

Fit to Drive

4th International Traffic Expert Congress
Tallinn from June 4th - 5th 2009



Welcome



Ignition Interlocks (Alcolocks): Past, Present and Future

Paul R. Marques, Ph.D.

Pacific Institute for Research and Evaluation

Calverton, MD, USA

marques@pire.org





Four Key Elements of Alcohol Interlocks

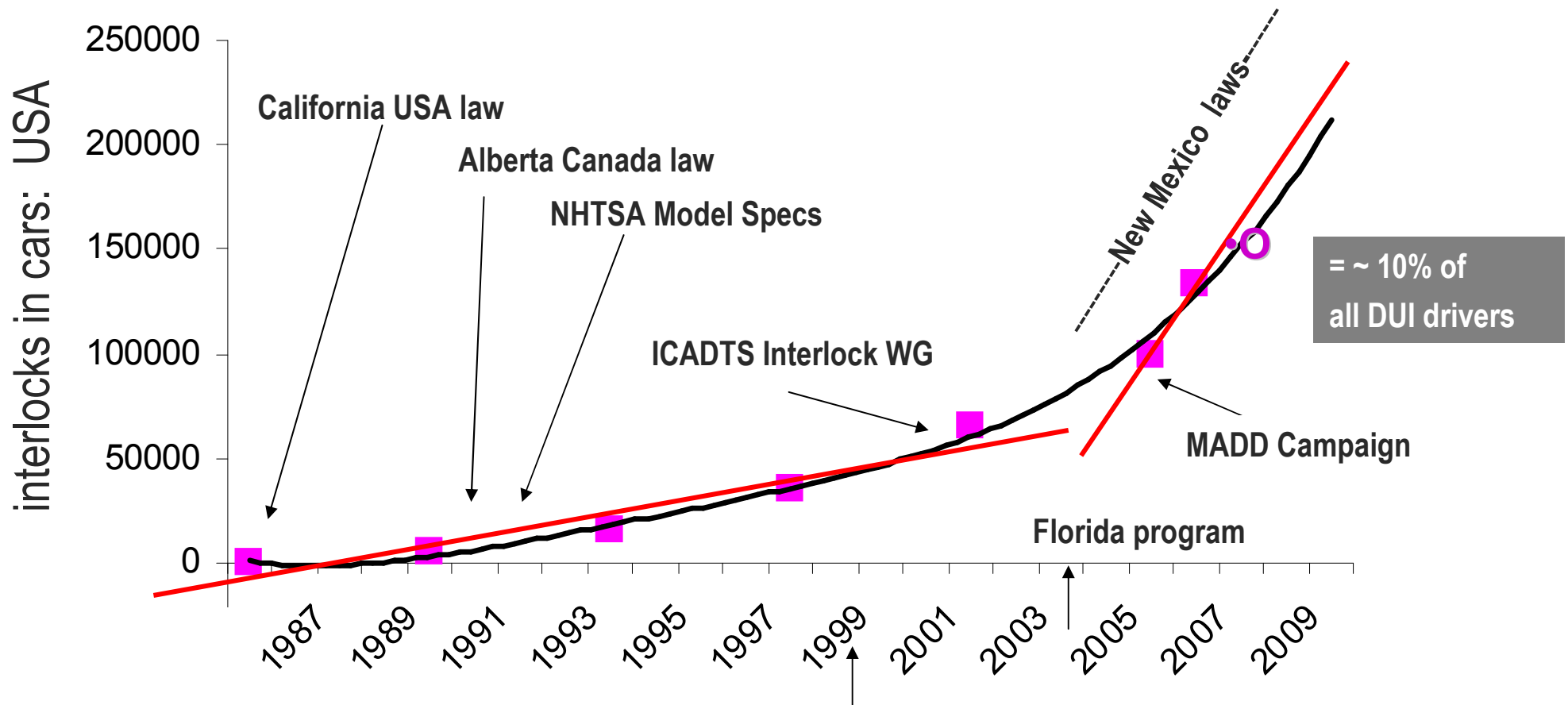
- (1) an alcohol sensor: locks ignition if BAC \geq setpoint, usually .02 - .04 g/dL
- (2) a running retest feature: requires retests after the car has started
- (3) a tamper-detection installation: requires wire inspection every 30 to 60 day
- (4) a data-recording system: that logs the time of all BAC tests and other activity.



