CITATION:

S. McEvoy & M. Stevenson. (2007). An exploration of the role of driver distraction in serious road crashes. In: I.J. Faulks, M. Regan, M. Stevenson, J. Brown, A. Porter & J.D. Irwin (Eds.). Distracted driving. Sydney, NSW: Australasian College of Road Safety. Pages 189-211.

An exploration of the role of driver distraction in serious road crashes

Suzanne McEvoy & Mark Stevenson
The George Institute for International Health

Introduction: Little is known about the real-world effect of distractions on driving. We conducted a case-control study in Perth, Western Australia to examine the role of self reported driver distraction in serious road crashes resulting in hospital attendance. Method: Cases were drivers aged 17 years or over who had been involved in a crash and presented to an emergency department. Controls were drivers aged 17 years or over who had not had a crash immediately prior to interview. Four control drivers were matched to each case by crash location and time of day and day of week of the crash. Structured interviews were conducted and the data were analysed to describe the prevalence and types of distracting factors reported by drivers involved in crashes and to assess the role of driver distraction in serious road crashes, the latter using a conditional logistic regression model which adjusted for gender, age group, driving routine and weather. Results: A total of 1370 participants were enrolled in the study (274 cases and 1096 controls; 1:4 matching). One in seven cases (14%) reported that a distraction had contributed to the crash that resulted in hospital attendance. The types of distractions reported included passenger distractions, internal cognitive distractions, in-vehicle manual distractions and outside distractions. Drivers distinguished between a 'distracting factor' and 'being distracted'. After adjusting for confounders, being distracted while driving increased the odds of having a serious crash by more than 2 ½ times (OR=2.8, 95% CI 1.5-5.1, p=0.001). Conclusion: Driver distraction can lead to serious consequences such as crashes resulting in injury to the driver. Further work is required to identify the types of distracting factors that pose the greatest risk. However, based on driver descriptions, the road environment, the driving task and driver characteristics may mitigate the risk associated with driver distraction and these factors should be considered when assessing the issue.

Introduction

Major gains in road safety have been achieved in Australia through the introduction of legislation, enforcement and education in relation to seatbelt use, speeding and drink driving. However, in more recent years these gains appear to have reached a plateau. Consequently, there is an emerging need for research into other causes of road crashes, such as the role of driver distraction.

A driver distraction refers to any factor either inside or outside a vehicle that can result in divided driver attention and driving impairment. Driving impairment is defined as a failure to exercise the expected degree of control to ensure the safe operation of a motorised vehicle (Consensus Development Panel, 1985). This in turn may be expected to increase the risk of an adverse event such as a driver error, near miss or road crash.

Some experimental studies using driving simulators have looked at the effect of distractions on driving. The distractions that have been examined include mobile phone use, adjustment of in-vehicle controls and music tempo. Most have demonstrated a degree of driving

impairment as a result of the distraction as measured by factors such as slower response times and a failure to notice changes in road conditions (Consiglio, Driscoll, Witte & Berg, 2003; Strayer, Drews & Johnston, 2003; Alm & Nilsson, 1995; Alm & Nilsson, 1994; McKnight and McKnight, 1993). However, interpreting the real-world effect of these results can be problematic.

When examining published crash data, the prevalence of driver distraction in police-reported road crashes varies. A recent analysis of the US Crashworthiness Data System revealed that in over 8% of crashes, drivers were distracted by a specific factor either outside or inside the vehicle at the time of crashing. A further 5% of crashes were also caused by driver inattention and classified as "looked, but did not see" (Stutts, Reinfurt, Staplin & Rodgman, 2001). In another report, the US National Highway Traffic Safety Administration (2000) estimated that driver distraction was a contributing factor in 25% of road crashes. An analysis of the causes of crashes in New South Wales between 1996 and 2000 using Roads and Traffic Authority (RTA) data showed a gradient of involvement of distractions across crash severity. Between 10 and 16 percent of fatal crashes involved a distraction, compared to between five and seven percent of non-fatal injury crashes and between two and five percent on non-casualty crashes.

When considering the estimates for driver distractions however, there are a number of caveats to note. Firstly, police-reported data on crash-related driver distractions may be incomplete and inconsistent. Secondly, the prevalence of driver distraction in the event of a crash tells us nothing about the risk or contribution that the distraction actually conferred on the crash event. This is because, as drivers, we have all experienced occasions during which we have been exposed to a distracting factor but not had a near miss or crash. To assess the real world risk more comprehensively, we need to conduct analytical epidemiologic studies. Unfortunately, there are few such studies on the role of driver distraction in road crashes, and among the few that have been published, significant methodological limitations have been identified (McEvoy & Stevenson, 2004).

Thus, research into the role of driver distraction in serious road crashes is in its infancy. Anderson, Abdalla, Pomietto, Goldberg and Clement (2001) published a report on driver distraction which highlighted the paucity of epidemiologic research and emphasised the need for research conducted under real driving conditions to determine the extent and impact of distracted driving. To that end, we conducted a case-control study to examine the role of driver distraction in crashes resulting in hospital attendance by the driver.

Methods

Study setting

The case-control study was undertaken in the metropolitan area of Perth, Western Australia. The city is on the west coast of Australia and has a population of 1.3 million residents, with close to 1.1 million residents aged 15 years and over (Australian Bureau of Statistics, 2002). Based on driver's licence statistics, it is estimated that 75% of people aged 17 years and over in Perth hold a driver's licence.

Case selection

Cases were consenting drivers aged 17 years or over who had been involved in a crash and presented to one of the three major hospital emergency departments in the metropolitan area for medical assessment and possible treatment. The exclusion criteria were drivers with critical injuries (severe head injuries or requiring intensive care), crashes in which a fatality had been recorded, medical advice against seeing the driver, and drivers with

language difficulties. The recruitment hours were between 8am and 9pm Monday to Friday. Drivers who were taken to hospital by ambulance were identified using a real time automatic text messaging service from the sole emergency road transport provider. Drivers who were transported by other means were identified through contact three times a day with each of the hospitals during recruitment hours.

Control selection

Controls were drivers aged 17 years or over who had not had a crash immediately prior to interview and were recruited at a service station close to the crash site of the corresponding case. Controls were matched by crash location and time (time of day ±1 hour and same day of the week as the crash) to simulate similar road and driving conditions. Generally, this process was completed one or two weeks after the crash. Four controls were recruited per case to maximise the statistical power of the study. Drivers with language difficulties were excluded. Each service station was selected by the research officers based on its proximity to the crash site.

Data collection

The study was conducted between June 2003 and January 2004. Two research officers interviewed consenting drivers (cases) in hospital after medical or nursing staff permitted access. An additional two research officers were involved in interviewing controls at the service stations. Service station managers were contacted prior to the service station visit to arrange an appointment time to recruit controls.

From the cases and controls, we collected information on demographics; driving frequency, pattern and experience; road and weather conditions during the trip of interest; and distracting factors and perceived distractions. For cases, we obtained a description of the crash and the events leading up to it from each driver and additional information on injuries from the medical records. In relation to controls, data on distracting factors and perceived distractions were collected for the three minutes prior to arriving at the service station and this period was recorded in one-minute aliquots.

Statistical analysis

Before the study commenced, we estimated that a sample size of 1290 (258 cases and 1032 controls) was needed to detect an odds ratio (OR) of 1.8 given a prevalence estimate for distractions of 10%, a ratio of cases to controls of 1:4, study power ($1-\beta$) of 80% and a p-value (α) of 0.05. We performed analyses, matched on crash location and time, to compare cases and controls to identify factors associated with serious road crashes and generate ORs, 95% confidence intervals (95% CIs) and p-values using STATA® version 8 (StataCorp, College Station, TX). Factors with a p-value of ≤ 0.10 in the unadjusted analysis were considered potential confounders in the relationship between driver distraction and a serious road crash. To adjust for potential confounders (gender, weather conditions, age of driver, presence of a passenger and driving routine) and to take account of the matched design, a conditional multiple logistic regression model was fitted to determine whether driver distraction was independently associated with a road crash resulting in hospital attendance by a driver (Woodward, 2005).

Ethics and permissions

The case-control study was approved by the Human Research Ethics Committees at the University of Western Australia and the participating hospitals. Permission for the study was also obtained from service station companies for recruitment of controls.

Results

Of the 344 drivers approached following a crash, 39 declined participation (11%) and 34 (10%) met an exclusion criterion. The remaining 274 drivers were interviewed. The case response rate was 88% (274/313). Among the 2267 drivers approached at service stations, 1145 declined participation and 26 were ineligible. The remaining 1096 drivers were interviewed. The control response rate was 49% (1096/2241). Thus there were a total of 1370 participants in the case-control study, 274 cases and 1096 controls (1:4 matching).

