

Helmet Use in Bicyclists Struck



Innovations in Translating Injury Research into Effective Prevention
Annual Meeting of the Center for Injury Epidemiology and Prevention at Columbia University

Linda A. Dultz, MD, MPH
NYU School of Medicine
Bellevue Hospital Center
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Background

- Injuries to cyclists are very common, particularly in large cities
- Helmets have been pursued as injury prevention mechanism
- Many previous studies have shown efficacy of helmets in preventing head/face injury but there is little data on social-economic differences and behavior patterns

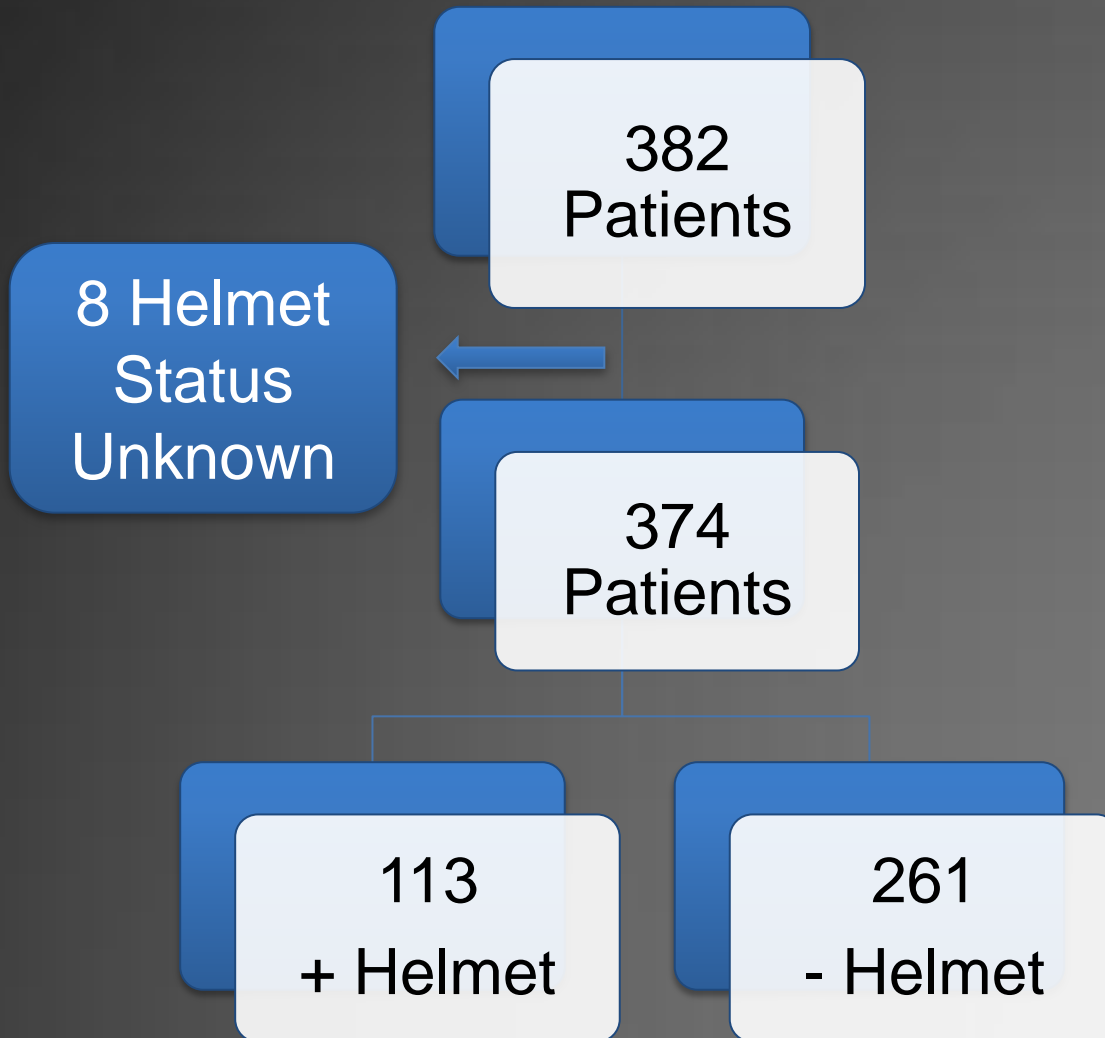
Objectives

- Identify prevalence and impact of helmet use on bicyclists in New York City
- Assess behavior patterns to assist providers and aid in targeted prevention
- Assess outcomes in bicyclists struck

