Abstract

Most journeys by older people in Britain are made by car. From age sixty for men and fifty for women the number of trips reduces with increasing age, and almost all the reduction is a progressive reduction in the number of journeys as a car driver.

Driving licence holding in Britain is increasing for older people, particularly older women. Licence holding by men aged 40 to 69 has saturated at about 90 per cent, and for women aged 30 to 59 at about 78 per cent. Drivers begin to surrender licences after age 70. By age 90, 43 per cent of women and 25 per cent of men who had held a licence at 70 have surrendered their licences. This analysis is used to forecast licence holding by men and women of various ages to 2030.

The paper shows the numbers of car drivers of different ages killed and injured in accidents since 1975 and the fatality rates per driver. The safety of older drivers is improving faster than that of younger age groups. Demographic projections and the trends in fatality rates are used to project the numbers of fatalities for drivers of different ages in Britain. This shows that fatalities among older drivers aged are likely to continue to reduce, despite a steady increase in the number of older drivers.

Fatality rates for older road users are increased by the fragility of older persons. This disguises the fact that the accident involvement rate for older drivers does not increase with age until after age 75 or 80.

Key words

Older drivers: mobility: safety: forecast licence holding: forecast casualties

1. Introduction

The car provides mobility for very many older people in Britain. The majority of journeys by older people are made as car occupants. But after age 60 for men and 50 for women the number of journeys people make reduce with increasing age. Almost all of this reduction is a result of people making fewer journeys as a car driver.

This paper summarises data on the use of cars by older drivers, and the role of the car as an enabler of mobility. It shows how the holding of driving licences has been increasing, particularly among women and older people. It forecasts licence holding to the year 2030, which will have stabilised for men aged 50 and over and for women aged 30 to 70.
It then turns to the safety of older drivers. Despite forecasts in the 1980s and 1990s of large increases in the number of deaths of older car drivers, in reality deaths of older drivers have reduced, despite the numbers of drivers increasing (TRB, 1988: Burkhardt and McGavock, 1999). A more detailed study of the safety of older drivers shows that involvement in injury accidents per driver per year is lowest for drivers aged 60 to 79, and per mile driven for drivers aged 60 to 69. The large increase in the fatality rate with age is a consequence of the greater physical fragility of people as they age.

Older drivers are shown to pose relatively little risk to pedestrians, as another group of road users. The paper concludes that older drivers are at risk themselves, because of their increased fragility, but they do not pose an excessive risk to other road users. A forecast of car driver fatalities to 2030 shows that the number of deaths of older car drivers will continue to reduce, despite an increasing number of drivers. The British system for licensing older drivers appears to be achieving a sustainable situation with regard to older driver fatalities and mobility by car, at least until 2030.

2. Mobility

In Britain, most journeys by older people are made as car occupants. Figure 1 shows the numbers of journeys made by men and women by age and by means of travel. Men travel more as car drivers, women as car passengers. The number of journeys declines with increasing age for men after age 60 – 64 and for women after age 50. Virtually all the reduction is a result of fewer journeys as a car driver. The number of non-driver journeys is rather constant with increasing age; about 380 a year for men to age 80, and about 560 a year for women, to age 75 or 80.

![Figure 1](image_url)  
**Figure 1** Journeys per person per year, Britain 2006 – 08  
National Travel Survey, Department for Transport, annual (a)

Figure 1 shows the number of journeys per person, regardless of whether they hold a driving licence. The reduction in car driver journeys is partly due to fewer older people having licences, and partly due to those who have licences driving less as they get older. Figure 2 shows the number of car driver journeys per licensed car driver.
Women start to reduce their journeys as car drivers about twenty years younger than do men, from their late 50s as opposed to late 70s. There is a question over whether some women are stopping driving before they need to for safety reasons, and so reducing their mobility.

3. Licence holding

The percentage of older people, particularly older women, who hold driving licences has been increasing. Data on car driving licence holding in Britain comes from the National Travel Survey, a household survey that has been conducted regularly since 1972 and annually since 2002 (Department for Transport, annual (a)). At present about 20,000 individuals are surveyed and complete a one week travel diary.

