Reducing Young Driver Crashes: What Should We Be Targeting?

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Overview

• What is the problem?
  – Crash statistics Australia, young drivers

• Why does it occur?
  – Contributing factors

• How do we address it now?
  – Driver education
  – Licensing initiatives

• What should we be doing (differently)?
  – Conclusions and implications
What is the problem?
Crash statistics
(CIESIN, 2005; BITRE, 2016; Poblet & Casanovas, 2013)
Why Focus on Young Drivers?

- Road crashes leading cause of death, acquired disability
- Australian drivers aged 17-25 years
  - <10% licensed drivers
  - ≈ 20% road deaths
- Australians aged 15-24 years
  - Highest rate of serious injury due to transport
  - Highest rate of serious injury for males and females

(AIHW, 2015; ATC, 2011; BITRE, 2014)
Why does it occur?
Contributing factors
Inexperienced Crashes by months licensed – NSW

(Prendergast, 2012)
AUSTRALIA
Drivers in casualty crashes by years licensed – QLD

(Queensland Transport, 2009)
AUSTRALIA
Casualty crashes by years licensed – VIC

(VicRoads, 2015)
CANADA
Crashes – Nova Scotia

(Mayhew et al, 2003)
USA
Crashes - Connecticut, Delaware, New Jersey, New York

(McCartt et al, 2003)
GREAT BRITAIN
Proportion of Catastrophic Insurance Claims

(Association of British Insurers, 2012)
Young Age:
Crashes by age at licensure – GREAT BRITAIN
THE NETHERLANDS
Crash risk by age at licensure

(Vlakveld - reported in Twisk & Stacey, 2007)
Role of neurobiological development

- Frontal lobe myelination
  - regulates impulsivity, emotional arousal, anticipating consequences
  - susceptibility to distraction
- Shift in melatonin release
  - greater sleep need, later onset

(Carskadon, 2006; Johnson & Jones, 2013; Luna & Sweeny, 2004; Martiniuk, Glozier, Senserrick et al, 2010; Pack et al, 1995; Sowell et al, 2003)
(Photos: Hayward, 2016; The Bob Richardson Law Firm, 2016, Driving Accident Lawyers TX, 2016)
AUSTRALIA
Risk of fatal crash for young drivers by passenger carriage – VIC

(VicRoads, 2005)
USA
Fatal crash risk by passenger carriage per 10,000 trips

(Source: www.nhtsa.dot.gov)
6 OUT OF 10 teen crashes involve driver distraction.

The most common forms of distraction leading to a teen driver crash include:

- 15% Interacting with one or more passengers
- 12% Using a cellphone
- 10% Looking at something in the vehicle
- 9% Looking at something outside the vehicle
- 8% Singing/dancing to music
- 6% Grooming
- 6% Reaching for an object

For teen driving tips, visit TeenDriving.AAA.com
USA
Melatonin onset shift by developmental stage

- Greater sleep needs
  - 9.2 h high school
  - 8.4 h graduate

- Actual average sleep times
  - 6.9-7.5 h high school
  - 7 h graduate

- 17-19 h awake ≈ .05 BAC
- 20-25 h awake ≈ .10 BAC

(Carskadon & Acebo, 2002)
(Carskadon, 2011; Lamond & Dawson, 1999; National Sleep Foundation, 2006; Williamson & Feyer, 2000)
USA
Age Distribution of Fall Asleep Crashes

(Pack et al, 1995)
Role of risky driving behaviour

- More likely to speed, drive too fast for conditions
- More secondary task engagement
  \[\Rightarrow\text{less selective use/time} \Rightarrow\text{longer glances}\]
- Less likely to drink-drive, much higher crash risk
  \[\Rightarrow.02\text{ BAC} = 5\text{ times risk} \Rightarrow .07\text{ BAC} = 11\text{ times risk}\]

Role of situational risks

- More driving at night, on weekends, recreationally, in high alcohol hours, older and smaller cars
  - Higher risk for all drivers
- More driving with multiple peer passengers
  - Higher risk for youth

Intentional Risk Taking Versus Error

Passenger vehicle fatalities by gender

(Ferguson, 2003)
How do we address it?