- Interlock History in North America
 - Timeline, Penetration and Effectiveness Research
 - First Offender, Multiple Offender Program
- Present Trends
 - BAC (alcohol) Patterns in Interlock Record
 - Alcohol Biomarkers and DUI (impaired driving)
 - Several Europe programs underway now or starting
- A Possible Future: Alcohol Sensing in All New Cars
 - DADSS project: transdermal, near or distance spectroscopy

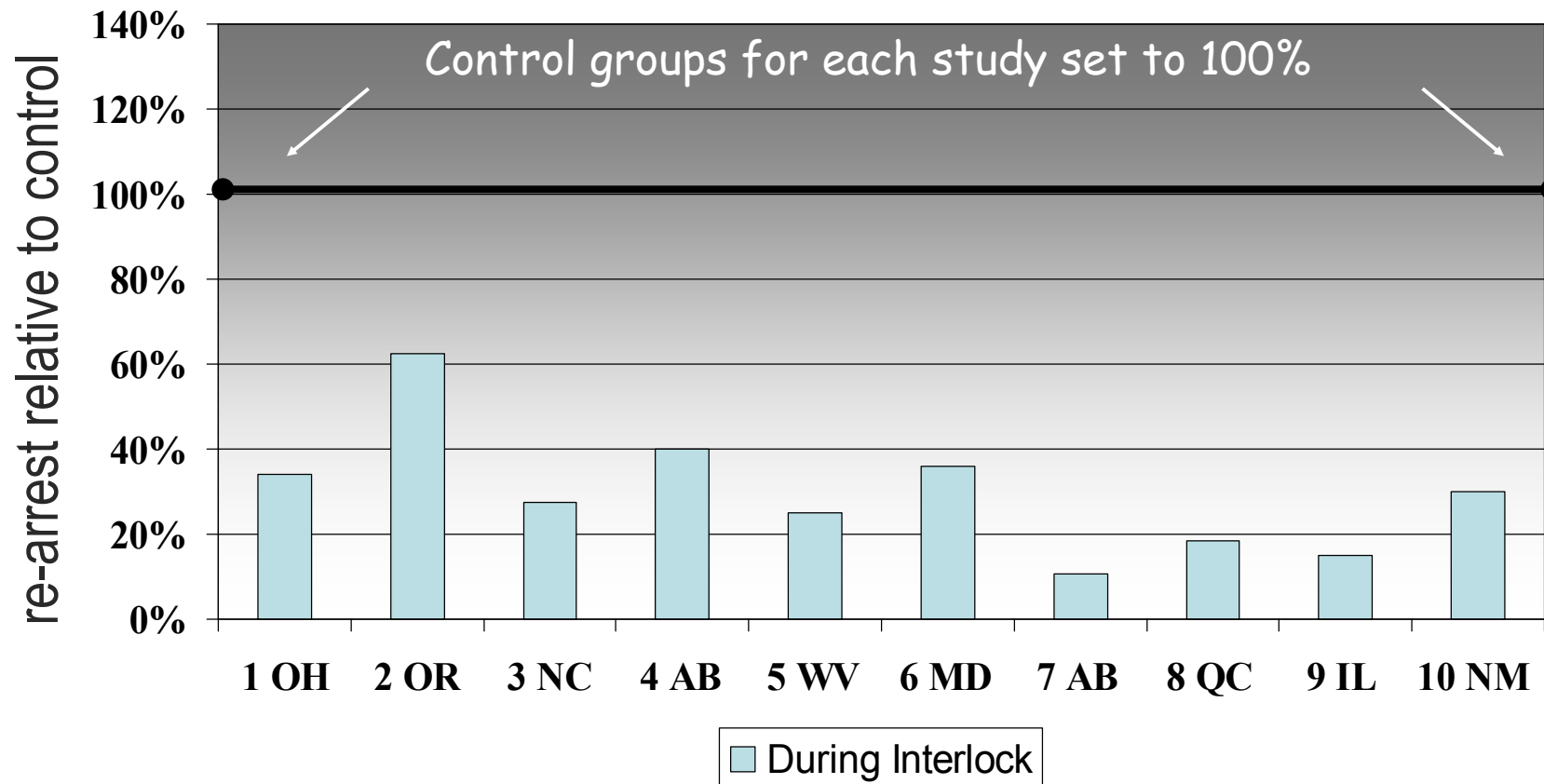


Some key events in alcohol interlock history



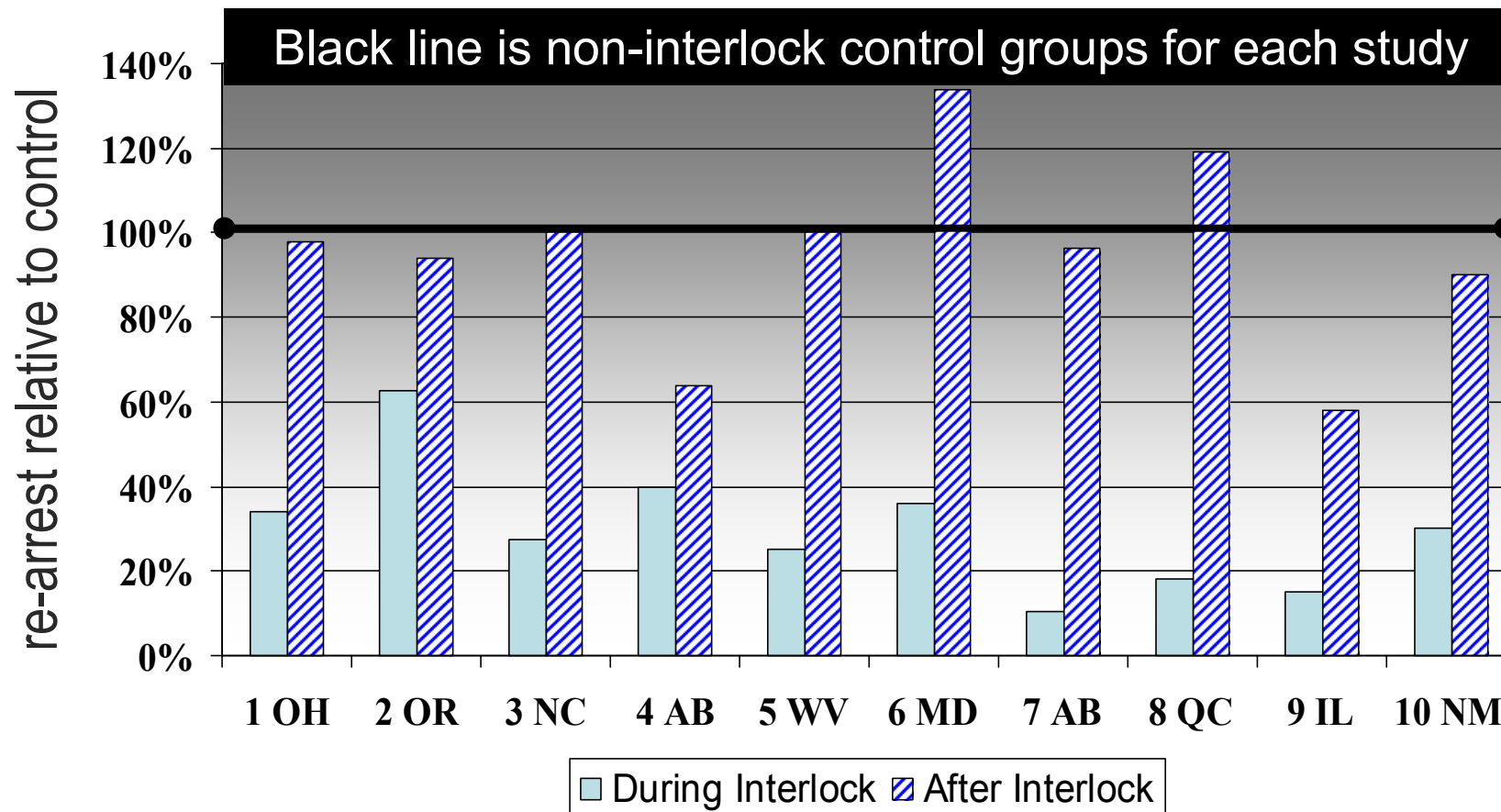


10 Interlock Studies: Recidivism reduction compared to Non-Interlock Group (set to 100%)





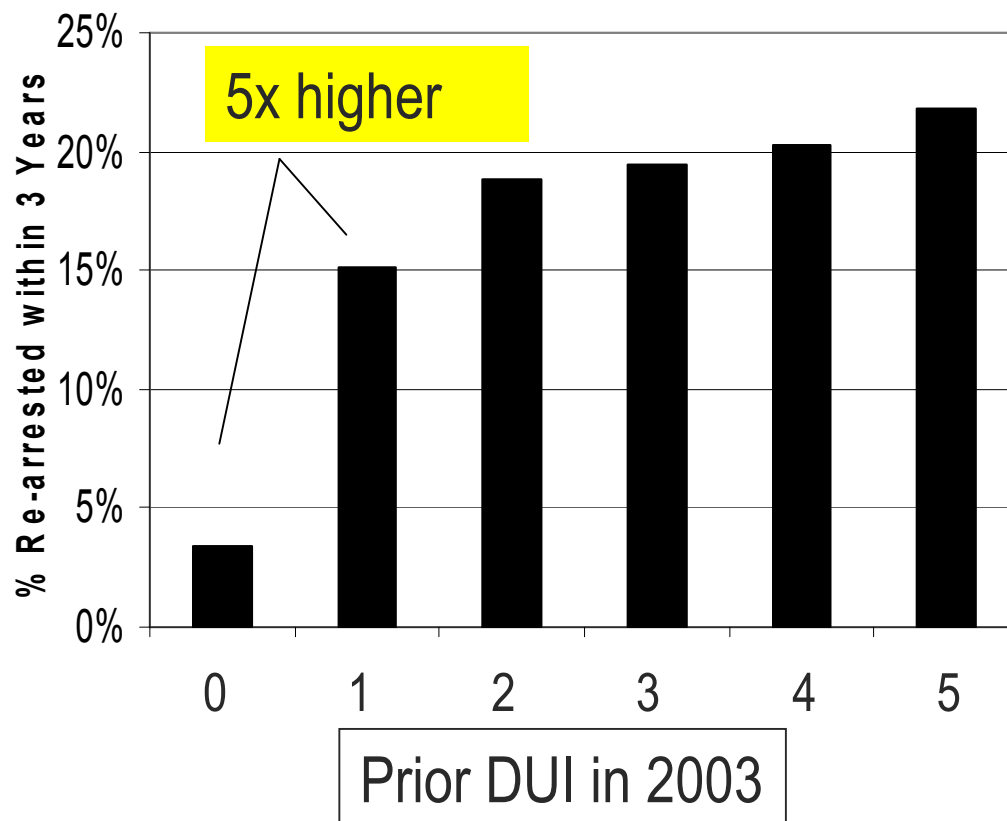
Striped Bars are same people as Solid Bars BUT... after Interlock Removal