Methods

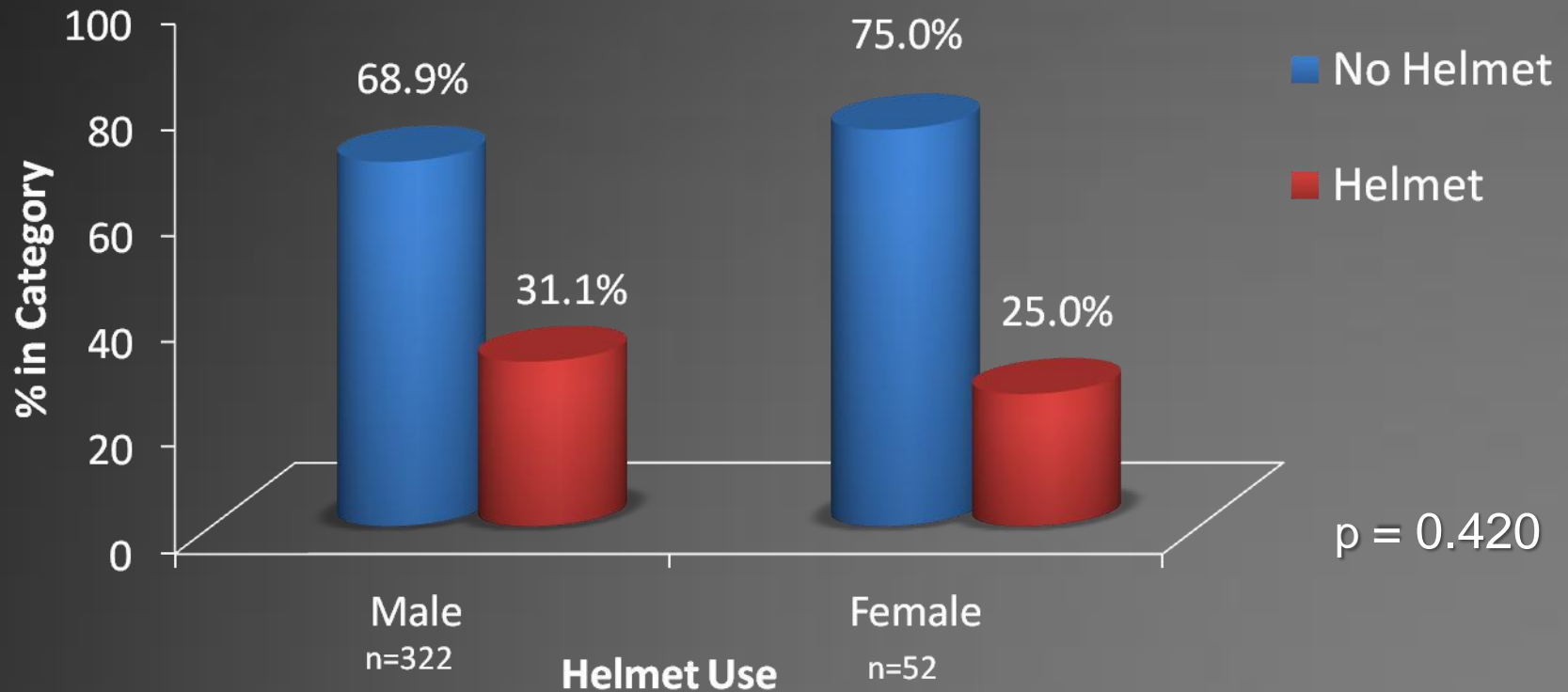
- Prospective cohort study (Dec 2008 to Jun 2011)
- All bicyclists-struck who presented to Bellevue Hospital Center ≤ 24 hrs of injury
 - Catchment area: Lower Manhattan (and Western Brooklyn)
- Variables obtained by interviewing patients, witnesses, first responders, and review of medical records
- Collected variables
 - Demographics, helmet use, biking
 - Glasgow Coma Scale (GCS)
 - Abbreviated Injury Score (AIS) and Injury Severity Score (ISS)
 - Disposition
 - Mortality
- Verbal consent obtained prior to study enrollment