- Driver Education
- Licensing Initiatives
Driver Education

- Broad education focuses on awareness, knowledge, attitudes
  - Licence and road rules, driving risks
- More specifically, training focuses on skill development
  - Vehicle handling, hazard perception

➢ Important foundation role for licensure
➢ Protective role yet to be established
  - Limited evaluations of weak scientific quality
  - Advanced vehicle handling training can increase risk (miscalibration)
  - Hazard perception skills can be trained – impact on crashes?

(Jones, 1993; Katila et al, 1992; Keskinen et al, 1992; Senserrick & Williams, 2015; Photo: MUARC-TAC DriveSmart CD-ROM)
TEENS HAVE RISKY DEFINITIONS OF "SAFE DRIVING"

More than 1,100 fatal crashes involving young drivers are the result of texting or drinking while driving.

TEEN DRIVERS REPORT THEY understand DANGEROUS DRIVING BEHAVIORS...

Texting & Talking Behind the Wheel
- Nearly all teens understand that using a cell phone while driving is at least slightly distracting: 96%
- More than half of teens think texting and driving is extremely or very distracting: 62%

...BUT THEIR actions BEHIND THE WHEEL REVEAL A DANGEROUS DISCONNECT

- 86% of teens admit to using a cell phone behind the wheel
- 68% of teens admit to reading or replying to text messages while driving
- 47% of the teens who say they never text while driving still admit to texting at a red light or stop sign

Driving Under the Influence of Alcohol
- Few teens admit to at least sometimes driving under the influence: 5%
- Very few teens define driving under the influence as acceptable: 1%
- Majority of teens view driving under the influence as extremely or very distracting: 86%
- 10% of teens who say they never drive under the influence admit they occasionally drive after having 1 drink
- 25% of teens who use designated drivers admit that the person is not 100% sober
NEW ZEALAND
Drivers in casualty crashes by age at licensure

(Mortimer, Ministry of Transport, New Zealand, 2010)
Resilience Education & Driving

• Resilience education more broadly focused on youth empowerment, enhancing or building strengths and competencies in relation to risk-taking generally
  • Includes focus on strategies to reduce risks: not just “what” and “why” but “how” to prevent/avoid risks

• US randomised control trial of resilience program *Life Skills Training* for 7<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> Grade students (n=2,000)
  • Alcohol/drug abuse prevention program: not driving-focused
    ➢ Lower demerit points on licence by end high school

(Griffin et al, 2004)
Life Skills Training

“The goal of the prevention program is to provide adolescents with the knowledge and skills needed to effectively resist social influences to engage in substance use, as well as to reduce potential motivations to use substances by increasing general personal and social competence.

The program teaches students a variety of cognitive–behavioral skills for building self-esteem, resisting advertising pressure, managing anxiety, communicating effectively, developing personal relationships, and asserting one’s rights.

These are taught using proven skills-training techniques such as group discussion, demonstration, modeling, behavioral rehearsal, feedback, and reinforcement, and behavioral “homework” assignments for out-of-class practice.”

(Griffin et al, 2004; p. 209)
Australian Resilience Program: RRISK

- Aims to empower young people with knowledge, attitudes and skills to make informed decisions about driving, but also drug and alcohol use generally, including safe celebrating and looking after friends.
- One-day seminar ~500 Year 11 students from various schools but also: peer-facilitator training workshops for students; factsheets for parents in school newsletters; professional development sessions for teachers, health workers, and community members.
- Range of learning strategies: factual presentations; drama; peer education; real-life experiences relevant to the social life, developmental stage and interests of adolescents.

