Innovative Countermeasures for Driver Fatigue

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arrb
GROUP

This presentation

- Austroads

- The Australian Road Research Board – ARRB Group

- Australian research on fatigue countermeasures:

Innovative Road Safety Measures to Address Fatigue: Review of Research and Results from a Treatment Trial

Austroads

- a forum for Australian and New Zealand road agencies to work together to achieve common objectives and promote harmonisation and consistency in their operations

ARRB Group

- ARRB was established in 1960 as Australia's principal transport research centre
- Member based organisation:
  - Australian federal, state and local government road agencies
  - New Zealand Transport Agency

Driving hours - Australia

Option	Requirements
Standard hours	Basic work and rest limits
Basic fatigue management	Accredited more flexible work and rest hours
Advanced fatigue management	Based on accredited safety management system

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Driving hours - Australia

Example – Standard hours:

Time	Work	Rest
11 hours	10 hours	60 minutes rest (15 minute blocks)
24 hours	12 hours	7 hours continuous stationary rest
7 days	72 hours	24 hours continuous stationary rest

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Recent Australian Research on Fatigue

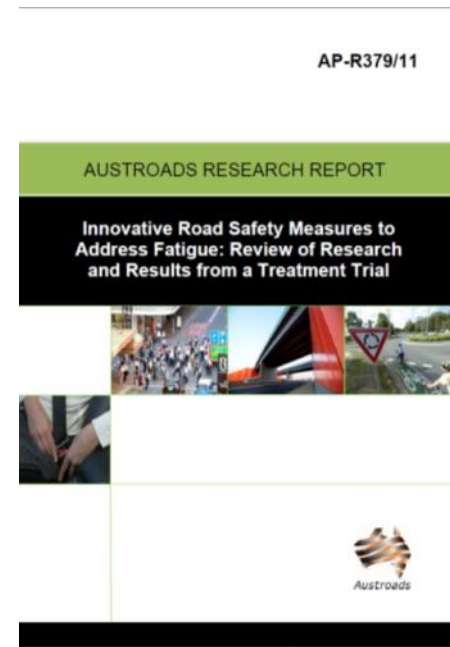*Fatigue is a major contributing factor to rural and remote crashes*

Austroads commissioned ARRB to research:

- identification of innovative fatigue countermeasure treatments
- the effectiveness of these treatments
- practical treatment applications

Police at the scene of Sunday's crash near Castlemaine in which five people died.   PICTURE: ANDREW DE LA RUE

AP-R379/11

AUSTROADS RESEARCH REPORT

Innovative Road Safety Measures to Address Fatigue: Review of Research and Results from a Treatment Trial

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Categories of treatments identified included:

- provision of rest opportunities for drivers

- advising drivers of the need to rest

- reducing monotony for drivers

- alerting drivers to specific hazards

- helping to avoid departure from the roadway

- alerting drivers to their departure from the roadway

- protecting drivers if they do depart the road

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The literature review recommended the design and trial of a treatment in the "reducing monotony for drivers" category.

Factors to be assessed included:

- estimated effectiveness of the treatment
- evidence base for effectiveness
- estimated cost of implementation
- extent of prior use and evaluation as a fatigue countermeasure

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The key to such a countermeasure is: how to increase alertness without increasing distraction?

- Some recent research suggests that trivia questions can maintain alertness without distraction

WHAT'S THE CAPITAL OF ZIMBABWE?
a. Fremantle
b. Harare
c. Maputo

Recent Australian Research on Fatigue

The 'trivia questions' approach had previously only been tested as an in-vehicle countermeasure. In this form it is:

- expensive
- has low uptake
- exposure must be self initiated

In the Austroads/ARRB project it was reconceptualised as a roadside sign. This makes it:

- cheap
- universal
- provide for guaranteed exposure

Example from Queensland

Example from Queensland

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Example from Queensland

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Example from Queensland

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Research findings

Evaluation involved surveys of road users:

