
Using the U.S. National Household Travel Survey to Estimate the Impact of Passenger Characteristics on Young Drivers' Relative Risk of Fatal Crash Involvement

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Context

- Epidemiological studies have estimated teenage crash risk in the presence of passengers
- Some of these studies have accounted for driving exposure in estimating crash risk
 - None have examined crash risk in terms of distance driven by
 - Driver and passenger characteristics (i.e., sex and age)
- Consequence: We do not know the fatal crash involvement per distance driven of, e.g., a male teenage driver with a male teenage passenger

Context

Reasons?

- ✦ Data collection on driving exposure often precludes appropriate analysis
- ✦ In the U.S., the National Household Travel Survey (NHTS) (only national probability survey)
 - ✦ Collects sex and age of  drivers and passengers, and number of vehicle occupants
 - ✦ Does not collect sex and age of  passengers








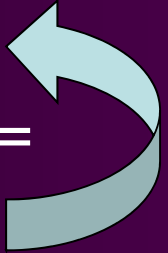
Goals of the Study

- Impute missing data in order to examine
 - ✦ Relative risk of fatal crash involvement in 15-20 year-old drivers per 10 million vehicle trips (VT) and vehicle-miles traveled (VMT) with one passenger vs. solo driving
 - by driver sex and passenger age and sex

Method

- Fatality Analysis Reporting System (FARS):
1999-2003
 - ◆ Fatal crash involvement
 - ◆ N = 29,077 drivers aged 15-20 involved in a fatal crash, but not necessarily as a victim
- National Household Travel Survey (NHTS)
2001
 - ◆ Driving exposure in VT and VMT with 1 passenger and while solo driving

Trip Characteristics 2001 NHTS

	Number of Passengers	Type of Driver	Type of Passenger	Total Number of Trips	Passenger Age and Sex Info
a)	Solo driving		-----	4464	-----
b)	1 passenger			788	✓
c)				829	X
d)			 = 	775	✓

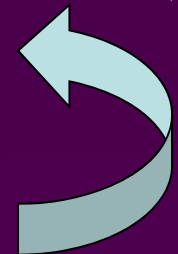
Hot-Deck Imputation of Missing Data

- Conducted with Westat macro WESDECK
- Three hard boundary trip characteristics
 - time of day
 - week vs. weekend
 - 11 trip purpose categories including going home or to school
- Six soft boundary trip and income characteristics
 - trip distance
 - urban/suburban/rural
 - region
 - season
 - average speed
 - household income

