

THE LOWERING OF THE  
MINIMUM PURCHASE AGE  
IN NEW ZEALAND IS  
ASSOCIATED WITH A  
LONG TERM IMPACT ON  
ALCOHOL-INVOLVED  
CRASHES

# Introduction

- To assess the long term effect of lowering the minimum purchase age for alcohol, from 20 to 18 years in 1999, on alcohol–involved crashes in New Zealand.
- Significance:
  - No studies have assessed the long term effects of a lowered purchase age using ten or more years of data following the law change
  - Studies from US have found moderate to long term benefits from raising legal drinking age.

# Previous NZ studies

- Previous studies have assessed the short term effects of the lowered purchase age on vehicle crashes in NZ
  - Studies by Kypri et al 2006 and Huckle et al 2006 found significant increases in alcohol-involved crashes among 18–19 group, Kypri also found large increases among the 15–17 year group.
  - There were some limitations with these studies, however, as external influences on crashes were not controlled for.

# Crashes: determining alcohol-involvement in NZ

- Crashes involving injury or death are required by law to be reported to the Police
- Hospital blood tests or police administered breath tests determine alcohol-involvement of drivers – required to be over the legal BAC limit 0.08.
- In some cases, Police recorded that alcohol was suspected but did not provide an alcohol level.
- Relatively accurate indicator of alcohol-involvement.<sup>20</sup>

# Operationalizing the data

- We collected data on all drivers involved in crashes resulting in an injury or fatality from 1994 to 2010 by age & gender.
- capture multiple vehicle crashes where only the non-injured/non-fatally injured driver was over the legal BAC limit for driving
- accounted for variation in the size (number of cars) involved in crashes over time.

# Example

- If two drivers were involved in a crash where a passenger was injured, one driver was over the legal BAC limit for driving and the other was not.
- Classification was as follows:
  - ▣ one driver in an alcohol-involved injury crash.
  - ▣ one driver in a non alcohol-involved injury crash.

# Methods

- Because alcohol-involved crashes do not occur in controlled environments, it was necessary to adjust for factors, not related to alcohol legislation, but which affect the number of total crashes. [19](#), [21](#)
  - ▣ demographic changes
  - ▣ driving exposure
  - ▣ the number of drivers on the road [23](#), [24](#)
  - ▣ Crash-worthiness
  - ▣ Weather
  - ▣ Road conditions
  - ▣ Graduated driver licensing program in New Zealand (for young drivers). [16](#)

# Kilometres driven (million)

□ Age	1997/98	2003–06	2007–10
15-17	4.9	4.7	3.4
18-19	4.9	6.5	7.0
20-24	22.9	20.0	22.9



# Dependent measures: ratio's

- Drivers in alcohol-involved injury and fatal crashes to drivers in non alcohol-involved injury and fatal crashes (also fatal only)
  - ▣ As potentially confounding factors are expected to influence the total number of crashes and not to have a different relationship with alcohol-involved crashes – they provide the control.
  - ▣ Approach used previously (e.g. Voas) directly compares treatment to control
  - ▣ Ratio standardises the dependent variable across age groups (& controls for variation in external influences on crashes over time).



# Analysis

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- Three time periods
  - ▣ 1994 to 1999 (pre law change)
  - ▣ 2000 to 2005 (post law change)
  - ▣ 2006 to 2010 (longer term)
- Age groups: 14–17, 18–19, 20–24 (age comparison group)
  - ▣ Comparison group esp. important other policy changes.
- Gender – controlled for gender
- Age group\*time period interaction term was added to the model to investigate how the change in the odds differed between the age groups over time.
- Adjusted for multiple comparisons.

# Results for 18–19 year olds

- Prior to purchase age:
  - ▣ odds of a driver experiencing an alcohol-involved crash resulting in injury or fatality were similar between 18–19 & 20–24 groups ( $p=0.1$ )
- Directly after law change:
  - ▣ 18–19 year olds had 15% higher odds of experiencing an alcohol-involved crash relative to 20–24 year olds ( $p=0.038$ )
- Longer term:
  - ▣ 18–19 year olds had 21% higher odds relative to 20–24 year olds ( $p=0.0004$ ).

# Results for 14–17 year olds

- No evidence of trickle down effect
- Their odds did not move closer towards or above the 20–24 year olds in the time periods following the law change.
- Graduated driver licensing program

# Limitations

- Using crash data based on drivers (and not crash events) may inflate the number of non alcohol-involved drivers in our data as alcohol-involved crashes are more likely to be single vehicle loss of control or run off the road crashes (Pers com Jones 2013). Under-estimate.
- In some instances, police suspicion of alcohol-involvement was recorded when test results were not available. This would be most detrimental to our findings if happened differentially by age group. There is currently no evidence that this occurs (Pers comm. Jones).
- A driver may be in more than one age group in any one of the three time periods considered in the analysis. SF

# Conclusion

- The lowering of the purchase age in 1999 was associated with a long term impact on alcohol-involved crashes among those directly affected – the 18–19 year olds.
- The main increase in the odds of experiencing an alcohol-involved crash for drivers aged 18–19 years was found directly following the law change, relative to the age control group, but the increased odds was maintained long term.
- Raising the minimum purchase age for alcohol in New Zealand would be an appropriate public health intervention.

# Last but not least

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- This study has been accepted for

publication in **American**

**Journal of Public**

**Health**