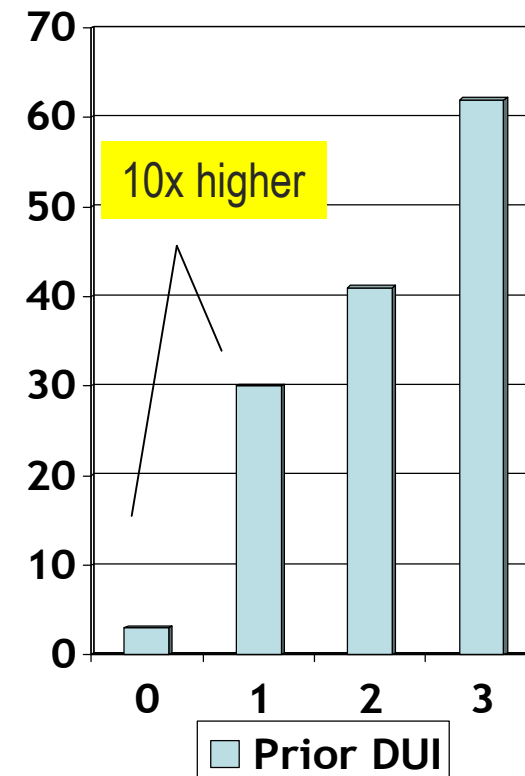


Non-offender vs. First Offender Risk

New Mexico 2003 - 2006 (% new DUI)



Maryland 2002 (alcohol charges)



