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Trends in the crash involvement of older drivers in Australia

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ABSTRACT

Research from the USA and Great Britain indicates that the number of fatal crashes (as well as the rates of crashes of all levels of injury and property damage) involving older drivers declined between approximately 1997 and 2010 despite increases in the number of older drivers on the road and in their driving exposure. Differing results have been found in Australian research with the number of older driver fatalities having been steady and even slightly increasing between 2004 and 2013. The present study further examined trends in the crash involvement of older drivers in Australia to determine whether their involvement has been increasing or decreasing, and how this compares to trends for younger aged drivers. Crash, injury, population and licensure data were examined by age group for the years 2003–2012. There were increases in the population and licensure of drivers aged 65 years and older, while the total crashes, serious injuries, and fatalities remained steady for drivers aged 65–84 and increased for the oldest group (85+) between 2003 and 2012. Increasing trends were also found for drivers 85 and older for rates of serious or fatal injuries per head of population and per licensed driver. Population and licensure among younger age groups also increased but their crash numbers and crash rates remained steady or declined. The stable or slightly increasing fatal crash involvement of older drivers in Australia contrasts with the declining trends in the USA and Great Britain. Therefore, greater attention should be given to the road safety of older drivers in Australia.

1. Introduction

The population in most developed countries is ageing (ABS, 2013; AIHW, 2007; BITRE, 2014; OECD, 2001; Road Safety Foundation, 2016; UN, 2013a,b). It has been estimated that the global proportion of people aged over 60 years will almost double from 11.7% currently to 21.2% in 2050 (UN, 2013a). There are also higher proportions of older adults who hold a driver's licence, as well as increases in the amount of driving done, in more recent cohorts (BITRE, 2014; Fildes et al., 2001; Hakamies-Blomqvist, 1993; Hjorthol et al., 2010; Hu et al., 2000; Lyman et al., 2002; Mitchell, 2013; OECD, 2001; Road Safety Foundation, 2016). As a result, there is likely to be a larger number of older drivers on the road in coming years (Fildes, 2006; Hjorthol et al., 2010; Langford and Koppel, 2006; OECD, 2001). In Australia, the proportion of drivers aged 65 and over is expected to increase from 13% of the population of licensed drivers in the year 2000 to 22% in 2030 (OECD, 2001).

As a result of the expected increase in the number of older drivers on the road, it has also been predicted that the number of crashes involving older drivers will increase (Fildes et al., 2001; Hu et al., 2000; Lyman et al., 2002). Lyman et al. (2002) provided estimations of crash rates in the USA for 2010, 2020 and 2030. This study predicted that, between 1999 and 2030, crash involvement of drivers aged 65 and older would increase by 178% and fatal crash involvement would increase by 155%. Older drivers accounted for 8% of police-reported crashes in 1999, but it was estimated that this would rise to 16% by 2030. It was also predicted that the proportion of fatal crashes that they account for would rise from 14% in 1999 to 25% in 2030. In Australia, Fildes et al. (2001) predicted that fatal crash involvement for older drivers would increase by 286% between 1995 and 2025. However, Fildes et al. (2001) and Lyman et al. (2002) also suggested that a range of countermeasures (e.g. improvements in the traffic environment, increased crashworthiness of cars and increased driver fitness) could mitigate the predicted increase in the crashes of older drivers.

More recent research has demonstrated that the number of fatal crashes involving older drivers has not increased to the predicted levels. Research from the USA by Mullen et al. (2013) examined crash data from 1975 to 2008 and found a decline in the number of fatal crashes involving older drivers and passengers despite their increasing number and exposure. The proportion of fatalities that drivers and passengers aged 65 and over accounted for decreased from 18% in 1997–1999 to 14–15% in 2006–2008. The decline was attributed to the success of road safety initiatives. Other USA studies (Cheung and McCartt, 2011; Cheung et al., 2008; Cicchino and McCartt, 2014) have indicated that

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the rates (per head of population, per licensed driver and per distance driven) of crash involvement for older drivers (in terms of fatal injury, non-fatal injury and property-damage-only crashes) are also declining. Cheung and McCartt (2011) found that, on a per licensed driver basis, the 37% reduction in fatal crashes for drivers aged 70 and over far exceeded the 23% decrease for drivers aged between 35 and 54. This study concluded that the greater declines in the fatality risk of older drivers reflected decreases in both the likelihood of crashing (due to improved road infrastructure and vehicle technology) and the likelihood of dying in the crash (due to medical and general health advances and improved vehicle protection).

Similar results have been found in Great Britain by Mitchell (2013), who examined the annual number of fatalities for drivers of various age groups from 1975 to 2010. Despite an increasing number of drivers aged 70 and older, their total fatalities had reduced by about 40% over the previous 10–15 years. Fatalities per licensed driver had been falling since 1975 and fatalities per distance driven had been falling since 1996 when data on miles driven by car were first available. Other research from Great Britain by the Road Safety Foundation (2016) also found that total fatalities, fatalities per licensed driver and fatalities per distance driven and over had decreased between 1995 and 2014 for drivers aged 70. These findings are similar to those in the USA. However, the annual number of casualties (all injuries and deaths) for drivers aged 70 and over in the study by Mitchell (2013) had increased between 1975 and 2010, but had decreased on a per licensed driver and per distance driven basis. Similarly, the Road Safety Foundation (2016) found that casualty crashes for drivers aged 80 and over had increased between 1995 and 2014, but had decreased per licensed driver and per distance driven. Mitchell (2013) suggested that the fatality reductions may be due to road safety measures, as well as the fact that many drivers now in their seventies have been driving since they were teenagers and that this level of experience may help them to better compensate for age-related declines in cognitive, visual and perceptual functioning.

