

Handheld mobile telephone use among Melbourne drivers

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Use of handheld mobile phones ("mobiles") can impair driving performance, as measured by reaction time and situational awareness,¹⁻⁶ and mobile use is associated with a fourfold increase in crash risk.⁷⁻⁹ The current ban on handheld mobile use by drivers in Victoria dates from 1999.¹⁰ In 2005, the Victorian Road Safety Committee made recommendations proposing increased penalties for offences, supported by a subsequent education and enforcement campaign.¹¹ The government planned to review the infringement penalty (\$145 fine and three demerit points against the driver's licence) towards the end of 2006.¹²

Despite existing penalties, infringement rates have increased, and averaged about 25 000 per year during 2002–2005.¹² An inquiry by the Road Safety Committee into driver distraction found that there was a need to develop programs to monitor the use of mobiles by drivers.¹² Consistent with this recommendation, we undertook an observational study in 2002 that examined the use of mobiles by drivers in metropolitan Melbourne.¹³ Here, we replicate the 2002 study to determine changes in the epidemiology of mobile use between 2002 and 2006.

METHODS

We performed an observational study of motor vehicle drivers in metropolitan Melbourne, Australia, during October 2006. For consistency, the study design and methods were the same as in our previous report.¹³ In brief, we used 12 sites to observe four major metropolitan roads, four central business district (CBD) roads, and four freeway exit ramps. Data were collected on three consecutive Tuesdays at exactly the same sites and by the same techniques as in 2002. Three observation sessions per day at each site (10:00–11:00, 14:00–15:00, 17:00–18:00) provided 36 hours of observation.

Four research assistants were each assigned one metropolitan road, one CBD road and one freeway exit ramp. All motor vehicles (except motorcycles), in the lane closest to the curb only, were screened. The total number of vehicles, the number of drivers using a mobile, drivers' sex and approximate age group (young <30 years, middle age [30–50 years], older >50 years) were recorded. Mobile use was

ABSTRACT

Objective: To evaluate change in handheld mobile telephone (mobile) use among motor vehicle drivers between 2002 and 2006.

Design and setting: Observational study of motor vehicle drivers at three times (10:00–11:00; 14:00–15:00; 17:00–18:00) on three consecutive Tuesdays in October 2006 at 12 highway sites in metropolitan Melbourne.

Main outcome measures: Rates of handheld mobile use overall and by the sex and age of drivers, highway site (major metropolitan road, central business district, freeway exit ramp) and time of day.

Results: In 2002, 315 of 17 023, and in 2006, 331 of 20 207 drivers were observed using handheld mobiles. This represented a non-significant rate decrease from 18.5 to 16.3 users/1000 drivers (rate difference, 2.1 users/1000 drivers; 95% CI, –0.6 to 4.8; $P=0.07$). Unlike 2002, the rate of handheld mobile use among men in 2006 was significantly higher than for women (rate difference, 3.7 mobiles/1000 drivers; 95% CI, 0.1–7.3; $P=0.03$). In both 2002 and 2006, mobile use was most common in the central business district. In 2002, there was significantly more mobile use in the evening, while in 2006, the evening rate was significantly lower than the morning rate (rate difference, 4.3; 95% CI, –0.1 to 8.7; $P=0.03$) and slightly lower than the afternoon rate (rate difference, 3.0; 95% CI, –1.1 to 7.1; $P=0.08$). The effect of age remained unchanged between 2002 and 2006, with older drivers using mobiles least ($P<0.001$).

Conclusion: The number of drivers at risk from handheld mobile phone use remains almost unchanged. However, a slight reduction in the rate of use overall and variations in use among driver subgroups are apparent. Policing and public awareness campaigns need to further address this preventable risk of injury.

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recorded only if the research assistant had a clear view of the mobile itself. "Hands-free" mobile use was not recorded. Most vehicles were moving slowly although some were stopped at lights. An additional 1-hour observation period was undertaken to assess interobserver variability.