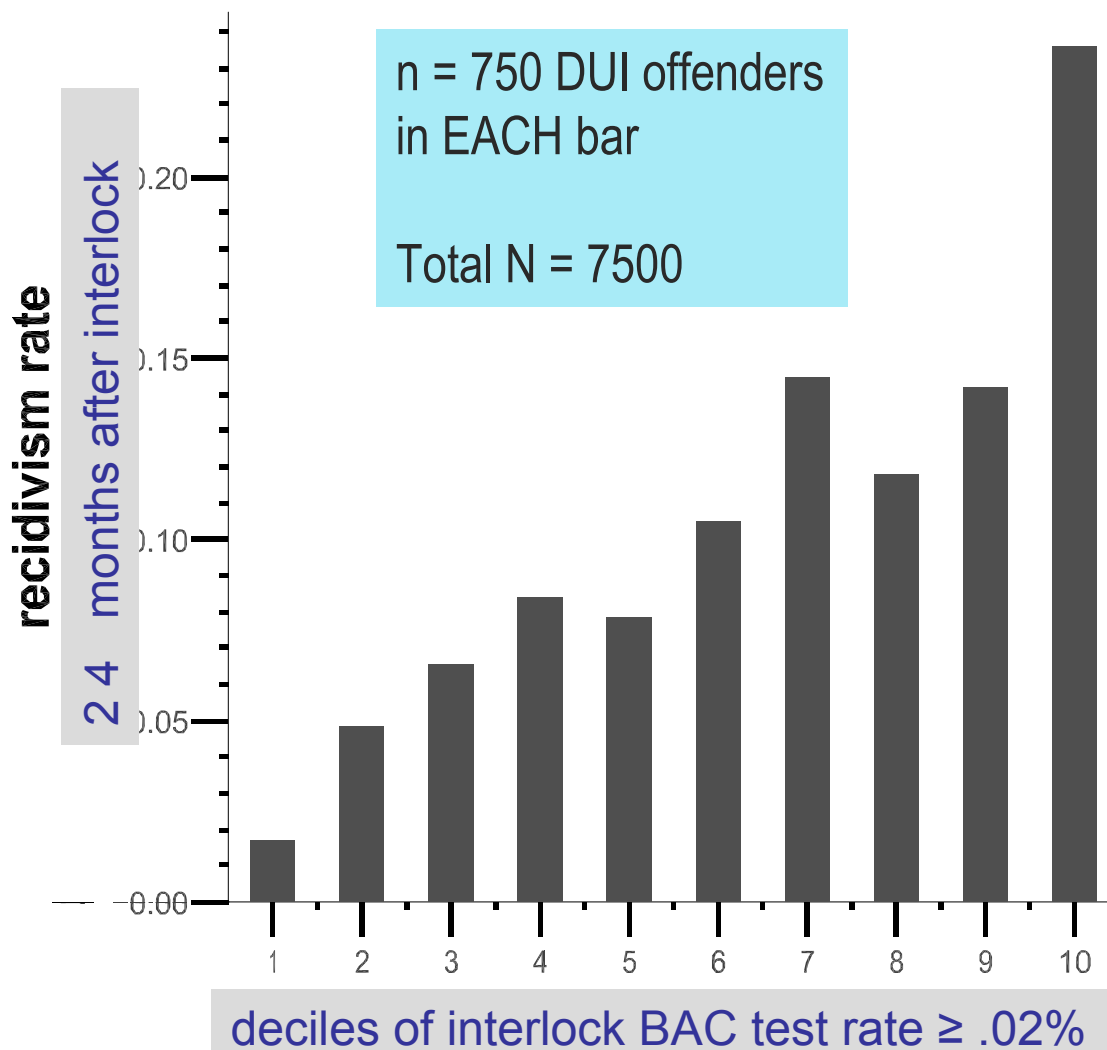


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