CENTER FOR THE STUDY OF
Young Drivers
University of North Carolina

Preventing Motor Vehicle-related Injury to North Carolina Adolescents

Robert Foss, PhD

University of North Carolina at Chapel Hill

NC Institute of Medicine
Task Force on Adolescent Health - Injury Seminar

July 11, 2008

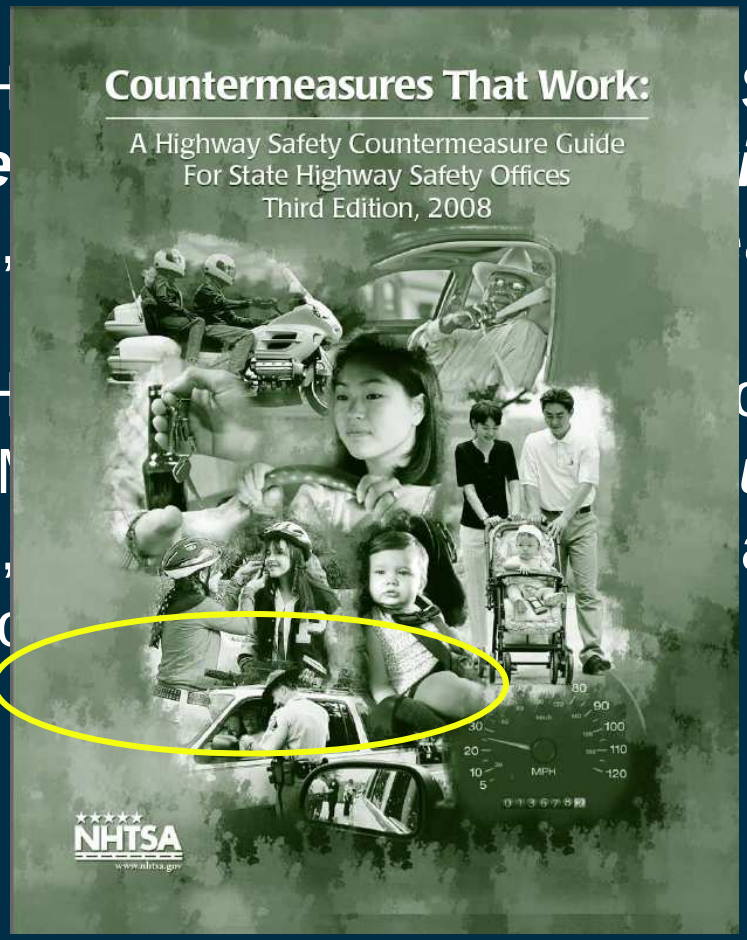
A tale in three acts:

- Background/context
- Some crash facts
- Promising approaches
- Nature of human behavior (?)

Previous experience doing this:

Goodwin AH Sohn J (2007). ***A guide for re ing young drivers.*** Washington, arch Board.

Goodwin AH omas LJ, Masten SV, Tucker M ***ures that work.*** Washington, affic Safety Administratio



Previous experience doing this:

- Frustrating …
- Thin research base
  - Virtually no Federal research funding
- Much tried
  - Little works

UNC Center for the Study of Young Drivers

CENTER FOR THE STUDY OF
Young Drivers

The Issues | Center Projects | About the Center

A UNIVERSITY OF NORTH CAROLINA RESEARCH CENTER

THE ISSUES

Learn more about why motor-vehicle crashes are the leading cause of death among teenagers

CENTER PROJECTS

Find out more about the areas of current research conducted at the Center

ABOUT THE CENTER

Read more about the Center and its history, purpose and published research

Motor-vehicle crashes are the leading cause of death among teenagers. A combination of inexperience and the natural impulsiveness of the adolescent years contribute to this increased risk of being involved in a crash.

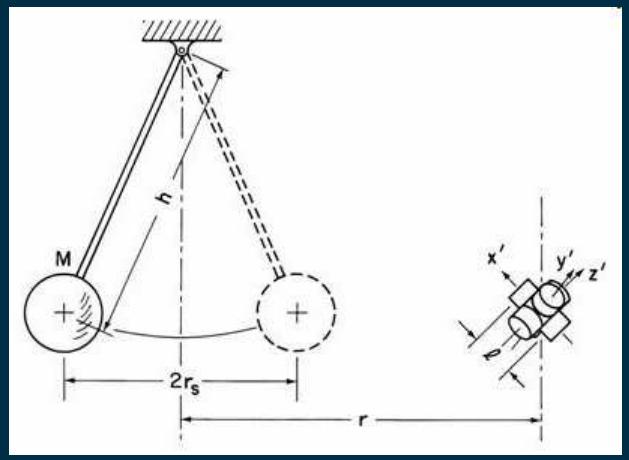
The Center for the Study of Young Drivers (CSYD) was established within the UNC Highway Safety Research Center in 2005 to study and improve the safety of young drivers. The Center's focus is on developing a fundamental understanding of the multitude of factors that contribute to the high crash rate among young drivers. This understanding is critical for the development of effective policies and programs to reduce travel-related deaths and injuries among teens.

730 MARTIN LUTHER KING JR BLVD, SUITE 300, CB #3430, CHAPEL HILL, NC 27599-3430

Understanding Human Behavior

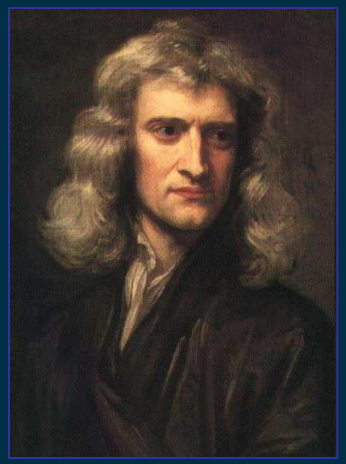
- Not “Rocket Science”

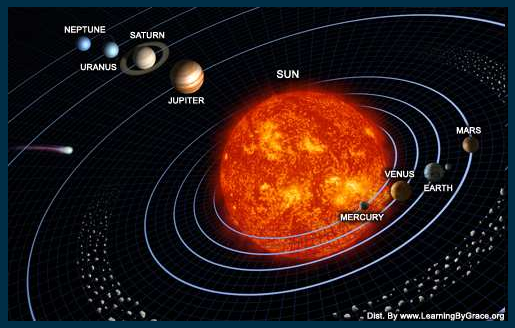
  … it’s harder!



"I can calculate the motions of the heavenly bodies but not the madness of the people"

- Sir Isaac Newton





Saturday Review - June 3, 1972

HUMAN BEINGS ARE NOT VERY EASY TO CHANGE AFTER ALL

An unjoyful message and its implications for social programs

BY AMITAI ETZIONI

A while back there was a severe shortage of electricity in New York City, and Columbia University tried to help out in two ways: A card reading "Save a watt" was placed on everyone's desk and janitors removed some light bulbs from university corridors. The ways in which this shortage was made up for illustrate two major approaches to social problem solving. One approach is based on the assumption that people can be taught to change their habits, that they can learn to remember to switch off unused lights. The second approach assumes that people need not, or will not, change and instead alter their environment so that, even if they leave light switches on, watts are saved.

The prevalent approach in the treatment of our numerous and still-multiplying social problems is the first. Imbedded in the programs of the federal, state, and city governments and embraced almost instinctively by many

> Solving social problems by changing people is apparently less productive than accepting people as they are and changing their circumstances instead.

$27 million is used to make nonsmokers out of smokers—that is, to try to change a basic habit—no significant effect is to be expected. Advertising molds or teases our appetites, but it doesn't change basic tastes, values, or preferences. Try to advertise desegregation to racists, world government to chauvinists, temperance to alcoholics, or—as we still do at the cost of $16 million a year—drug abstention to addicts, and see how far you get.

In fact, the mass media in general have proved to be ineffectual as tools for profoundly converting people. Studies have shown that persons are more likely to heed spouses, relatives, friends, and "opinion leaders" than broadcasted or printed words when it comes to deep concerns.

Another area in which efforts to remake people have proved glaringly inefficient is that of the rehabilitation of criminals. We rely heavily on re-educational programs for prisoners. But

“Messages” rarely the answer

Elements of Intervention Effectiveness

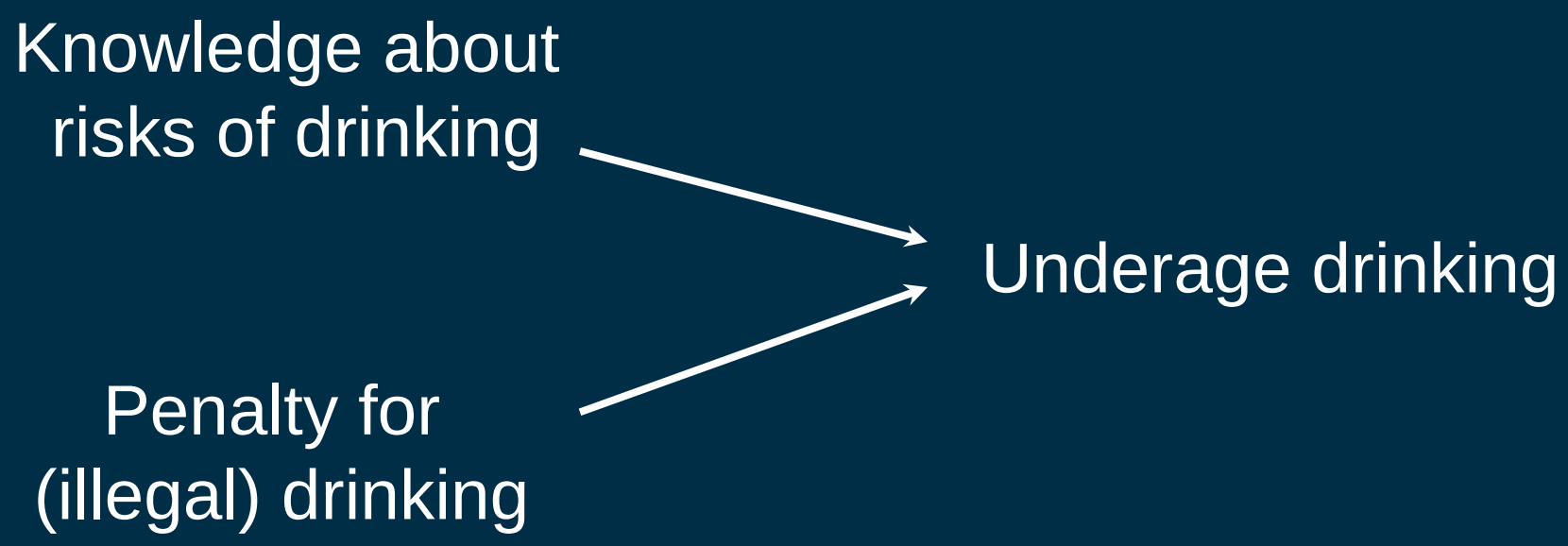
Conceptual Soundness → Implementation Fidelity → Desired Outcome

Difficult

Astoundingly Difficult

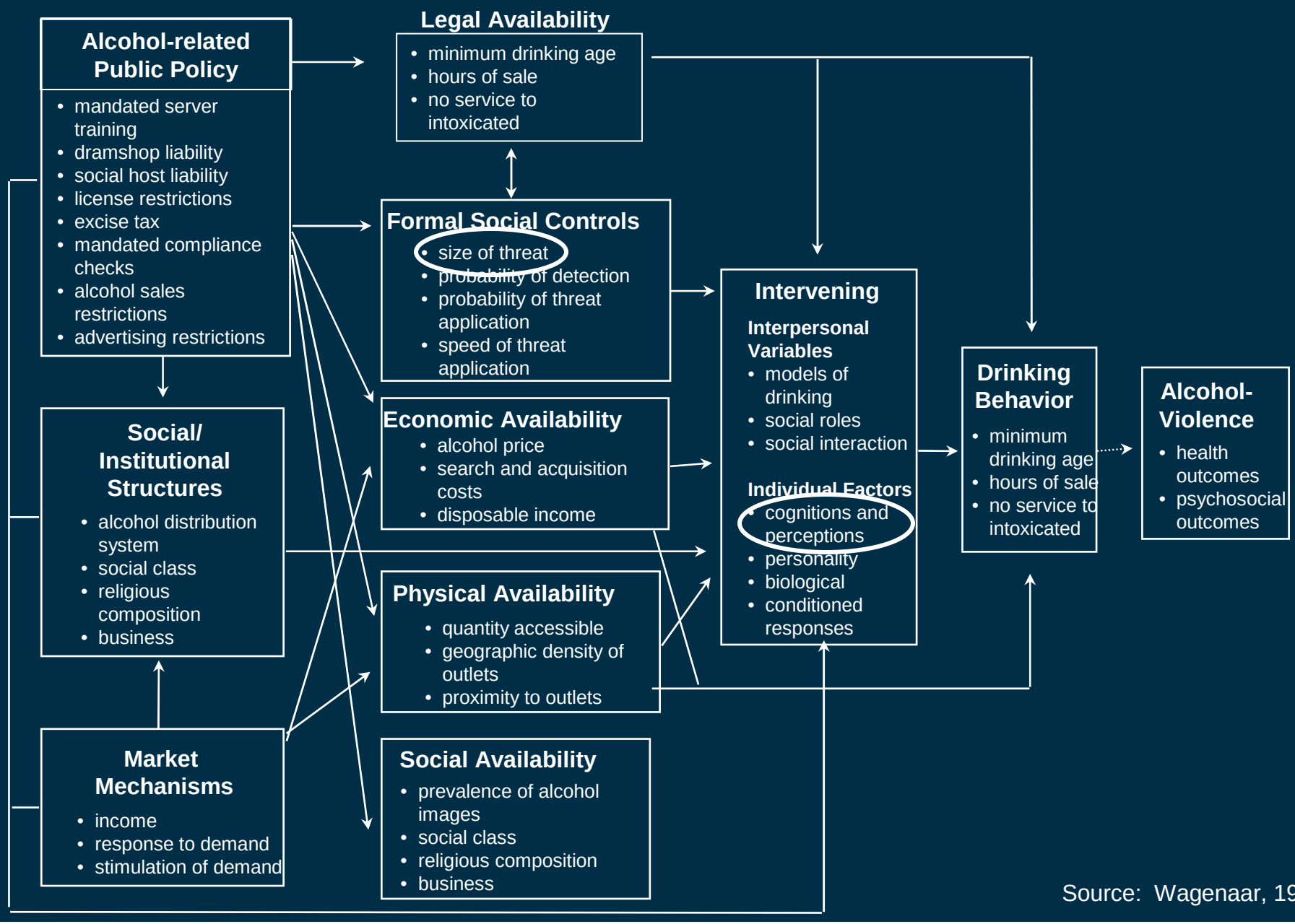
Distressingly Rare

A Typical Conceptual Model (Underage Drinking)



