Leading Legislative Change: A 05% BAC Case Study
[Evolving Safety Priorities and Solutions]

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Speakers: Tara Gill, Advocates for Highway and Auto Safety
Leah Walton, National Transportation Safety Board [NTSB]
Marcus Kowal, Liam’s Life Foundation
Potential Effectiveness of Lowering the BAC Limit to .05 in the U.S.

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The Evidence:

• Lowering BAC limits reduces drinking driver fatal crashes:
  from .10 to .08.
  from .08 to .05.
  from adult limit to .02 for youth.

• General public does not think anyone should drive after two or three drinks.

• Most people are impaired at .05 BAC.

• Relative risk of crash is statistically significant at .05 BAC.
Rationale for .05 BAC

• Is not typically one or two drinks after work.
• Is a level at which critical driving skills are impaired.
• Is a level above which the risk of a crash is increased significantly.
• Is a level which most industrialized countries have adopted.
• Is an effective measure which has reduced alcohol-related fatalities.
Q31: How many [drinks of alcoholic beverages drunk most often] could you drink in two hours before you should not drive? [Base: drivers who drink**]
Number of Drinks and BAC in Two Hours of Drinking

1 Drink = .54 ounces of alcohol

4 Drinks

5 Drinks

4 Drinks

3 Drinks

3 Drinks

2 Drinks

2 Drinks

Male 170 lbs.

BAC

Female 137 lbs.

[Source: NHTSA 1994]
BAC and Impairment

Concentrated attention, speed control

Information processing, judgment

Coordination

Eye movement control, standing steadiness, emergency responses

Tracking and steering

Divided attention, choice reaction time, visual function

[Source: NHTSA 2001]
Experimental Studies of Impairment and BAC

Percent Decrement in Performance Measure

BAC

Moskowitz (1985)
Moskowitz (1974)
Mortimer (1963)
Landauer (1983)
Laurell (1975)
Relative Risk* of Being Involved in a Fatal Crash by BAC

<table>
<thead>
<tr>
<th>Driver Age</th>
<th>BAC</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.05 - .079</td>
<td>.08 - .099</td>
<td>&gt; .15</td>
</tr>
<tr>
<td>16-20</td>
<td>6.24</td>
<td>12.61</td>
<td>490.41</td>
</tr>
<tr>
<td>21-34</td>
<td>4.78</td>
<td>8.74</td>
<td>200.03</td>
</tr>
<tr>
<td>35+</td>
<td>4.03</td>
<td>6.89</td>
<td>111.94</td>
</tr>
</tbody>
</table>

*Risk relative to BAC=.00 for same age group

Relative risks are the same for men and women at a given BAC. Relative risk for 16-20 year old women are now the same as 16-20 year old men at a given BAC (a change from 1996).

[Source: Voas, Torres, Romano, Lacey, JSAD, (2012)]
## Studies of the Effects of Lowering the Illegal BAC Limit to .05

<table>
<thead>
<tr>
<th>Location</th>
<th>Study Details</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australia</strong>&lt;br&gt;(Homel, 1994)</td>
<td>Percent drivers with positive BACs in weekend fatal crashes decreased 13% pre-post law implementation but did not affect weekday fatal crashes</td>
<td></td>
</tr>
<tr>
<td><strong>Australia</strong>&lt;br&gt;(Henstridge et al., 1997)</td>
<td>Lowering the BAC limit to .05 resulted in an 11% decrease in alcohol-related fatal crashes and significant reductions in the number of non-fatal crashes</td>
<td></td>
</tr>
<tr>
<td><strong>Japan</strong>&lt;br&gt;(Nagata, et al., 2008)</td>
<td>Resulted in 38% decrease in alcohol-related crashes of all severities</td>
<td></td>
</tr>
<tr>
<td><strong>Sweden</strong>&lt;br&gt;(Norstrom, 1997)</td>
<td>10% reduction in alcohol-related fatal crashes and significant reductions in single vehicle crashes and all crashes associated with lowering limit to .05</td>
<td></td>
</tr>
</tbody>
</table>
### Illegal Per Se BAC Limits for Driving