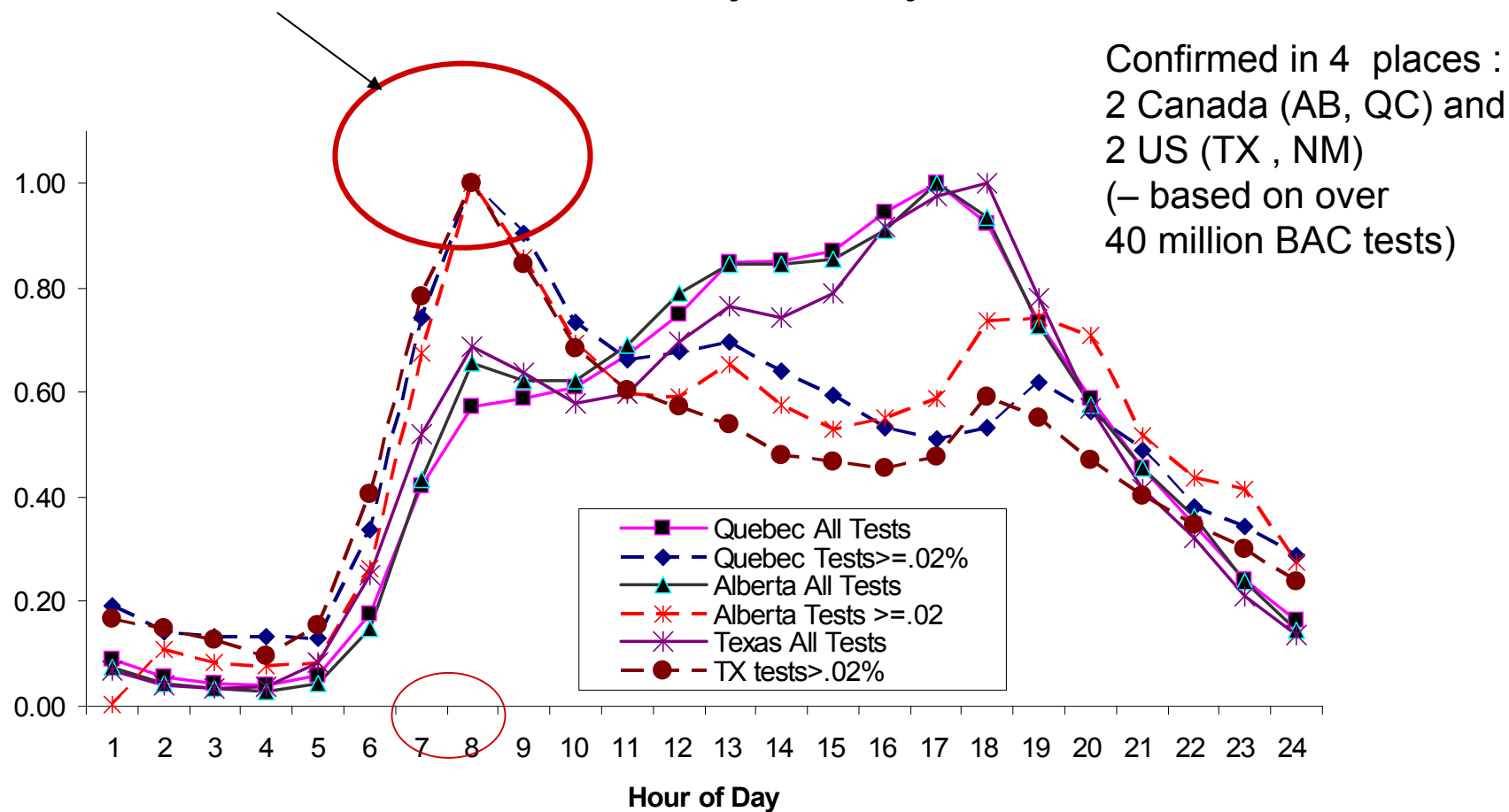