Theoretical Model for National Initiative to Reduce Underage Drinking

Theoretical Model for Initiative to Reduce Underage Drinking



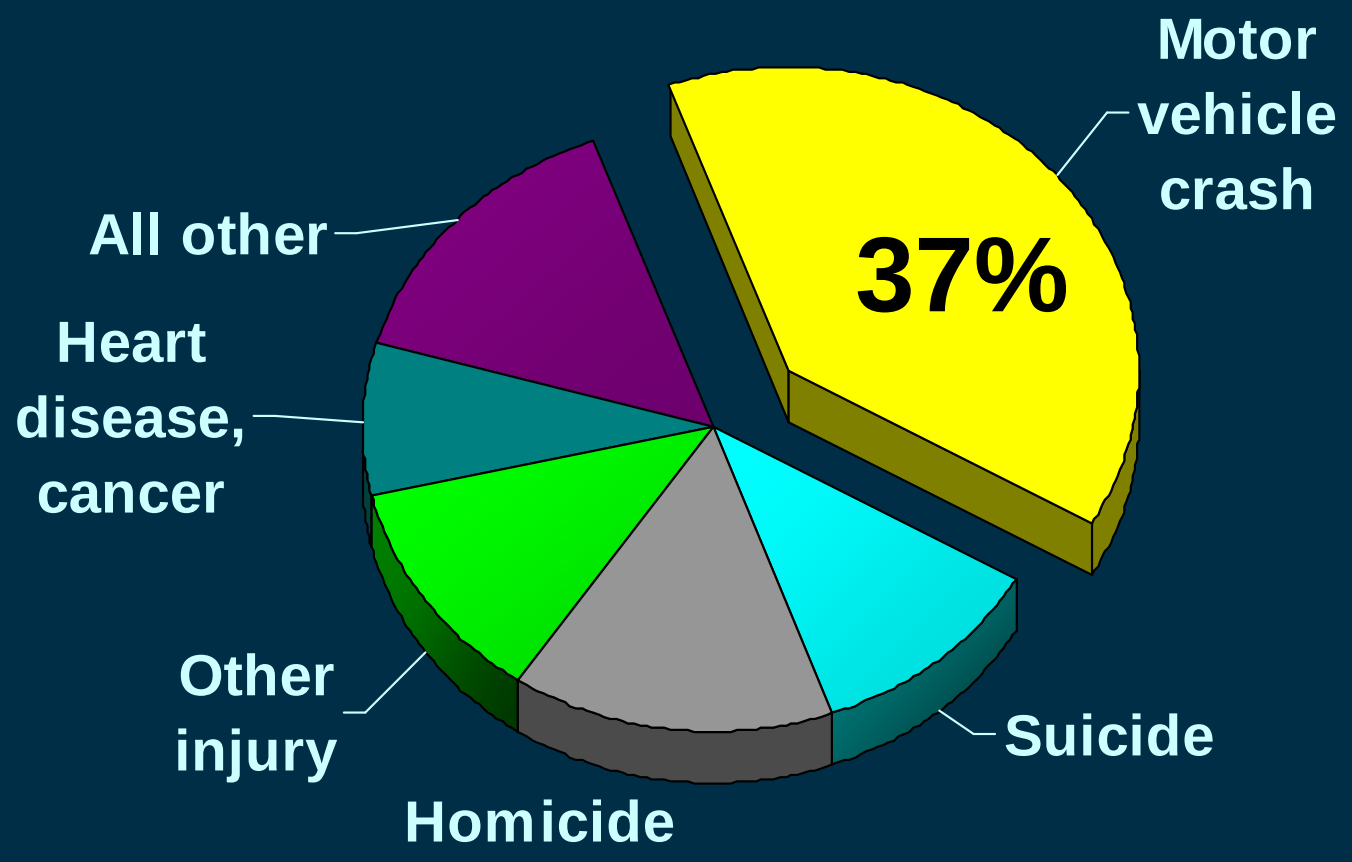
Source: Wagenaar, 1997

Effective Strategy

- Implement *Principles*
  - Laws, programs, policies …
    - Not the goal
    - Merely the tools
- Details matter
  - Implementation fidelity

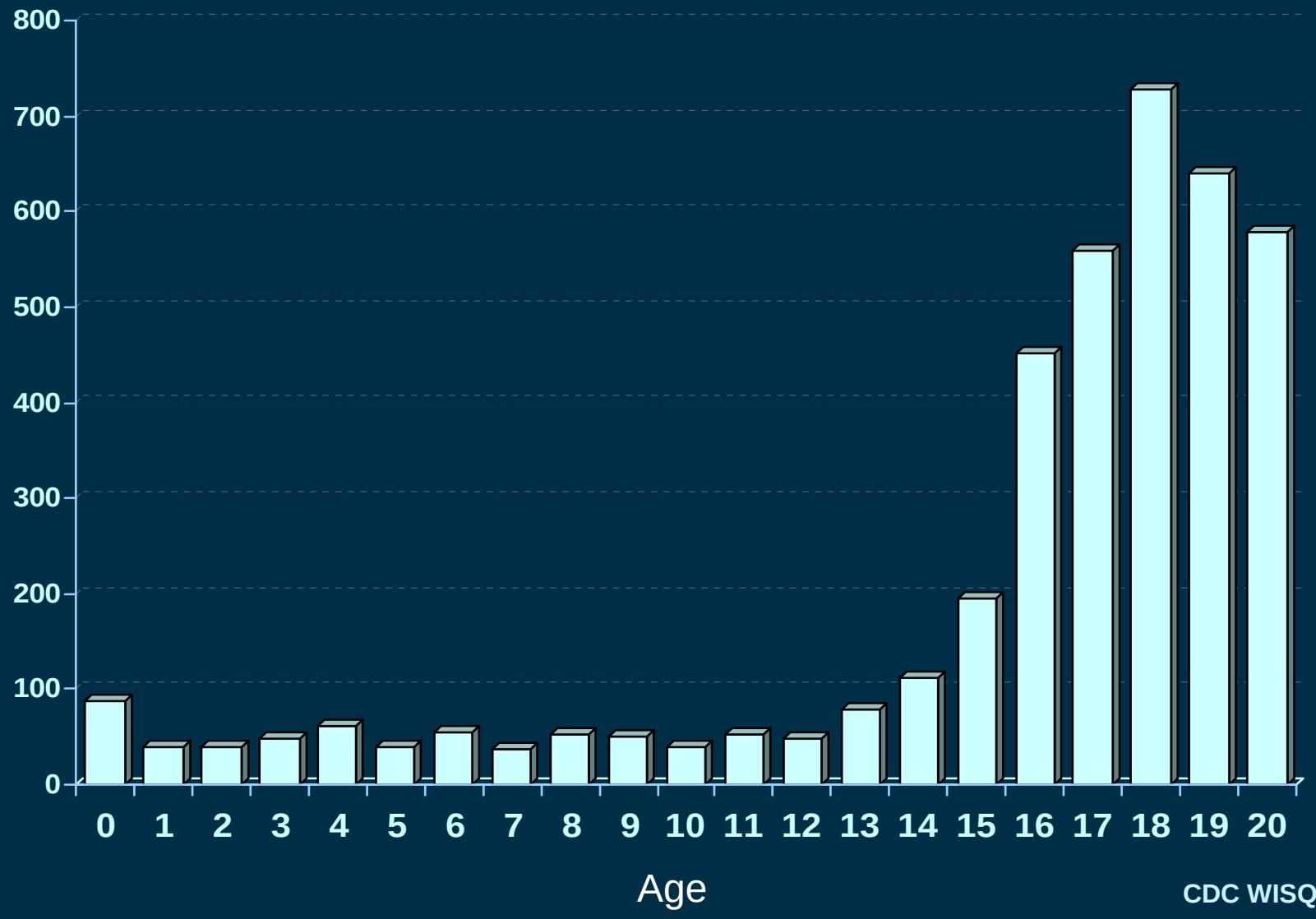
Teen MV crash data

Leading Causes of Death
United States, Ages 16 - 20



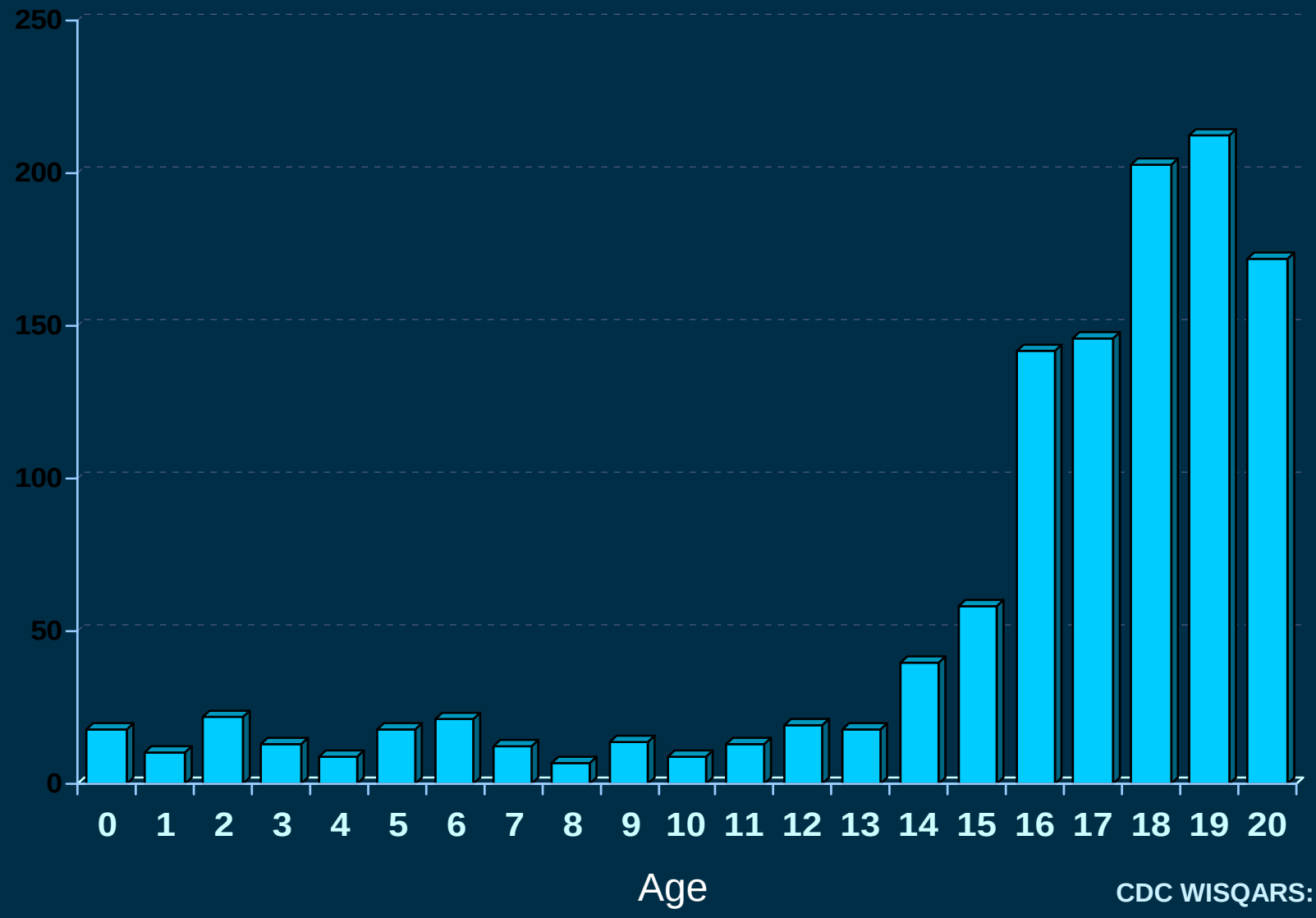
Source: CDC, 2004

MV Child Crash Fatalities by Age – U.S.



