Young Drivers – Impact of Alcohol

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Talk outline

• Some background statistics
• Reasons why alcohol has a particular impact on young drivers
  – Highlight on areas of weakness which are exacerbated by alcohol
• Antecedents of drink driving
• Policy and training/education interventions
Young drivers - a universal problem

Adapted from OECD Policy Brief - Young Drivers: The Road to Safety 2006
Fatality reduction by age
EU-23 Young Driver fatalities

Percentage of fatalities 18-24, 2008

Derived from DaCoTA Road Safety Facts, 2010
Accounting for proportion in population

- Relative fatality rate
  - % of fatalities from specific age category / % of population which comes from age category

DaCoTA Road Safety Facts, 2010
Gender by age – 2010 driver injuries

Calculated from Census 2011 & RSA Road Collision Facts 2010
Gender by age – 2010 fatalities

Calculated from Census 2011 & RSA Road Collision Facts 2010
Timing of YD fatalities – Sat + Sun

% of 18-24 fatalities occurring at the weekend

- FI
- EE
- CZ
- LU
- HU
- SK
- DE
- EL
- ES
- AVE
- NL
- FR
- IT
- LV
- PL
- UK
- SI
- BE
- IE
- PT
- DK
- RO
- SE
- AT

- 42.8
- 46.7
Location of 18-24 fatalities
Impact of alcohol on fatality risk

Adapted from Keall, Frith & Patterson (2004)
Alcohol related Irish driver fat. 2003

Bedford, McKeown, Vellinga & Howell (2006)
Comparative data - Australia

Proportion of driver fatalities from 1999 with BAC> 50mg/100ml

Mandatory Alcohol Testing data

• Detection rates
  – 2007 = 4% (19,848 / 489,029)
  – 2011 = 2% (10,575 / 537,311)

• Gender
  – Up to 2012, 84% of DD offences committed by males
  – Compare to 90% in 2004, pre-MAT
Mandatory Alcohol Testing data

- **Age**
  - Majority of offences committed by drivers aged 22-36
  - 23% of the offenders in this age category are linked to 2 or more offences since Jan 2008
Impact of Alcohol on YDs

• Lower tolerance due to less exposure
• YDs are less experienced/skilled - anything which makes the task more difficult will have a greater negative impact on them
  – At low levels of BAC YDs are more likely to be negatively impacted than older more experienced drivers (Palamara, Adams & Gavin, 2004)
Impact of Alcohol on YDs

- Alcohol reduces inhibition and since neurodevelopmentally YDs are not at full capacity the impulsive gain is greater.
Behavioural control – mot. vs inhibition

- Behavioural activation system – **Go**
  - Encourages behaviour participation
  - Risky behaviour usually leads to rewards for participation

- Behavioural inhibition system – **Stop**
  - Evaluates consequences of action and dissuades us from actions that might be harmful
Young adult Go system

• Encourages sensation seeking or risk taking
  – Number of dopamine receptors peaks in areas such as NAcc and VS
  – Adolescence is a period of increased reward associated with novel/exciting experiences

• Sensation seeking correlated with wide range of risky behaviors:
  – Risky driving, taking drugs, unsafe sex, gambling, delinquency
Young adult Stop system

• Brain development ongoing
  – Increased myelination, especially in prefrontal cortex and increased inter-neuronal connectivity
  – Pruning and thinning of cortex

• The young brain does not develop fully until mid/late 20s
  – Has lead to speculation that maturational lag in the prefrontal cortex leads to poor impulse control found in young drivers, particularly males
Evidence for the impact on YDs

- Offenders produced more commission errors than non-offending age matched controls
- More sensitive to group differences than psychometric measures

O’Brien & Gormley, 2013
‘Maladapted’ behavioural control

- Likely consequence is the participation in risk related behaviours

Steinberg, 2008
Impact of Alcohol on YDs

- Alcohol reduces inhibition and since neurodevelopmentally YDs are not at full capacity the impulsive gain is greater
- YDs progress from collisions caused by a skill deficit to collisions caused by risky decisions (Clarke, Ward & Truman, 2005)
  - Alcohol increases the frequency and severity of this risk taking
Impact of Alcohol on YDs

• Combined with other risky behaviours such as driving at night, driving with passengers from peer group, speeding and lack of seat belt use (Williams, 2003)
Peer influence

• Simulated driving recorded in the presence or absence of peers

• In the presence of peers participants:
  – Took more risks
  – Focused more on benefits than costs
  – Made riskier decisions

• Peer influence stronger in adolescents (13-16) and youths (18-24) than in adults

Gardner & Steinberg, 2005
Peer influence

Williams, 2001
Impact of Alcohol on YDs

• Combined with other risky behaviours such as driving at night, driving with passengers from peer group, speeding and lack of seat belt use (Williams, 2003)

• Poor sleep hygiene is a particular problem for YDs and when combined with alcohol the impact is exacerbated
Antecedents

• Higher incidence of self-reported drink driving convictions reported by YDs whose parents used alcohol and those whose peers used alcohol

• Being drunk in the previous year significantly increased the odds of a self-reported drink driving conviction

O’Malley & Johnston, 1999
Antecedents

• Drivers aged 17-25 with initial conviction for drink driving had highest relative risk of all age groups of involvement in future alcohol related crash (Ferrante, Rosman & Marom, 2001)
  – Underlines the importance of dealing effectively with offenders to reduce recidivism
Antecedents

- Novice drivers who reported illegally driving 6 or more times prior to obtaining license were nearly 3 times more likely to report drink driving in first year post license (Palamara, Stevenson, Morrison & Ryan, 1999)
Antecedents

• Link between early onset drinking and early onset driving while under the influence (Zhang, Wieczorek, Welte, 2014)

• Drink/drug driving was predicted by adolescent marijuana use, greater alcohol misuse and tolerance of deviant behaviours (Bingham & Shope, 2004)
Counter measures

- Reduced BAC for novice drivers
- 20mg/100ml
  - Reduces possibility of false positive associated with a zero level
  - Does not require the withdrawal of enforcement capacity away from high risk categories which could potentially increase alcohol related crashes
Interventions

• Programmes relating to alcohol misuse prevention containing an element of refusal skills training had a positive effect on novice drivers’ first year serious driving offenses

(Shope, Elliott, Raghunath, 2001)
Interventions

• “Alcohol-free on the road” – drive round circuit first sober and then intoxicated
  – Intervention group showed more awareness of the dangers of DD than a control group
  – .7% of intervention group vs 4% for control group were subsequently convicted of DD related offences (Brookhuls, De Waard, Steyvers & Bijsterveld, 2011)
Recommended aims of interventions

• Promote good decision making particularly when faced with risky situations
• Clear evaluation of the consequences of behaviour on self and others
• Recognition of undue influence of peers
• Encourage help seeking rather than consumption of alcohol
Recommended aims of interventions

• Recognition of impact of alcohol
  – Why it has a greater impact on YDs
  – How it exacerbates the impact of poor sleep hygiene
Thank you for your attention