BASED on
18 million BAC tests
in Quebec

Data from
Marques, Voas, Tippetts
(2003) Addiction



Morning BAC is the most frequently elevated 7 -8 am Monday-Friday





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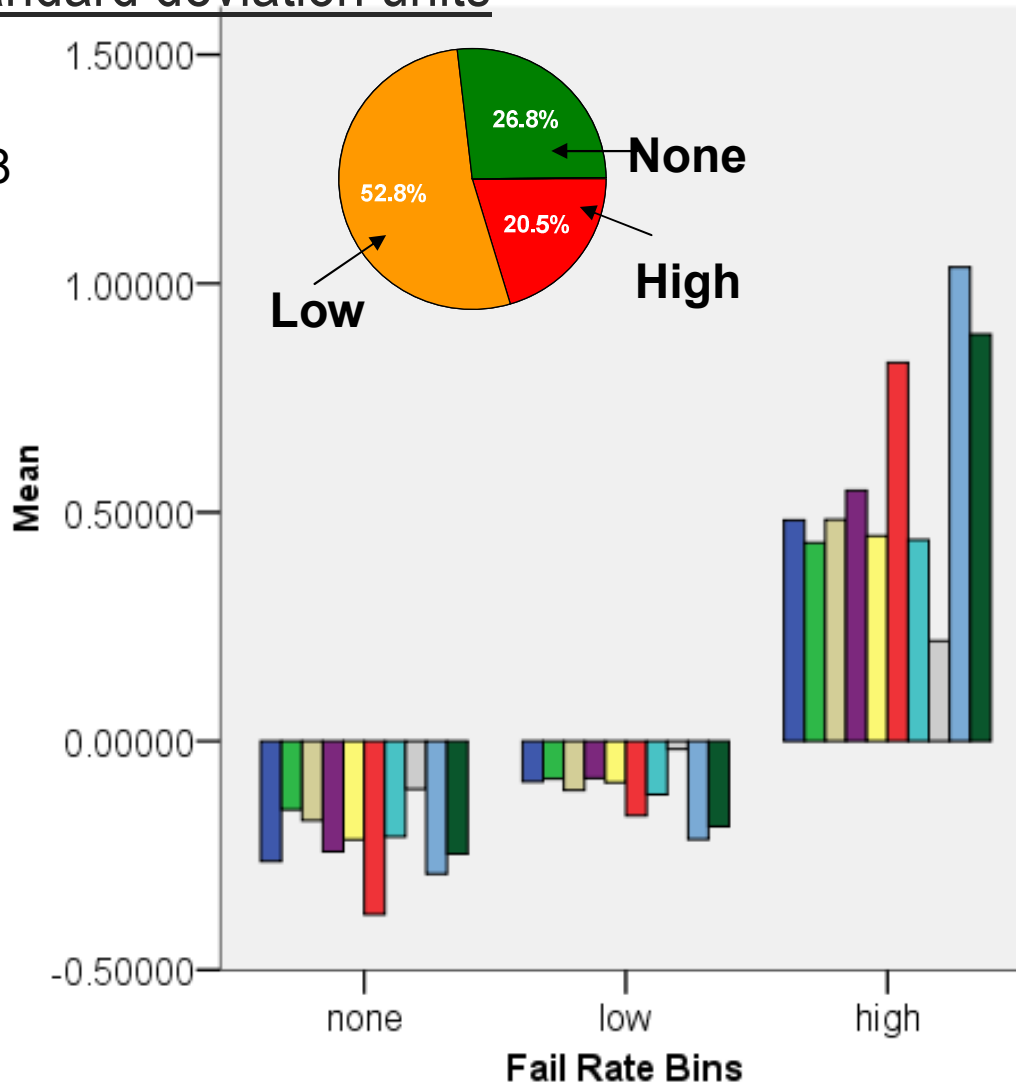