The demographic profile of participants and key characteristics of the driving trip of interest are shown in Table 1.

Table 1: Demographic profile of survey respondents and key characteristics of the driving trip under observation

Factor	Cases Number (%)	Controls Number (%)	p-value
Demographic profile			
Male gender	134 (49)	701 (64)	<0.001
Age group <25 years	71 (26)	179 (16)	<0.001
Routine driving pattern	183 (67)	897 (82)	<0.001
Driving experience[a]	20y (5-35y)	23y (10-33y)	0.058
Driving trip			
Trip length[a]	20m (10-30m)	20m (12-30m)	0.003
Passenger(s) in vehicle	73 (26.6)	190 (17.3)	<0.001
Wet road	59 (21.7)	183 (16.7)	0.012

[a]: Median (interquartile range) and result of Mann-Whitney U non-parametric test shown

Crash characteristics and sequelae

Thirty-two crashes (12%) were single vehicle and 242 (88%) involved multiple vehicles such as cars (219, 80%), trucks (18, 7%) and vans (4, 2%) with or without impacting fixed objects such as trees and barriers. There were 185 crashes at intersections (68%), 65 crashes on stretches of road (24%) and 18 crashes in driveways or parking areas (7%). Speed was known to be involved in 33 crashes (12%), fatigue in 6 (2%), medical reasons in 8 (3%), alcohol in 9 (3%) and drugs in 5 (2%).

Most cases (253, 92%) sustained at least one injury in the crash. The types of injuries that were reported included fractures, dislocations, lacerations, sprains, bruising, mild head

injuries, and internal organ injuries to the chest or abdomen. One-hundred and sixteen cases (42%) had more than one injury with up to six reported injuries.

Distraction and crashes

Among cases, 96 (35%) reported a distracting factor at the time of the crash. Distracting factors included passengers; internal cognitive factors such as thinking about something else; manual factors including reaching for objects and in-vehicle equipment; and outside factors including roadside objects or sunlight. Of these, 38 (14% of all drivers) believed that the distracting factor(s) had contributed to the crash. A selection of explanations is shown in Table 2. The remainder felt that the distracting factor(s) had not contributed to the crash. The reasons drivers gave for this included culpability (i.e. other driver at fault), the road environment (e.g. familiarity with the road), the driving task (e.g. stationary at set of red traffic lights) and driver characteristics (e.g. a perception that driving experience mitigated risk).

Table 2: A selection of crashes resulting from driver distraction based on self report

Distracting factor(s)	Crash circumstance and contribution
PASSENGERS	Crash 1. Driver failed to see car in front and hit it while talking to a passenger. Crash 2. Unrestrained child jumping in car seat, driver hit tree while trying to restrain the child.
INTERNAL COGNITIVE	Crash 3. Driver did not slow down for a chicane, hit kerb then tree because lacking concentration due to overwhelming social problems. Crash 4. Driver hit car exiting carpark onto main road because driver was in a hurry and thinking about something else.
MANUAL	Crash 5. Driver skidded on wet road and hit a tree while reaching for lunch bag.
OUTSIDE	Crash 6. Driver failed to give way at an intersection because driver was distracted by roadworks in the distance.

In the initial analysis matched by crash location and time, the following factors were associated with a crash requiring hospital attendance by the driver:

- Presence of a passenger(s) (OR=1.73, 95% CI 1.27-2.36, p<0.001)
- Female driver (OR=1.85, 95% CI 1.42-2.42, p<0.001)
- Driver <25 years (OR=1.79, 95% CI 1.31-2.45, p<0.001)
- No routine driving pattern (OR=2.30, 95% CI 1.71-3.09, p<0.001)
- Wet weather (OR=1.78, 95% CI 1.14-2.78, p=0.012)
- Driver lost, seeking directions (OR=3.50, 95% CI 1.27-9.65, p=0.015)
- Among drivers reporting any distracting factor while driving, the perception of being distracted by that factor (OR=2.64, 95% CI 1.47-4.75, p<0.001)

In a conditional multiple logistic regression model including the following factors: perceived distraction among drivers reporting a distracting factor(s), presence of a passenger, gender,

age group, driving routine, and weather, only perceived distraction as defined by the driver (OR=2.8, 95% CI 1.5-5.1, p=0.001) and the presence of a passenger (OR 2.2, 95% CI 1.2-4.1, p=0.012) were significantly associated with crash risk after adjusting for the other factors in the model.

Discussion

Over one-third of cases (35%) reported a distracting factor at the time of the crash resulting in hospital attendance. Of these drivers, 40% felt that this had contributed to the crash. This means that one in seven drivers (14%) was distracted at the time of crashing. The seriousness of the crashes was demonstrated by the high proportion of cases who sustained at least one injury (92%). Furthermore, being distracted increased the odds of having a serious crash by more than 2 ½ times (OR=2.8, 95% CI 1.5-5.1, p=0.001). The presence of a passenger(s) and being lost were also associated with an increased likelihood of having a serious crash.

Comparison with other research

Past prevalence studies have used existing road crash databases and information on driver distraction has been limited by missing data and reporting inconsistencies (Stutts *et al.*, 2001; National Highway Traffic Safety Administration, 2000). Our study systematically collected information on a range of distractions that occur while driving and is likely to represent a more accurate estimate of the prevalence of distractions at the time of crash. Determining a risk estimate was also possible in our study because comparable data were collected from a group of controls derived from the same population.

An association between driver distraction and fatal or injurious crashes among learner drivers has been described previously (Lam, 2003). That study used the Traffic Accident Database System (TADS) in New South Wales to compare the level of distraction recorded among learner drivers involved in fatal or injurious crashes and those involved in non-casualty crashes. This may have resulted in reporting bias because the level of police documentation on the presence of a distraction among drivers in serious crashes is likely to be systematically different to that of minor crashes. Our study did not have this limitation and the results indicate that driver distraction has a role in serious road crashes at all levels of experience.

With rising mobile phone ownership, there has been an interest among road safety researchers about the role of mobile phone use in road crashes and published data have suggested an increased risk (McEvoy, Stevenson, McCartt, Woodward, Haworth, Palamara & Cercarelli, 2005; Redelmeier & Tibshirani, 1997). The case-control study presented in this report was not powered to investigate this association. However, the case-control study has demonstrated that many distracting factors, in addition to mobile phones, can lead to road crashes.

Limitations

Selection bias may have occurred. Firstly, the response rate differed for cases (88%) and controls (49%). The lower response among controls was not surprising given that drivers may have had commitments that precluded their completion of a questionnaire while at a service station. As distracting factors are common, any resultant bias from this is likely to have been low. Secondly, it is possible that recruitment of controls at service stations may in itself have introduced a selection bias. For example, men may be more likely to fill up the family car than women. However, this was taken into account by controlling for gender (and other factors) in the analysis.

Measurement bias was also possible because the data were self reported. Firstly, recall bias may have occurred and the role of the traumatic event and a greater time lag prior to interview among cases needs to be considered. Secondly, respondents may have been reluctant to admit potentially reckless behaviour for legal or social reasons. Finally, for logistical purposes, we collected information on distracting factors in one-minute aliquots for controls. This is in contrast to cases who reported on distracting factors immediately prior to the crash (i.e., seconds rather than one minute). This may have overestimated the prevalence of distracting factors among controls compared to cases thus favouring a null finding.

Recruitment occurred on weekdays between 8 a.m. and 9 p.m.. Therefore, the relative contribution of alcohol and speeding, which are both important factors in late night and weekend crashes, was not captured in our study. However, speed was known to be involved in 33 crashes (12%) and alcohol in 9 (3%).

Policy implications

Distracting factors under certain circumstances can lead to driver distraction and serious road crashes requiring hospital attendance by the driver. However, distracting factors do occur commonly and drivers perceive that aspects of the road environment, driving task and driver characteristics may mitigate the risk. Further research is needed to determine the risk attributable to specific distracting factors and to define in greater detail the circumstances during which a distracting factor presents the greatest risk. This will help to identify the most effective approaches to deal with driver distraction.

In the future, in-vehicle early warning systems such as interactive speed adaptation (ISA's) may enable drivers to avert collisions in some instances. However, in the meantime, given that one in seven drivers (14%) in our study reported being distracted at the time of the crash and that distracted drivers were more than 2 ½ times more likely to have a serious road crash than those who were not, a strategy to deal with driver distraction is warranted to improve road safety. Components of the strategy might include a driver education and community awareness campaign to highlight the dangers of distracted driving, increased enforcement of the hand-held mobile phone law and related regulations, and research to ensure that new in-vehicle gadgetry is safe to use.