- trivia signs were well received
- signs provided a positive message
- a practical and enjoyable means of maintaining alertness
- drivers did experience an increase in alertness
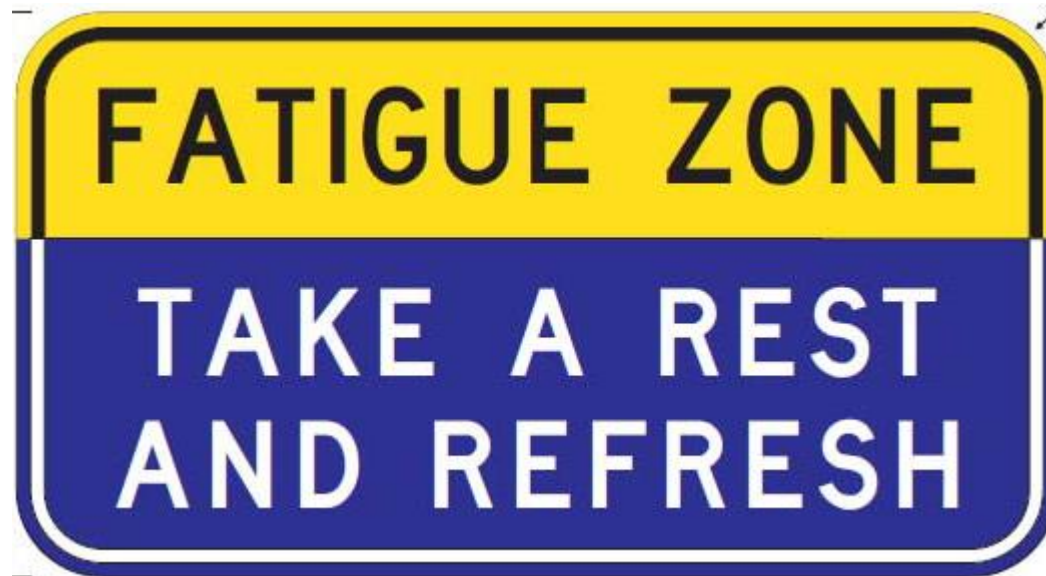- drivers were more likely to stop and rest

However no measurable decrease in sleepiness for drivers
Possible causes:

- treatment effect was only transitory in nature
- selection bias – possible that only those drivers unaffected by fatigue may have stopped for the survey
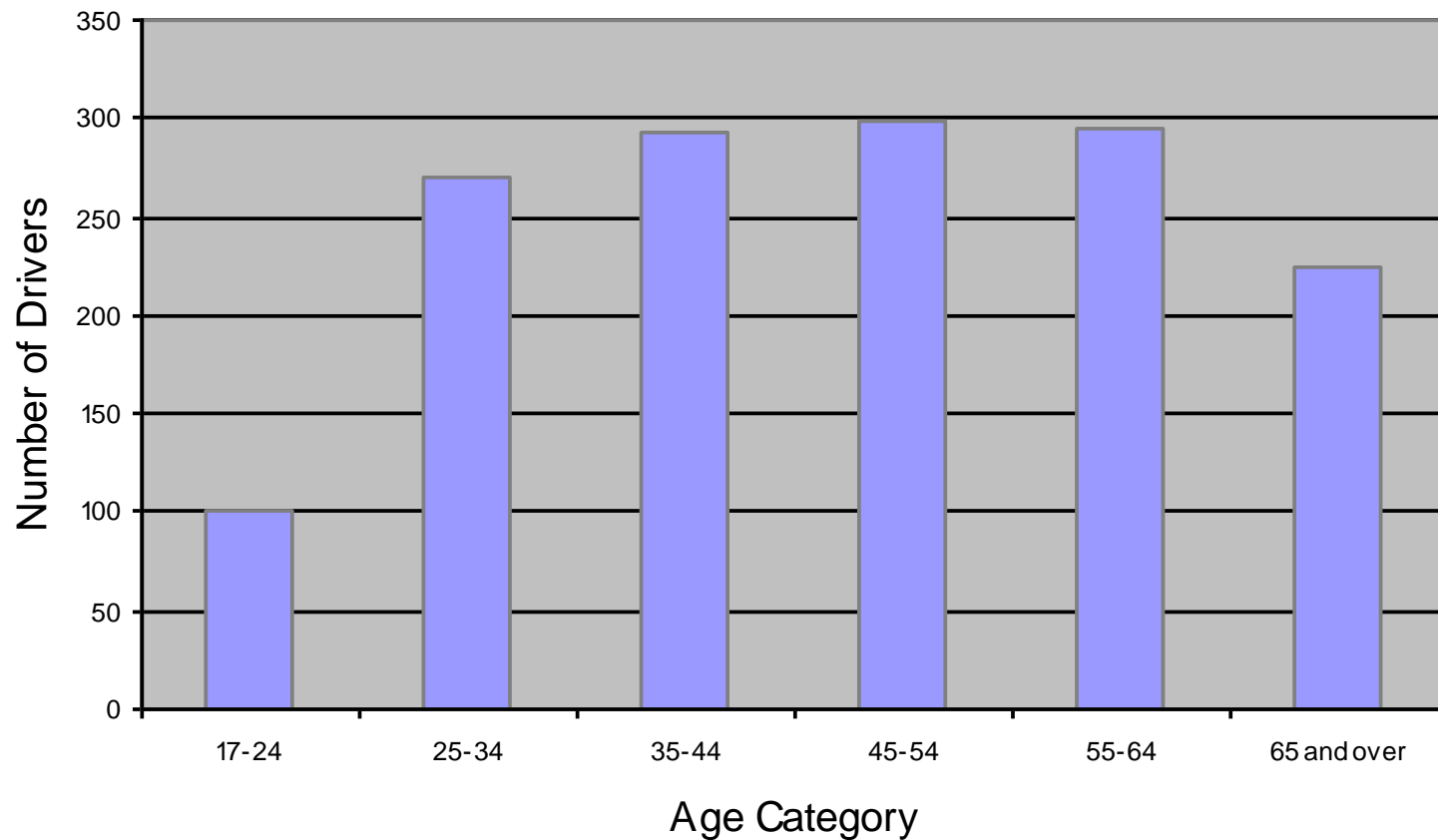- mean sleepiness level is close to 'alert'

