INTRODUCTION

Young drivers are over-represented in casualty crashes, particularly in developed countries[1], despite road safety improvements over the last few decades[2]. In Australia, novice drivers aged 17-25 accounted for about 15% of total licensed drivers but represented over one-quarter of the total road casualties[3]. Despite the implementation of various prevention strategies in Australia[4], the effect of such considerable effort may have been minimal as young driver deaths only decreased from 27.0% in 2002 to 25.2% in 2007, with no statistical testing reported to confirm whether this was a significant decrease[5]. Furthermore, considering potential differentials in severity of crash, and gender and age disparities in crash involvement, the different effects of intervention programs may be masked when examining only an overall fatal crash trend. Overall, there is no clear evidence in Australia showing whether the over-involvement of young drivers in crashes has actually changed or whether there are differences by crash severity or by gender and age, with these issues not examined for more than a decade.

The primary objective of this study was to examine the trend of crash rate by driver injury severity for drivers aged 17-25 living in New South Wales (NSW), Australia between 1997 and 2007. A secondary objective was to explore gender and age disparities in crash rates over the study period, irrespective of driver injury.

METHODS

RTA provided data on crashes for drivers aged 17-25 for the period 1 January 1997 to 31 December 2007. A total of 260 219 crashes during this period involved drivers known to be aged 17-25. Crashes were excluded if the gender of the driver was unknown (n=253, 0.1%). The focus of this study was on passenger vehicle crashes (excluding vehicles such as motorcycles, farm or heavy vehicles) as these are the main crash type in which young drivers are killed or injured and therefore the main focus of interventions. Categories of passenger vehicles included were '4 wheel drive', 'Car (sedan/hatch)', 'Utility', 'Panel van based on car design', 'Light trucks' (including panel van and utility not based on car design, and mobile vending vehicle), 'Passenger van' and 'Station wagon', which accounted for an average 95% (range: 94%-96% between 1997 and 2007) of total crashes. In total, 11 584 (5%) non-passenger vehicle crashes were excluded.

The number of licensed drivers was selected as the denominator to approximate the at-risk population, recognising unlicensed driving also occurs. This study classified young drivers into 3 age groups: 17, 18-20 and 21-25 years. The crash rates (per 10 000 licensed drivers) were estimated overall and by gender and age group across three levels of young driver injury: non-injury, injury and fatality. As the urban-rural nature of drivers’ place of residence and their socio-economic status (SES) could be approximated by postcode, place of residence and SES were both adjusted for in multivariable models as potential confounders. Three levels of place of residence (urban, inner regional/surroundings and rural/remote) were classified by the Australian Standard Geographic Classification[6]. A tertile SES index (high, moderate and low) was obtained by linking postcodes to one of the 2001 Socio Economic Indexes For Areas[7]. Aggregated rates were estimated for 594 strata, generated from multiplication of the strata of sex (2), age group (3), place of residence (3) and SES (3) for each year (11).

Generalised linear models were used to examine the trend of young driver crash rate between 1997 and 2007, adjusting for age, gender, place of residence and SES. Adjusted relative risks by gender and age group for each year were computed and modelled using a linear regression model. All analyses were undertaken using SAS software[8].

RESULTS AND DISCUSSION

Young driver non-injury and fatality rates significantly decreased by an average of 4% (95%CI: 4-5%) and 5% (95%CI: 0-9%) respectively each year from 1997 to 2007. Young driver injury rates significantly increased by about 12% (95%CI: 9-14%) to the year 2001 and then significantly decreased. The crash rates among young drivers significantly differed by gender and age group.

The reductions, either in numbers or rates, suggest there has been success in reducing young driver crashes overall, including fatalities and more recently injuries also (since 2001). Although a range of prevention work has been implemented in NSW, given the nature of the data used for the current study, the effects of these interventions on the observed decreasing crash casualties’ rates cannot be determined.

Strength of this study includes updating the trend of young driver crash by severity of driver injury as well as by gender and age and providing a more precise estimation of the young driver crash problem than those rates including all road traffic crashes. It should also be noted that, due to
the way RTA data are collated, non-injury and injury crash rates in 2007 may be slightly underestimated. Finally, the potential aggregation bias (ecological fallacy) of this study should be recognised since the crash rates were estimated by area, and we cannot account for individual differentials that contribute to crashes, such as drinking driving [9]. Nevertheless, such ecological data is able to provide an accurate estimate of crash rates for young drivers residing in NSW.

CONCLUSIONS
The findings of present study indicate that interventions implemented in NSW during the study period may have been effective overall, especially for males, but potentially less effective for fatalities and not substantially affecting the disparity between drivers younger than 21 than those aged 21-25. The reasons for these differences are worthy of further investigation.

REFERENCES
3. ATSB, Young people and road crashes. 2004, Australian Transport Safety Bureau: Canberra, ACT.
Figure 1. Trend of young driver passenger vehicle crash rates (per 10 000 licensed drivers) by gender

(a) Trend for young driver non-injury rate by gender

(b) Trend for young driver injury rate by gender

(C) Trend for young driver fatality rate by gender

Figure 2. Trend of young driver passenger vehicle crash rates (per 10 000 licensed drivers) by age group

(a) Trend for young driver non-injury rate by age group

(b) Trend for young driver injury rate by age group

(c) Trend for young driver fatality rate by age group