DRIVER LICENSING REVIEW
CRASH STUDY: IMPACTS OF VISION TESTING

April 2016

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Assessment of the crash rates of drivers who fail the driver licensing eyesight check and are subsequently required to wear corrective lenses

Internationally, there has been little research conducted about the safety impacts of vision testing for drivers other than older drivers. The purpose of the crash rate analyses below was to develop evidence of the safety impacts of vision testing for the general population of drivers in New Zealand. The analyses indicate that there is no discernible benefit from repeated vision testing as part of the driver licensing process.

Test 1

The crash rates of drivers who renewed their licence during the period 1 January 2005 to 1 January 2011 were established by matching driver licence numbers with the Crash Analysis System (CAS) database. The statistical test compared the proportion who crashed during the 3-year period prior to licence renewal for two groups: drivers who failed the eyesight test at licence renewal, and were subsequently granted a licence to drive with correcting lenses; and drivers who passed the eyesight test and were granted a licence to drive without a condition to wear correcting lenses.

Table 1: Comparison of crash rates during 3-year period prior to licence renewal – drivers who failed eyesight test vs. drivers who passed

Full licence renewals - licence grant date 1/01/2005 to 31/12/2011 and all injury crashes within 3 years prior to the licence grant date							
	Sample size	Number crashing	Proportion crashing	Notation	Hypothesis to be tested	Result at 5 percent significance	Are the two proportions significantly different?
Drivers granted licence with condition to wear lenses	7,437	72	0.00968	P_1	Null hypothesis H0 : $P_1 <= P_2$ Test hypothesis H1: $P_1 > P_2$	Accept null hypothesis	No
Drivers passed eyesight test at agents and granted licence without condition to wear lenses	678,920	7,962	0.01173	P_2			

Conclusion: the result was tested at the 5 percent significance level. It was found that the crash proportion of the intervention group was not significantly different to that of the non-intervention group prior to the licence grant date (p value= 0.05155 > 0.05 and z-score= 1.6317 < Z critical 1.645). Note that the effect was in the opposite direction to that hypothesised (i.e. drivers who failed the eyesight check had fewer crashes than the general population). There was no evidence in support of the research hypothesis so the null hypothesis is accepted

Test 2

This test looked at the pre- and post-licence renewal crash rates of drivers who failed an eyesight check at a licensing agent and were subsequently granted a licence with a condition to wear corrective lenses. The hypothesis was that the proportion that crashed would be lower after licence renewal, given that vision is important for driving and therefore, the correction of poor vision (requirement to wear corrective lenses) should reduce their crash risk.

Table 2: Comparison of crash rate pre- and post-licence renewal for drivers who failed the eyesight check and were required to wear corrective lenses

Full licence renewals - licence grant date 1/01/2005 to 31/12/2011 and all injury crashes with a crash date between 3 years before and 3 years after the licence renewal date							
	Sample size	Number crashing	Proportion crashing	Notation	Hypothesis to be tested	Result at 5 percent significance	Are two proportions significantly different?
Drivers granted licence with condition to wear lenses (post grant date crash match)	7,437	73	0.00982	P_1	Null hypothesis H0 : $P_1 >= P_2$ Test hypothesis H1: $P_1 < P_2$	Accept null hypothesis	No
Drivers granted licence with condition to wear lenses (pre grant date crash match)	7,437	72	0.00968	P_2			

Conclusion: the result was tested at the 5 percent significance level. It was found that there was no significant difference in the crash proportions of the intervention group before and after the licence grant date (p-value= 0.468120 >0.05 and z-score =0.0835 < Z critical 1.645). There was no evidence in support of the research hypothesis so the null hypothesis is accepted.