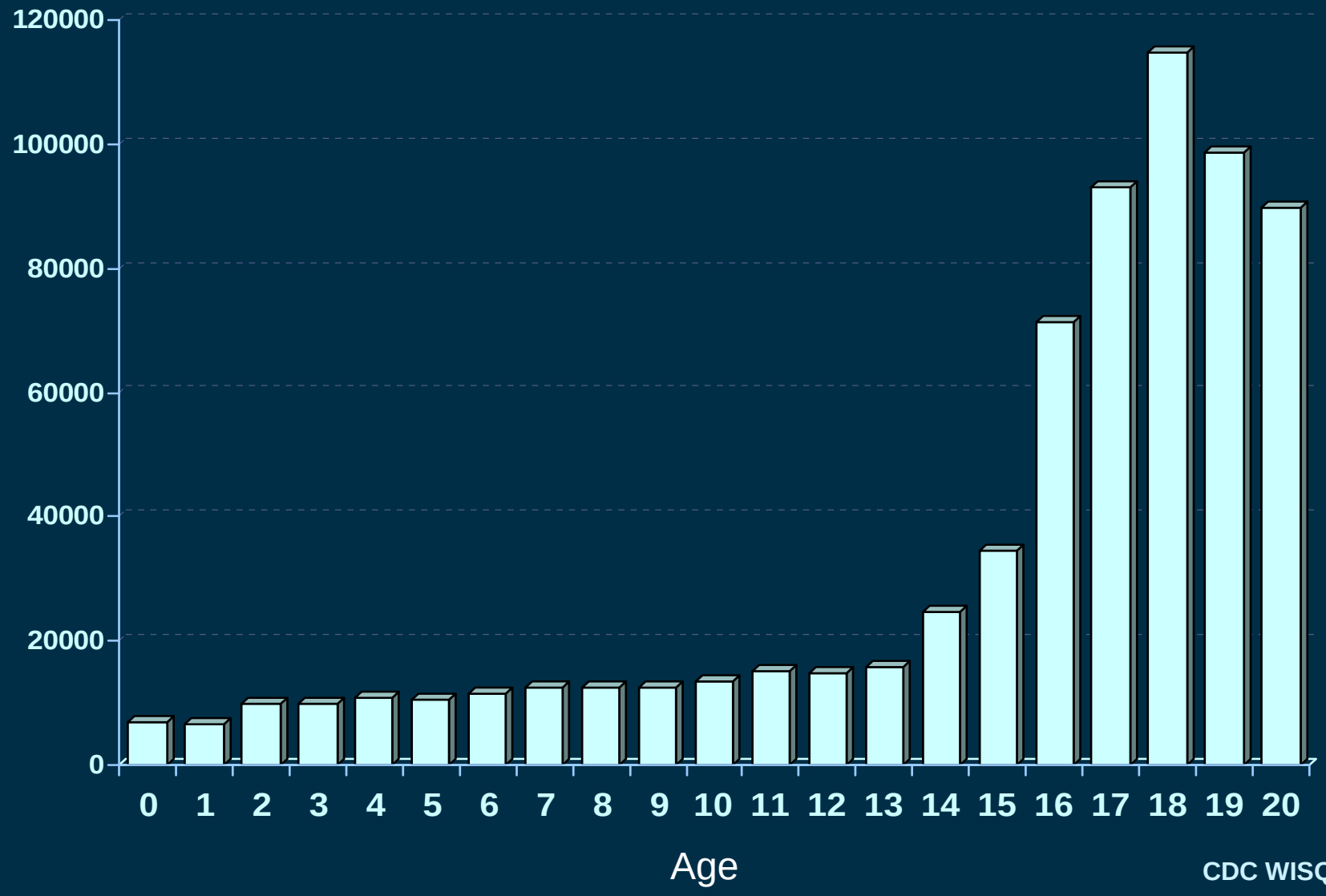
CDC WISQARS: 2005

MV Child Crash Fatalities by Age – NC



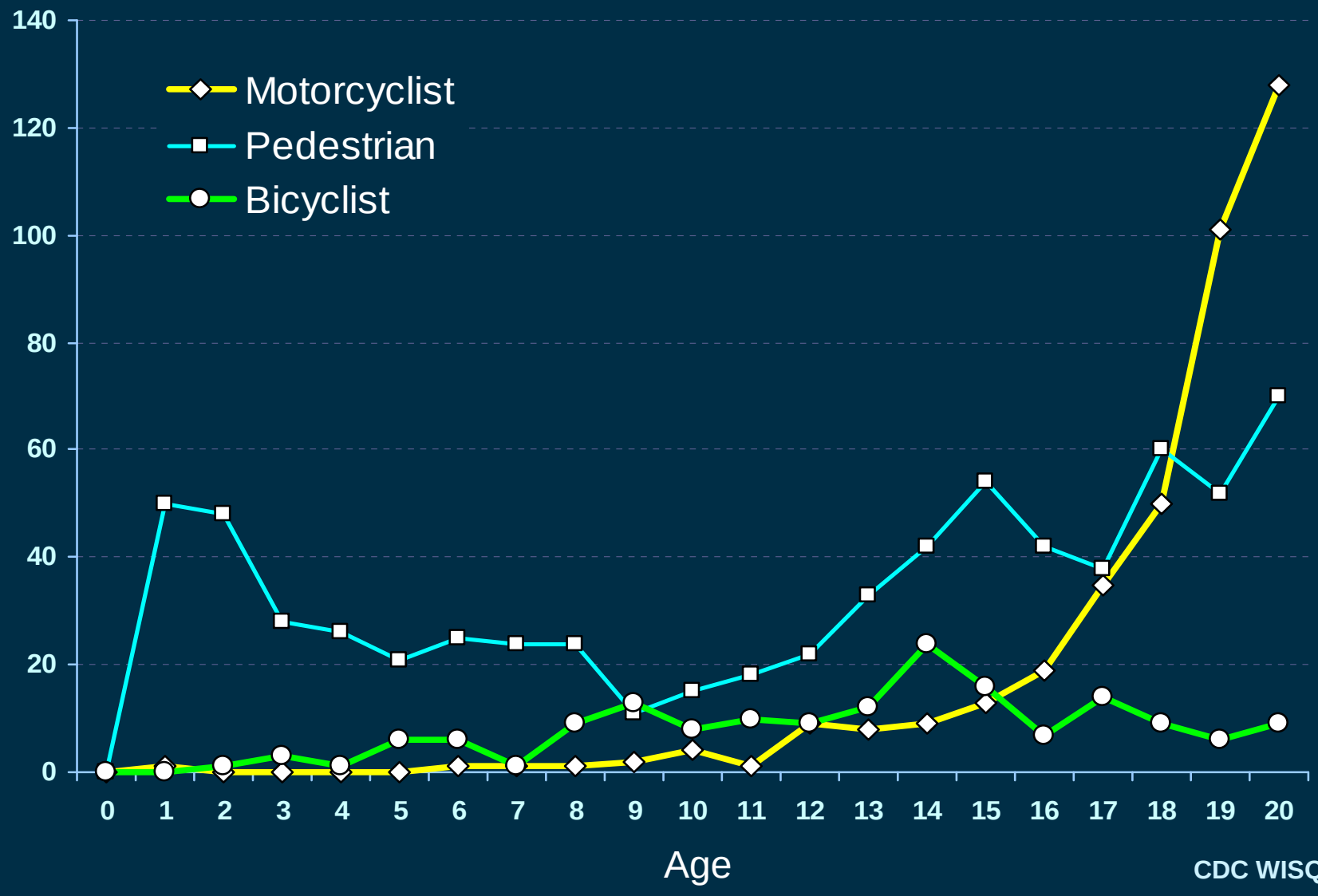
CDC WISQARS: 2001-2005

MV Child Crash Injuries by Age – U.S.



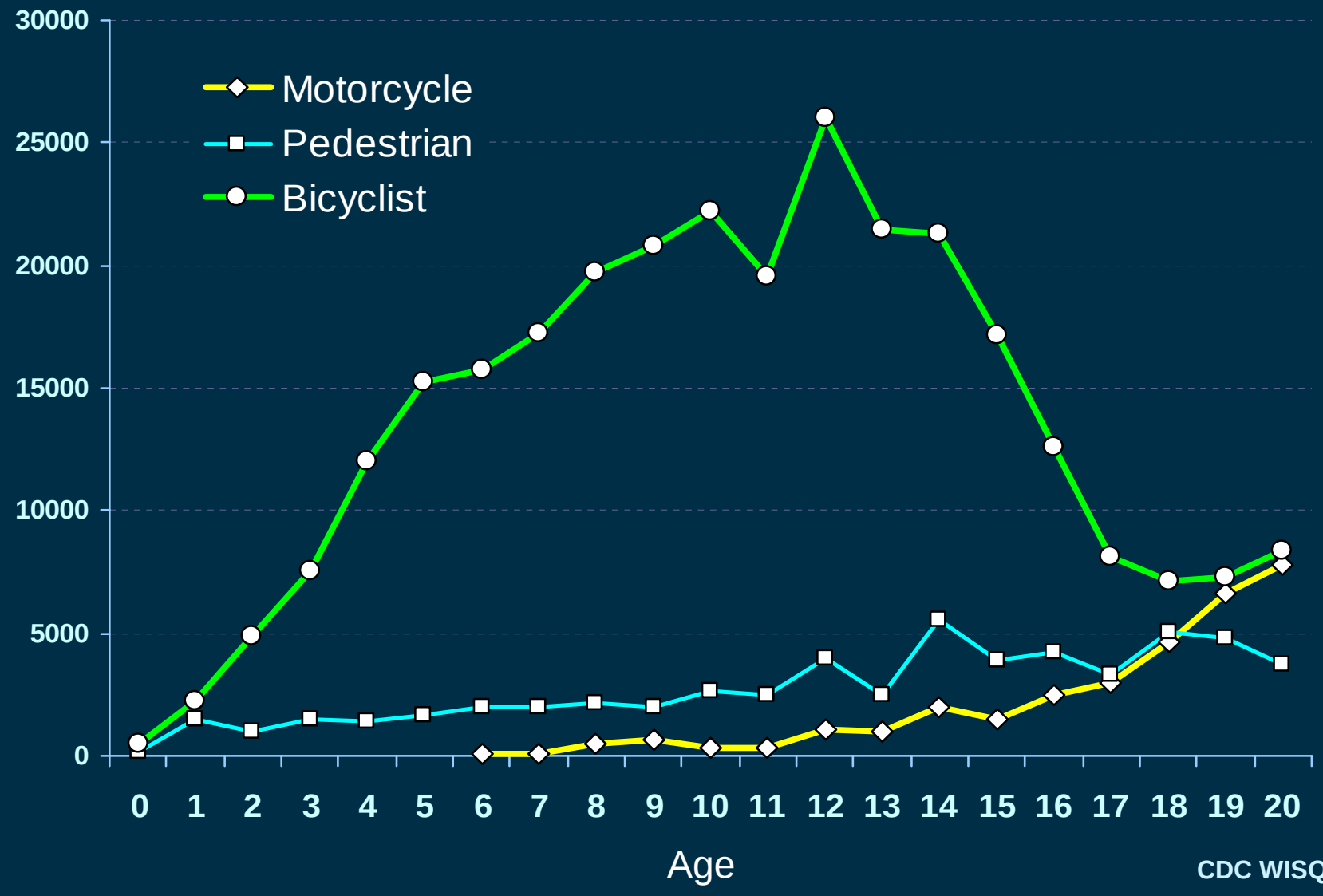
CDC WISQARS: 2006

MV *Non-occupant* Fatalities by Age & Type - U.S.



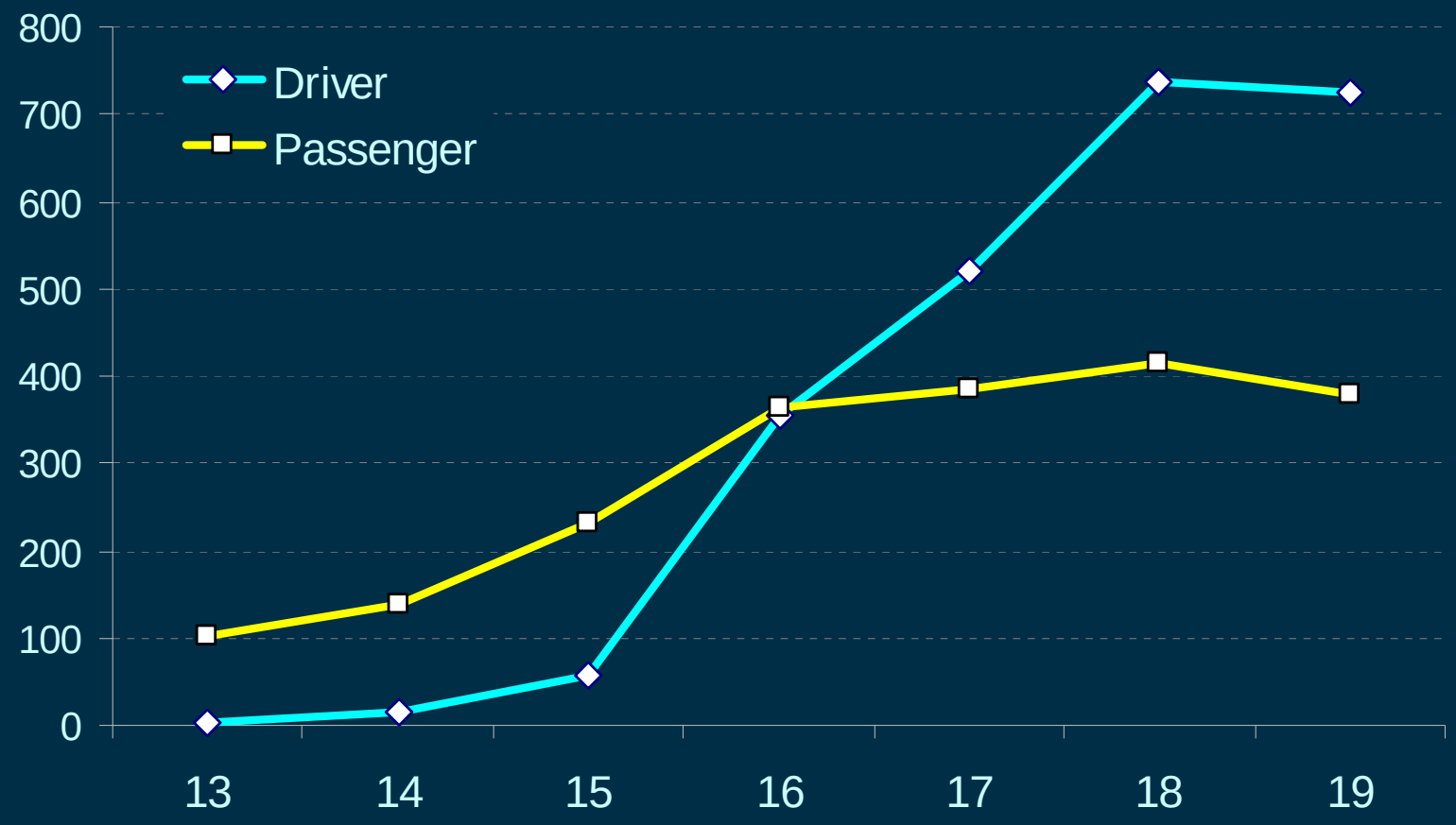
CDC WISQARS: 2006

MV *Non-occupant* Injuries by Age & Type - U.S.