The sample size was unchanged since our previous report.¹³ At least 2351 drivers in each of two variable subgroups (subgroups of driver type, highway site, time) were screened to enable us to show a "clinically significant" twofold rate difference. Data analysis provided an overall rate of mobile use and rates for each sex and age subgroup, highway site and time. Rates are reported as number of mobile users/1000 drivers with 95% CIs. Differences in rates between the subgroups were calculated using the normal curve (z) test (level of significance, 0.05) and EpiCalc version 1.02 (Brixton Health, Llanidloes, UK) software.

As no driver was approached and no identifying data were recorded, ethical approval was not sought.

RESULTS

During the 36 hours of observation, 331 of 20 207 drivers screened (1.6%) were observed using mobiles. The Box shows the rates of mobile use for both 2002 and 2006 within the driver subgroups and at the various highway sites and times. The absolute number of drivers observed using mobiles (331) was almost unchanged from that observed in 2002 (315). However, the increase in traffic volume (number of cars screened) resulted in a slight, non-significant reduction in the rate of mobile use (rate difference, 2.1 mobiles/1000 drivers; 95% CI, –0.6 to 4.8; $P=0.07$).

The epidemiology of mobile use was different in 2006 compared with 2002. The rate for men in 2006 was significantly higher than for women (rate difference, 3.7 mobiles/1000 drivers; 95% CI, 0.1–7.3; $P=0.03$). In 2002, mobile use was most common in the CBD, followed by metropolitan and freeway sites. This pattern continued in 2006 although the rate differences were significantly higher. The rate differences

between the CBD and the metropolitan sites was 8.8 mobiles/1000 drivers (95% CI, 4.2–13.3; $P < 0.001$), and between the CBD and freeway sites was 4.7 mobiles/1000 drivers (95% CI, 0.4–9.0; $P = 0.02$).

In 2002, there was significantly greater mobile use in the evening. This pattern was reversed in 2006, when the evening rate was significantly lower than the morning rate (rate difference, 4.3; 95% CI, –0.1 to 8.7; $P = 0.03$) and slightly lower than the afternoon rate (rate difference, 3.0; 95% CI, –1.1 to 7.1; $P = 0.08$). The effect of age on mobile use did not change between 2002 and 2006. In 2006, significantly fewer older drivers used mobiles compared with both middle-aged drivers (rate difference, 13.4; 95% CI, 10.3–16.6; $P < 0.001$) and younger drivers (rate difference, 18.8; 95% CI, 14.2–23.4; $P < 0.001$).

The interobserver observation trial found variability between the four research assistants. The number of vehicles reported as screened ranged from 457 to 471. Two assistants observed eight mobile users, one observed seven and the other observed six. The number of male and female drivers observed ranged from 309 to 321 and 137 to 160, respectively. Greater variability was evident in their assessment of driver age. The number of drivers in the young, middle and older age groups ranged from 118 to 156, 212 to 276 and 75 to 106, respectively.

DISCUSSION

The number of drivers at risk from handheld mobile use while driving in Melbourne remained almost unchanged between 2002 and 2006. While it is encouraging that the overall rate decreased, this decrease was small. One important confounder is that it is likely that there were more mobiles within the vehicles observed during the 2006 survey. Indeed, over eight million mobile phone handsets were sold in Australia in 2005, more than double the figure in 2002.¹⁴ It is possible, therefore, that the opportunity for mobile use was increased in 2006 and that preventative initiatives have been more successful than our figures suggest.

The changing epidemiology of handheld mobile use while driving is of interest. In 2006, significantly more men used handheld mobiles while driving than women, a finding consistent with another Australian report.⁸ In 2006, the significant decrease in handheld mobile use while driving in the evening and the moderate increase in morning use are difficult to explain. However, our

Rates of mobile phone use as a function of driver sex and age, driving location and time of day