By 2010, car licence holding by men aged 40 to 70 had saturated at about 90 per cent. For women aged 30 to 60 it had also saturated, at the lower level of about 78 percent. Licence holding by older people was lower, but rising.

3.1 Forecast licence holding to 2030

From the National Travel Survey it is possible to follow cohorts of respondents (but not individuals) and deduce when people obtain licences and also how many surrender licences as they age. This makes it possible to forecast future levels of licence holding. Figures 3a and b show the percentage of men and women who have held licences since 1965, with forecasts of licence holding to year 2030. The large increase in licence holding by both men and women aged 70 and over since 1975 is clear. For all age groups over forty, the forecasts of licence holding is based on following cohorts who are already qualified to hold licences. For ages up to forty, at least some of the forecast is based on smooth extrapolations of current trends.
For both men and women aged 17 to 20, licence holding peaked in 1992-93, fell back rapidly until 2004 and is now increasing again, although for men it appears to be stabilizing at levels lower than the peak in 1992-93. This reduction has now reduced the licence holding of men and women aged 20 to 29, and appears to be beginning to
reduce it for men aged 30 to 39. During the forecast period it is going to reduce licence holding by men in their 30s and 40s, but only slightly for women. By 2030, licence holding by men aged 50 to 70 will have stabilised at 90 per cent and for men aged 70 and over at about 80 per cent. For women aged 30 to 70 it will have stabilised at about 78 per cent, but will still be rising for older women and women aged 21 to 29.

Older drivers start to surrender their licences from age 70. The best measure of licence surrender is the percentage of drivers who held a licence ten years earlier who no longer do so. Figure 4 shows this for Britain; the results for the USA are surprisingly similar. After age 70 the rate of licence surrender by women is about twice that of men.

4. Older car driver casualties

4.1 Trend in car driver fatalities

Data on road accident casualties in Britain is published annually by the Department for Transport as Reported Road Casualties Great Britain (Department for Transport, annual (b)). For most age groups, car driver casualties of all severities (that is, the total of all injuries and deaths) peaked during the 1990s and are now falling. For drivers aged 60 and over, the fall is very small, and for those aged 80 and over, the number is almost constant.

Between 1970 and 2010 the number of car driver fatalities reduced from 1,598 to 574. For drivers aged 40 to 70, the number of deaths has declined fairly steadily since 1980, and for those aged 70 to 79, from 1995 (the first year data for this group is available) (Figure 5). Deaths of drivers aged 80 and over have been steady at about 60 a year, although now falling. For all drivers aged 70 and over, the number of deaths increased until 1990, remained steady at about 160 per year until the late 1990s, and has subsequently reduced about 40 per cent.
This data can be presented as a casualty rate per driving licence (Figure 6). Fatality rates for car drivers fall steadily for all drivers aged 30 and over. For younger drivers, the reduction in the fatality rates started more recently. The reductions have been greatest for the oldest drivers and this has more than balanced the increase in the number of older drivers.
4.2 Forecasting car driver casualties

When casualty rates are plotted on log-linear paper, trends often appear as straight lines. Fitted straight lines can be extrapolated, to predict future rates, on the basis that current trends continue. These fatality rates can be applied to the forecast future population of licence holders, to determine the future number of casualties (Figure 7).

The forecast shows that, except for the 16 to 19 age group, numbers of fatalities will continue to fall. However, improvements in road safety since 2005 have been so great that the current numbers of casualties are well below the long term trend lines. This makes it difficult to extrapolate with any confidence.

In particular, the number of older driver fatalities will continue to fall. This is a result of the safety of older drivers improving faster than their number is increasing, and also faster than the safety of younger drivers.

This demonstrates that the current procedures for licensing older drivers in Britain is providing a level of safety that is sustainable, at least to 2030. It is also likely that the increasing percentage of older people who hold a driving licence means that the mobility of most older people will continue to improve, though problems will remain for those who do not drive.