Acknowledgements

This study was funded by the Motor Accidents Authority of New South Wales and the Insurance Institute for Highway Safety in the United States. Professor Mark Woodward of The George Institute for International Health provided statistical advice. The contribution of Ms Claire Haworth, Ms Margaret Hocking, Mr John Anderson, Mr Frank West and Ms Judy Hartigan at The University of Western Australia is gratefully acknowledged. The case-control study relied upon the support of the participating hospitals, St John Ambulance Service and the participating service stations.

References

Alm, H. & Nilsson, L. (1994). Changes in driver behaviour as a function of hands free mobile phones- a simulator study. Accident Analysis and Prevention, 26, 441-451.

Alm, H. & Nilsson, L. (1995). The effects of a mobile telephone task on driver behaviour in a car following situation. Accident Analysis and Prevention, 27, 707-715.

Anderson, D., Abdalla, A., Pomietto, B., Goldberg, C.N. & Clement, V. (2001). Distracted driving: review of current needs, efforts and recommended strategies. Fairfax, VA: George Mason University, Center for Advancement of Public Health, November 2001.

Australian Bureau of Statistics (2002). 2001 Census of Population and Housing. Canberra, ACT: Commonwealth of Australia.

Consensus Development Panel. (1985). Drug concentrations and driving impairment. *JAMA*, 254, 2618-2621.

Consiglio, W., Driscoll, P., Witte, M., Berg, W.P. (2003). Effect of cellular telephone conversations and other potential interference on reaction time in a braking response. Accident Analysis and Prevention, 35, 495-500.

Lam, L.T. (2003). Factors associated with fatal and injurious car crash among learner drivers in New South Wales, Australia. Accident Analysis and Prevention, 35, 333-340.

McEvoy, S.P., Stevenson, M.R., McCartt, A.T., Woodward, M., Haworth, C., Palamara, P. & Cercarelli, R. (2005). Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-cross over study. British Medical Journal, 331, 428-430.

McEvoy, S.P. & Stevenson, M.R. (2004). Response to: Mobile telephone use among Melbourne drivers: a preventable exposure to injury risk (*Med J Aust* 2003, 179, 140-142). Medical Journal of Australia, 180, 43.

McKnight, A.J. & McKnight, A.S. (1993). The effect of cellular phone use upon driver attention. Accident Analysis and Prevention, 25, 259-265.

National Highway Traffic Safety Administration (NHTSA) (2000). Traffic safety facts 1999: a compilation of motor vehicle crash data from the fatality analysis reporting system and the general estimates system. Washington DC: NHTSA, December 2000.

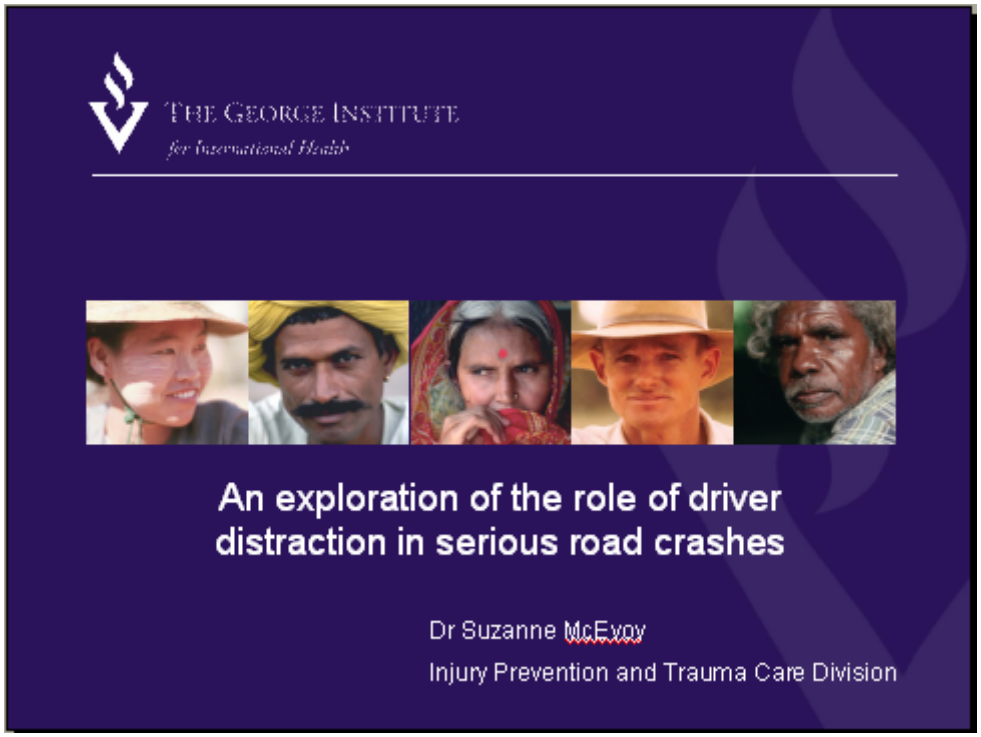
Redelmeier, D.A. & Tibshirani, R.J. (1997). Association between cellular telephone calls and motor vehicle collisions. New England Journal of Medicine, 336, 453-458.

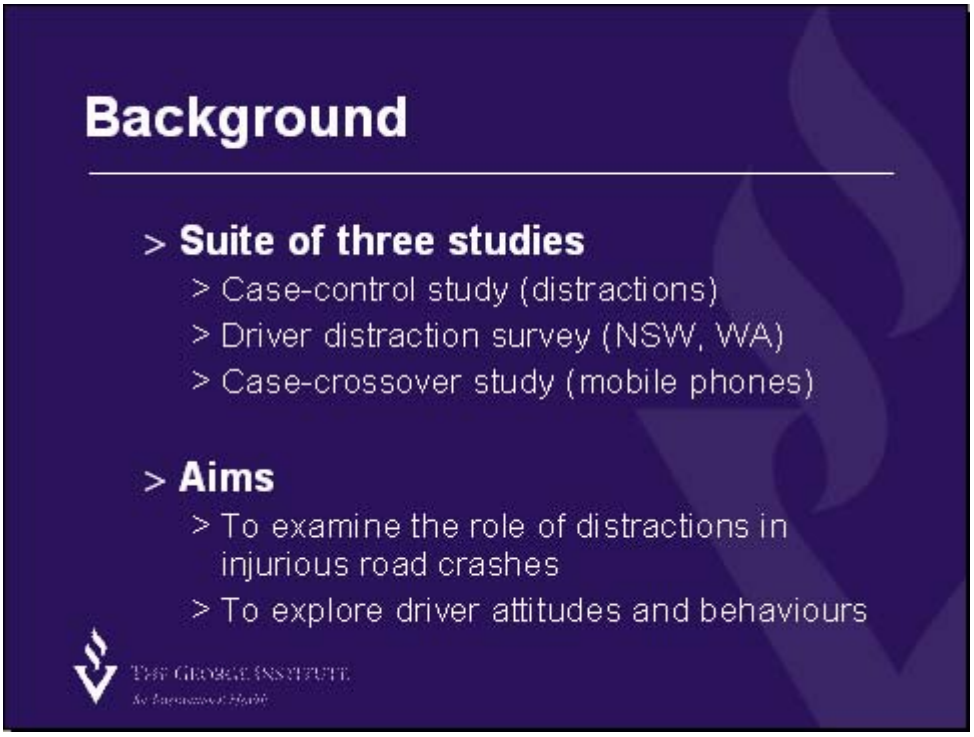
Strayer, D.L., Drews, F.A. & Johnston, W.A. (2003). Cell phone-induced failures of visual attention during simulated driving. *Journal of Experimental Psychology Appl*. 9, 23-32.