Different results have been found in Australia by the Bureau of Infrastructure, Transport and Regional Economics (BITRE, 2014) using data on fatalities, hospitalisations and population extracted from the Australian Road Deaths Database (ARDD), the Australian Institute of Health and Welfare (AIHW) National Injury Surveillance Unit and the Australian Bureau of Statistics (ABS). The annual number of fatalities for drivers under 65 were stable between 2004 and 2007 and then declined between 2008 and 2013. In comparison, annual fatalities for drivers 65 and older were stable between 2004 and 2011, but slightly increased over the final two years (2012 and 2013). Therefore, there may be a difference between Australia and other countries in long-term trends in fatality numbers for older drivers. It should be noted, however, that when BITRE examined annual Australian fatality rates per head of population, there were declines between 2004 and 2013 for adults 65 and older and those aged 40–64 (although this examination included all road users, such as pedestrians and passengers, not just car drivers), which is consistent with the declining rates in the USA research. However, other differences were noted, with increases in the total and per head of population rates of hospitalisation (non-fatal) crashes between 2001 and 2009 for all age groups (again, this included all road users) contrasting the declining non-fatal injury rates in the USA.

The studies mentioned above from the USA, Great Britain and Australia are summarised in Table 1. They are presented in this way to make their findings easier to compare.

The present study was developed from a larger project by Baldock et al. (2016), which examined the crash involvement of older drivers in Australia and New Zealand. The purpose of the present study was to further explore recent trends in the crash involvement of older drivers (excluding other road users, such as older pedestrians, passengers or motorcyclists) in Australia to determine whether their involvement has been increasing or decreasing, and how this differs compared to younger aged drivers. Crash, injury, population and licensure data were examined for 10 years spanning 2003–2012. To substantiate the findings in Australia by BITRE (2014), the annual number of fatalities for drivers aged 65 years and older had to be found to be steady or have slightly increased over the 10-year period but decreased for drivers under 65

2. Method

2.1. Data

Crash data were obtained from the relevant road agencies in every jurisdiction in Australia. It was intended that crash data for the same 10-year period as in BITRE (2014) would be examined (i.e. 2004–2013). However, the most recent year for which data were available was 2012, and so the period of a decade spanned 2003–2012. Unfortunately, full crash data for 2012 were not available from the Queensland database. Therefore, all of the Queensland crash data were left out of the analyses. The data for the other states and territories included road crashes that resulted in no injury (i.e. property damage only), injury or fatality to each driver involved in a crash.

Population data by age for 2003–2012 for all Australian states and territories were obtained from the Australian Bureau of Statistics (ABS). From these data, the total annual population for various age groups was calculated. This was then used to calculate crash, serious injury and fatality rates per 100,000 head of population for each year of investigation.

Suitable data on driving licensure were difficult to obtain in a timely manner. Therefore, the researchers used data that had already been obtained for other purposes, covering two jurisdictions: South Australia and Victoria. The South Australian data were provided by the Department of Planning, Transport and Infrastructure and the Victorian data by VicRoads. Although it was not ideal to have data from just two states, it was thought that this would still give an indication of licensing patterns across Australia. From these data the total annual number of licensed drivers in various age groups was calculated. This was then used to calculate crash, serious injury and fatality rates per 100,000 licensed drivers in South Australia and Victoria for each year of investigation.

2.2. Procedure

The variables that were extracted from the crash databases of the various jurisdictions included crash year, driver age and driver injury severity. It was important to use data that related to crash involved drivers instead of the crashes themselves so that the age of the drivers involved could be examined. One consequence of this approach is that, for crashes involving several drivers, each driver would have a separate entry in the database. Therefore, a single crash that involved more than one driver would represent multiple crashes. This approach also means that other participants in a crash (i.e. passengers) were excluded. Additionally, crashes were only included in the analyses if the crash-involved driver was driving a car or similar vehicle (e.g. station wagon, utility).

The categories of driver injury severity often differed between the various states and territories in terms of the labels used. Generally, however, all of the jurisdictions had a category for "N/A" (or "no injury to the driver" or "property-damage only crash"), "injury but not admitted to hospital" (or "hospital treated but not admitted" or "other injury" or "received medical treatment" or "minor injury" or "private doctor" or "first aid" or "injured not seeking treatment"), "serious injury" (or "hospital admission") and fatal injury (or "died within 30 days" or "killed"). The data for New South Wales for the years 2003–2012 only categorised injury outcomes as "no injury to the driver", "injury" and "killed". Therefore, NSW was excluded from examinations of serious injuries because this level of severity could not be