Patient Flow Diagram



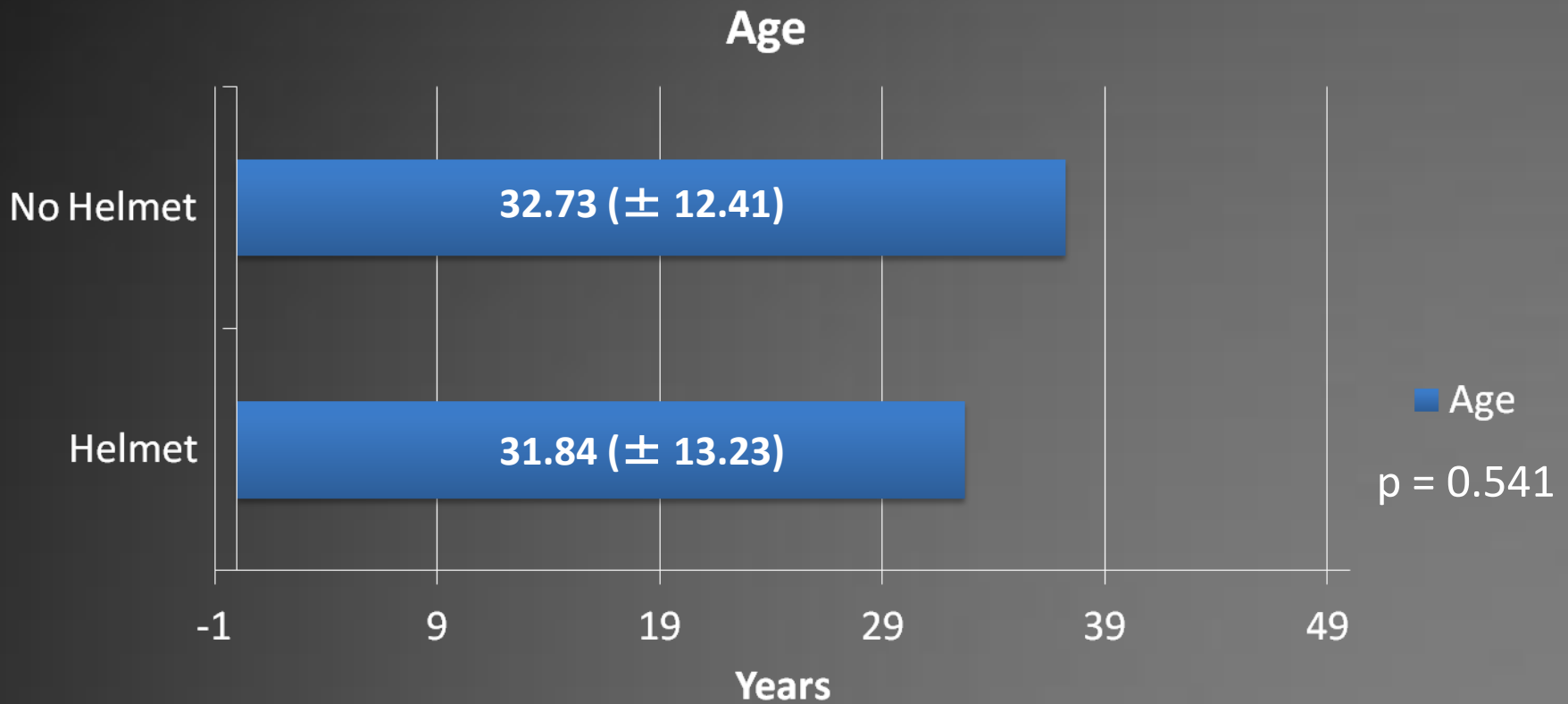
Demographics: Gender

n = 374



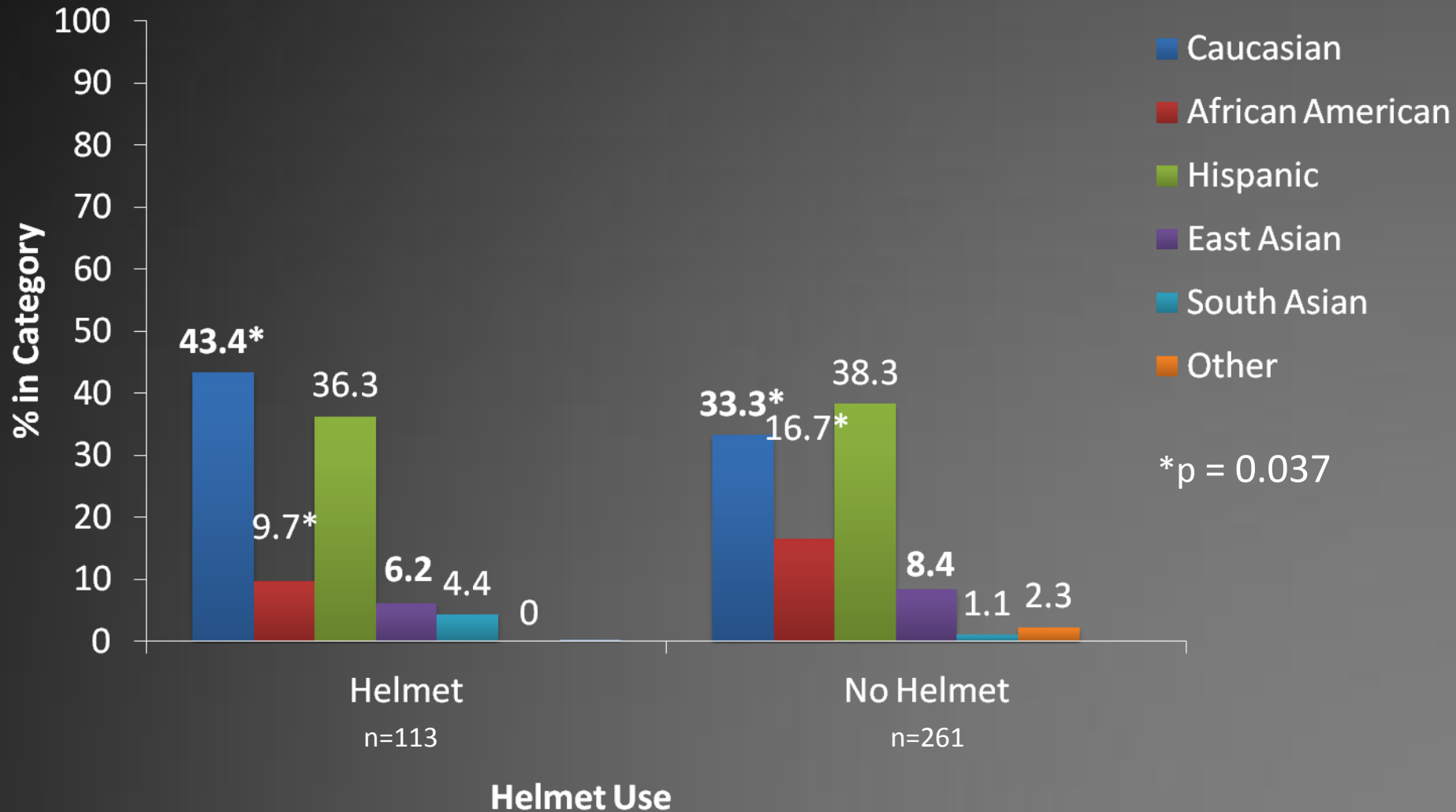
Demographics: Age

n = 374



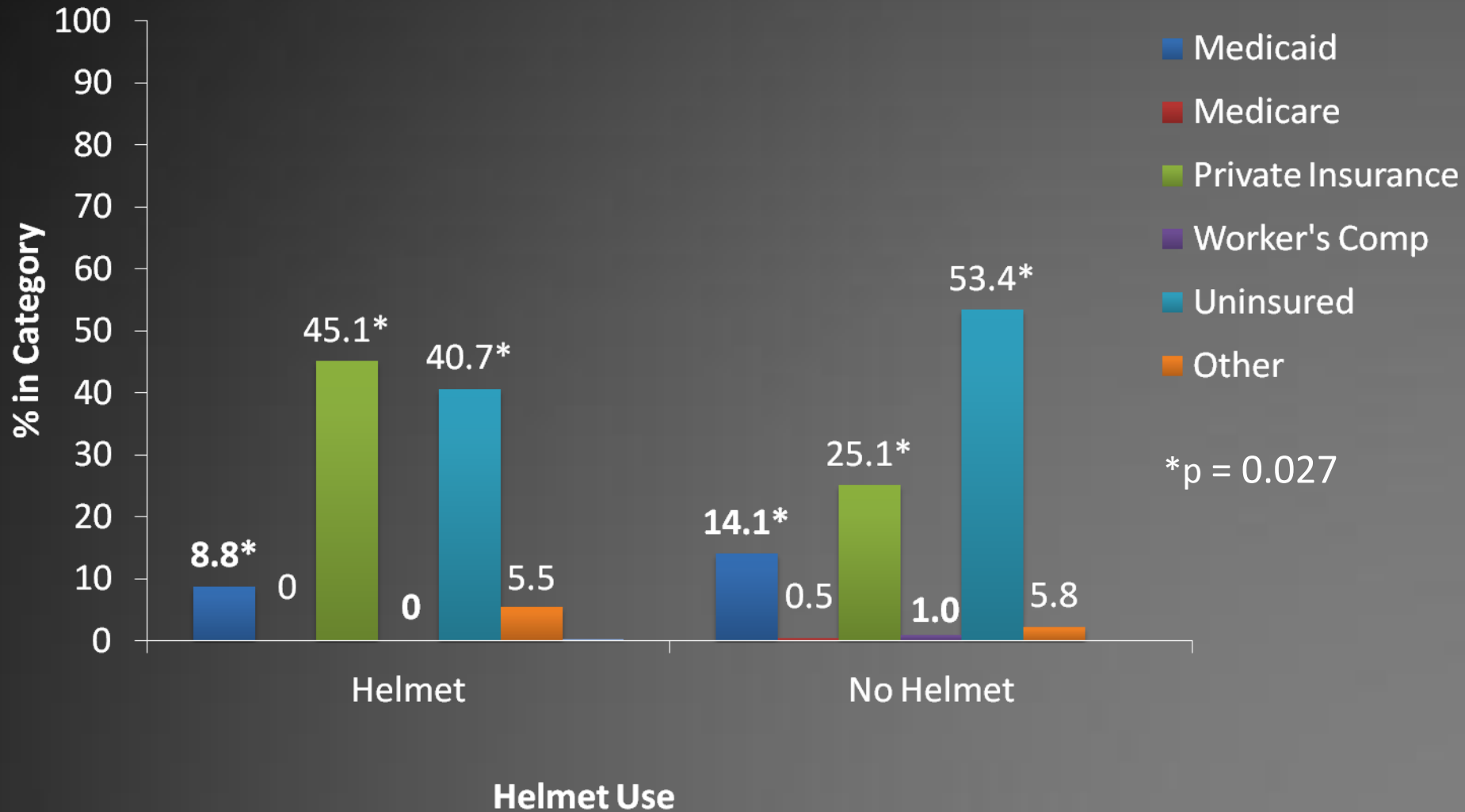
Demographics: Ethnicity

n = 374



Demographics: Insurance

n = 365



Behavior Patterns

n = 374