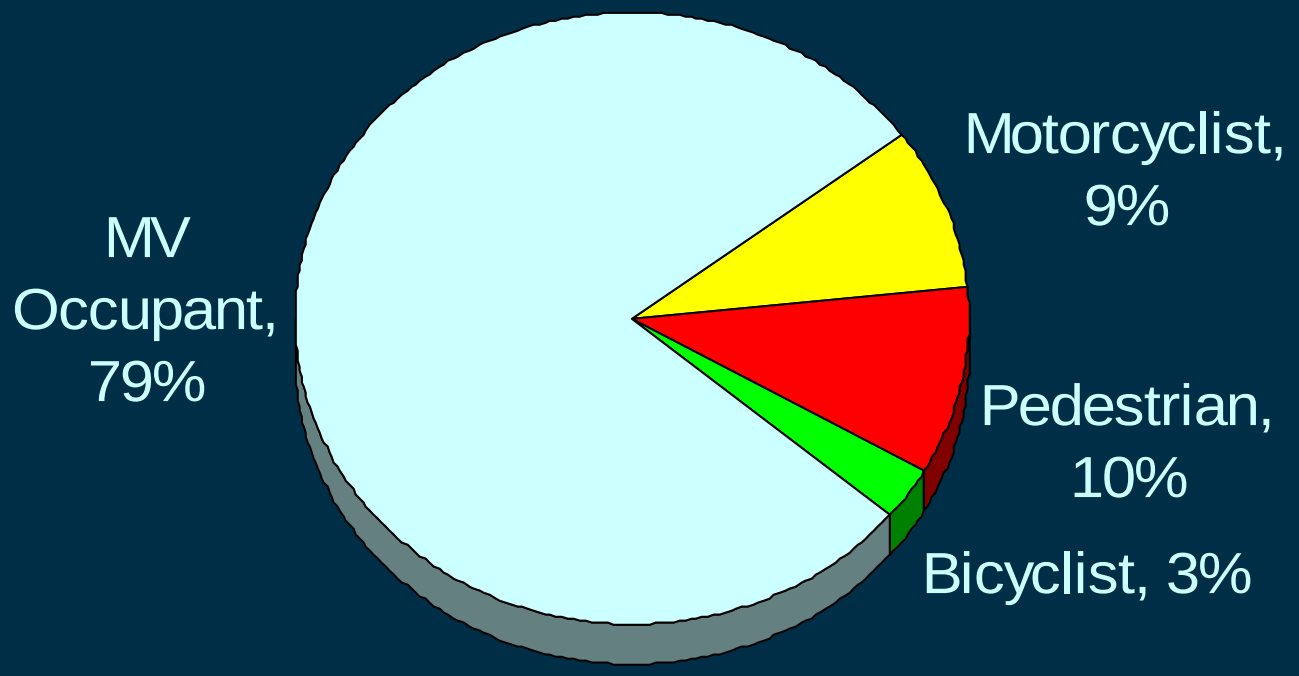
CDC WISQARS: 2006

Teen MV deaths by age & role – U.S.