Recipient:
Age & sex



Donor:
Age & sex

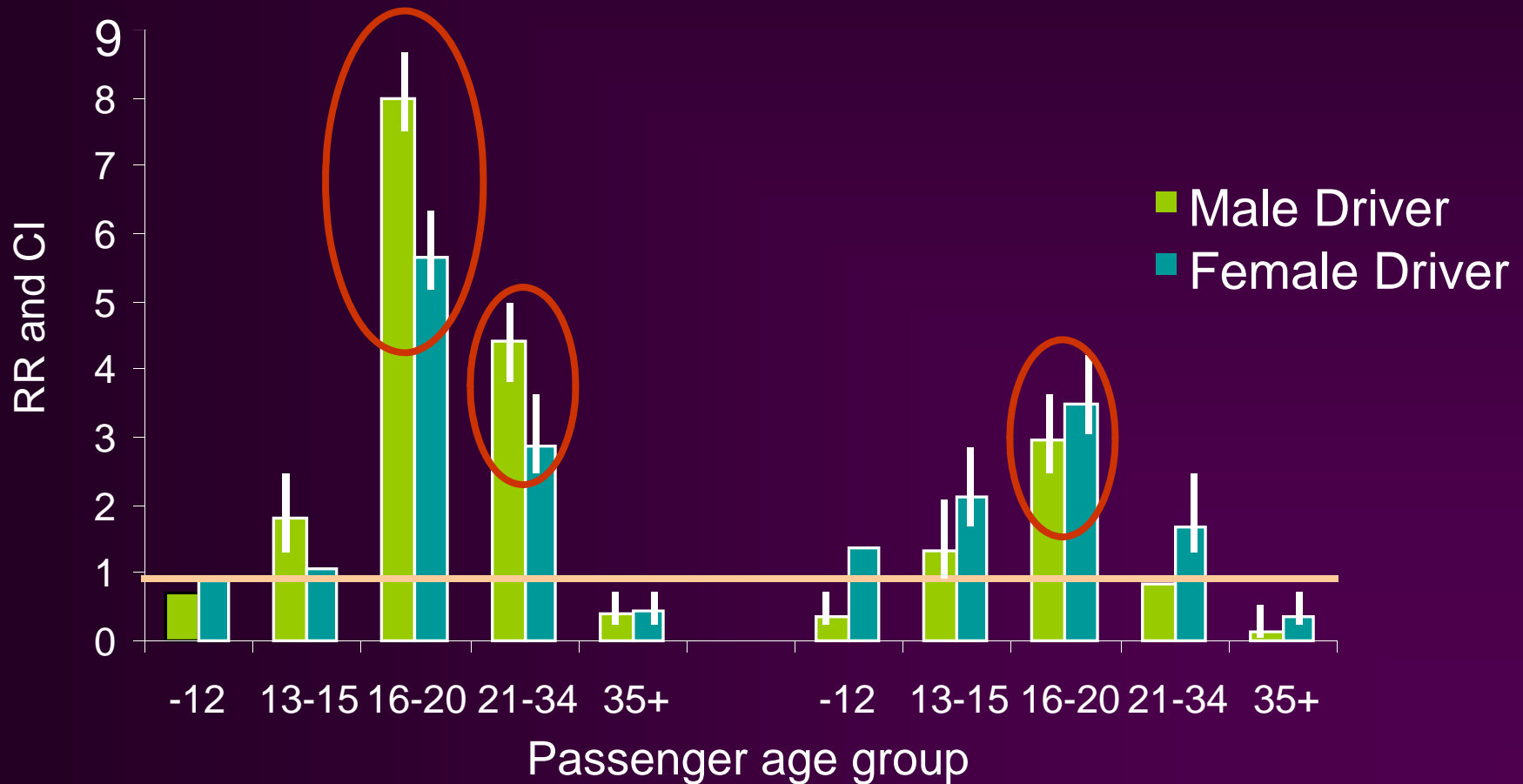


Relative Risk of Fatal Crash Involvement per 10 million VT

1 passenger vs. solo driving

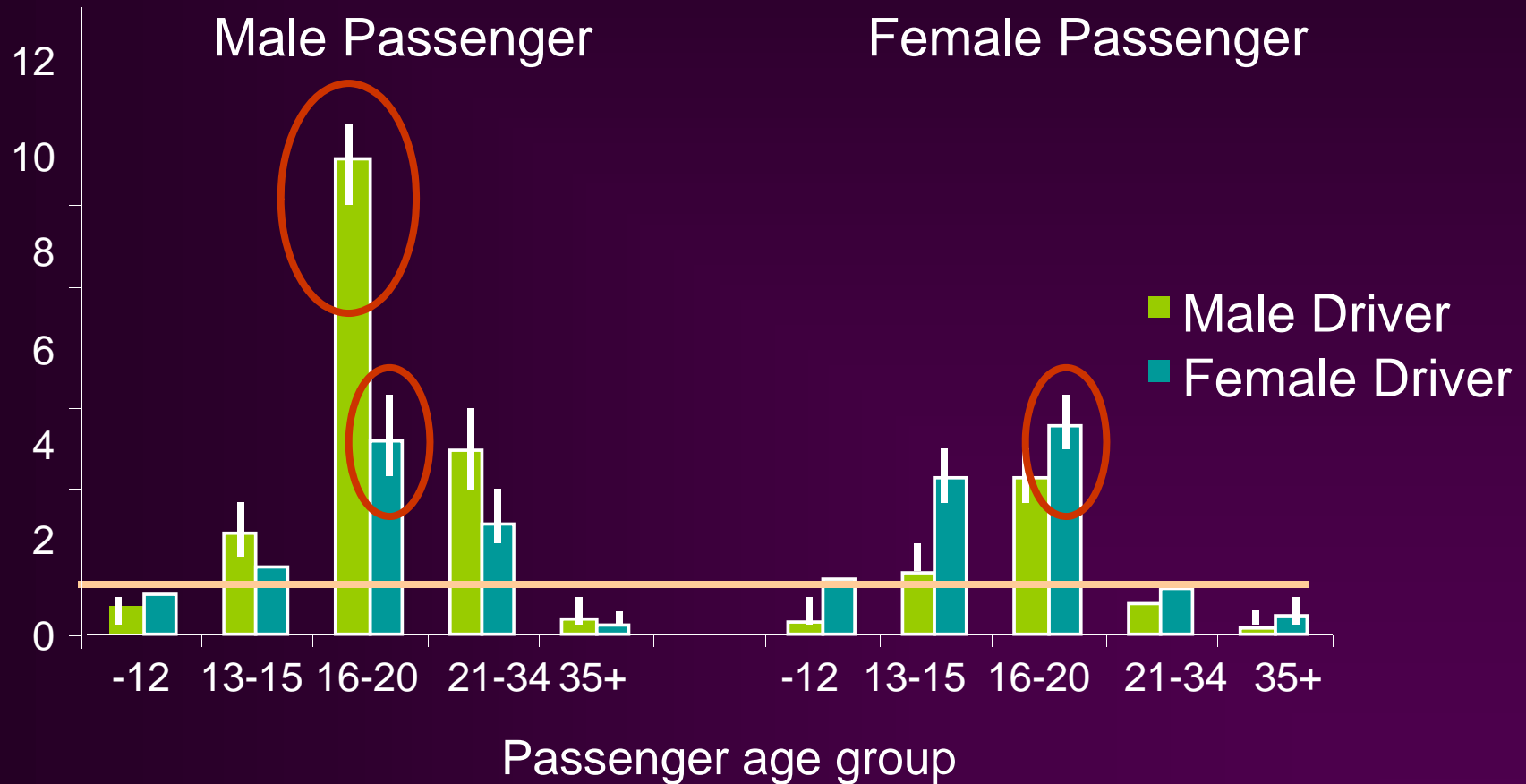
Male Passenger

Female Passenger



Relative Risk of Fatal Crash Involvement per 10 million VMT

1 passenger vs. solo driving



Conclusion

- First study of this kind
 - ◆ Very high RRs were found
 - ◆ Results need to be investigated further

- NHTS should collect age and sex from
 - ◆ Not included in the 2009 survey





Thank you!

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