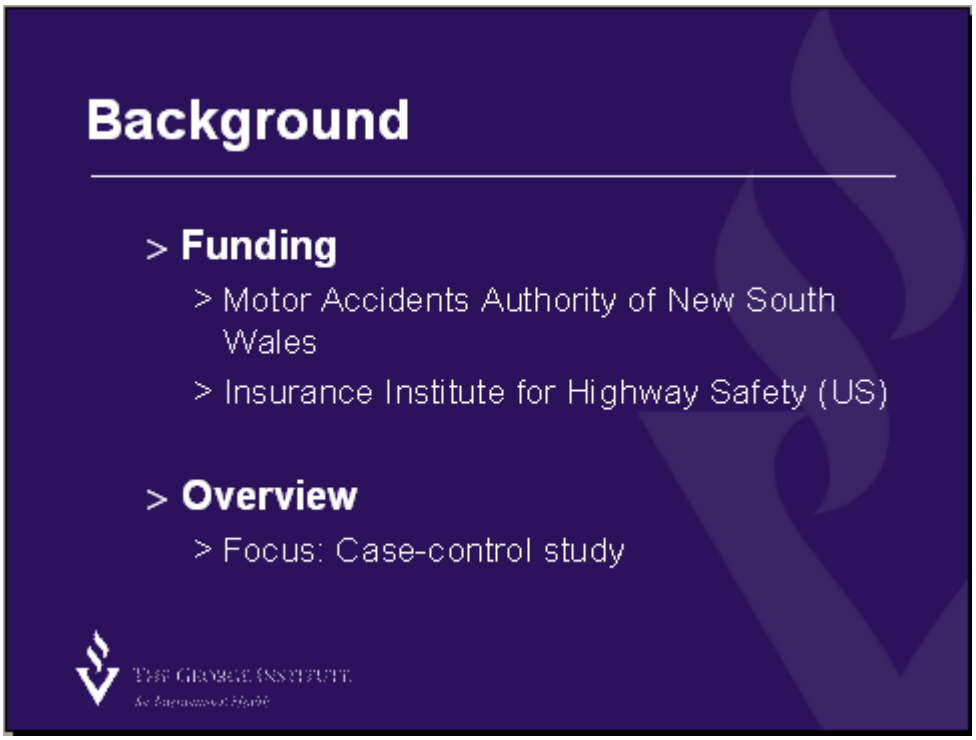
Stutts, J.C., Reinfurt, D.W., Staplin, L. & Rodgman, E. (2001). The role of driver distractions in road crashes. Chapel Hill, NC: University of North Carolina Highway Safety Research Centre, May 2001

Woodward, M. (2005). Epidemiology: Study Design and Data Analysis. Second Edition. Boca Raton: Chapman and Hall/CRC Press.

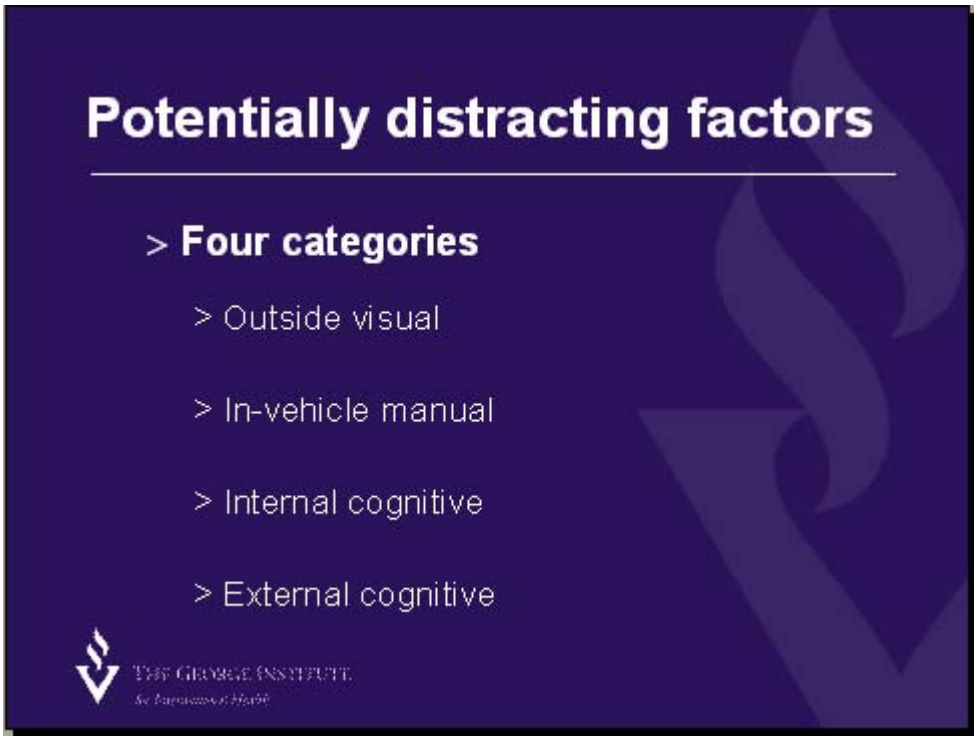
PRESENTATION SLIDES

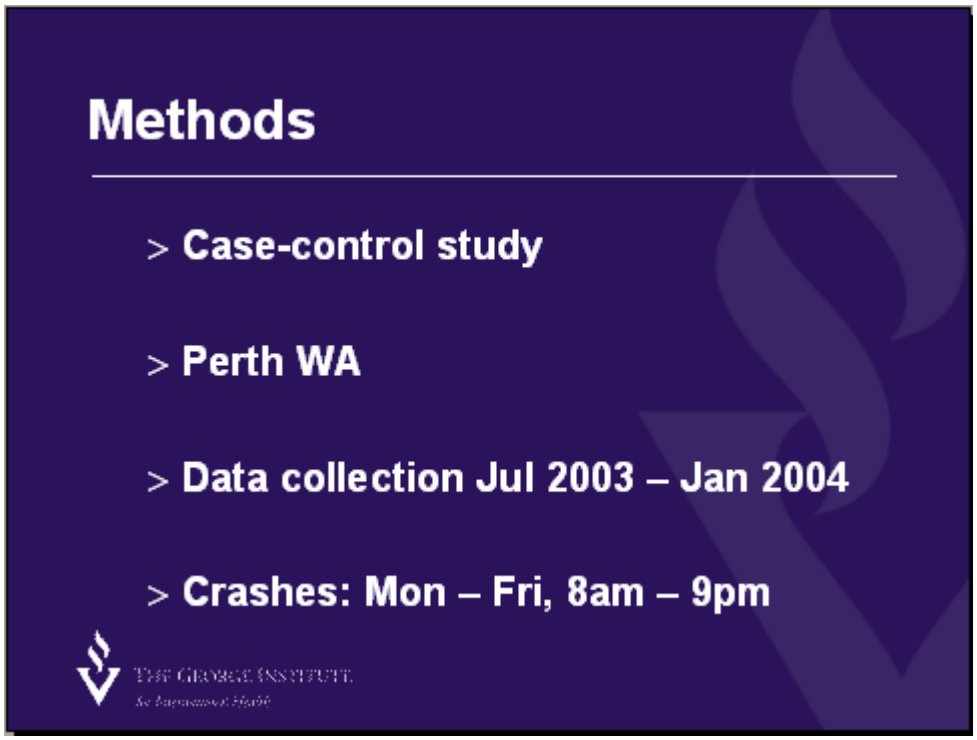


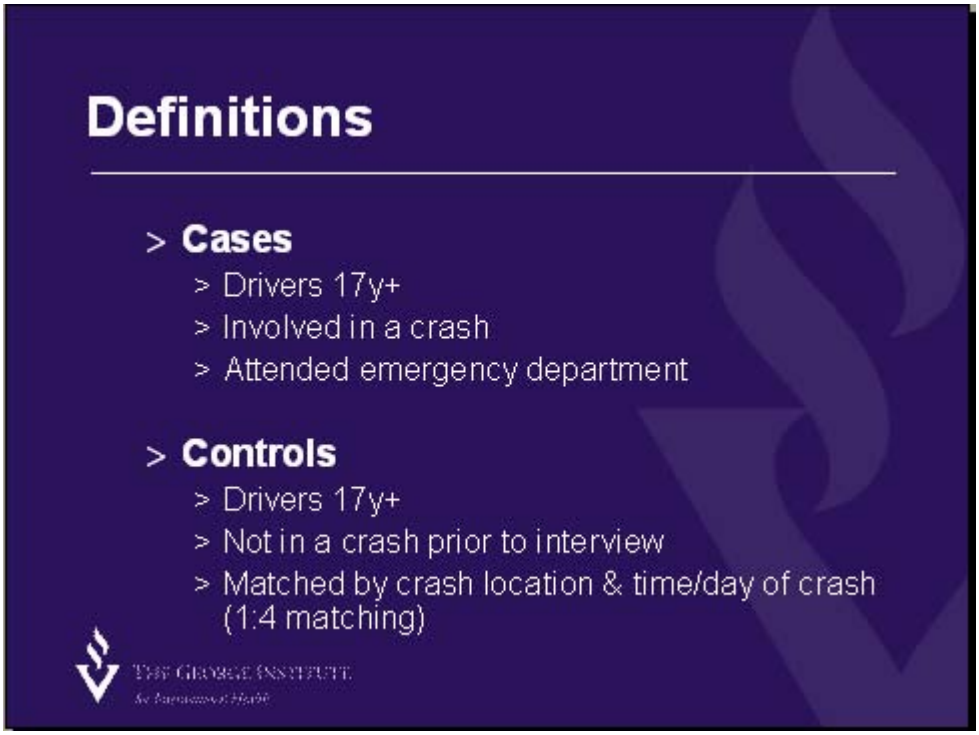



Background
> Funding
> Motor Accidents Authority of New South Wales
> Insurance Institute for Highway Safety (US)
> Overview
> Focus: Case-control study
The George Institute

