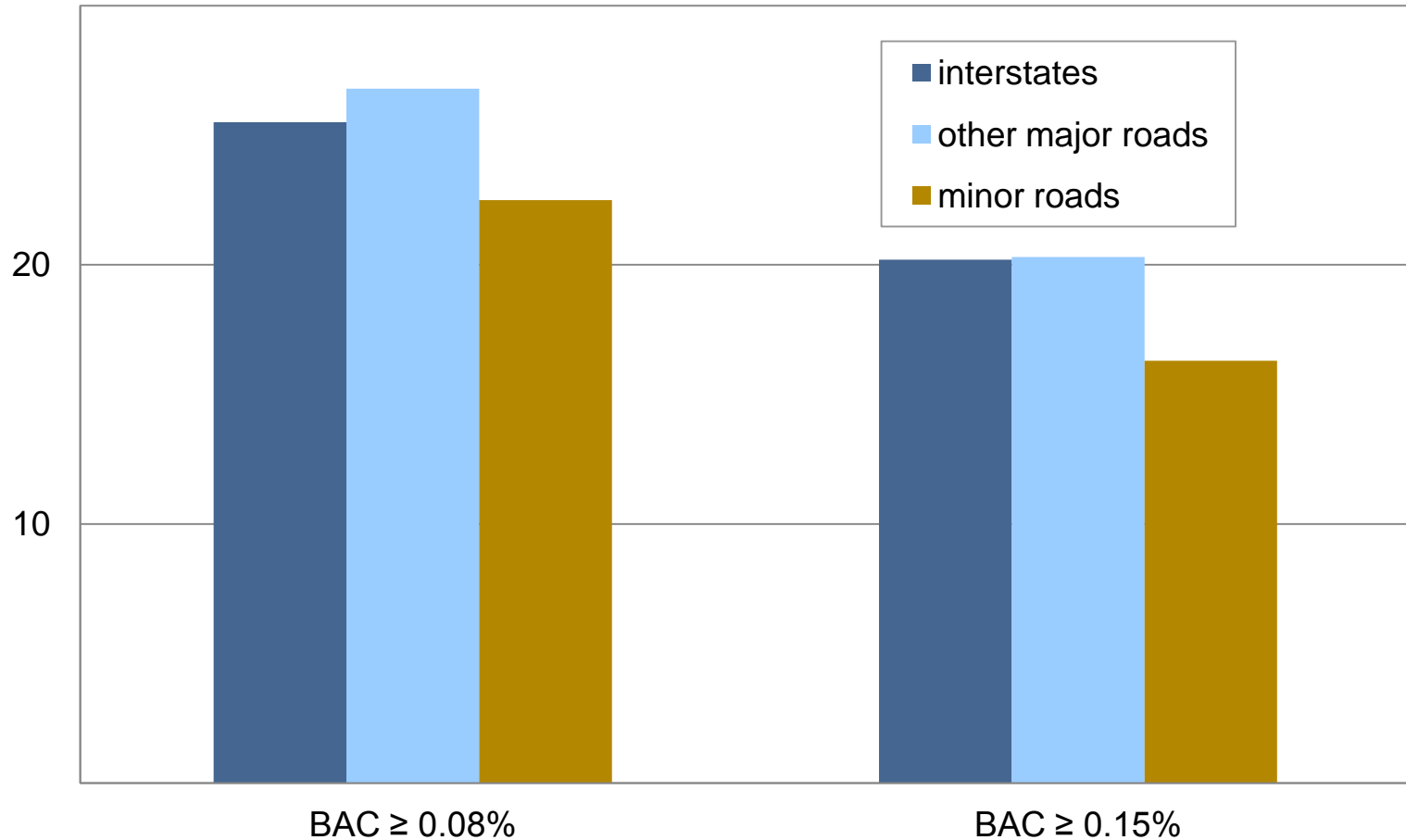
# Percent of bicyclist deaths 16 and older with high BACs by rural vs. urban location of crash