Categories		Helmet (n=113)	No Helmet (n=261)	p Value
Riding Patterns				
	With flow of traffic (%)	106 (97.2%)	204 (83.6%)	<0.001
	Against flow of traffic (%)	3 (2.8%)	30 (12.3%)	0.003
	Riding in bike lane (%)	36 (83.7%)	46 (61.3%)	0.013
	Crossing against signal (%)	6 (5.5%)	30 (12.6%)	0.057
Alcohol Involvement				
	Yes (%)	7 (6.3%)	29 (11.1%)	0.181

Behavior Patterns

n = 374

Working Status	Helmet	No Helmet	p Value
Working When Struck	52 (31.9%)	111 (68.1%)	0.110
Not Working When Struck	60 (28.8%)	148 (71.2%)	

Glasgow Coma Scale

n= 371

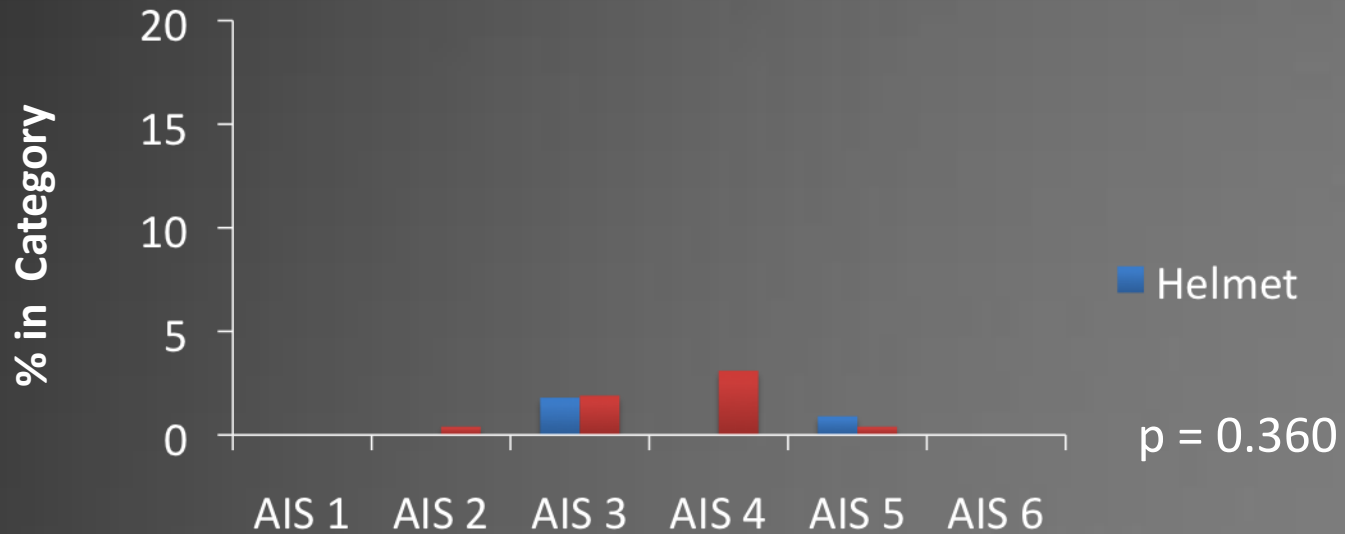
Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None

