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Impact of mandating a driving lesson for older drivers at license renewal in Japan

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ABSTRACT

In Japan, a driving lesson consisting of a lecture, a driver aptitude test, on-road driving assessment and a discussion session was added to the driving license renewal procedure for drivers aged 75 years or older in 1998 and for drivers aged 70 years or older in 2002. We investigated whether these additions contributed to a reduction in at-fault motor vehicle collisions (MVCs) by examining the trend of the at-fault MVC rates per licensed driver and the rate ratios of the older drivers relative to those aged 65–69 years for the years 1986–2011. All data were derived from nationwide traffic statistics. If the introduction of the lesson was effective in reducing at-fault MVCs of older drivers, the rate ratio should have declined, given that the lesson targeted only the older drivers. We found this was not the case, i.e., there was no declining trend in the at-fault MVC rate ratios of both drivers aged 75 years or older and drivers aged 70 years or older, relative to drivers aged 65–69 years, after the driving lesson at license renewal became mandatory for these older drivers. Therefore, the mandatory lesson for the older drivers at license renewal needs to be reconsidered.

1. Introduction

In countries with aging populations, older drivers and their involvement in motor vehicle collisions (MVCs) are increasing (Organization for Economic Co-Operation and Development, 2001; National Police Agency, 2013). To ensure that older drivers drive safely, some countries are imposing medical screening and driving skills tests at re-licensing of older drivers (Kahvedžić, 2013). These assessments are intended to help older drivers modify driving behaviors according to their functional changes and maintain their mobility on one hand; older drivers might be prompted to avoid or stop driving for safety reasons on the other. In whichever way, the assessments are expected to reduce MVCs among older drivers, but previous studies suggest this is not the case (Rock, 1998; Grabowski et al., 2004; Langford et al., 2004a,b; Langford et al., 2008; Siren and Meng, 2012; Tay, 2012).

Australian studies that compared crash involvement rates of older drivers between states with and without medical and on-road testing requirements in driver licensing reported that such mandatory testing had no protective effects on fatal and serious injury crashes for both older drivers themselves and other road users (Langford et al., 2004a,b, 2008). Similarly, a study in Canada that compared collision rates of older drivers across five provinces with different levels of licensing requirements found no significant relationship between stricter requirements and collision rates (Tay, 2012). A study in the state of Illinois in the United States found no increase in fatal crashes after the elimination of an on-road testing requirement for drivers aged 69–74 years (Rock, 1998). A study evaluating the effect of in-person renewal at the driver license office, vision tests, and road tests, and the frequency of license renewal on driver fatalities in the United States, revealed that only in-person renewal for drivers aged 85 years or older reduced driver fatalities (Grabowski et al., 2004). A study in Denmark reported that the introduction of cognitive screening in the license renewal of older drivers did not reduce fatalities (Siren and Meng, 2012).

Besides these observational studies examining the assessments at re-licensing, several randomized controlled trials (RCTs) have been conducted to evaluate the effectiveness of older driver retraining (Kua et al., 2007; Korner-Bitensky et al., 2009; Ball et al., 2010). A systematic review of the RCTs concluded that an educational intervention, on-road training, and a physical retraining intervention for older drivers would improve their driving knowledge and performance (Kua et al., 2007; Korner-Bitensky et al., 2009). However, an educational intervention appeared to be ineffective in reducing their crashes and there are no studies that

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have investigated whether other two components of the interventions reduce the crashes. Meanwhile, a more recent RCT demonstrated the effectiveness of cognitive training in reducing at-fault crashes (Ball et al., 2010).

In Japan, a driving lesson and a cognitive test have been added to the license renewal procedure for older drivers nationwide, providing us with an opportunity to examine the impact of these additional requirements. We focused on "at-fault" MVCs in which older drivers were primarily responsible, because at-fault MVCs can be a more direct indicator of the impact of older-driver education than all MVCs. We therefore investigated whether at-fault MVCs declined after the introduction of the mandatory driving lesson at license renewal among drivers aged 70 years or older, compared with the case for drivers aged 65–69 years, who are not subject to the lesson.

2. Methods

2.1. Driving license renewal in Japan

In Japan, driving license holders are required to renew their license regularly, every 3–5 years depending on drivers' age and their commitment to traffic violations. Until September 1998, drivers of all ages were required at the renewal to take a vision test and attend a 30-min (at least) class on traffic safety. This renewal procedure was revised for older drivers: a 3-h driving lesson became obligatory at renewal for those aged 75 years or older since October 1998 and this requirement was extended to those aged 70–74 years since June 2002. Additionally, those aged 75 years or older have been obligated to take a cognitive test before the lesson since June 2009.

The lesson is conducted by trained instructors at driving schools, consisting of a 30-min lecture, a 1-h driver aptitude test (in which, older drivers are tested for sensory motor skills using a driving simulator, and also tested for a field of vision, kinetic and night vision), a 1-h on-road driving assessment, and a 30-min discussion session. The lesson aims to make older drivers aware of their changes in driving ability and give them advice for safe driving based on the test results (Cabinet Office, 2012).