United States, 2007-11



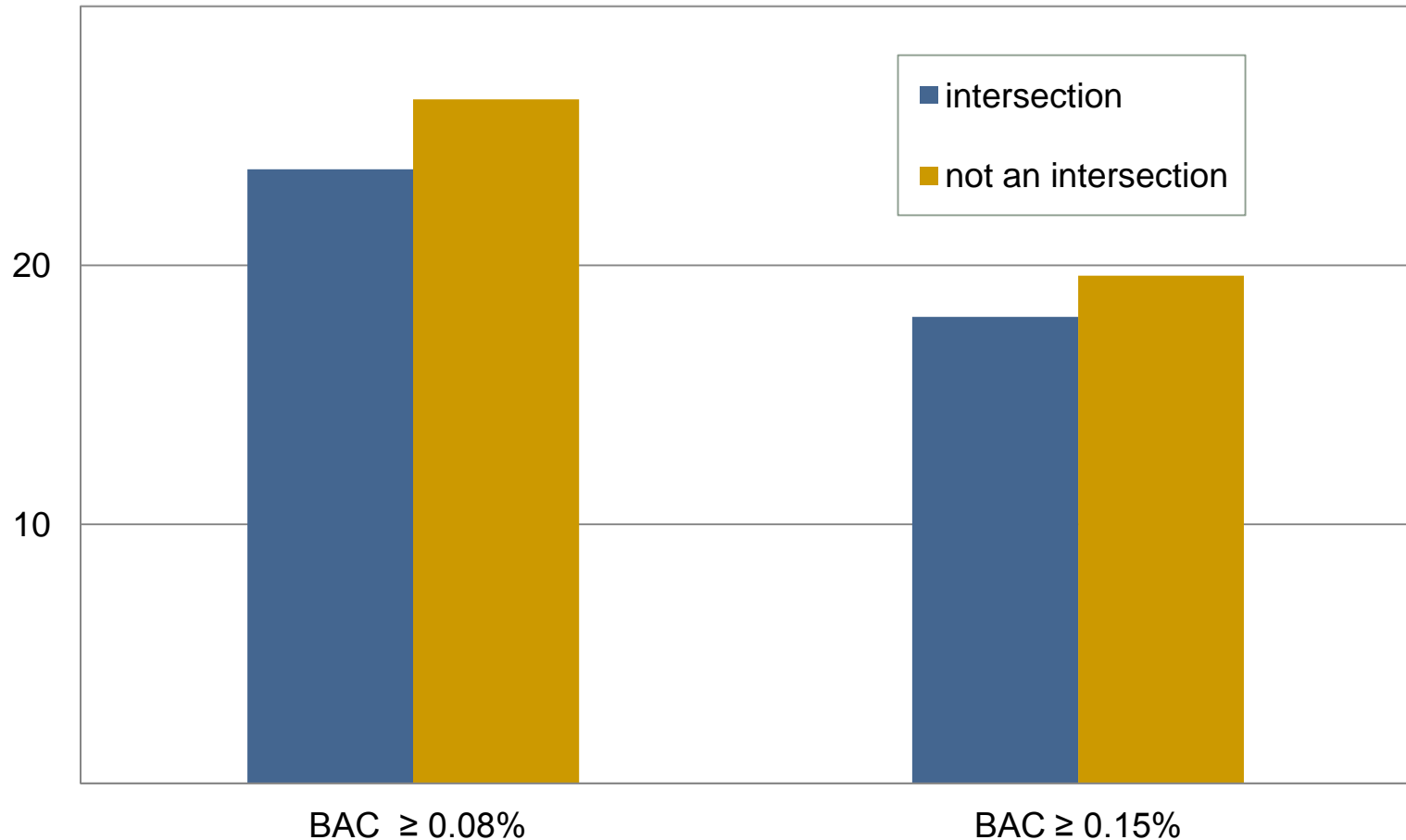
# Percent of bicyclist deaths 16 and older with high BACs by roadway type