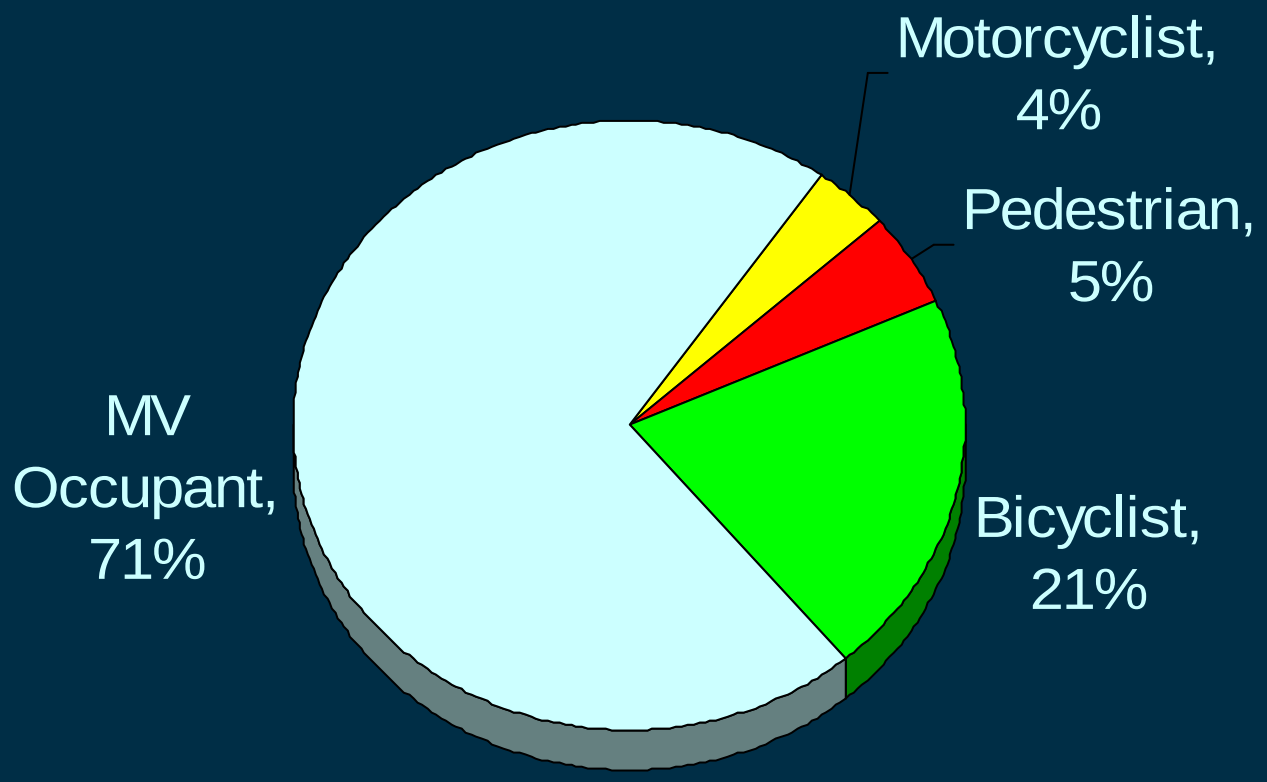
U.S. 2005

Adolescent (10 – 20) MV Fatalities – United States, 2005



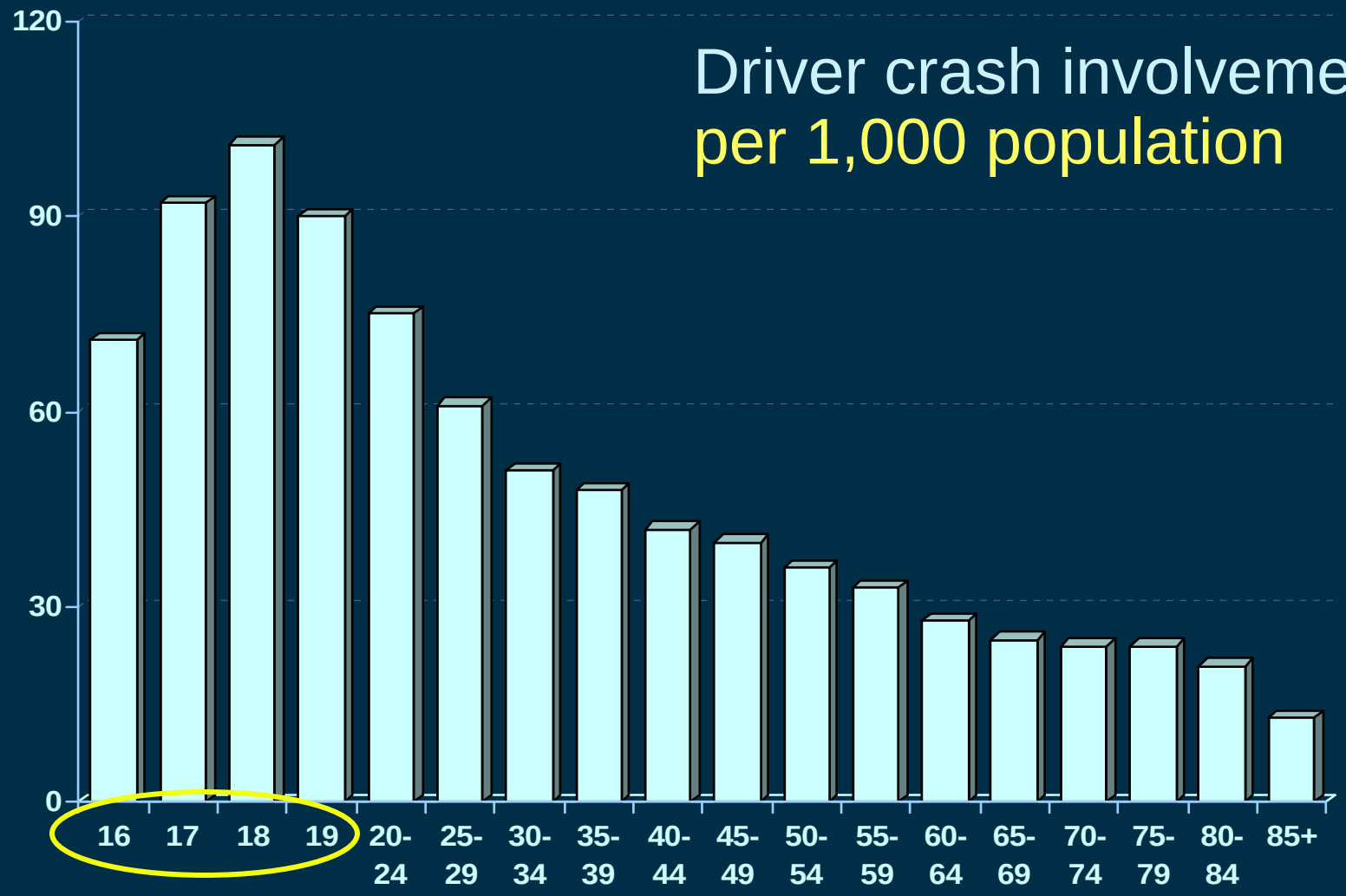
CDC WISQARS: 2006

Adolescent (10 – 20) MV Injuries – United States, 2006



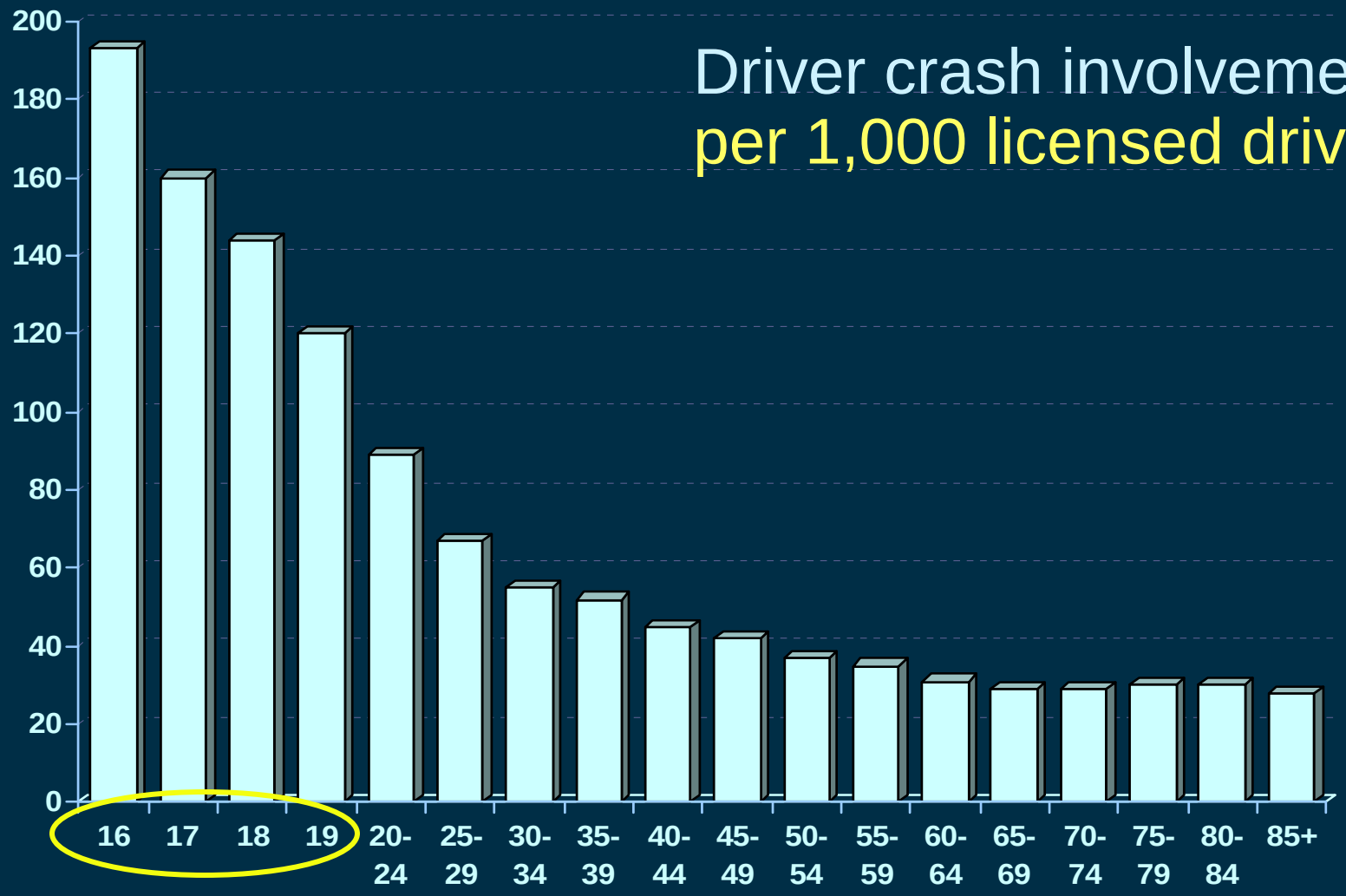
CDC WISQARS: 2006

Crash Rates by Age



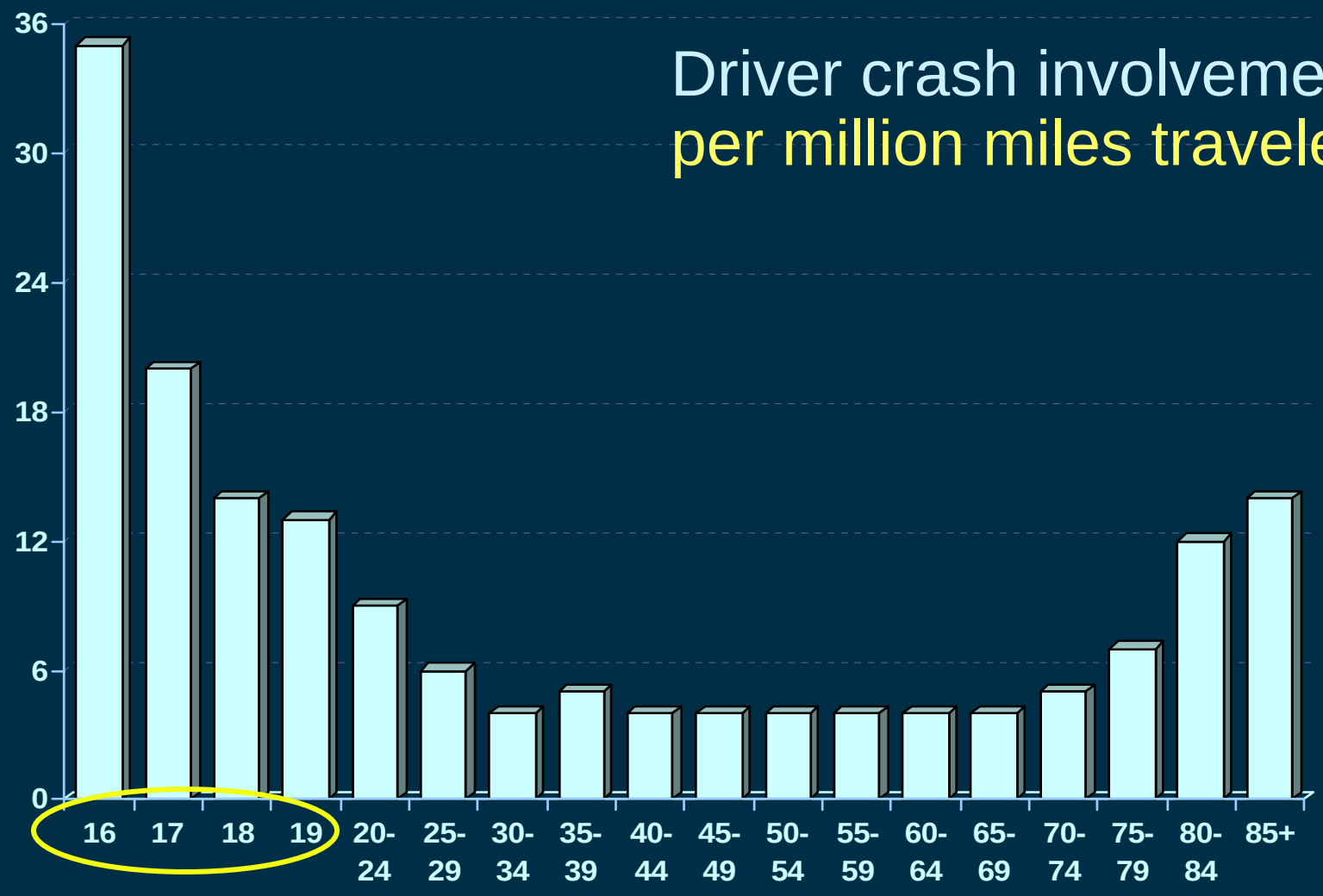
Source: A.F. Williams, Journal of Safety Research 34 (2003) 5-15

Crash Rates by Age



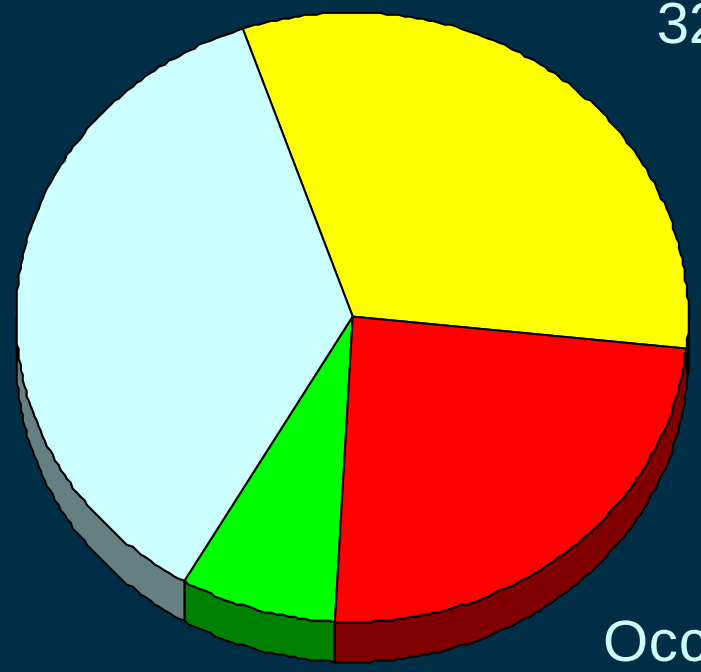
Source: A.F. Williams, Journal of Safety Research 34 (2003) 5-15

Crash Rates by Age



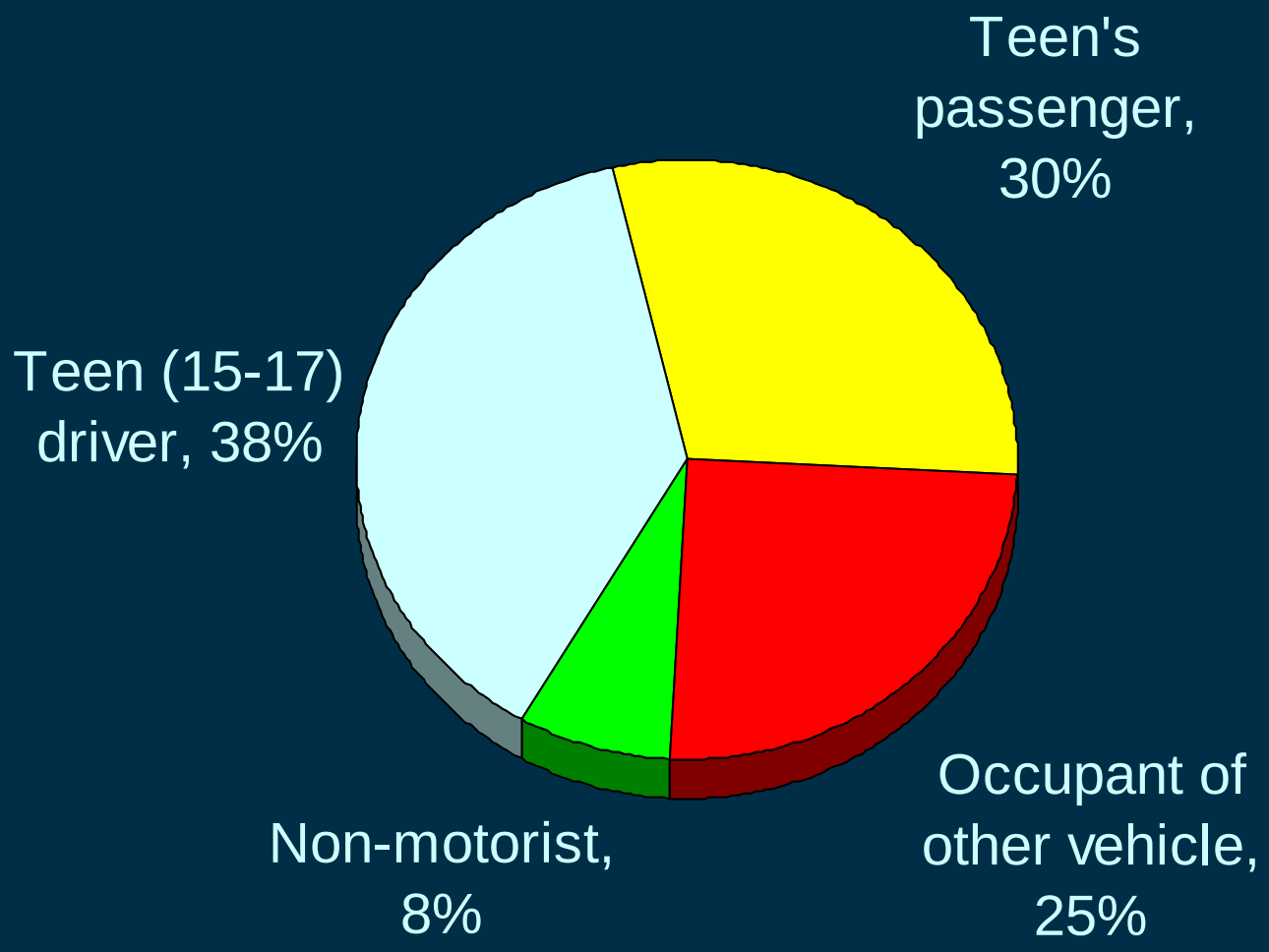
Source: A.F. Williams, Journal of Safety Research 34 (2003) 5-15

Victim role in teen driver fatal crashes, 1995-2004 – United States



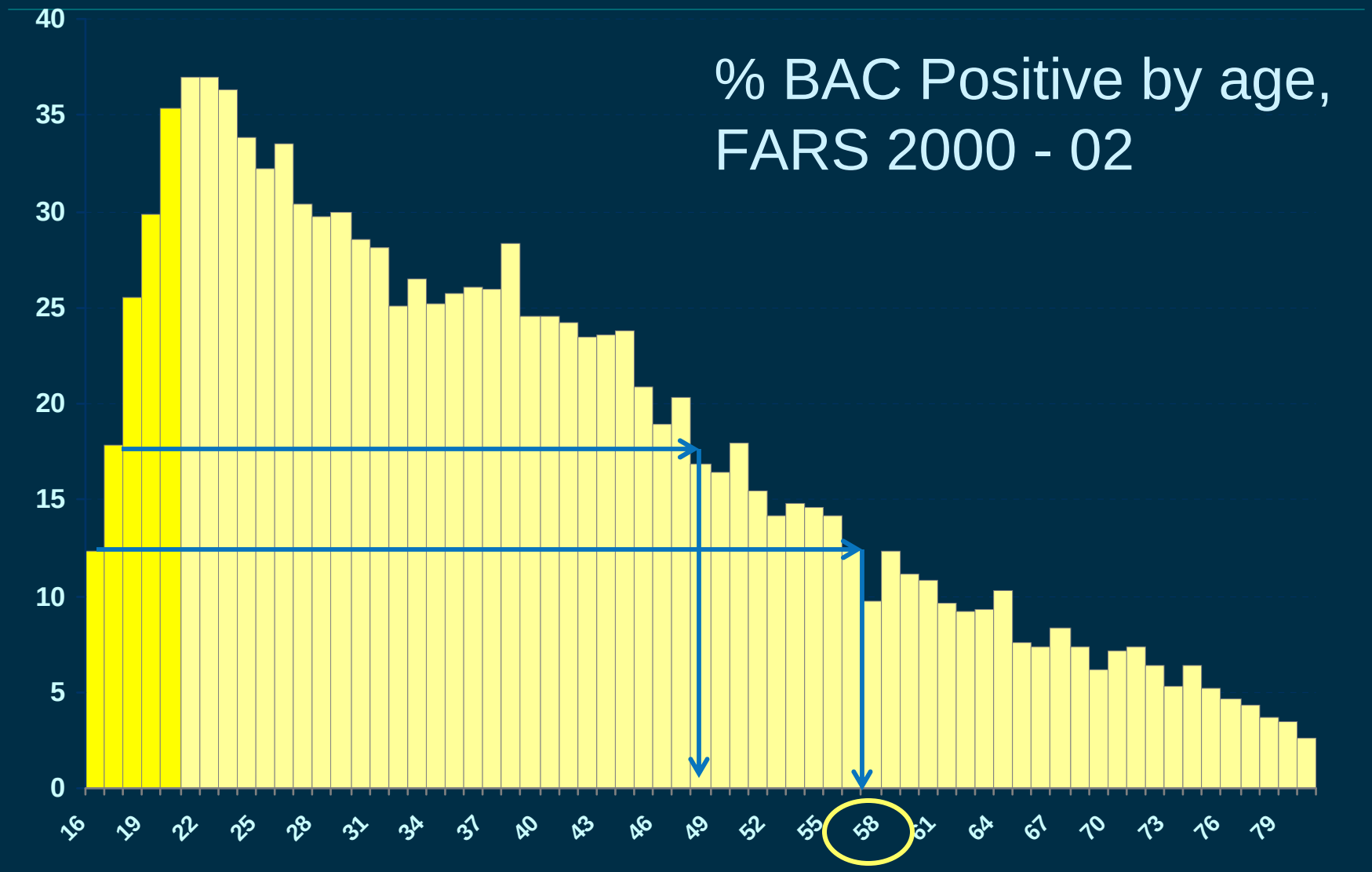
Source: AAA Foundation for Traffic Safety