Conclusion

This project successfully developed and trialled an inexpensive fatigue countermeasure designed to increase a driver's alertness and hence counteract driver fatigue
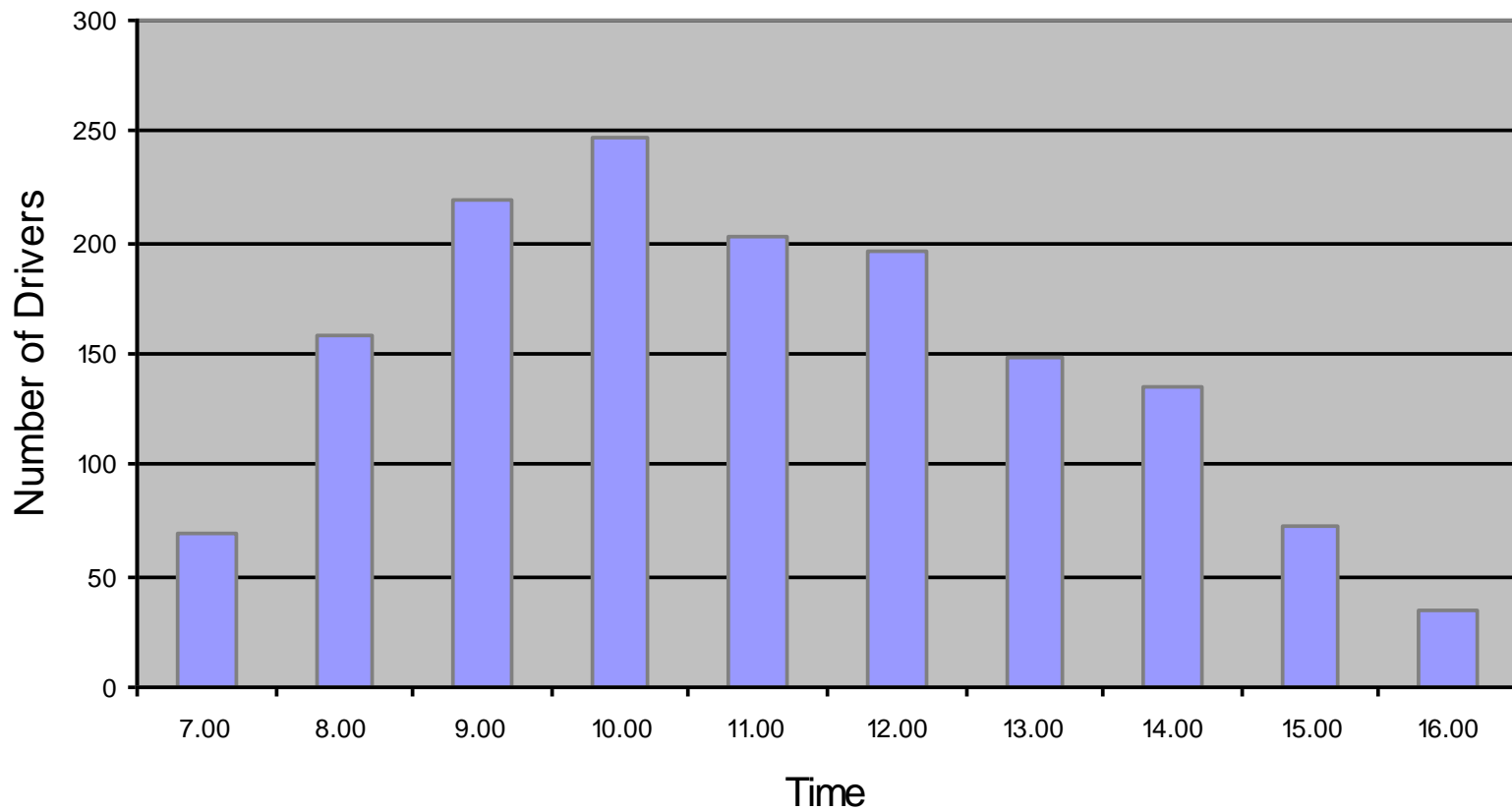
The End