United States, 2007-11



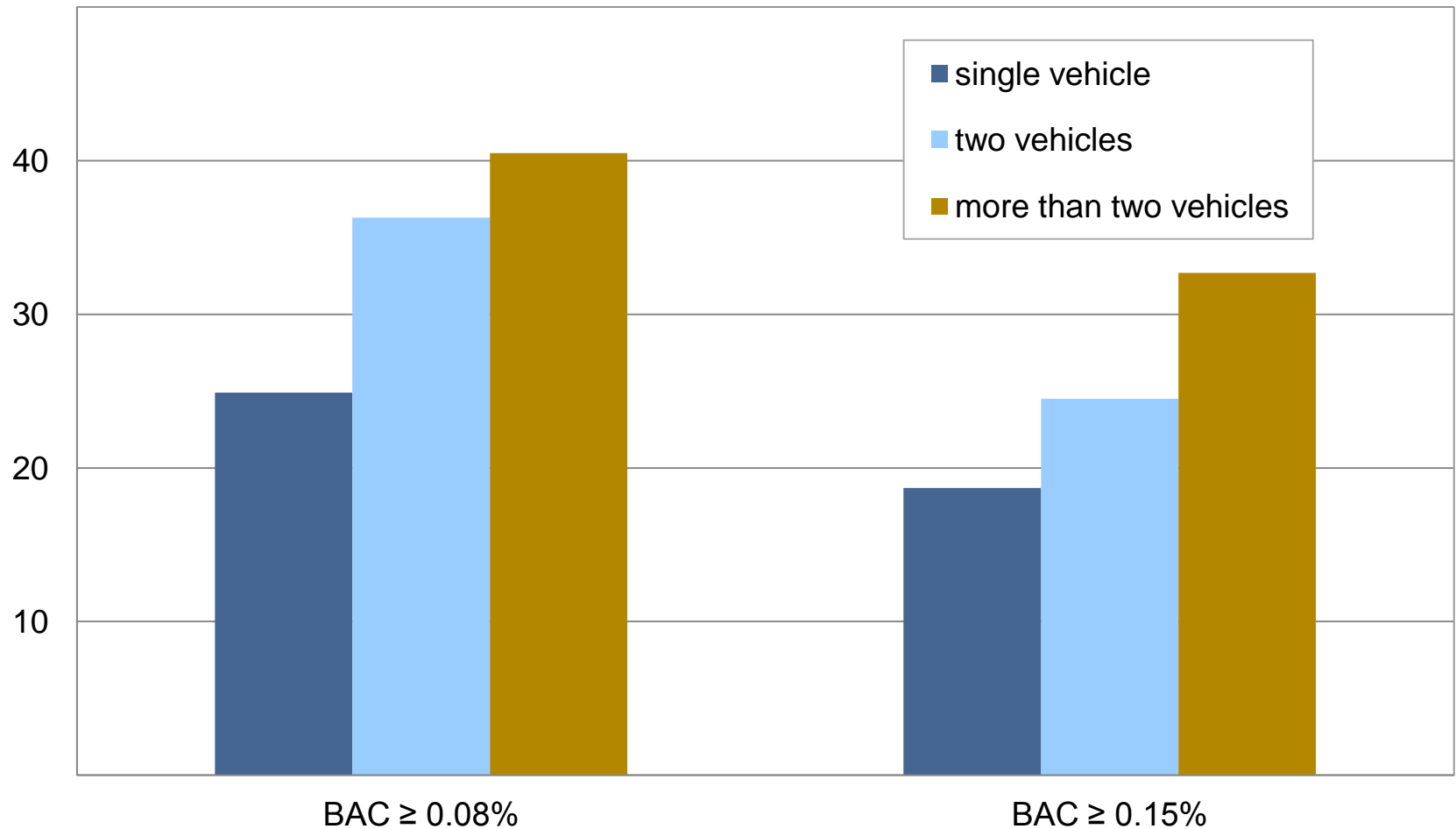
# Percent of bicyclist deaths 16 and older with high BACs by whether crash occurred at intersection