<table>
<thead>
<tr>
<th>Country</th>
<th>BAC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>.05</td>
</tr>
<tr>
<td>Austria</td>
<td>.05</td>
</tr>
<tr>
<td>Belgium</td>
<td>.05</td>
</tr>
<tr>
<td>Denmark</td>
<td>.05</td>
</tr>
<tr>
<td>Finland</td>
<td>.05</td>
</tr>
<tr>
<td>France</td>
<td>.05</td>
</tr>
<tr>
<td>Germany</td>
<td>.05</td>
</tr>
<tr>
<td>Italy</td>
<td>.05</td>
</tr>
<tr>
<td>Spain</td>
<td>.05</td>
</tr>
</tbody>
</table>

[Source: WHO 2012]
11 Studies of the Change in Alcohol-Related Fatal Crash Rates After Lowering the BAC to .05

<table>
<thead>
<tr>
<th>Article</th>
<th>Mean</th>
<th>SD</th>
<th>95% CI lower</th>
<th>95% CI upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andreuccetti et al., 2011</td>
<td>-0.018</td>
<td>0.007</td>
<td>-0.025</td>
<td>-0.011</td>
</tr>
<tr>
<td>Assum, 2010</td>
<td>-0.021</td>
<td>0.026</td>
<td>-0.047</td>
<td>0.005</td>
</tr>
<tr>
<td>Hingson et al., 1998</td>
<td>-0.131</td>
<td>0.046</td>
<td>-0.177</td>
<td>-0.085</td>
</tr>
<tr>
<td>Homel, 1994</td>
<td>-0.133</td>
<td>0.037</td>
<td>-0.17</td>
<td>-0.096</td>
</tr>
<tr>
<td>Henstridge et al., 1997</td>
<td>-0.117</td>
<td>0.042</td>
<td>-0.159</td>
<td>-0.075</td>
</tr>
<tr>
<td>McLean et al., 1995</td>
<td>-0.009</td>
<td>0.062</td>
<td>-0.071</td>
<td>0.053</td>
</tr>
<tr>
<td>Nagata et al., 2008</td>
<td>-0.384</td>
<td>0.099</td>
<td>-0.483</td>
<td>-0.285</td>
</tr>
<tr>
<td>Nakahara et al., 2013</td>
<td>-0.118</td>
<td>0.123</td>
<td>-0.241</td>
<td>0.005</td>
</tr>
<tr>
<td>Norström, 1997</td>
<td>-0.1</td>
<td>0.061</td>
<td>-0.161</td>
<td>-0.039</td>
</tr>
<tr>
<td>Smith, 1986</td>
<td>-0.181</td>
<td>0.071</td>
<td>-0.252</td>
<td>-0.11</td>
</tr>
<tr>
<td>Živković, et al., 2013</td>
<td>-0.019</td>
<td>0.033</td>
<td>-0.052</td>
<td>0.014</td>
</tr>
</tbody>
</table>

Forest plot of articles examining alcohol-related fatal crash outcomes associated with lowering BAC limit to .05 or lower.
Conclusions

• The meta-analysis found no significant effect of lowering the BAC limit on *alcohol consumption*
Conclusions

- Lowering the BAC Limit resulted in a significant 5% decline in *non-fatal alcohol-related crashes*
Conclusions

- Lowering the BAC Limit to .08 resulted in a significant 9.2% decline in fatal alcohol-related crashes.
Conclusions

• Lowering the BAC limit to .05 (or lower) resulted in a significant 11.1% decline in fatal alcohol-related crashes according to the meta-analysis.
Conclusions

• It is estimated that 1790 lives could be saved each year if all states lowered the BAC limit to .05 in the U.S.
Arguments Against .05 Per Se

**Point:**
Lowering the limit from .08 BAC to .05 BAC will just distract us from the real problem—high BAC, chronic drinking drivers.

**Counterpoint:**
The studies of the effectiveness of .08 BAC laws indicate that these laws are just as effective in reducing alcohol-related fatalities involving high BAC drivers as they are in reducing fatalities involving low BAC drivers (Hingson, Heeren, & Winter, 1996; Wagenaar, et al., 2007). To reduce alcohol-impaired driving, it is essential to pursue both a broad preventive approach (of which a .05 BAC law is but one component) as well as a more specific approach that deals primarily with those chronic, heavy drinkers who are apprehended and identified by the system.
Implications for .05 BAC

- Progress in reducing impaired drivers in fatal crashes has stalled since 1997
- It will be at least 10 years before technological solutions can be implemented (e.g. DADSS, autonomous cars)
- 10,000 deaths each year due to impaired driving. 100,000 more people will die in the next 10 years if the status quo is maintained
- A .05 BAC limit is a countermeasure that is proven to have a significant effect on the problem
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