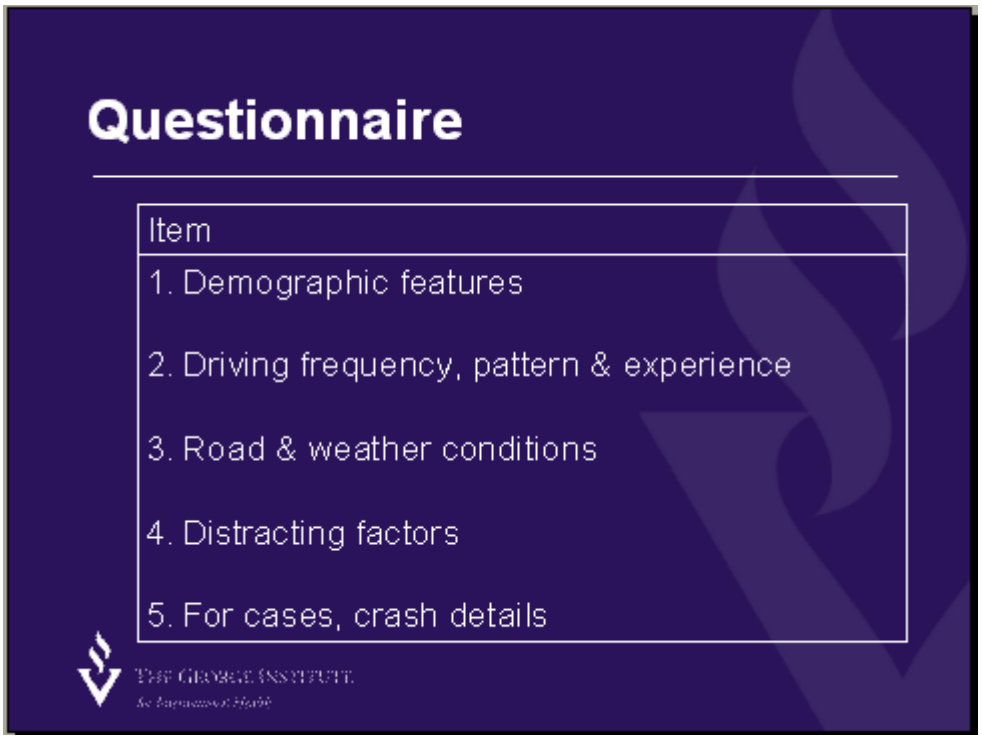

Driver distraction
> Any factor inside or outside a vehicle that can result in divided driver attention & driving impairment
> This in turn could increase the risk of an adverse event (driver error, near miss or road crash)
The George Institute

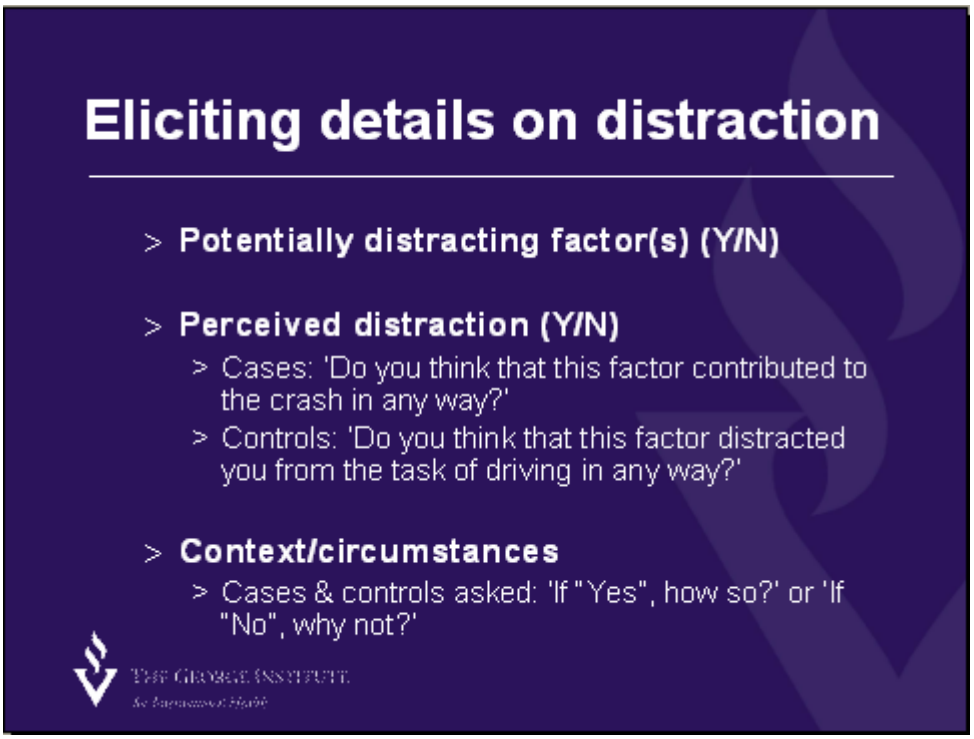

Potentially distracting factors
> Four categories
> Outside visual
> In-vehicle manual
> Internal cognitive
> External cognitive

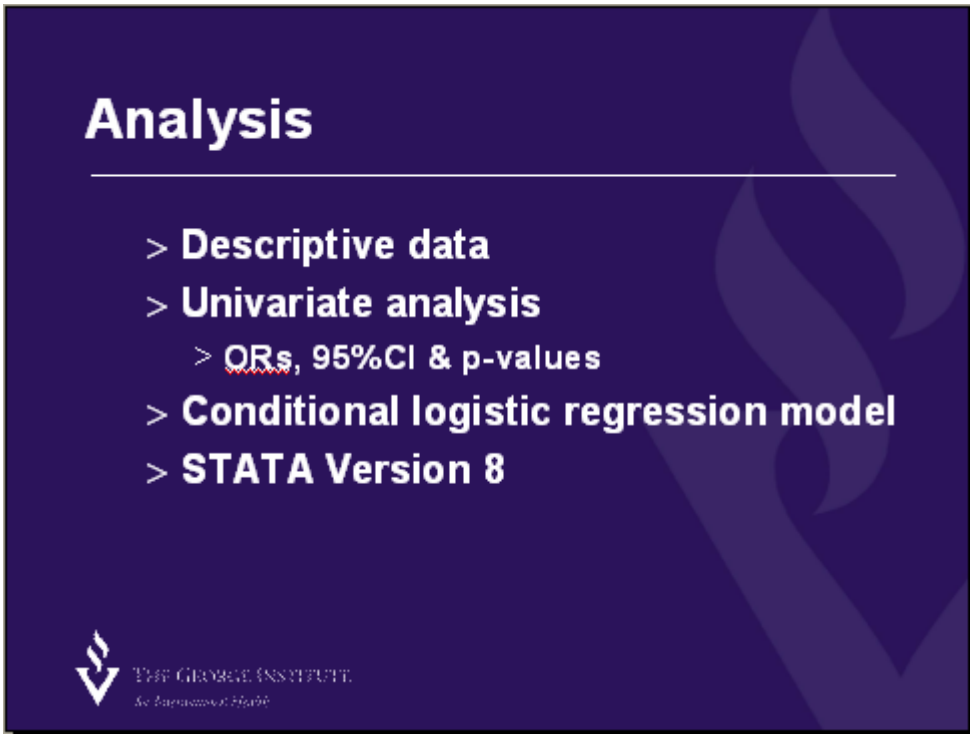

Methods
> Case-control study
> Perth WA
> Data collection Jul 2003 – Jan 2004
> Crashes: Mon – Fri, 8am – 9pm

