

## **For whom didn't it click? A study of the non-use of seat belts in motor vehicle fatalities in New Zealand**

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### **Abstract**

The aim of this research was to determine profiles of a representative sample of seat belt non-users who were killed in motor vehicle crashes in New Zealand between 2011-2015. A Safe System analysis of 186 vehicle occupant fatality reports (n=200 fatalities) was conducted and 63 variables were coded for each case. A Multiple Correspondence Analysis explored relationships between the variables and identified five clusters of individuals with similar characteristics. The profiles were: 'young and risky'; 'driving for work'; 'elderly and retired'; 'passengers from overseas'; and 'people driving in rural settings'. Initiatives to reduce seat belt non-use road deaths should consider what will most likely influence these various groups, acknowledging that each profile may need to be targeted with a different approach.

### **Background**

There is an increased risk of death or serious injury for occupants who did not wear a seat belt in a crash (Høye 2016). Common factors associated with seat belt non-users include: night-time crashes; younger drivers; males; marginalized or minority ethnic groups; low levels of education; and a history of previous driving offences (Begg and Langley 2000, Eluru and Bhat 2007, Raftery and Wundersitz 2011, Alattar, Yates et al. 2016).

In New Zealand, seat-belt wearing rates are high (over 96% for front and rear occupants), yet between 2006 and 2016, non-seat belt fatalities annually accounted for 19-30% of overall motor vehicle occupant road deaths. The trend in these potentially preventable deaths is not decreasing and therefore there is a need to better understand how the contextual factors associated with these situations may be understood. Therefore, the aim of this research was to determine profiles for seat belt non-users who were killed in motor vehicle crashes.

### **Method**

In addition to a review of the literature, the method involved two key parts. Firstly, an analysis of a representative sample of 186 NZ Police-generated Serious Crash Unit (SCU) reports of fatal seat belt non-use crashes (n=200 fatalities) between 2011-2015 was conducted. The analysis followed a Safe System (Larsson and Tingvall 2013) framework, and 63 variables were coded from each crash. In the second stage, a Multiple Correspondence Analysis explored relationships between these variables, which then clustered individuals with similar characteristics into one of five 'occupant profiles'. Every one of the 200 individuals were part of one and only one occupant profile, and some individuals fitted the profile better than others. However, all individuals fitted their allocated occupant profile more strongly than any other profile.

### **Results**

The cluster analysis identified five seat belt non-user profiles. Contrary to the literature, seat belt non-users were not solely associated with the commonly identified factors described in the literature. Rather, these factors were specifically analogous with 26.5% of the fatality cohort (n=53) and were captured in the 'young and risky' profile. The four additional profiles were: people driving for work (n=20); elderly and retired people (n=12); passengers from overseas (n=7); and people in rural settings (n=108). An infographic summary of some of the components of these profiles is presented

in Figure 1. This enhanced understanding of ‘occupant profiles’ indicates that there is a wide variety of people who are killed in crashes where seat belts are not worn.

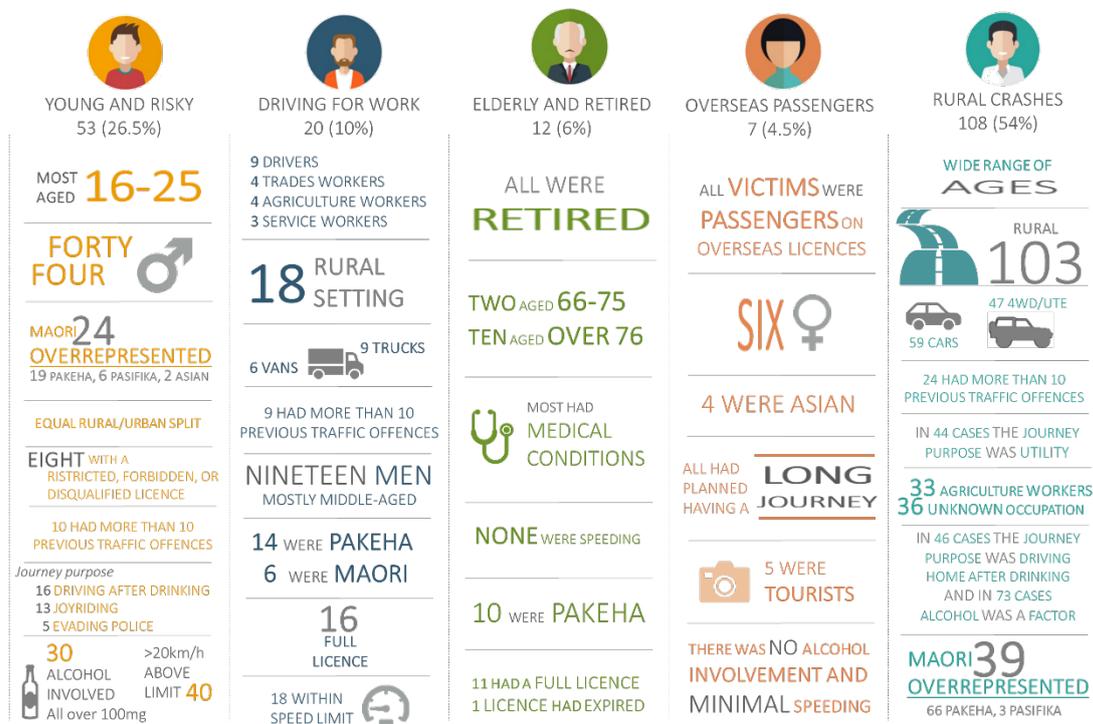


Figure 1. Profiles for seat belt non-use fatalities

## Conclusions

A concerning high number of people are still being killed in crashes where seat belts are not worn and urgency to address this issue is warranted. If it is assumed that those most at risk of being killed in seat belt non-use crashes match the profiles developed in this study, then a range of intervention approaches will be needed to effectively target each group. Some of these interventions may be outside the direct jurisdiction of the New Zealand Transport Agency, but are likely to be part of the wider road safety sociotechnical system. For example, for ‘passengers from overseas’, hire car companies could be more prescriptive about the legal requirement of wearing a seat belt in New Zealand. However, for those ‘driving for work’, WorkSafe, or the relevant industry, may encourage an ergonomic assessment of work tasks to understand how tasks could be altered to better align with seat belt use. Finally, NZ Police and the Ministry of Education could work together in schools to target behaviours associated with the ‘young and risky’ group. In addition, further work to understand why the range of people within each profile do not wear seat belts would be beneficial for better-targeted interventions.

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