United States, 2007-11



# Percent of bicyclist deaths 16 and older with high BACs by number of vehicles in crash

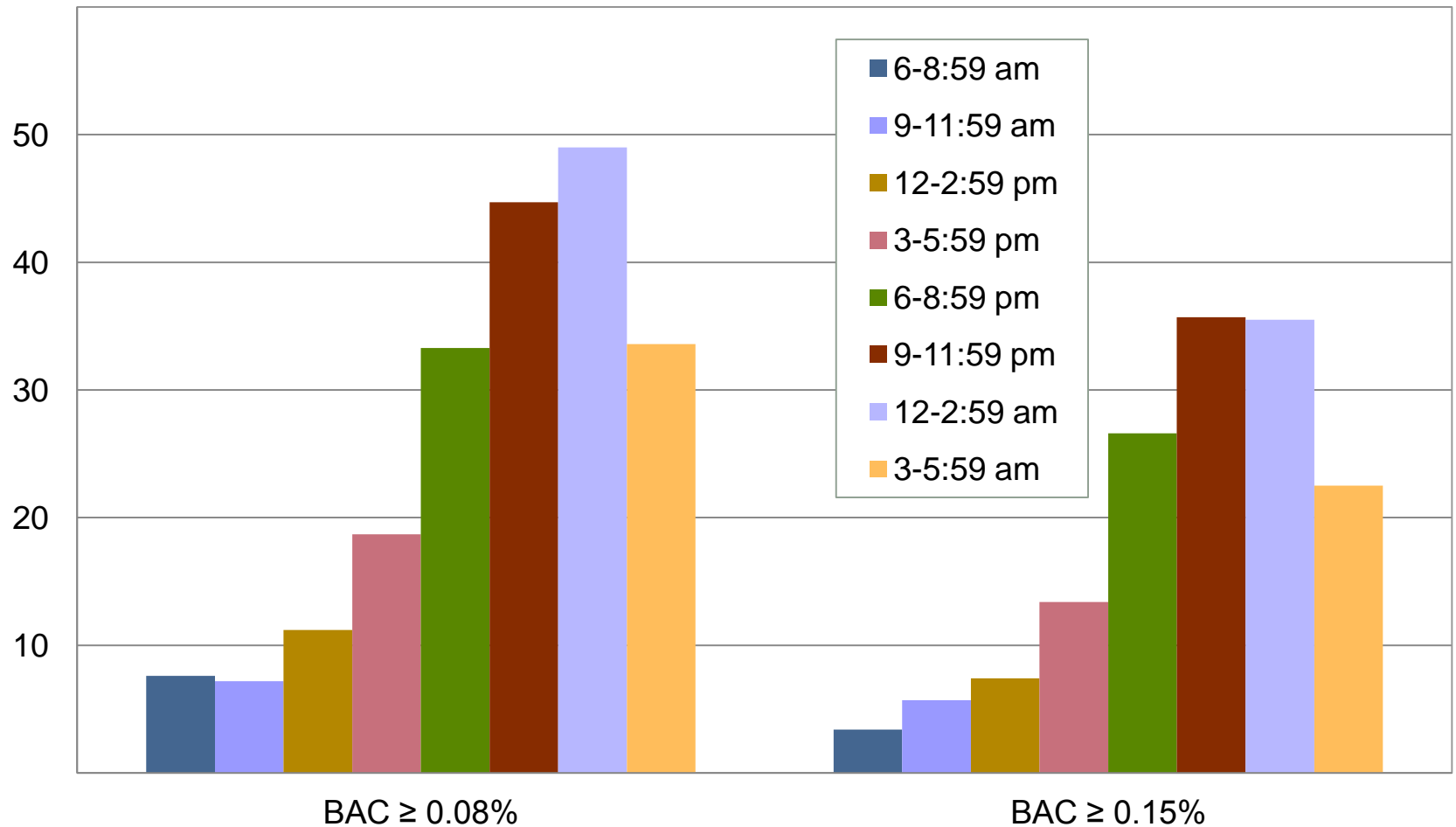
