Random drug testing in Australia, analogies with RBT, and likely effects with increased intensity levels

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Australian research on drug driving risk of fatality (“culpability analysis”)

• Drummer (1994) – 1045 drivers, odds ratios
  – Alcohol alone OR = 6.0
  – Opiates 2.3
  – Alcohol & benzos 9.5
  – Alcohol & stimulants 8.7
  – Alcohol & cannabis 5.6

  – THC 2.4 – 2.7
  – THC with alcohol increases OR for alcohol alone by 2.9
Australian research on drug driving risk of serious injury (hospitalised)

• Ogden et al (2011) – 1801 drivers (from Dec 2008)

• Found increased risk with multiple drugs
  – One impairing drug \( \text{OR} = 4.5 \)
  – Two drugs 11.4
  – Three drugs 37.5
  – Four or more drugs higher, but indeterminate

• Alcohol – with THC 62.0
  - with benzos 20.2

• Benzodiazepines alone 3.1
  - with other drugs 8.9

• First 837 drivers – MA (OR 5.4), MDMA (OR 5.1)
Roadside oral fluid testing for drugs

• “Random drug testing” (RDT) introduced
  – Victoria December 2004
  – Tasmania December 2005
  – South Australia July 2006
  – New South Wales January 2007
  – Western Australia October 2007
  – Queensland December 2007
  – Northern Territory July 2008
  – ACT May 2011

• THC, MA and MDMA current proscribed drugs
Random Drug Tests - 3 stage process

• Roadside Screen

• Second Sample Screen

• Laboratory Confirmation
Preliminary drug testing

Roadside Handheld screening

Preliminary Handheld drug testing

- Securetec Drugwipe Twin or the Securetec Drugwipe II Twin
Second Screen
Cozart
RapiScan

COZART

RapiScan
Oral fluid drugs of abuse testing system

The on-site testing system for
drugs of abuse in oral fluid
New second screen used in Victoria
Random Breath and Drug Test Buses used in Victoria
Earlier “Booze Bus” (RB T only) used in Victoria
Publicised visible activity
Questions asked of this presentation

• How effective is random and targeted roadside drug testing?

• Is the expense worth it?

• Is the risk of getting caught (and subsequently detected) sufficient to deter people drug driving?
Analogy of RDT with RBT

• Initially, most ROFTs in Victoria were carried out at bus-based testing stations (Drug/Booze Buses) in conjunction with RBT

• Strategic principle was general deterrence of drug-driving
  – that is, to raise the perceived risk of an illegal drug-driver being caught for this offence
  – not necessarily to detect illegal drug-driving on a larger scale that could be achieved by targeted drug-driving enforcement operations

• Same strategic principle as applied to RBT
Random breath testing

  - 40 quality studies of DUI checkpoints (RBT)
  - 11 studies of DUI patrols targeting drink drivers
- RBT reduces alcohol involved crashes by 17%
  - All crashes by 10-15%
- Larger crash reductions were found due to Australian methods of RBT
  - involving use of high-visibility bus-based testing and supported by mass media publicity
  - compared with alcohol checkpoints in other countries
Targeted alcohol screening testing

- Car-based testing of intercepted suspect drivers and/or at targeted locations and times
- Less effective on crashes than RBT
  - 6% reduction in casualty crashes
  - Compared with 10% reduction from RBT (and 17% reduction in fatal crashes – more alcohol involved)
- Role of targeted testing in apprehending those drink-drivers with very elevated BAC (> 0.15 g/100ml)
  - These “problem” drink-drivers still represent a substantial proportion in Australia
Relationship between enforcement levels and crash outcomes
Change in crashes v. level of enforcement (from Elvik)
Research on elasticity of RBT

- **Victoria**
  - Cameron & Sanderson (1982): minimum levels

- **New South Wales**

- **Western Australia**
  - Cameron (ICADTS 2013): decreasing levels of RBT

- **International**
  - Elliott & Broughton (2005)
WA breath tests per licensed driver

Random and total preliminary breath tests per licensed driver per annum, 1999 to 2011
WA drivers killed with BAC above 0.05%

Percentages of killed drivers/riders with BAC > 0.05% versus BAC level

- Green: >= 0.15%
- Red: 0.08% - 0.149%
- Blue: 0.05% - 0.079%

Year: 1999 - 2010
Recent calibration of RBT elasticity in WA: Drivers killed with BAC above 0.05% v. RBTs

Percentage of killed drivers with BAC > 0.05% versus RBT per driver
Recent calibration in Western Australia: Drivers killed with BAC above 0.05% v. PBTs
### Economic analysis of increased Preliminary Breath Tests (90% RBT) per licensed driver

<table>
<thead>
<tr>
<th>Preliminary breath tests (PBTs) per annum</th>
<th>PBTs per licensed driver</th>
<th>Estimated proportion of driver fatalities with BAC &gt; 0.05%</th>
<th>Percentage of total driver fatalities saved</th>
<th>Social cost of fatal crashes saved p.a. ($ m)</th>
<th>Cost of additional PBTs p.a. ($ m)</th>
<th>Expanded program BCR (above 2011 level)</th>
<th>Marginal BCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>0.485</td>
<td>0.382</td>
<td>0.0%</td>
<td>0</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Double</td>
<td>0.996</td>
<td>0.322</td>
<td>8.8%</td>
<td>84.3</td>
<td>14.8</td>
<td>5.69</td>
<td>5.47</td>
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<tr>
<td>Three times</td>
<td>1.494</td>
<td>0.293</td>
<td>12.6%</td>
<td>120.7</td>
<td>27.1</td>
<td>4.45</td>
<td>2.05</td>
</tr>
<tr>
<td>Four times</td>
<td>1.991</td>
<td>0.274</td>
<td>14.9%</td>
<td>142.9</td>
<td>40.5</td>
<td>3.53</td>
<td>1.36</td>
</tr>
</tbody>
</table>
**Elvik et al (2012) economic analysis of drink-driving enforcement**