Variable	Year	No. of mobile phones observed	No. of drivers screened	No. of mobile phones/1000 drivers (95% CI)
Sex				
Male	2002	215	11 299	19.0 (16.5–21.6)
	2006	241	13 719	17.6 (15.4–19.8)
Female	2002	100	5 724	17.5 (14.1–20.9)
	2006	90	6 488	13.9 (11.0–16.7)
Age group (years)				
Young (< 30)	2002	112	4 834	23.2 (18.9–27.5)
	2006	118	5 184	22.8 (18.7–26.9)
Middle (30–50)	2002	185	8 436	21.9 (18.8–25.1)
	2006	199	11 464	17.4 (15.0–19.8)
Older (> 50)	2002	18	3 753	4.8 (2.5–7.0)
	2006	14	3 559	3.9 (1.9–6.0)
Highway site				
Major metropolitan	2002	89	5 316	16.5 (13.3–20.2)
	2006	56	4 777	11.7 (8.7–14.8)
CBD	2002	114	5 550	20.5 (16.8–24.3)
	2006	139	6 790	20.5 (17.1–23.9)
Freeway exit	2002	112	6 157	18.2 (14.8–21.6)
	2006	136	8 640	15.7 (13.1–18.4)
Time of day				
10:00–11:00	2002	84	5 262	16.0 (12.6–19.4)
	2006	104	5 616	18.5 (15.0–22.1)
14:00–15:00	2002	83	5 473	15.2 (11.9–18.4)
	2006	110	6 378	17.3 (14.0–20.5)
17:00–18:00	2002	148	6 288	23.5 (19.8–27.3)
	2006	117	8 213	14.3 (11.7–16.8)
Total	2002	315	17 023	18.5 (16.5–20.6)
	2006	331	20 207	16.3 (14.6–18.2)

CBD = central business district.

2006 findings are consistent with those of another study in which the highest rate of use was during the morning.¹⁵ These changes may have been the result of a change in the nature of the calls being made — for example, more business calls in the morning.

This study has the same limitations as our study in 2002.¹³ Limited observation times and sites, single-lane screening, high traffic flows, and tinted windows may all have introduced inaccuracies. Also, the higher rate of handheld mobile use while driving in the CBD may have resulted from slower traffic flow making observation more accurate. Data were collected on non-holiday Fridays in 2002, and on Tuesdays, in 2006. Although unlikely, this may have introduced

selection bias. Three of the research assistants had not taken part in the 2002 study, and interobserver variability will also have introduced inaccuracy. Handheld mobile use while driving was only recorded when a clear view of an offending driver was obtained. On occasions, this was difficult and the reported rate of handheld mobile use is likely to be an underestimation.

The slight decrease we found in the rate of handheld mobile use while driving is encouraging when compared with a United States study that reported an increase in mobile use by drivers from 2.7% to 5.8% over 4 years in Michigan, where no restrictions on mobile use while driving exist.¹⁶ Legislation banning mobile use by drivers can be effective. A United Kingdom study

attributed a decrease in the rate of mobile use (from 1.85% to 0.97%) to legislation banning the practice.¹⁷ Similarly, rates decreased significantly in both Washington, DC (6.1% to 3.5%)¹⁸ and New York State (2.3% to 1.1%)¹⁹ after legislative bans.

Increased enforcement and media campaigns to raise drivers' awareness have been advocated,⁸ without which long-term compliance may be difficult.^{9,18} The targeting of drivers at particular risk has also been advocated,⁸ and a ban on all mobile use (including hands-free) by novice drivers is to be introduced in Victoria.²⁰ Victoria Police have introduced driver education initiatives, increased infringement penalties,¹² and regularly run operations targeting drivers using mobiles. However, Victoria Police advise of the difficulties of observing and intercepting drivers using mobiles.¹² Techniques include using plain-clothes police on foot to identify offending drivers and uniformed police to intercept offenders further along the road.

Handheld mobile phone use by Melbourne drivers remains a preventable risk behaviour for the city's road users, and deserves further investigation. Ongoing surveillance is indicated, and we recommend research into prevention and deterrence, and into reasons for continuing handheld mobile use while driving. Additionally, the epidemiology and risk of hands-free use of mobile phones by drivers should be further examined.

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COMPETING INTERESTS

None identified.

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