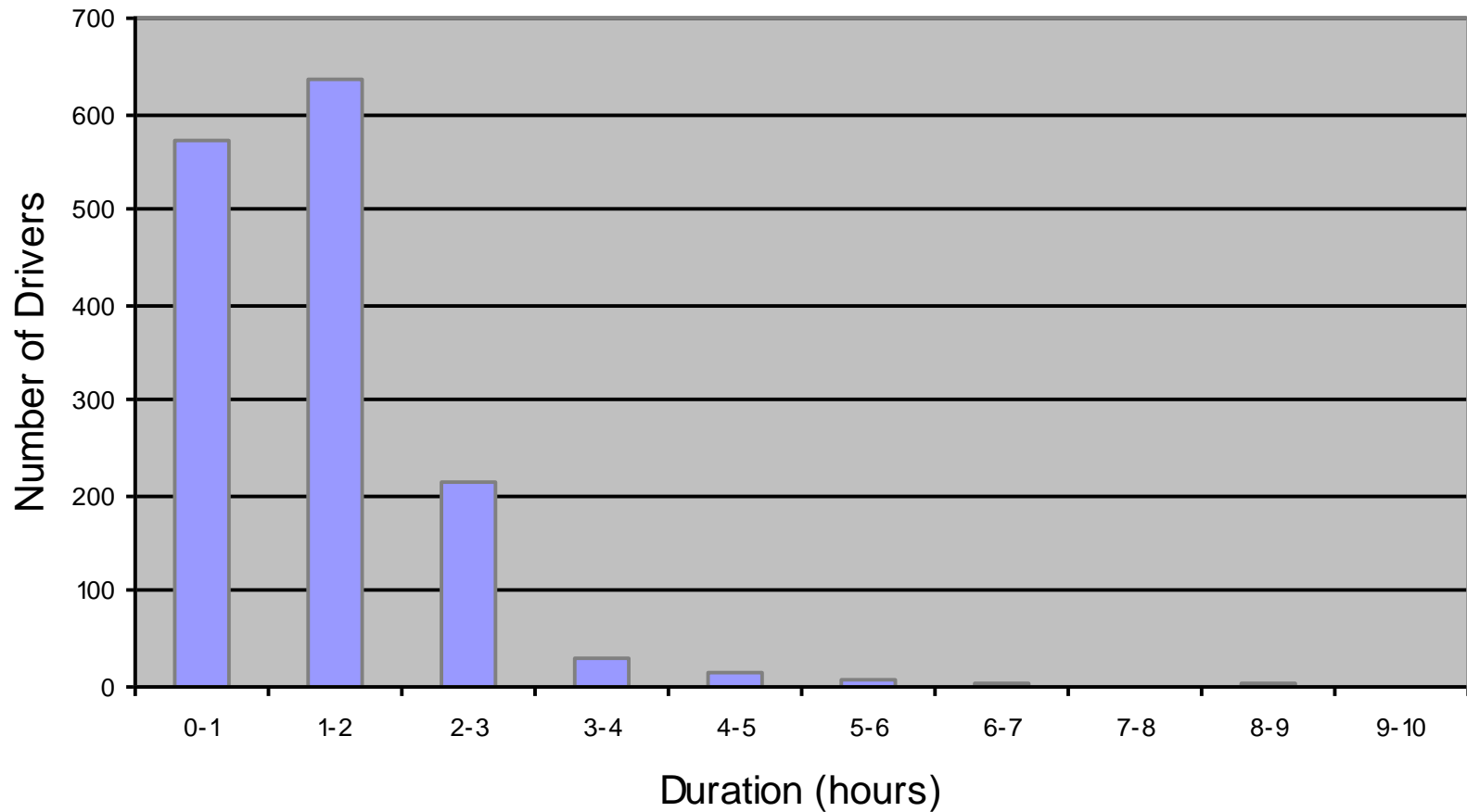Trusted advisor to road