*Reduce Risk Increase Student Knowledge* (North Coast Area Health Service, NSW Health)
(Senserrick et al, 2009; Zask et al, 2006)
RRISK: The DRIVE Study Evaluation

- Prospective cohort study first-year provisional drivers aged 17-24 years in NSW (n=20,822)
  - Detailed questionnaire to all eligible drivers 2003-2004, including involvement in driver education programs
  - Linked to police crash and offence records ~2 years later

  - No differences in risk of traffic offence for any program
  - RRISK participants (3%) had 35% unadjusted and 44% adjusted reduced risk of crash not found for a traditional program
  - Need for further research

(Senserrick, Ivers, Boufous, Chen, Stevenson, Norton, 2009)
Licensing Initiatives

• Focus on learner stage where crash risk is lowest
• Encourage more supervised practice driving
  ➢ VIC: promotion of 120h prior to introduction resulted in
    16 yos 120h+, 17 yos 58h (99h once introduced), 18 yos 69h (109h)
  ➢ VIC: logbook analysis found complex experience increased markedly after
    110h (only)
• Toughen practical driving test for independent licence
  ➢ VIC: 132h > 82h > 69h performance on complex components
  ➢ NSW: 120h ≈ 5% higher pass rate than 50h
  ➢ VIC: ≈ 16% reduction in casualty crashes

(Cavallo & Oh, 2008; Healy et al, 2012; RTA, 2009; Senserrick & Williams, 2015)
Graduated Driver Licensing:
Reduce Exposure to High Risk Conditions

- Increase minimum age - 23%
- No alcohol - 13%
- No late night driving - 28% incl. 49% night
- No driving with peer passengers - 20%

(Harder tests - 3%) → No alcohol
No phone use

↑ Reduce min. age - 13%
↑ Extend learning - 17%
↑ (High hours/distance - 18%)

(Senserrick & Williams, 2015; VicRoads, 2008)
Queensland GLS July 2007

**Learner phase**
- Lower min. age from 16.5 to 16
- Increase min. period from 6 to 12 months
- Require 100 logbook hours
- Restrict all phone use (including driver and passenger loudspeaker use)
- Retain zero alcohol if age <25*

**Provisional phase**
- Retain minimum age 17 years
- Retain zero alcohol if age <25*
- Restrict high powered vehicles
- Single 3-year phase divided into P1 one year, then P2 two years

**P1**
- Restrict all phone use
- Night peer passenger restriction: max. one aged <21 y from 11pm-5am

* Extended to drivers of any age from July 2010
Trend in All Crashes involving Novice Drivers

Crashes involving novice (learner, provisional) drivers per 10,000 novice licences, Queensland, July 1999-June 2012

(Senserrick et al, 2016)
Trend in All Crashes involving Novice Drivers under Old and New GLS

↓14% crashes
↓12% single-vehicle
↓29% night
↓23% passenger
(↓22% alcohol)

Crashes involving Old-GLS and New-GLS drivers per 10,000 licences, Queensland, July 1999-June 2012

(Senserrick et al, 2016)
What should we be doing (differently)?
Conclusions

- Young drivers over-represented in road trauma
- New drivers at risk due to inexperience
- Young drivers at most risk due to developmental, lifestyle factors

Driver Education

- Shift focus from risk awareness, knowledge, attitudes
- Focus on personal empowerment, resilience
- Tactics and strategies to manage, overcome risks
- Young drivers are also young passengers, pedestrians
- Fatigue and time management?
- Hazard perception skills training?

Licensing Initiatives

- Focus on increasing experience and establishing low-risk driving habits as Learners
- Provide a low-risk environment to gain independent driving experience
### The Young Driver Safety System: QLD

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<th>Government policy and budgeting</th>
<th>Regulatory bodies and associations</th>
<th>Local area government</th>
<th>Technical and operational management</th>
<th>Physical processes and actor activities</th>
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<tr>
<td>Government Licensing Authority</td>
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<td>Parents</td>
<td>Professional Driving Instructors</td>
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<tr>
<td>Road Infrastructure Authority</td>
<td>Corrective Services</td>
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<td>Indigenous Affairs</td>
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<td>Other Passengers (e.g., Parents, Peers, Others)</td>
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<tr>
<td>Federal Chamber of Automotive Industries</td>
<td>National Transportation Commission (NTC)</td>
<td></td>
<td>Other Family</td>
<td>Other Road Users</td>
</tr>
</tbody>
</table>
| Coroner | Australian Transport Council | | Community Groups | |}

### Equipment and surroundings

- Vehicles
- Road Infrastructure/Environment
- Racetracks

*(Scott-Parker, Goode, Salmon, Senserrick et al, 2016)*
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