5. Older driver safety

In the 1980s and 1990s researchers predicted a large increase in the number of older drivers killed in traffic accidents (TRB, 1988: Burkhardt and McGavock, 1999), although subsequent experience has shown that this was not the case, and the forecast given in section 4.2 suggests that fatalities will continue to reduce.
In the 1990s research initially focused on the car driver fatality rate per mile driven, which increases sharply with age after middle age (TRB, 1988). Further research has shown that much of the increase in driver fatalities in older age is a result of the way that people become physically more fragile as they age. The means that a given accident is more likely to cause injury, and a given injury more likely to cause death (Evans, 2000).

5.1 Accident involvement

The Department for Transport publications ‘Reported Road Casualties Great Britain’ and the National Travel Survey make possible analyses of injury accidents to assess car driver casualties of various severities by driver age, and the casualty rate per driver and per mile driven (Department for Transport, annual (a) and (b)). Figure 8 shows the casualty rates per driver licence for fatal, killed and seriously injured casualties (KSI) slight injuries and all casualties. The best measure of accident involvement is the rate of slight injuries, as this is most free from fragility bias. The difference in the shape of the curves for slight injuries and fatalities shows how much of the increase in fatal and serious casualties is a result of fragility. The rate for slight injuries is lowest for drivers aged 60 to 79, and increases by 18 per cent for drivers aged 80 and over.

Figure 9 shows the casualty rates per distance driven, also for Britain in 2009. As expected, there is more increase in rates with increasing age. The age for a minimum rate of slight injuries is 60 to 69, and the increase in the slight injury rate for ages 70 to 79 relative to that minimum is 40 per cent. The rate for ages 80 and over is significantly higher, almost three times the minimum rate for age 60 to 69. But because this age group average less distance driven, they do not pose a much greater hazard to other road users.
5.2 Danger to other road users

A good measure of the danger that drivers pose to other road users is the number of pedestrians killed by drivers of various categories. Even if the pedestrian is blameworthy in some accidents in which pedestrians are killed, the number of pedestrians killed is a measure of the extent to which a group of drivers tends, on average, to drive defensively, prepared to react to unexpected incidents.

Data for Britain in 2005 shows that the majority of pedestrians who are killed by cars are killed by young or middle aged male drivers. Relatively few pedestrians are killed by drivers aged 60 and over. A similar analysis by Hakamies-Blomqvist (2004) for the USA shows a similar result.

When this data is corrected for the number of drivers in each age group, the risk of a pedestrian being killed per million drivers shows the great danger to pedestrians posed by very young drivers. Drivers aged sixty and over still pose the lowest risk of all drivers, but within that group there is a small increase in risk for the oldest drivers.

6. Discussion and conclusions

In Britain the majority of journeys by older people are made as car occupants. The car provides great mobility for those who have one available. But after age 60 for men and 50 for women the number of journeys people make reduce with increasing age. Almost all of this reduction is a result of people making fewer journeys as a car driver. This is partly because fewer older people hold driving licences, and partly because older drivers drive less. Women start to reduce the amount they drive about twenty years younger than men, and this may cause mobility problems.
The casualty data for car drivers in Britain shows clearly that car drivers up to age 75 or 80 are, on average, no more likely to be involved in an injury accident than younger drivers, and pose no greater threat to other road users such as pedestrians. They are at greater risk of injury or death themselves, because of the greater physical fragility that results from ageing.

Despite their fragility, the car driver fatality rate for drivers aged 80 and over is reducing faster than the rate for any other age group. Because of this, the number of deaths of older drivers is reducing, despite the increase in numbers of older drivers.

Driving licence holding is continuing to increase for older drivers, and particularly for older women drivers. Licence holding by men aged 40 to 70, and women aged 30 to 60, have stabilized. Licence surrender begins to occur after age seventy. By age 80, 8 per cent of women who held a licence at age 70 have surrendered it, as have 5 per cent of men. By age 90, 43 per cent of women and 25 per cent of men who had held a licence at 70 have surrendered their licences. These data have been used to forecast future car driving licence holding. By 2030, licence holding by men aged 50 to 70 will have stabilised at 90 per cent and for men aged 70 and over, at 80 per cent. For women aged 30 to 70 licence holding will have stabilised at about 78 per cent, but will still be increasing for older women.

Forecast of older driver casualties show that the number of older driver fatalities will continue to fall, suggesting that the current process for licensing older drivers is sustainable, at least until 2030.

7. References


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