agencies
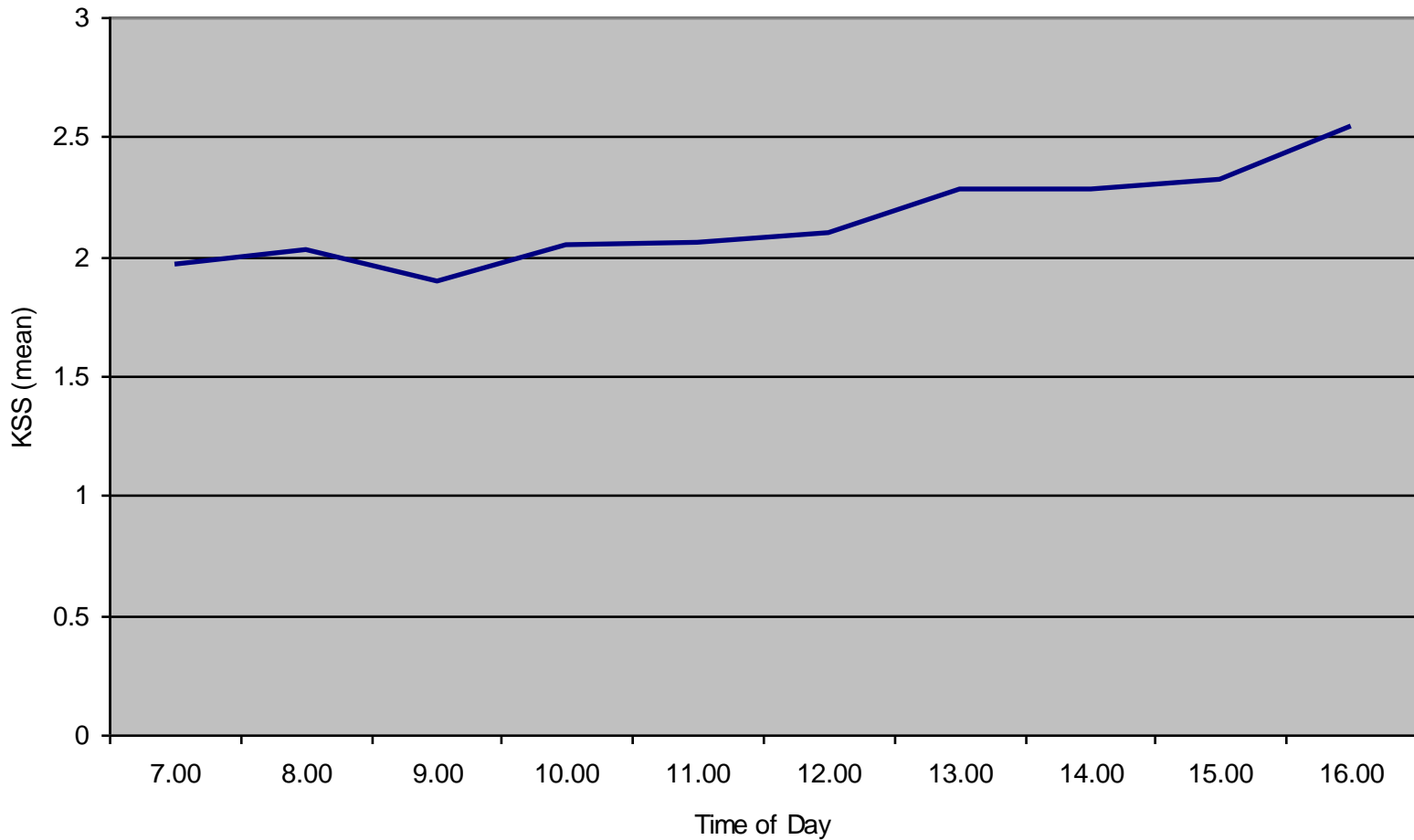
Appendices