<table>
<thead>
<tr>
<th>Increase in the amount of enforcement</th>
<th>Enforcement of drinking and driving</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Percentage reduction of fatalities</td>
<td>Total benefit-cost ratio</td>
</tr>
<tr>
<td>Increase by 50%</td>
<td>3.3</td>
<td>12.87</td>
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<tr>
<td>Double current level</td>
<td>4.8</td>
<td>9.40</td>
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<tr>
<td>Three times current level</td>
<td>6.3</td>
<td>6.19</td>
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<tr>
<td>Three and a half times current level</td>
<td>6.7</td>
<td>5.28</td>
</tr>
<tr>
<td>Four times current level</td>
<td>7.0</td>
<td>4.62</td>
</tr>
<tr>
<td>Four and a half times current level</td>
<td>7.3</td>
<td>4.10</td>
</tr>
<tr>
<td>Five times current level</td>
<td>7.4</td>
<td>3.67</td>
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<tr>
<td>Six times current level</td>
<td>7.8</td>
<td>3.07</td>
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<tr>
<td>Ten times current level</td>
<td>8.3</td>
<td>1.83</td>
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</tbody>
</table>
RDT at Drug/Booze Buses, Victoria
Percent drivers killed with drugs v. Random Drug Tests p.a. in Victoria

- % proscribed drugs
- % all impairing drugs

RDT screening tests per year in Victoria (2005 to 2009)
Estimated cost per RDT in Western Australia (in 2011/12)

- Securatec preliminary tester $38
- Cozart secondary tester $41.40
  - Applicable in 6.2% of ROFTs
- Laboratory analysis of oral fluid $200
  - Applicable in 5.4% of ROFTs
- Testing officer’s time
  - Preliminary test takes 6 minutes for a result
  - Cost estimated 5 times per RBT ($18.40) = $92
- Total average cost per RDT (approx.) $143
Percent drivers killed with drugs v. Random Drug Tests p.a. in Victoria

![Graph showing the relationship between RDT screening tests per year and percent drivers killed with drugs in Victoria. The graph includes data points for both prescribed and all impairing drugs, with a downward trend indicating a decrease in fatalities with increased testing.]
Economic analysis of increased Random Drug Tests per licensed driver

| Random Drug Tests (RDTs) per annum | RDTs per licensed driver (%) | Estimated proportion of driver fatalities with impairing drug(s) | Percentage of total driver fatalities saved | Social cost of fatal crashes saved p.a. ($ m) | Cost of additional RDTs p.a. ($ m) | Expanded program BCR (above 2008-11 level) | Marginal BCR |
|-----------------------------------|-----------------------------|---------------------------------------------------------------|-------------------------------------------|---------------------------------------------|--------------------------------||-----------------------------------------------|----------------|
| 8,700                             | 0.54%                       | 0.480                                                         | 0.0%                                      | 0                                           | -                              | NA                                                           | NA             |
| 20,000                            | 1.24%                       | 0.386                                                         | 15.2%                                     | 149.2                                       | 1.62                           | 91.97                                                         | 49.28          |
| 40,000                            | 2.49%                       | 0.322                                                         | 23.2%                                     | 227.1                                       | 4.49                           | 50.61                                                         | 16.53          |
| 80,000                            | 4.98%                       | 0.269                                                         | 28.8%                                     | 281.8                                       | 10.22                          | 27.58                                                         | 5.88           |
| 120,000                           | 7.47%                       | 0.242                                                         | 31.3%                                     | 306.6                                       | 15.95                          | 19.22                                                         | 3.27           |
| 160,000                           | 9.96%                       | 0.225                                                         | 32.9%                                     | 321.7                                       | 21.68                          | 14.84                                                         | 2.17           |
Changes to the Victorian roadside drug testing strategies in 2010

• In late 2009/early 2010, roadside drug testing was expanded to include targeted testing by Highway Patrols as well as random at Buses
  – Aimed at detection and specific deterrence of drug-drivers, especially drug-dependant drivers
  – Relatively invisible compared with Bus testing
• Drug-dependant drivers are less likely to be deterred by random testing (general deterrence)
  – Police have suggested that visible drug testing is most effective with non-dependant drivers
Increased drug tests and detections with mixed random and targeted operations.
Conclusions

• RDT has the potential to achieve significant general deterrence of drug-driving in a similar way as that achieved by best-practice RBT
  – RDT is highly cost-effective at the modest levels of intensity that it is currently operated at in Australia

• Analogy with RBT suggests that it will remain cost-effective if testing rates per licensed driver are increased up to 10% of drivers per year

• To remain cost-effective at even higher testing rates per year, the cost per random drug test must be substantially decreased
THANK YOU

Any questions?