An investigation of the factors associated with the non-use of a seat belt through the analysis of linked data

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OVERVIEW

• Background to seat belt use and *Austroads* seat belt project

• Presentation and discussion of the findings from the analysis of linked Western Australian crash, death and hospitalisation data

• Recommendations for further research and the promotion and enforcement of seat belt use
• Australian seat belt laws introduced 1970 to 1972

• Seat belts known to be highly effective against injury:
  - 45%-50% reduction in fatal and serious injury for drivers and front passengers; 25% reductions for backseat passengers (WHO, 2009)

• Estimates of usage in Australia varies with data source
  - ~70% for those involved in fatal crashes
  - ~95-98% self-report measures
  - Majority of non-wearers are inconsistent wearers

• Seat belt use by adults varies with user characteristics and behaviours; lower use among:
  - Males
  - Younger-middle age occupants
  - Back seat passengers
  - Lower socioecomic groups
  - Indigenous and minority non-caucasions
  - Travel on rural roads
  - Short distance trips close to home
  - Alcohol abuse; drink-driving; speeding
How do we move forward in the promotion of seat belt wearing when only a minority of Australian adult occupants fail to use a seat belt regularly or at all?

Austroads Project SS1388

Non-wearing of adult seat belts in Australia: Where to next?

Various project objectives, including:

- Determine the need for specific targeting of countermeasures
- Synthesise our understanding of adults who use and fail to use a seat belt
  - Review of the research literature
  - Analysis of Australian data, particularly linked crash, death and hospitalisation data
    (this presentation)
METHODOLOGY

Identified HMDS, death, and police crash records and final linked record numbers

Persons aged 16+ years, Western Australia 2001-2006

<table>
<thead>
<tr>
<th>Hospital Morbidity Data System and Death Records</th>
<th>Police Recorded Crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECodes V40-V49</td>
<td>Crash involved occupants meeting relevant inclusion criteria</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Deaths</th>
<th>Hospitalisations</th>
<th>Deaths</th>
<th>Hospitalisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>582</td>
<td>9,613</td>
<td>706</td>
<td>11,049</td>
</tr>
</tbody>
</table>

Linked n=8,118 records

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</thead>
<tbody>
<tr>
<td>Deaths n=679</td>
<td>Hospitalisations n=7,439</td>
<td></td>
</tr>
<tr>
<td>96% of police recorded crash deaths</td>
<td>77.3% HMDS admissions</td>
<td></td>
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</table>
SUMMARY OF DEMOGRAPHICS

- 16-40 years - 65%
- Male - 56.5%
- Non-Indigenous - 93.8%
- Metropolitan Perth residents - 65%
- Australian born – 73.6%

SUMMARY OF CRASH VARIABLES

- Metropolitan location – 52.6%
- Occupant type – 72% drivers
- Multiple occupancy – 15%
- Belt use - 68% worn; 9.3% not worn; 23% unknown
- Sedan/station wagon - 77%
- Attended by police – 85.6%
RESULTS

SUMMARY OF SEAT BELT NON-USE

• Killed 29.5%
• Aged 26-40 years 15.2% and 16-25 years 15.6%
• Male 15.8%
• Indigenous 53.7%
• Rural residents 17.6%
• Passengers 21.2%
• Rural crashes 17.4%
Logistic regression model for non-use of a seat belt by adult occupants with a linked death or hospitalisation record; Western Australia 2001-2006

<table>
<thead>
<tr>
<th>Sex</th>
<th>OR</th>
<th>95% CI</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female*</td>
<td>2.33</td>
<td>1.89-2.86</td>
<td>P&lt;.001</td>
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<tr>
<td>Male</td>
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Logistic regression model for non-use of a seat belt by non-Indigenous occupants with a linked death or hospitalisation record; Western Australia 2001-2006

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<th>Sex</th>
<th>OR</th>
<th>95% CI</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female*</td>
<td>1.66</td>
<td>1.01-2.73</td>
<td>P &lt;.001</td>
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<tr>
<td>Male</td>
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</table>

Hosmer & Lemeshow X^2=7.54, df=8, p=0.479 *Reference group; OR adjusted for the location of the crash and the type of vehicle in which the occupant was injured
Logistic regression model for non-use of a seat belt by adult Non-Indigenous occupants with a linked death or hospitalisation record; Western Australia 2001-2006

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
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</tr>
<tr>
<td>Female*</td>
<td>2.45</td>
<td>1.95-3.08</td>
<td>P&lt;.001</td>
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<tr>
<td>Male</td>
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<tr>
<td><strong>Age</strong></td>
<td></td>
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</tr>
<tr>
<td>41+ years*</td>
<td>2.53</td>
<td>1.90-3.39</td>
<td>P&lt;.001</td>
</tr>
<tr>
<td>26-40 years</td>
<td>2.67</td>
<td>2.03-3.50</td>
<td>P&lt;.001</td>
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<tr>
<td>16-25 years</td>
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<tr>
<td><strong>Residential Location</strong></td>
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<tr>
<td>Metropolitan Perth*</td>
<td>1.63</td>
<td>1.22-2.19</td>
<td>P&lt;.002</td>
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<tr>
<td>Rural WA</td>
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<tr>
<td><strong>Occupant Type</strong></td>
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<tr>
<td>Driver*</td>
<td>2.08</td>
<td>1.68-2.58</td>
<td>P&lt;.001</td>
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<tr>
<td>Passenger</td>
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Hosmer & Lemeshow X²=7.82, df=8, p=0.528 *Reference group; OR adjusted for the location of the crash and the type of vehicle in which the occupant was injured

**DISCUSSION**
WHAT DO THE RESULTS SUGGEST?

• Crash involved adults have a higher likelihood of being killed if unbelted
• High priority targeting of those who fail to use a seat belt
  ✔ Indigenous
  ✔ Passengers
  ✔ Males
  ✔ Aged up to 40 years
  ✔ Rural residents
• But…..why? Need for other data and methods.

RECOMMENDATIONS FOR RESEARCH

• Greater, in-depth understanding of those who fail to wear a seat belt
  ✔ Link other quantitative data such as prior traffic offence history
  ✔ Further investigation and reporting of crash factors, eg., availability of a belt, over-crowding
  ✔ Qualitative methods to investigate barriers and enablers
  ✔ Impact of technological solutions to change wearing habit
RECOMMENDATIONS FOR PROMOTION AND ENFORCEMENT

• Maintain focus on the probability of being detected and fined for not wearing, rather than crashing and injury

• Develop culturally relevant message for Indigenous

• Targeted promotion and enforcement campaigns for rural residents

• Consideration of a recidivist seat belt offender program: ignition interlocks; enhanced SBR systems

QUESTIONS?