	Helmet n=111	No Helmet n=260	p Value
Glasgow Coma Score	14.93 (± 0.499)	14.79 (± 1.293)	0.285
GCS ≤ 8	0 (0%)	3 (1.2%)	0.557
GCS > 8	111 (100%)	257 (98.8%)	

Head AIS

n= 374

AIS Score	Injury
1	Minor
2	Moderate
3	Serious
4	Severe
5	Critical
6	Unsurvivable



Outcomes: Bicyclists

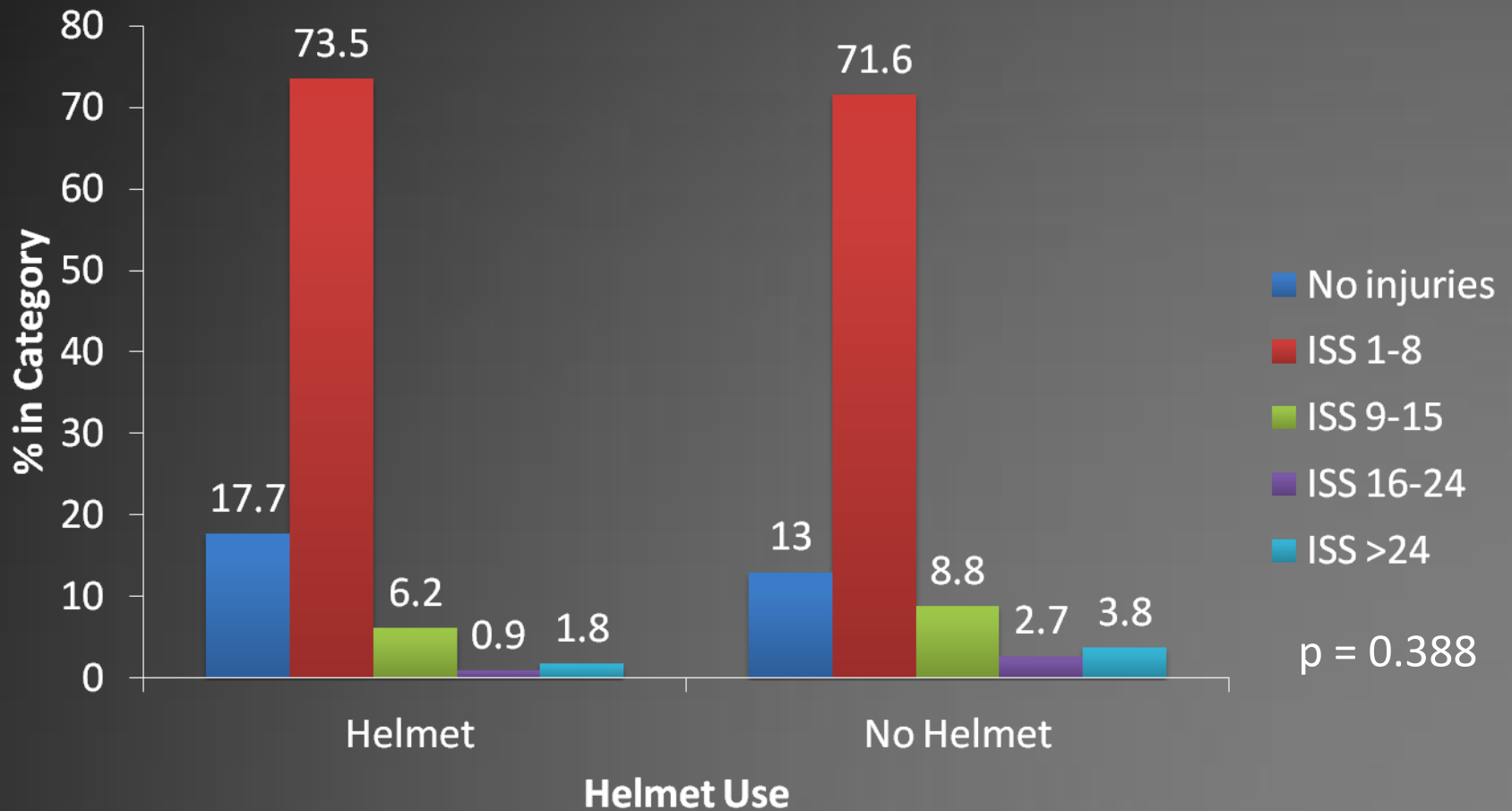
n= 374

	Helmet n=113	No Helmet n=261	p Value
Injury Severity Score*	3.18 (± 7.205)	4.13 (± 7.478)	0.255
*3 unknown excluded			