Victim role in teen driver fatal crashes, 1995-2004 – North Carolina



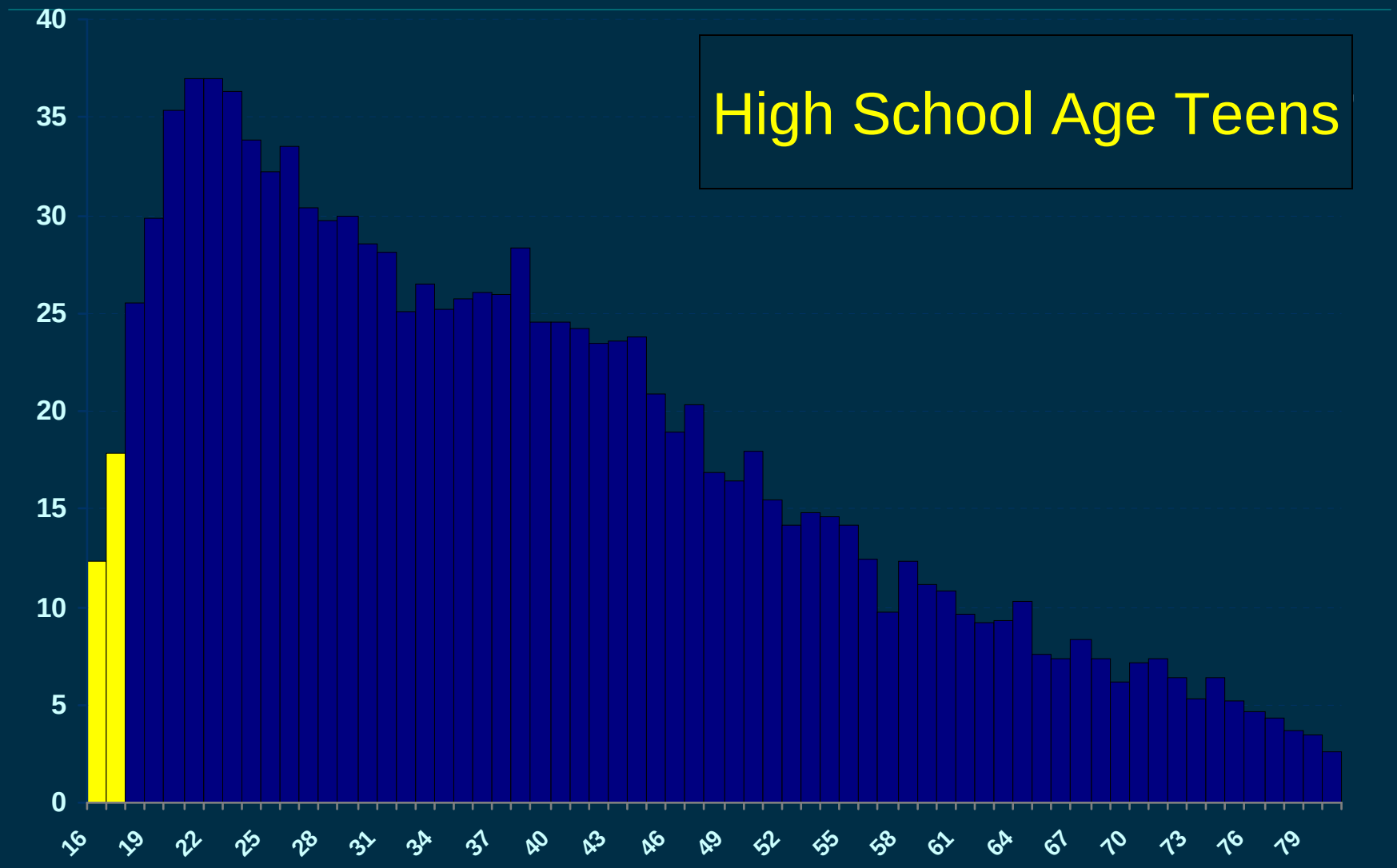
Source: AAA Foundation for Traffic Safety

Alcohol-involved Fatal Crashes – U.S.

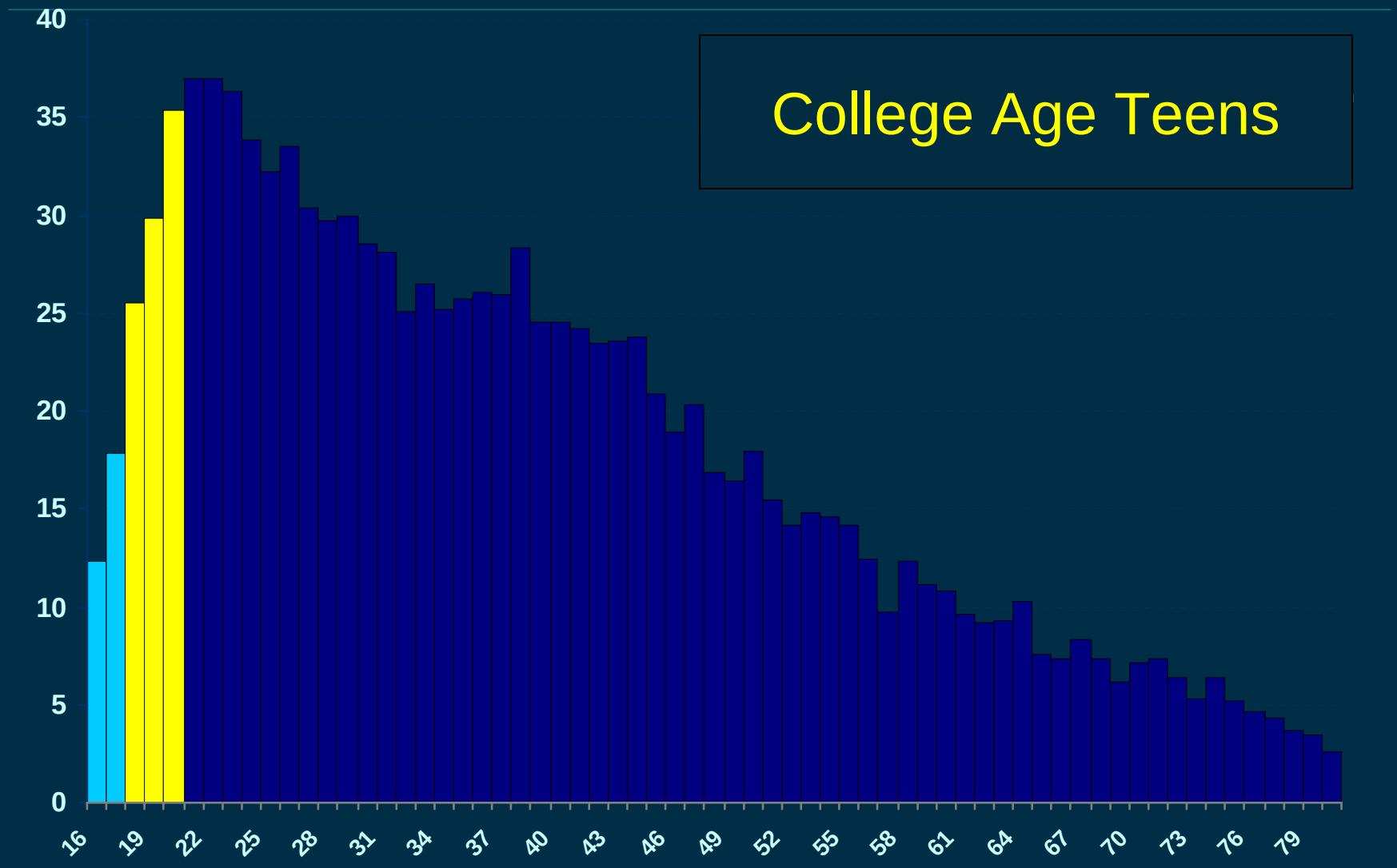


Source: National Highway Traffic Safety Administration

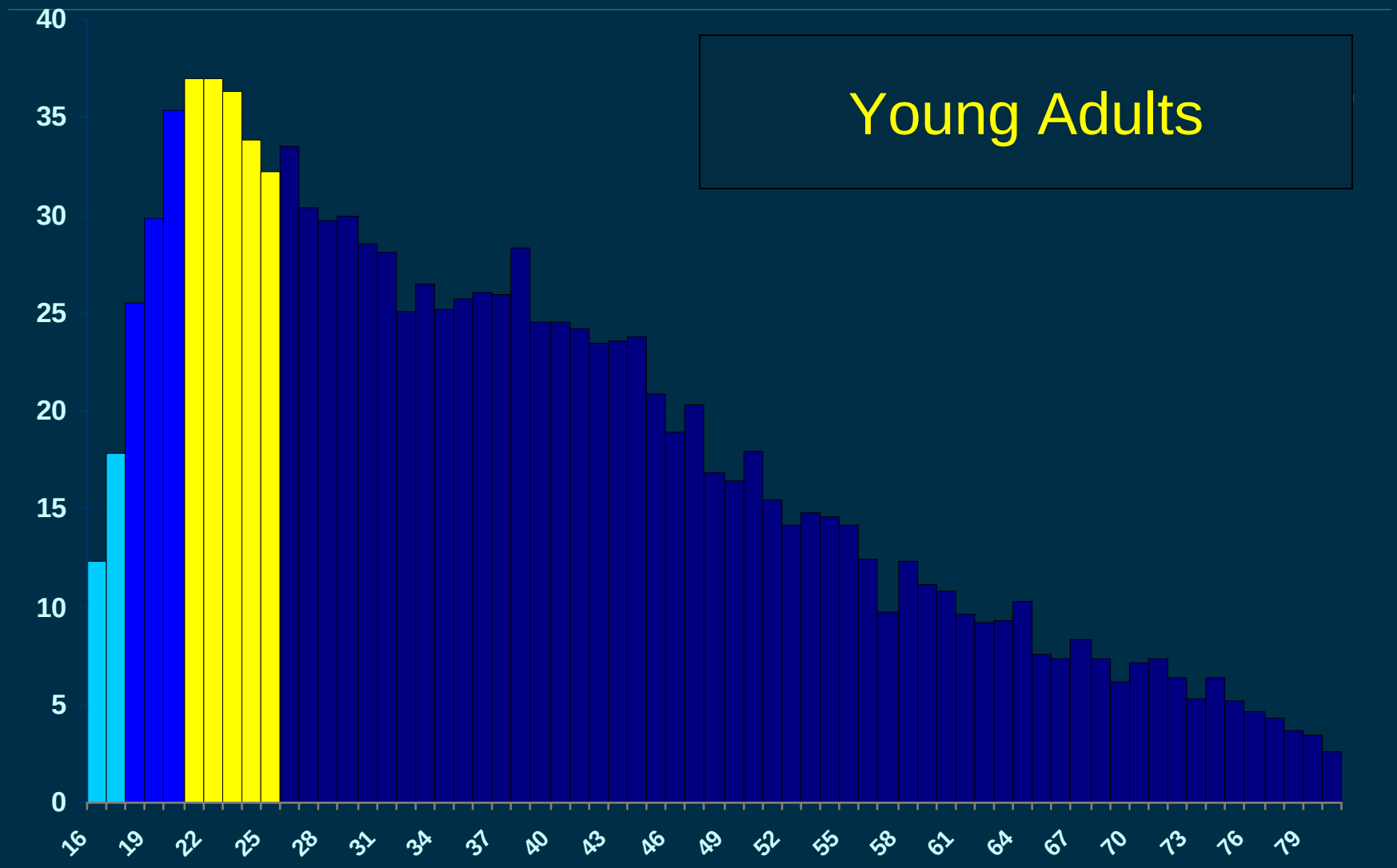
Alcohol-involved Fatal Crashes



Alcohol-involved Fatal Crashes



Alcohol-involved Fatal Crashes



What can we do about this?