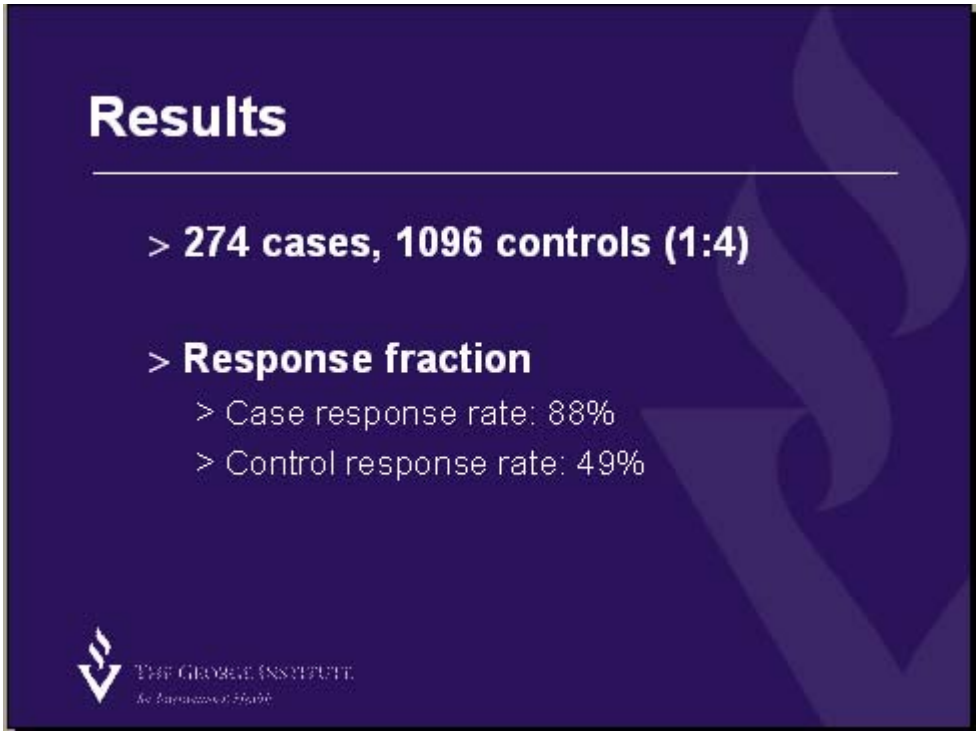

Definitions
> Cases
> Drivers 17y+
> Involved in a crash
> Attended emergency department
> Controls
> Drivers 17y+
> Not in a crash prior to interview
> Matched by crash location & time/day of crash (1:4 matching)
THE GEORGE INSTITUTE

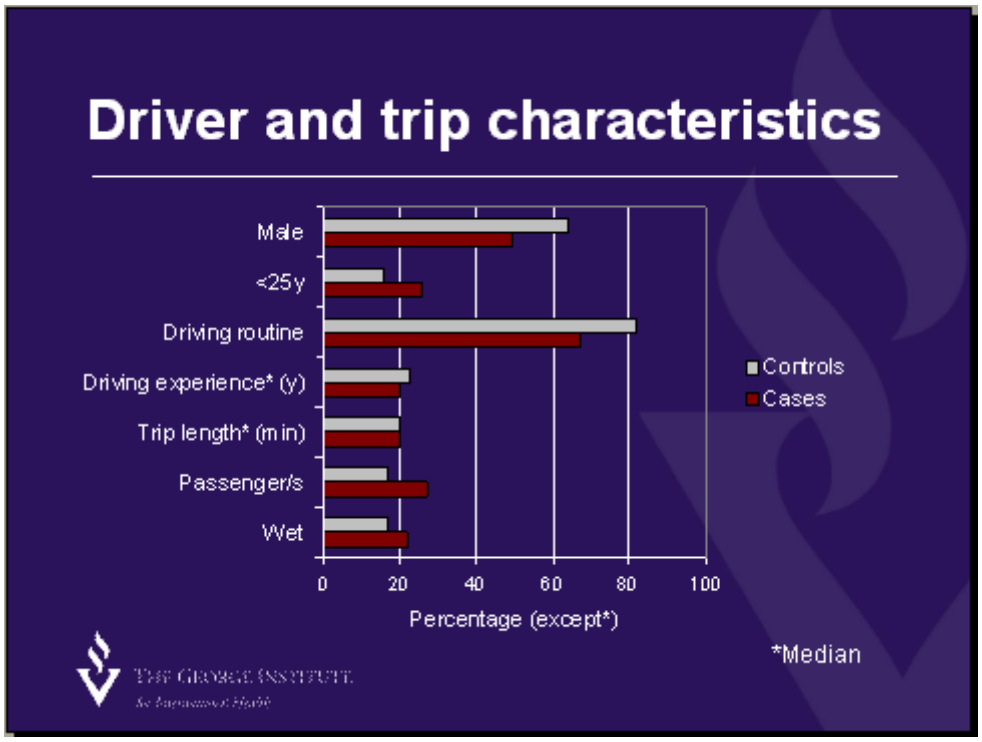

Recruitment
> Cases
> Hospital (gen), post discharge (occ)
> Exclusion criteria: fatality, head injury, NES
> Patient consent, questionnaire, medical records
> Controls
> Service stations
> Information sheet, questionnaire
THE GEORGE INSTITUTE

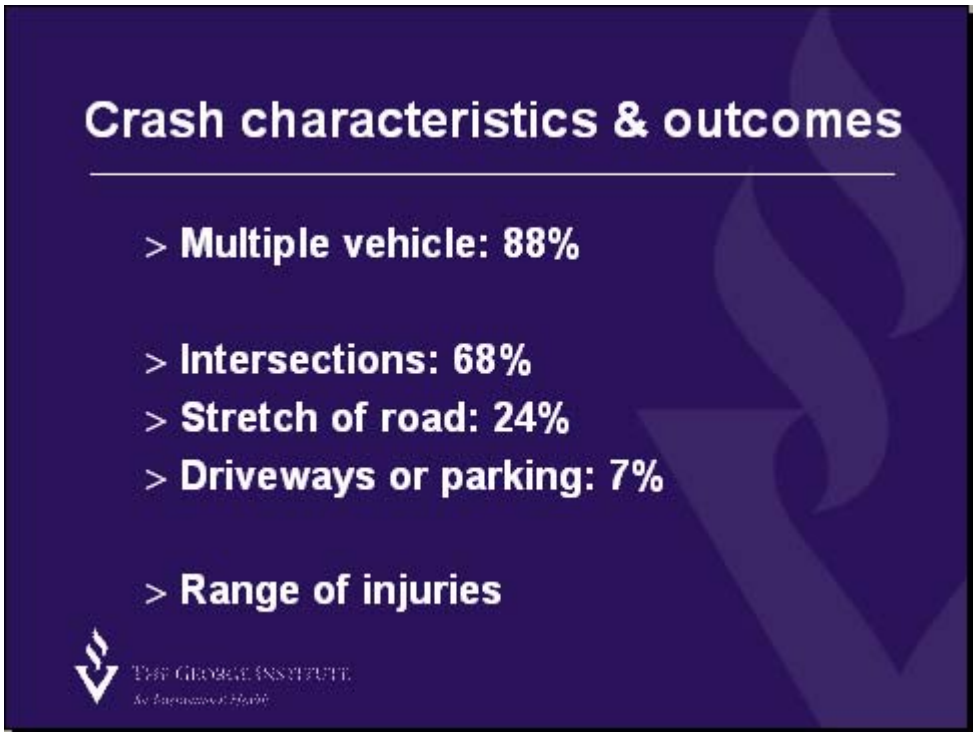

Questionnaire
Item
1. Demographic features
2. Driving frequency, pattern & experience
3. Road & weather conditions
4. Distracting factors
5. For cases, crash details
The George Institute