The cognitive test, a paper-based screening guided by an examiner, determines whether older drivers are impaired, slightly impaired or not impaired (National Police Agency, 2014; Oroku, 2010). Those identified as being impaired can renew their driving license only if they have not been ticketed for violation of certain traffic rules such as not obeying a traffic signal in the previous year before the renewal. Those who have been ticketed have to take a medical examination. For those diagnosed with dementia, their driving license is revoked. The same procedure is applied once the older drivers violate the rules.

2.2. Data

The number and rate of at-fault MVCs including motorcycles and other motorized two-wheelers per 10,000 licensed drivers by age groups of 65–69 years, 70–74 years, 75–79 years, and 80 years or older were obtained from the traffic statistics of the National Police Agency for the period 1986 through 2011 (Institute for Traffic Accident Research and Data Analysis, 1987–2012, each year). The rate of MVCs per 100 million vehicle-kilometers travelled (VKT) was also obtained from the traffic statistics for the same period but the rate in 1986 was excluded from the analysis because VKT by light motor vehicles (up to 660 cc.) was added to the denominator of the rate from 1987 onwards. MVC

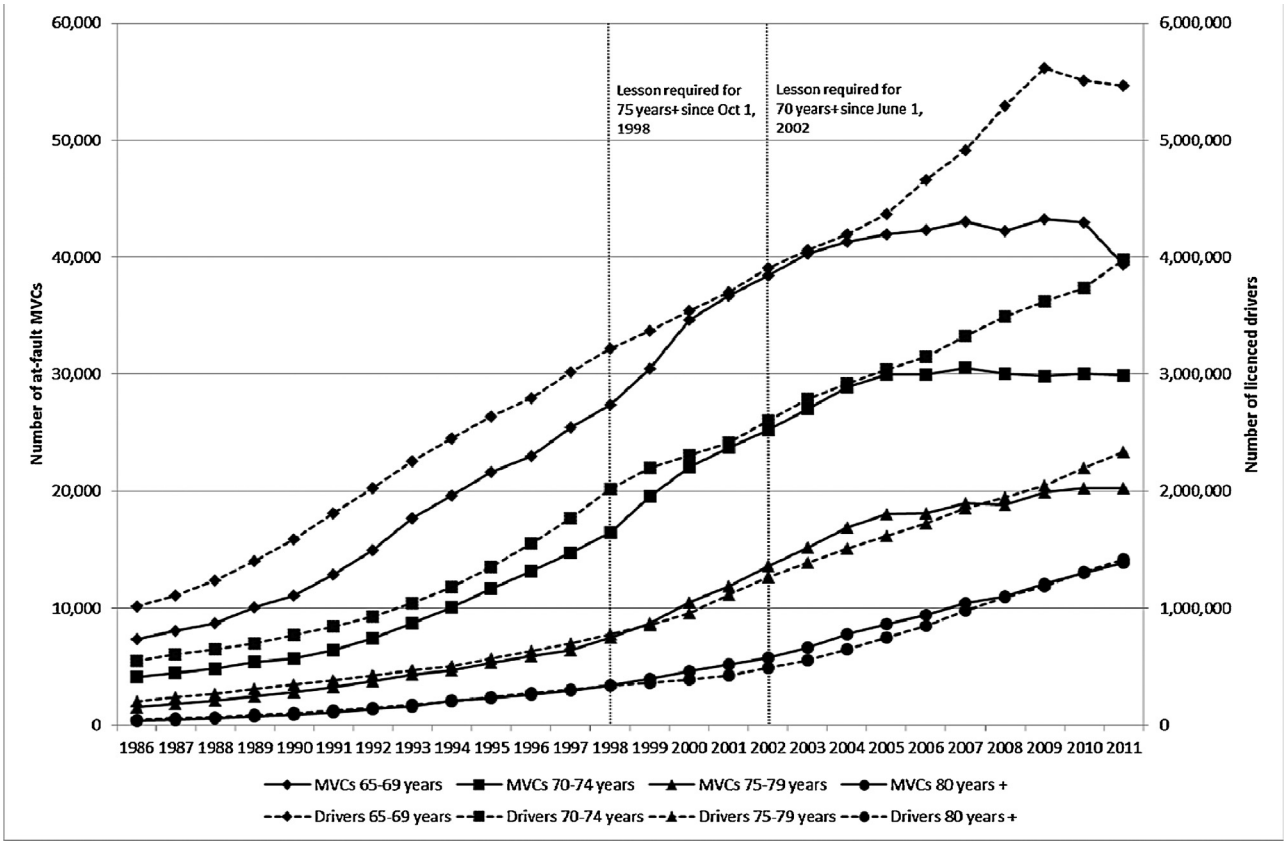

Fig. 1. Annual numbers of at-fault motor vehicle collisions (MVCs) and licensed drivers by age group in Japan, from 1986 to 2011.