Some promising options

- Graduated Driver Licensing (GDL)
- Require belt use - all seating positions
- Primary belt use law
- High visibility enforcement
- Zero BAC limit for teens

Some promising options

- Graduated Driver Licensing (GDL)
- Require belt use in all seating positions
- Primary belt use law
- High visibility enforcement
- Zero BAC limit for teens

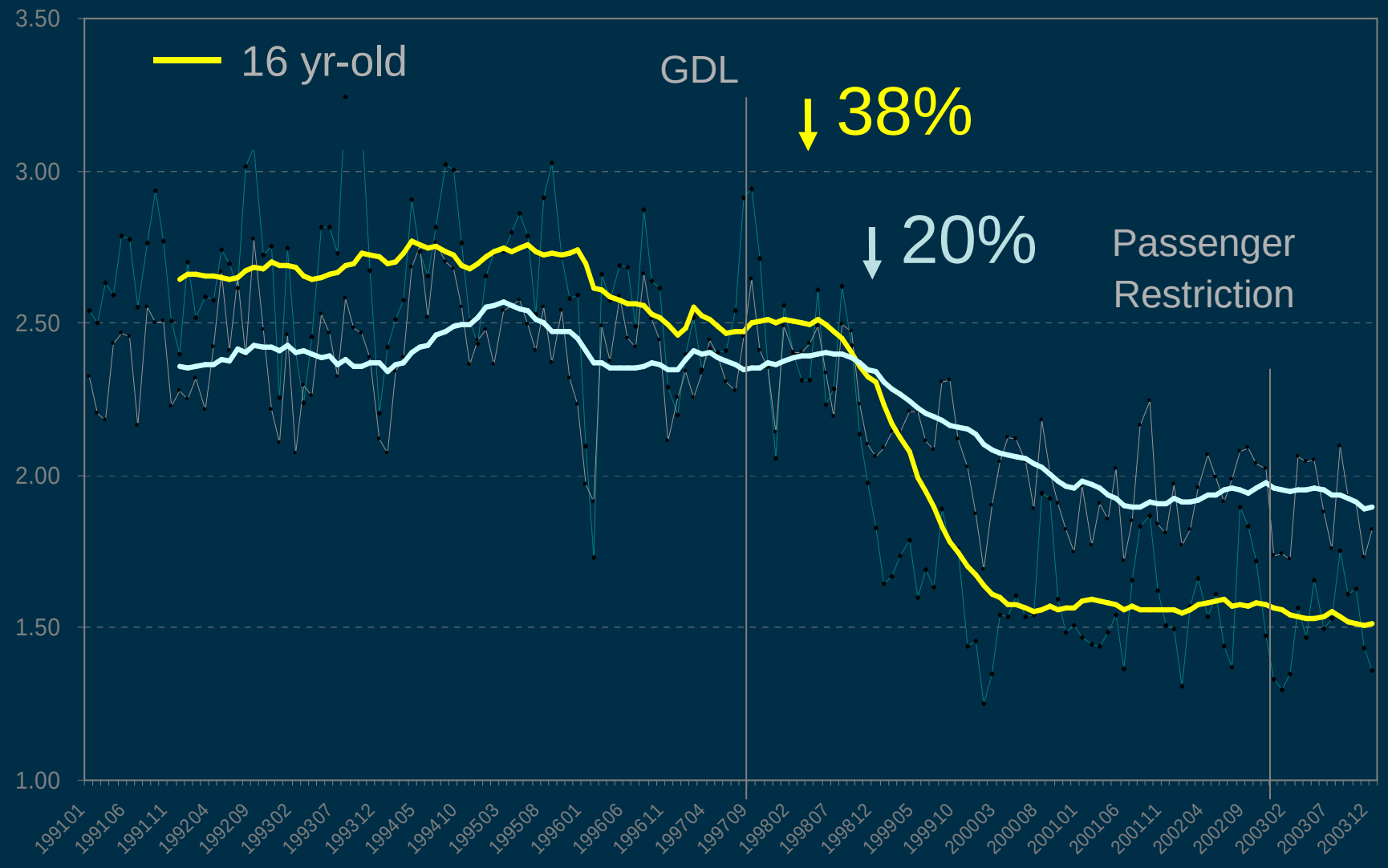
Accomplished!

GDL – a few words

- Concept, not cafeteria
  - Licensing System
    - Not a law
  - Gain experience while minimizing risk

Population-adjusted Crash Rate Ratios*

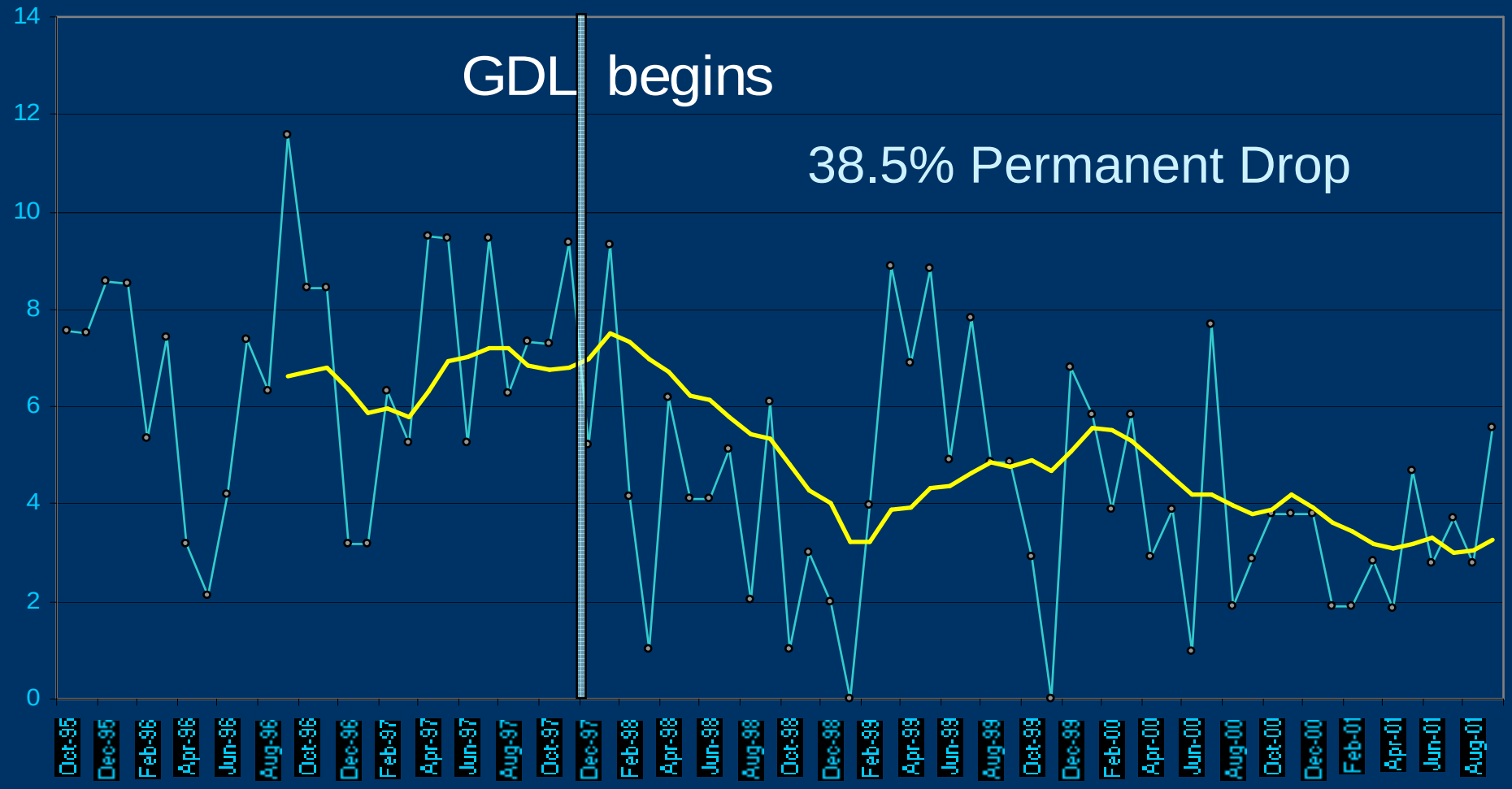
NC 1991-2003



* vs. 25-54 year-old

Monthly 16 Year-old Driver Hospitalization

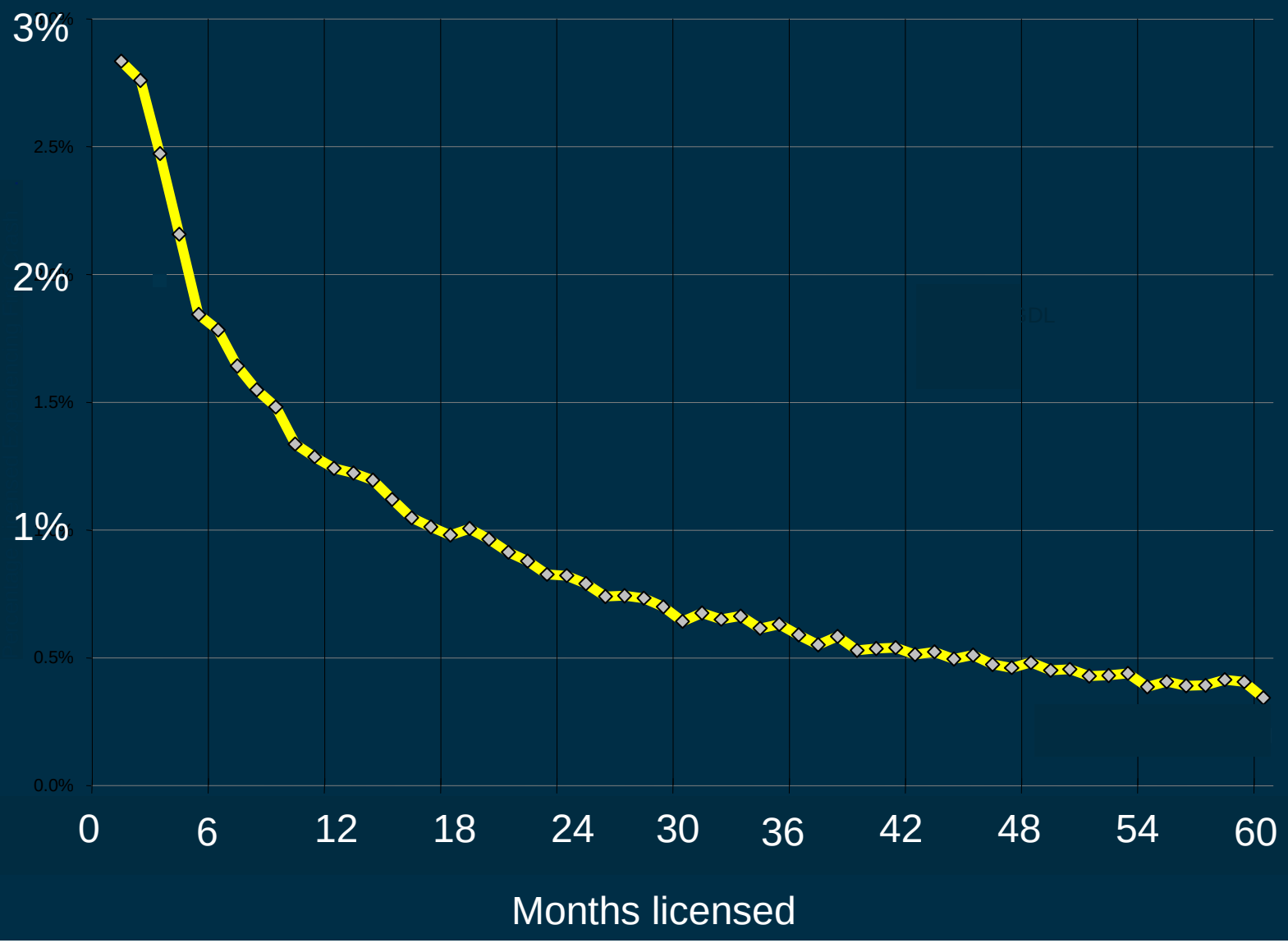
rate per 100,000 population, 1995 - 2001



Source: Margolis et al., 2007

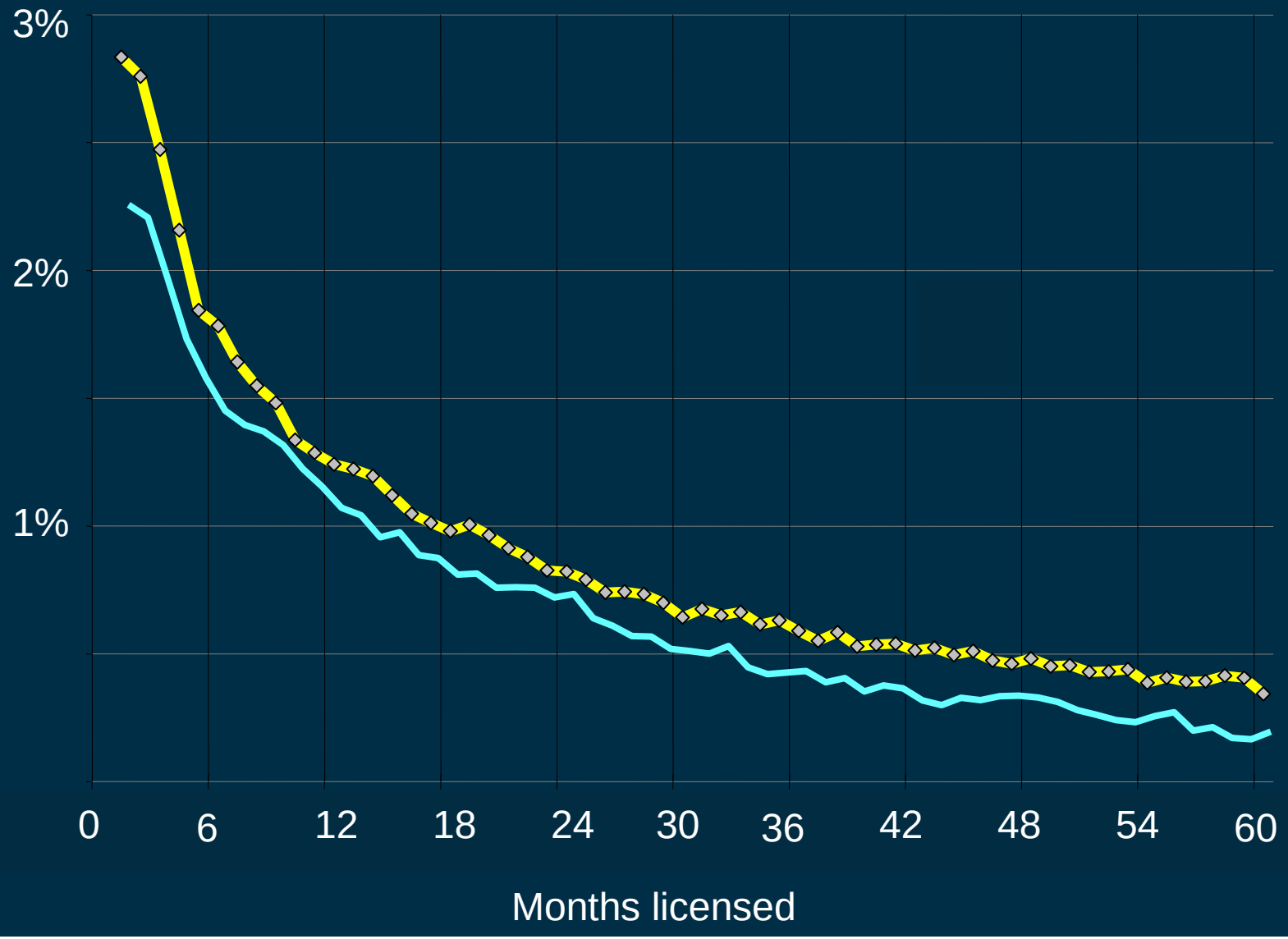
Experiential learning (pre-GDL)