United States, 2007-11





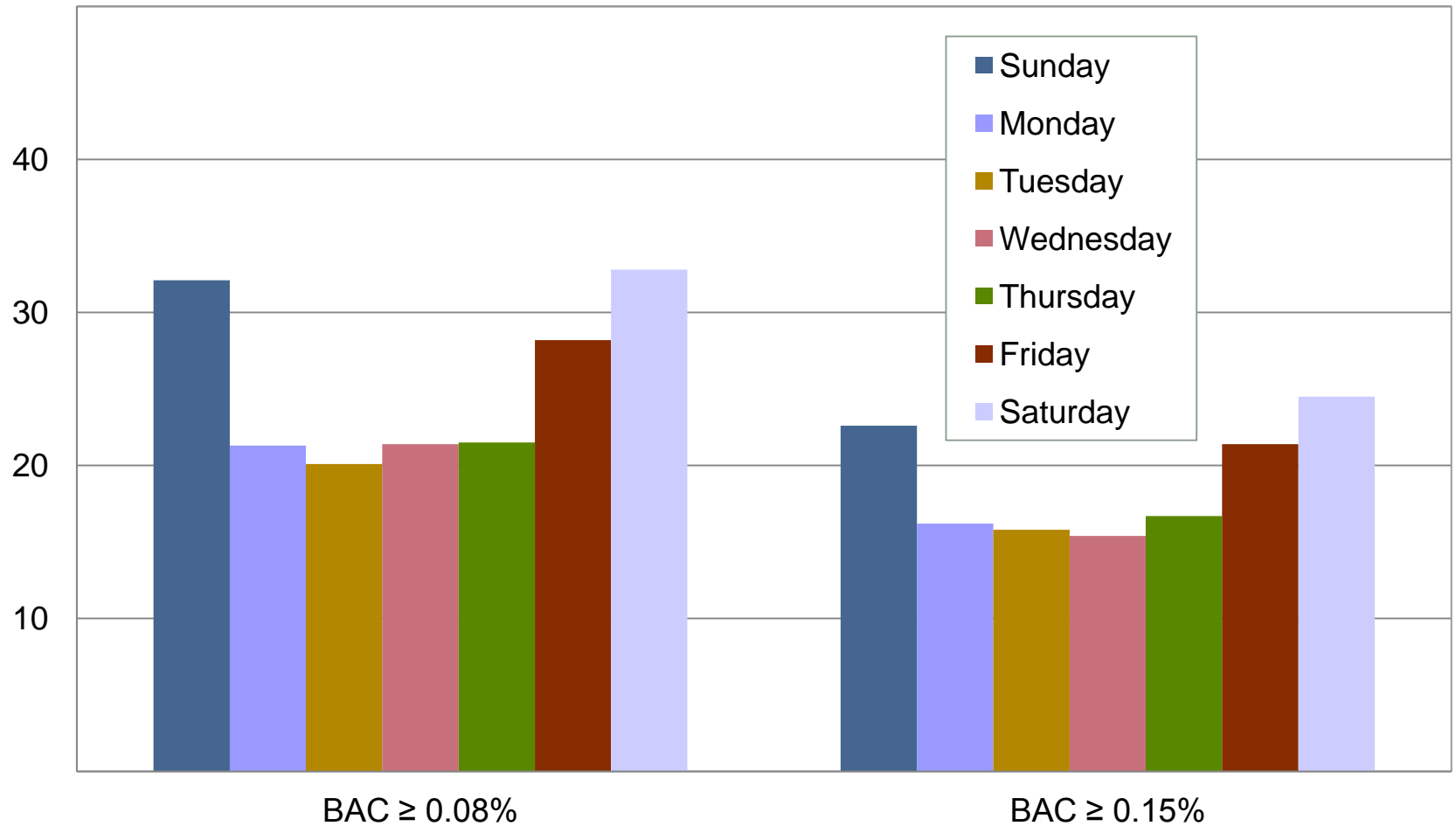
# Percent of bicyclist deaths 16 and older with high BACs by time of crash