Driver Age Distribution

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Sleepiness Across the Day

Sleepiness and Driving Duration

Chart: KSS (mean) vs Driving Duration (hours)

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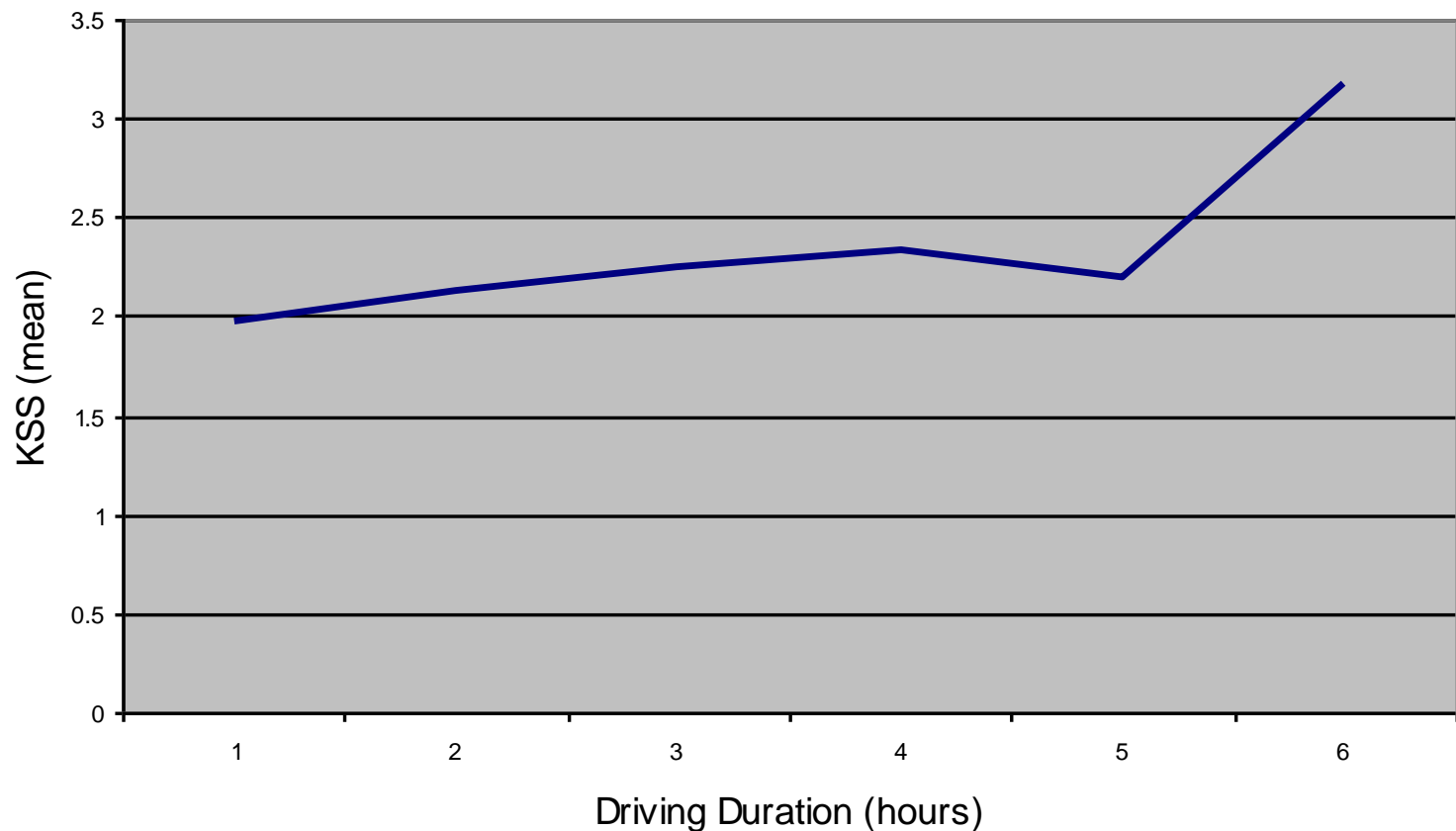
Table 7.1: Awareness of treatment signs (% drivers)

Awareness	Before		After	
	Control	Treatment	Control	Treatment
Yes	37.7*	37.7*	56.5	75.8*
No	62.3*	62.3*	43.5	24.2*

*significant (p < .05) standardised residuals.

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Table 7.2: Effectiveness of treatment signs (% drivers)

Effective	Before		After	
	Control	Treatment	Control	Treatment
Yes	60.2	63.0	61.6	73.0*
No	39.8	37.0	38.4	27.0*

*significant ($p < .05$) standardised residuals.

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Table 7.3: Influence on stopping behaviour (% drivers)

Influence	Before		After	
	Control	Treatment	Control	Treatment
Yes	16.5	17.2	13.1	10.6
No	83.5	82.8	86.9	89.4

*significant (p < .05) standardised residuals.

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Table 7.4: Rated sleepiness (mean)

State	Before		After		Total
	Control	Treatment	Control	Treatment	
Queensland	2.16	2.13	2.18	2.10	2.14
WA	2.11	2.16	1.95	1.95	2.05
Total	2.12	2.15	2.09	2.07	2.11

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