

Collaborative Sciences Center for Road Safety Coffee & Conversation

#### A Policy Solution to the Enduring Alcoholrelated Motor Vehicle Crash Problem

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#### Preview

- > Alcohol & humans
- > Epidemiologic data
  - > Driving after drinking
  - > Alcohol & crash risk
- > How to reduce impaired driving

## **Alcohol & Humans**



#### Alcohol:

## "The source of – and answer to – all of life's problems."



H. Simpson Philosopher, entertainer

## Alcohol & humans

- > Ancient history
- > All societies
- > Pleasant, rewarding sensations
- > Health benefits (in moderation)
- Makes us stupid (in excess)

## Alcohol metabolism

- > Presence in bodily systems
- > Behavioral effects
- Both far more complex than realized
  Drinking ≠ impaired
  Impaired ≠ "intoxicated" (or "drunk")
  "Binge" drinking ≠ impaired (or "drunk")

#### **Incidence of Driving after Drinking**

## How common is alcohol-impaired driving?

#### How can we know?

Good > Roadside BAC surveys (measure)

- Self-report sample surveys (ask)
- > Crash data (infer)

Poor > Anecdote (conventional wisdom)

## **Roadside BAC Surveys**

- Random sampling of drivers (from road)
  - Interview sites ~ randomly sampled
- > Brief Interview
  - Direct BAC measurement
- > Very high response rates (~ 90-95%)
  - Relatively little bias or random error
- Usually nighttime only (~ 10 p.m. 3 a.m.)
  Costly





## North American Roadside Surveys

National RSS (1973, 1986, 1996, 2007, 2013) – U.S. Minnesota (1990) – Statewide Ohio (1990 - 1992) – 2 counties North Carolina (1994) – Statewide British Columbia (1995, 1998, 2003, 2006, 2008, 2010, 2012) - 6 communities Alberta (2001) – 32 Rural communities Ontario (2014, 2016) – Entire province California – 4 counties Washington – Statewide

#### % of Weekend Nighttime Drivers with BAC > .08% U.S. National Roadside Surveys



Source: NHTSA, 2015



#### **Alcohol and Motor Vehicle Crashes**

## Likelihood of crash by driver BAC



## Likelihood of crash by driver BAC



% of fatalities involving driver with BAC  $\geq 0.08\%$  - 1982 to 2002 (U.S.)



More than half (52%) due to Baby Boom Generation aging out of the prime drinking age (21-25).

Most of the rest due to 3 policies:

- 1. Establishing 0.10% as *per se* illegal in all states
- 2. Adopting Administrative License Suspension policies (license immediately suspended upon arrest)
- 3. Raising legal drinking age to 21 in all states/Setting BAC limit for those under 21 at "zero" (actually 0.02%, 0.01% in most states)

# % of fatalities involving driver with BAC $\ge 0.08\%$ - 1994 to 2016 (US vs NC)



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## **Reducing Alcohol-Impaired Driving:**

# **Reduce impaired driving**

#### More Punishment ... ?

- > Arrest, convict, punish
- > Largely unworkable as presently "structured"
- System overloaded, hence it "leaks" to avoid total collapse
  - Many are able to subvert system
- > Fundamental conceptual flaws
  - Long-known

#### **The Solution**

A sensible, workable, **system!** 

Designed to *control*, rather than punish

Technology is one key element, but can only work if embedded in a system

- > Ignition interlocks for all *arrestees*
- > Remove based on success rather than time



# What about going to 0.05%?

#### > Public doesn't support

- > 0.10% to 0.08% was extremely difficult
  - Produced relatively little benefit
  - Crash risk at 0.05% only slightly elevated (1.38)
- > Could wreck the system
  - Overload
- ⊳ But …

There is a way!

#### 2010 British Columbia Legislation Immediate Roadside Prohibition (IRP)

Administrative, instead of criminal justice approach

#### "Warn" Range (.05% - .08%)

- > Immediate 3-day license suspension
- > Immediate 3-day impoundment
- > Administrative Penalty (\$200)
- > Reinstatement fee (\$250)
- > Towing and Storage (\$150+)
- Total = \$600

#### 2010 British Columbia Legislation Immediate Roadside Prohibition (IRP)

## "Fail" Range (>.08%)

- > 90-day license suspension
- > 30-day impoundment
- > Administrative Penalty (\$500)
- > Reinstatement fee (\$250)
- > Towing and Storage (\$680+)
- > Responsible Driver Program (\$880)
- Interlock (\$1730)
- > Total = \$4,040

#### **Results: Driver BAC Survey**



## **BC Alcohol-related Crashes**

#### Change from 2010 to 2012:



## 23.4% injury crashes

## 19.5% property damage crashes

## **Alcohol Research to Alcohol Policy**

## A long and winding road ...

- Political clout essential
- Dogged persistence essential
- Evidence important, but it's a tiny piece
- Emotion, "good ideas" overrule logic/evidence

Great efforts that haven't been heeded: 2004 NC DWI Task Force (Comprehensive) 2014 NC DWI Task Force (Comprehensive) MADD NC efforts (Interlock legislation)

## Alcohol absorption & elimination

- > Absorbed into bloodstream
- > Quickly to the brain
- > Eliminated slowly
- > A continuous process
- Intake rate varies, elimination ~ constant
- > Drinking not a problem ...
  - > Drinking too much, too fast is the problem!

## BAC after one hour of drinking

Average size male (170 lbs.), standard drink, empty stomach



## Alcohol effects are complex

- > Physiologic
- > Tolerance
- > Expectancy

# Questions? Comments?

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