United States, 2007-11



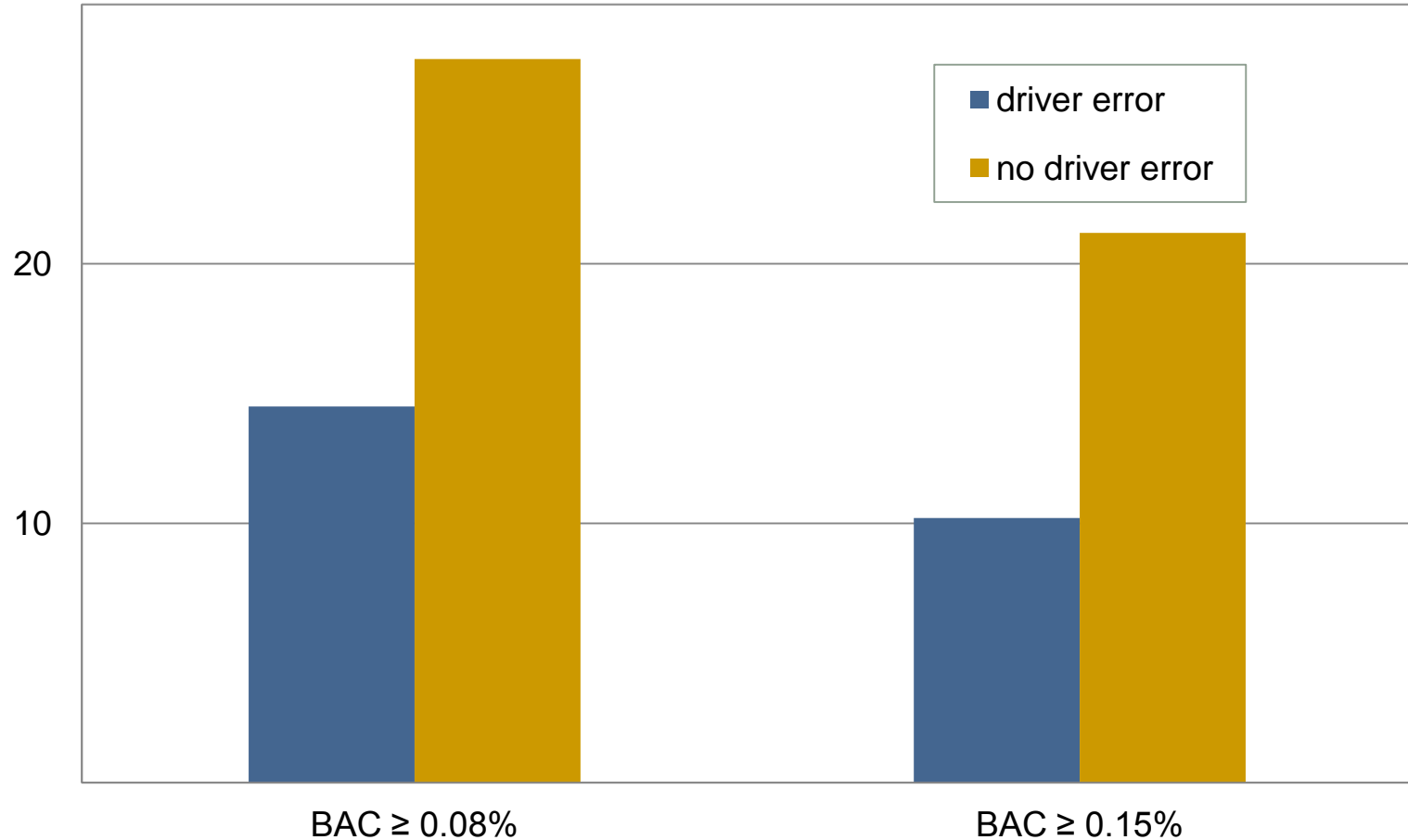
# Percent of bicyclist deaths 16 and older with high BACs by day of week of crash

United States, 2007-11



# Percent of bicyclist deaths 16 and older with high BACs in single vehicle crashes by presence of driver error

United States, 2007-11



# Summary

- In the U.S., many fatally injured pedestrians and bicyclists age 16 and older have high BACs, and this has changed little over the past two decades
- Characteristics of these crashes have changed little over time, except elevated BACs among different age ranges
  - Among pedestrians deaths, alcohol impairment was highest among ages 21-49 in the current study, but was highest among ages 25-34 in 1992
  - Among bicyclist deaths, alcohol impairment is highest among ages 30-49 in the current study, but was highest among ages 25-34 during 1987-91
- Among both pedestrians and bicyclists, alcohol impairment is highest among males, on weekends, and at night

# Conclusions

- The high prevalence of alcohol impairment among pedestrians and bicyclists and its persistence over time suggest that the problem needs to be publicized more widely and that countermeasures need to be directed at these groups
- Some programs directed at reducing alcohol-impaired driving could apply to pedestrians and bicyclists as well (e.g., ride share)
- Future research will examine role of alcohol impairment among drivers in pedestrian and bicyclist crashes
- Future research also may wish to explore a broader range of circumstances in pedestrian and bicyclist crashes involving impairment



INSURANCE INSTITUTE  
FOR HIGHWAY SAFETY

HIGHWAY LOSS  
DATA INSTITUTE

[www.iihs.org](http://www.iihs.org)

Dedicated to reducing deaths, injuries,  
and property damage on the highway