% Crashing by months licensed



Experiential learning (pre- vs. post-GDL)

% Crashing by months licensed



Other possible options

- Revise deployment of DWI checkpoints
- Enhance parental involvement
- Radically revise current approach to training new drivers
- Mass media (Alcohol - CDC)
  - But see NCHRP RRD-322 (2007)
- Multi-component interventions with community mobilization (Alcohol - CDC)

Law enforcement not always the answer

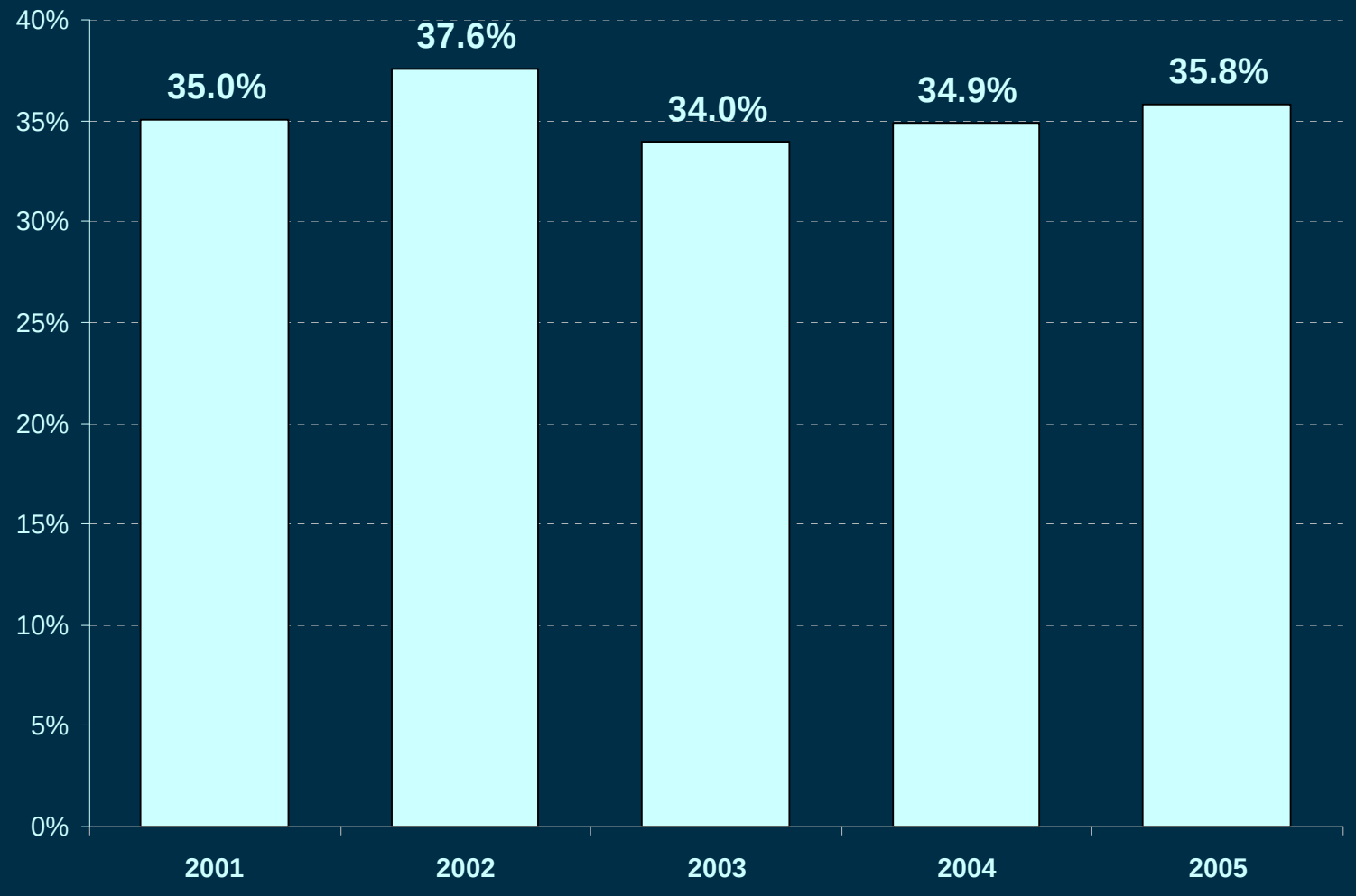
Effective use of DWI checkpoints

- Goal: Deterrence, not arrests
- Extensive publicity crucial
- On-going rather than ‘blitz’
- Create enduring uncertainty

DWI Checkpoints in NC

- 2001 - 2005
- More than 30,000 DWI checkpoints…
- 41,000 DWI arrests …

Alcohol Involvement in Fatal Crashes - NC



THE NEWS&OBSERVER

DWI crackdown starts Friday

FROM STAFF REPORTS
Comment on this story

State and local law enforcement officers will set up checkpoints and increase patrols starting Friday in their annual 4th of July crackdown on impaired driving.

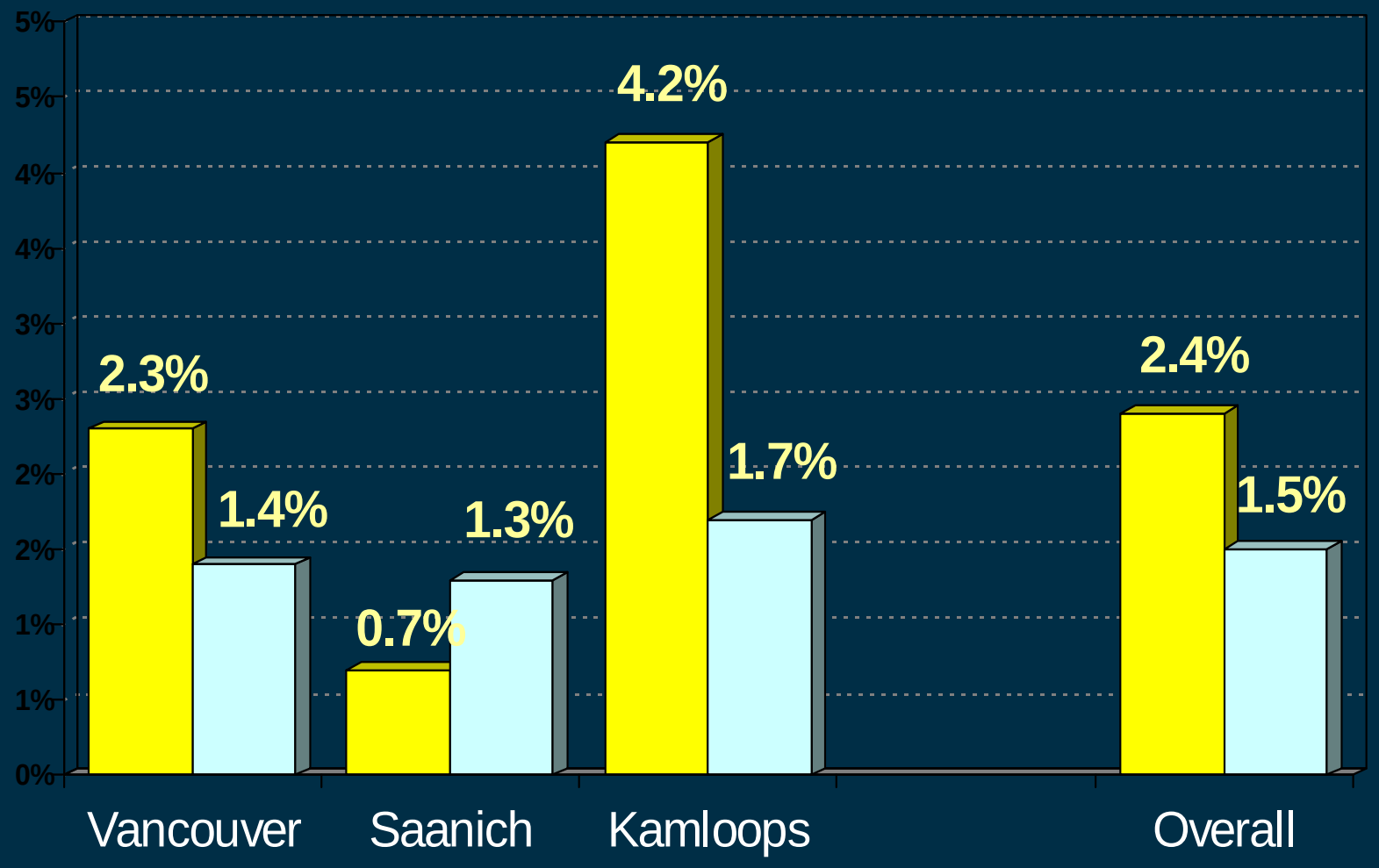
Last year, officers charged more than 2,100 people with driving while impaired during the "Booze It & Lose It: Operation Firecracker" campaign, according to a news release issued by Gov. Mike Easley's office.

Some 60 motorists were involved in fatal traffic crashes during the week of the 4th of July last year, according to the governor's office. Of those, 21 were alcohol-related. Alcohol-related crashes also accounted for 411 injuries in the state during the same week.

This year, the checkpoints and patrols will run through Sunday, July 6.

Published: Jun 24, 2008 07:47 AM
Modified: Jun 24, 2008 07:49 AM

Drivers with BAC > .08% Before & after High Visibility Checkpoint Program



Source: Beirness, Foss, WIlson, 2001

Effective Parental Involvement

- ???
- Promising ideas - nothing documented
- Research under way
  - Improve supervision – learners
  - Increase monitoring – intermediates

Parental supervision complexities

- Observed instances of parent-teen communication
  - Ships passing in the night
  - Parent conveys “gist” understanding
  - Teen speaks of rational processing
  - Both are correct!

Parental monitoring

- Human communication
  - Complex & imperfect
  - Parent-teen "disconnect”
    - Implications …

“Have you talked with your [*teen/parents*] about whether [*he/she/you*] should use the phone while driving”

		Parent	
		Yes	No
Teen	Yes		
	No		

“Have you talked with your [*teen/parents*] about whether [*he/she/you*] should use the phone while driving”

		Parent	
		Yes	No
Teen	Yes	82%	44%
	No	18%	56%

“Have you [*your parents*] placed restrictions on your [*teen’s*] phone use when driving”

		Parent	
		Yes	No
Teen	Yes	76%	35%
	No	24%	65%

“Have you [*your parents*] placed restrictions on your [*teen’s*] phone use when driving”

		Parent	
		Yes	No
Teen	Yes	76%	35%
	No	24%	65%

$\kappa = .34$

Improved New Driver Training

- ???
- Promising ideas
- Little research under way
  - Create “wisdom” rather than “skill”
    - Hazard recognition training
  - Driving simulation
    - Current technology pretty primitive
    - High hopes for improvement, but …
      - Little funding

Toward More Effective Training

- More appropriate content
  - Focus on behavior change (not knowledge)
  - Focus (only) on crash reduction
  - Based on evidence of risks
- More appropriate delivery method
  - Interactive
  - Simulation
  - Virtual reality

Needed Studies

- Measure driving errors
- Hazard recognition/insight training
- Parent involvement
- Evaluate advanced skill training
- Then … based on findings
  - Design Revised System

Determine Young Driver Errors

- Visual evidence (in-vehicle recording)
- Quantifiable elements
- Identifies what needs to be addressed
  - In formal driver training
  - During supervised practice

Addendum – Nature of Human Behavior

Human behavior is …

- Not (merely) rational
  - Behavioral economics
- Intuitive
- Social
- Moral
- Emotional
- Habitual

Traffic Safety Staples

- Raise awareness
  - “Educate”
- Increase penalties
- Change attitudes
- All mistakenly assume rational action
  - Logical, reasoned, direct

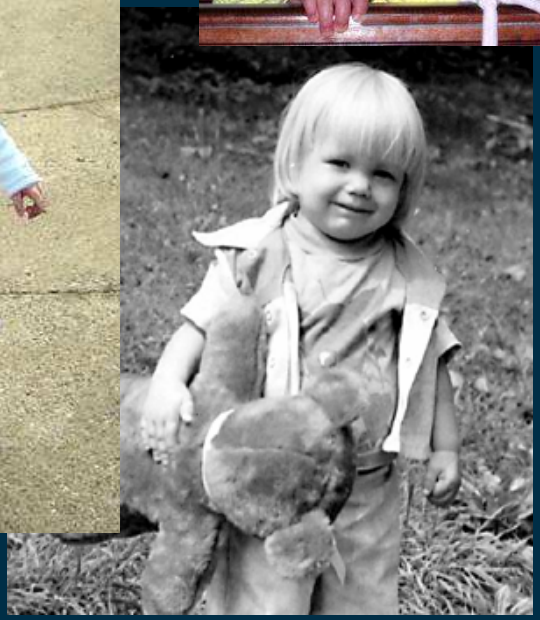
The nature of human behavior

- Dual process functioning
  - Most behavior is reactive, not reasoned
- Doing (well) without awareness
  - New Zealand driving simulator study

Final thoughts …

“For every problem, there is a solution that is simple,

For a successful technology, reality must take precedence over public relations, for nature cannot be fooled.

Richard Feynman

ERIC