standard deviation units

Alberta 2008

Ten alcohol biomarkers by 3 groups based on failed interlock BAC tests

none=27%
low=53%
high=21%



- Z: MCV ***
- Z: ALT ***
- Z: AST ***
- Z: GGT ***
- Z: %CDT ***
- Z: Peth1 ***
- Z: FAEE Hair ns
- Z: EtG Hair *
- Z: EtG Urine ***
- Z: EtS Urine ***

P<.0005





Why is there no long term benefit from interlock?

Paired data: Very little evidence of change in alcohol biomarkers from beginning to end of interlock period.

6 markers – no change in 5, only a small change in the least sensitive, the best markers shown no change.

This is evidence that we need to have alcohol treatment at same time as interlock

	Mean	N	Std. Dev.	Df	Sig
MCV	91.22	168	4.017		
MCV2	90.85	168	3.782		
<u>MCV pairs</u>				167	<u>.014</u>
ALT	33.75	169	20.216		
ALT2	34.59	169	26.398		
<u>ALT pairs</u>				168	<u>.510</u>
AST	28.36	169	13.460		
AST2	28.02	169	16.420		
<u>AST pairs</u>				168	<u>.676</u>
GGT	53.20	169	91.583		
GGT2	51.38	169	76.407		
<u>GGT pairs</u>				168	<u>.583</u>
%CDT	2.5852	161	.91501		
%CDT2	2.5589	161	1.03872		
<u>%CDT pairs</u>				160	<u>.704</u>
PETH	.6966	163	.71876		
PETH2	.6855	163	.77839		
<u>PETH pairs</u>				162	<u>.822</u>

Future Cars with Native Alcohol Sensing

- Joint effort in US began ~ 2005, Sweden earlier
- US gov't and industry (Alliance of Auto Manufacturers) set a 5 year plan to study this, begun in 2007
- Many issues to solve:
 - public acceptability, cost, reliability (no errors for 11 years)!
- Candidate technologies must be passive (no blow)
 - most likely: 1) tissue spectroscopy, 2) distance spectroscopy, 3) transdermal (skin), 4) environmental (electrochemical)

Summary

- Penetration of interlocks now about 10-15 % of DUI in USA.
- First Offenders are over half to two-thirds of all offenders. They have > 5x more risk than non-offenders. They need interlocks.
- Interlocks do not change long-term behavior for most people, but they do reduce recidivism by average 64 % while installed.
- Removal of interlock should depend on performance and lockout pattern.
- Interlock total BAC fail rates predict future new DUI.
- Morning fail test rates predict future new DUI.
- Alcohol biomarker levels predict rates of failed interlock BAC tests.
- There is a possible future with onboard alcohol detection in new cars.