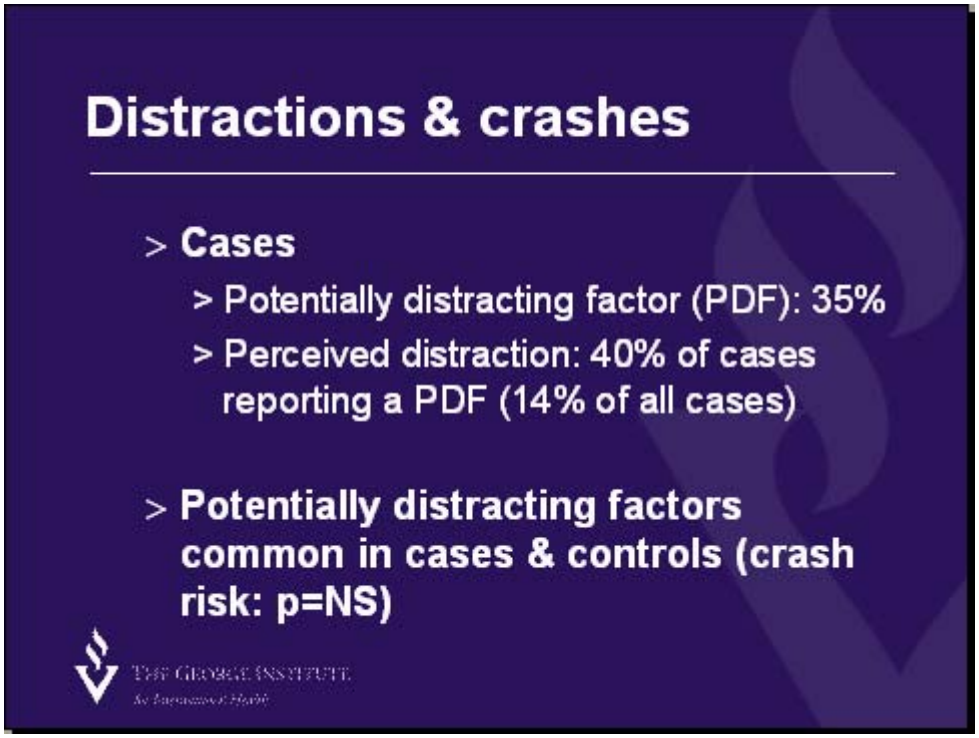

Eliciting details on distraction
> Potentially distracting factor(s) (Y/N)
> Perceived distraction (Y/N)
> Cases: 'Do you think that this factor contributed to the crash in any way?'
> Controls: 'Do you think that this factor distracted you from the task of driving in any way?'
> Context/circumstances
> Cases & controls asked: 'If "Yes", how so?' or 'If "No", why not?'
The George Institute


Analysis
> Descriptive data
> Univariate analysis
> ORs, 95%CI & p-values
> Conditional logistic regression model
> STATA Version 8
THE GEORGE INSTITUTE

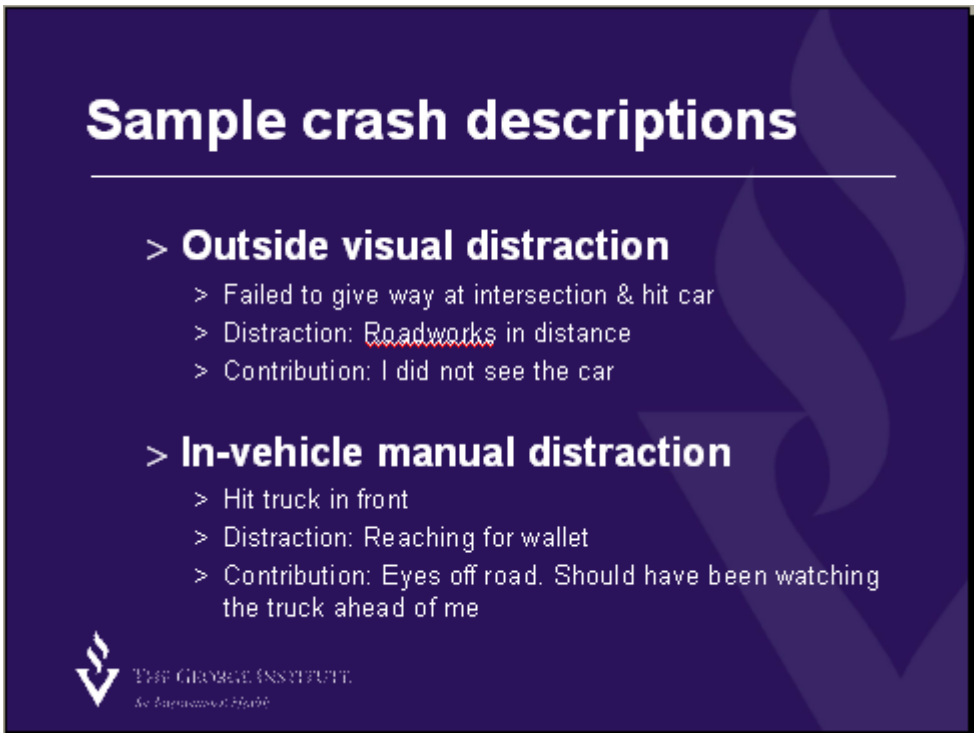

Results
> 274 cases, 1096 controls (1:4)
> Response fraction
> Case response rate: 88%
> Control response rate: 49%
THE GEORGE INSTITUTE

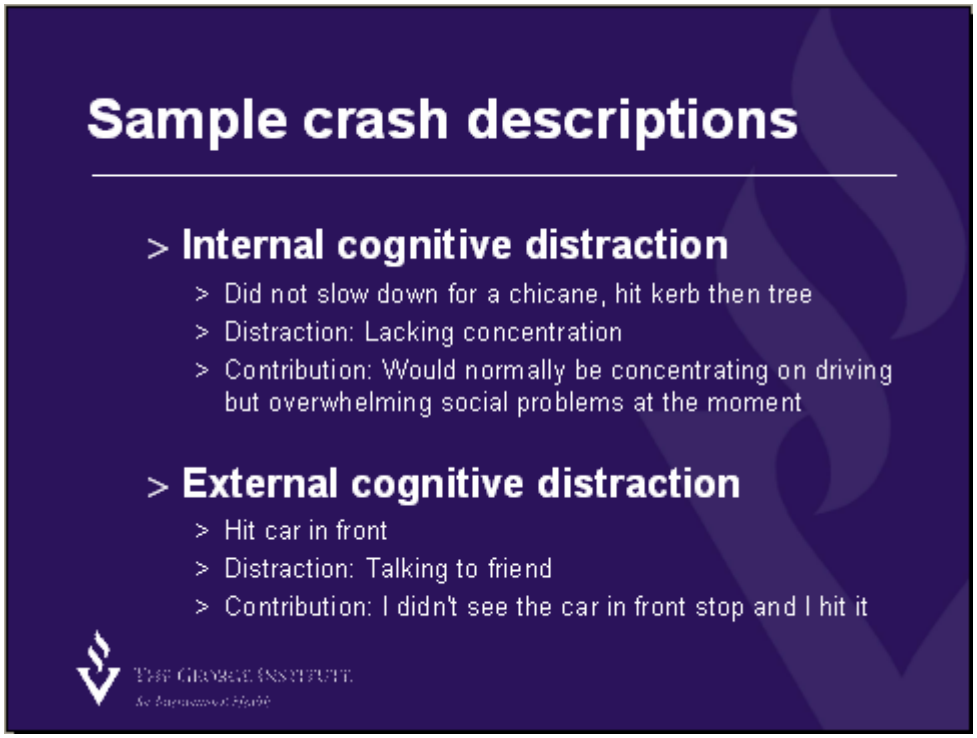

Driver and trip characteristics
Male
<25y
Driving routine
Driving experience* (y)
Trip length* (min)
Passenger/s
Wet
0
20
40
60
80
100
Percentage (except*)
Controls
Cases
*Median
THE GEORGE INSTITUTE


Crash characteristics & outcomes
> Multiple vehicle: 88%
> Intersections: 68%
> Stretch of road: 24%
> Driveways or parking: 7%
> Range of injuries
THE GEORGE INSTITUTE


Distractions & crashes
> Cases
> Potentially distracting factor (PDF): 35%
> Perceived distraction: 40% of cases reporting a PDF (14% of all cases)
> Potentially distracting factors common in cases & controls (crash risk: p=NS)
THE GEORGE INSTITUTE


Context
> Road environment
> Familiarity with road
> Traffic
> Weather
> Driving task
> Stationary or moving vehicle
> Driving manoeuvres
> Driver characteristics
> Driving experience
> Profession
THE GEORGE INSTITUTE


Sample crash descriptions
> Outside visual distraction
> Failed to give way at intersection & hit car
> Distraction: Roadworks in distance
> Contribution: I did not see the car
> In-vehicle manual distraction
> Hit truck in front
> Distraction: Reaching for wallet
> Contribution: Eyes off road. Should have been watching the truck ahead of me
The George Institute


Sample crash descriptions
> Internal cognitive distraction
> Did not slow down for a chicane, hit kerb then tree
> Distraction: Lacking concentration
> Contribution: Would normally be concentrating on driving but overwhelming social problems at the moment
> External cognitive distraction
> Hit car in front
> Distraction: Talking to friend
> Contribution: I didn't see the car in front stop and I hit it
The George Institute