Injury Severity Score = $A^2 + B^2 + C^2$
where A, B and C are the AIS scores of the three
most injured ISS body regions.

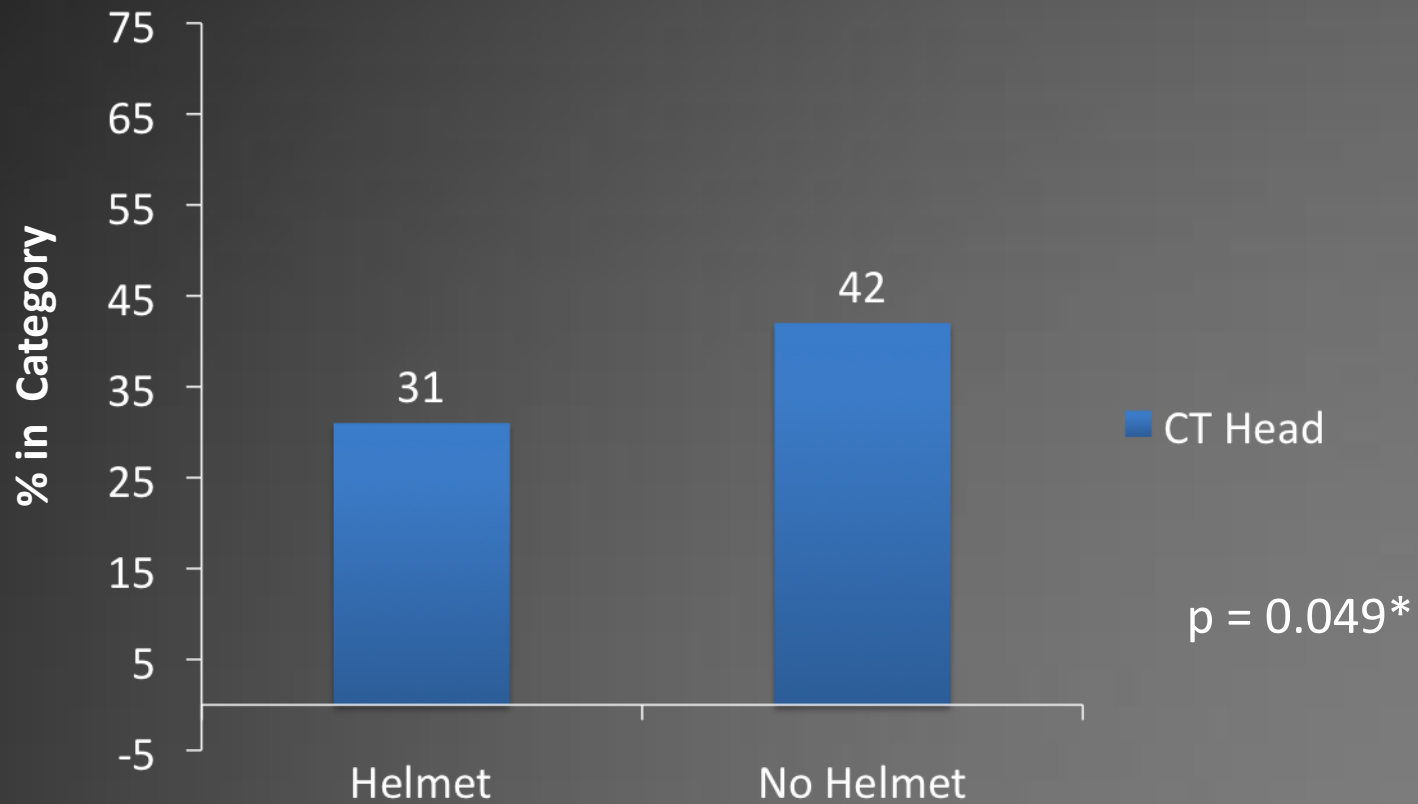
Outcomes: ISS

n= 374

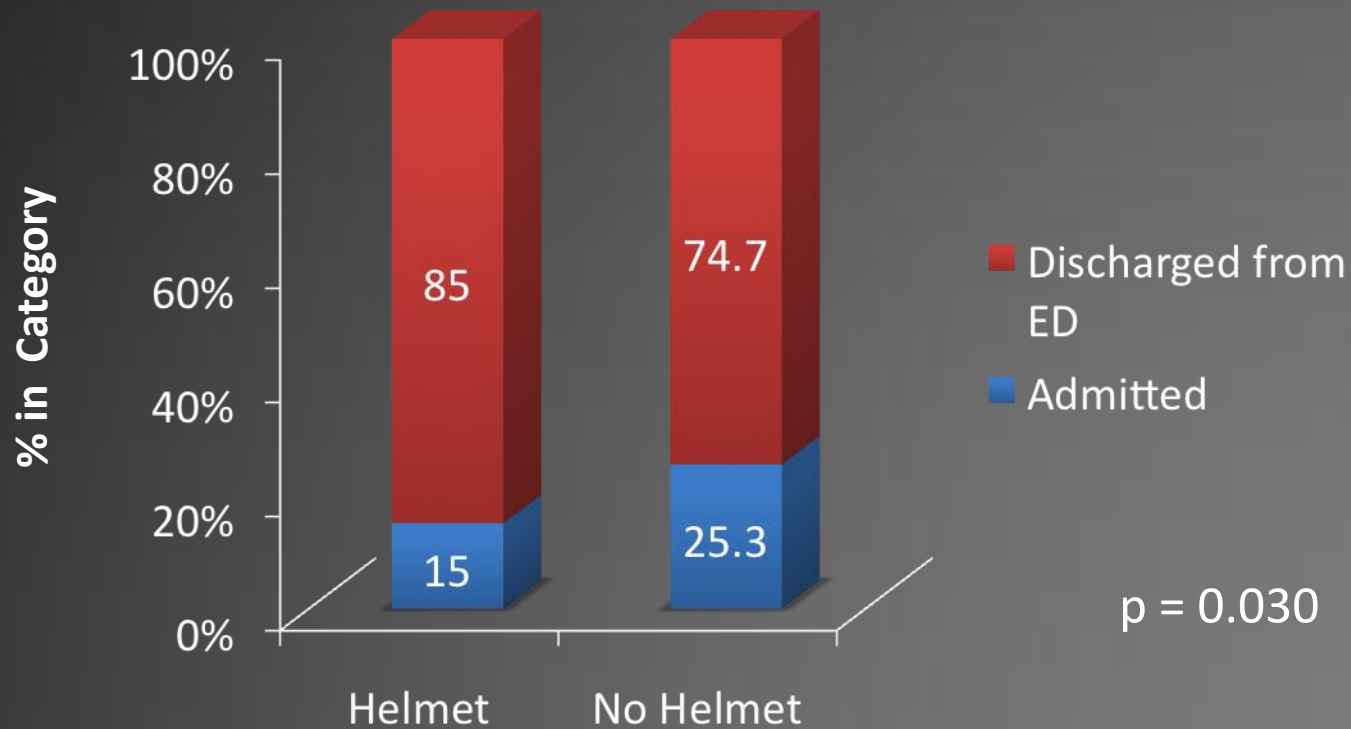


Management: CT head

n= 374



Disposition from Emergency Department n= 374



Outcomes: Bicyclists

n= 374

	Helmet n=113	No Helmet n=261	p Value
Mortality	0 (0%)	3 (1.1%)	0.555

Summary

- Ethnic and socio-economic disparities regarding helmet use exist.
- Helmeted bicyclists practice safer riding behaviors.
- Few differences were found in injuries or outcomes comparing helmet users and non-users.
 - Lower admission rate in helmeted cohort
- A larger population must be studied to delineate the number of preventable brain injuries or human lives saved by helmet use.

Next Steps

- New Grant: New Project
- “Road Safety NYC”
 - A project designed to investigate all bicycle related injuries (versus motor vehicles, other bicyclists, or pedestrians)

Thank You

- Grant Support
 - Highway Safety Grant from State of New York Governor's Traffic Safety Committee
- Principal Investigator
 - Dr. Spiros Frangos
- Project Coordinator
 - Dekeya Slaughter
- Statistician
 - Dr. Stephen Wall
- Study Design and Data Collection
 - Sally Jacko
 - Deborah Levine
 - Ronald Simon
 - S. Rob Todd
 - Chad Wilson
 - Nina Glass
 - Rachel Webman
 - Omar Bholat

Contact Information

Email: Dultzl01@nyumc.org and Spiros.Frangos@nyumc.org