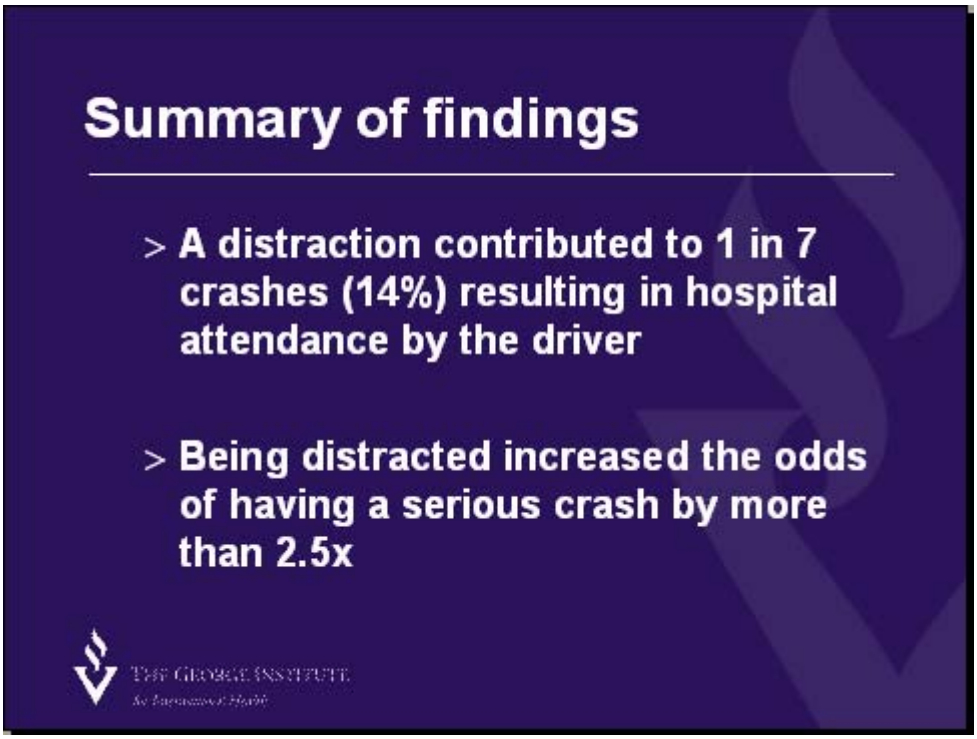
Univariate analysis

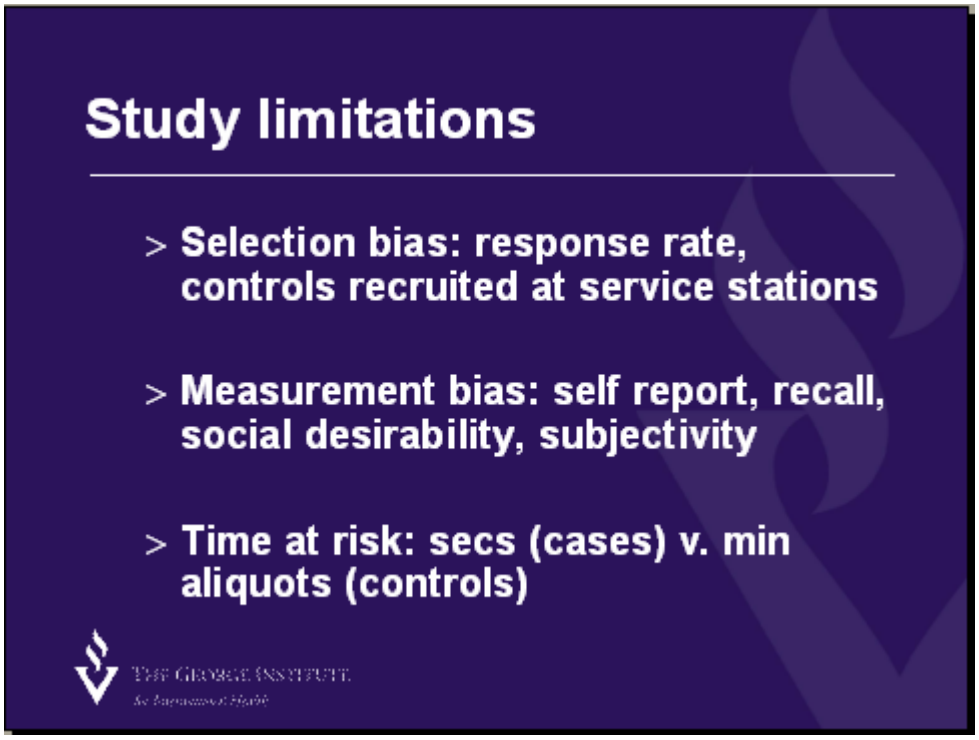
Characteristic	OR (95% CI)	P value
Driver lost	3.5 (1.3-9.7)	0.02
Perceived distraction	2.6 (1.5-4.8)	<0.001
Passenger(s) distraction	1.7 (1.3-2.4)	<0.001
<25y	1.8 (1.3-2.5)	<0.001
No driving routine	2.3 (1.7-3.1)	<0.001
Wet road	1.8 (1.1-2.8)	0.01

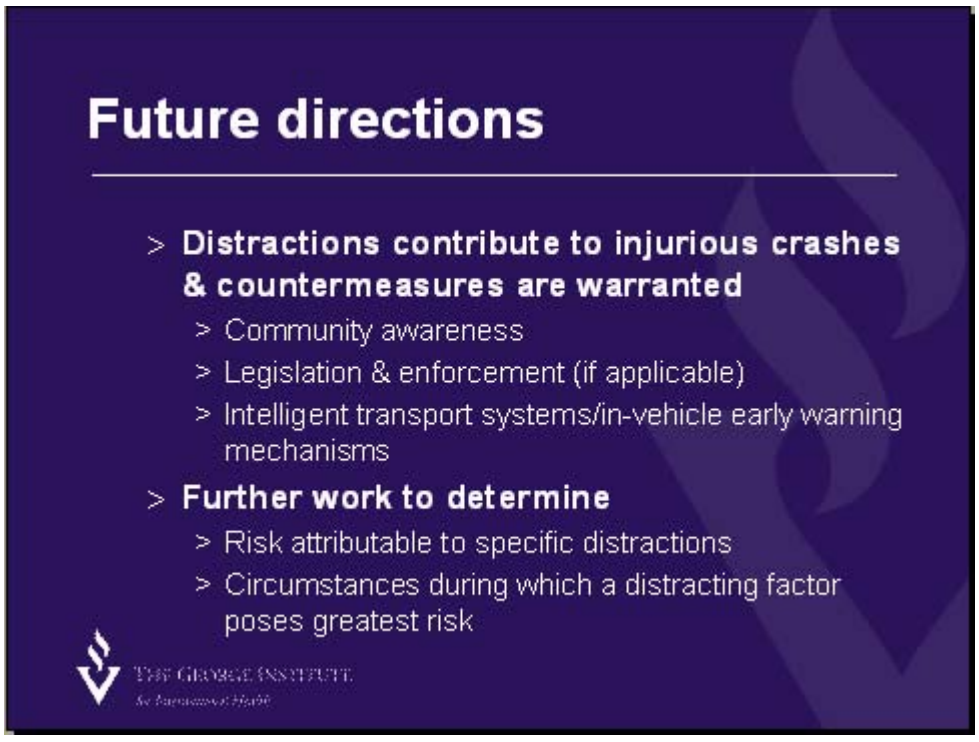
Conditional logistic regression

- **Perceived distraction**
  - Adjusted for gender, age group, weather, driving routine
  - Matched by location, time & day of week
  - OR 2.8, 95% CI 1.5-5.1, p=0.001


Summary of findings
> Potentially distracting factors occur commonly while driving
> The road environment, driving task & driver characteristics affect drivers' perceptions
THE GEORGE INSTITUTE


Summary of findings
> A distraction contributed to 1 in 7 crashes (14%) resulting in hospital attendance by the driver
> Being distracted increased the odds of having a serious crash by more than 2.5x
THE GEORGE INSTITUTE


Study limitations
> Selection bias: response rate, controls recruited at service stations
> Measurement bias: self report, recall, social desirability, subjectivity
> Time at risk: secs (cases) v. min aliquots (controls)
THE GEORGE INSTITUTE


Future directions
> Distractions contribute to injurious crashes & countermeasures are warranted
> Community awareness
> Legislation & enforcement (if applicable)
> Intelligent transport systems/in-vehicle early warning mechanisms
> Further work to determine
> Risk attributable to specific distractions
> Circumstances during which a distracting factor poses greatest risk
THE GEORGE INSTITUTE


Acknowledgements
Prof Mark Stevenson, Prof Mark Woodward
Participating hospitals
Fremantle, Royal Perth, Sir Charles Gairdner Hospitals & St John Ambulance
Participating service stations
Ampol, BP, Caltex, Gull, Mobil Quix, Peak, Shell
Injury Research Centre, UWA
Claire Haworth, Margaret Hocking, Frank West, John Anderson