

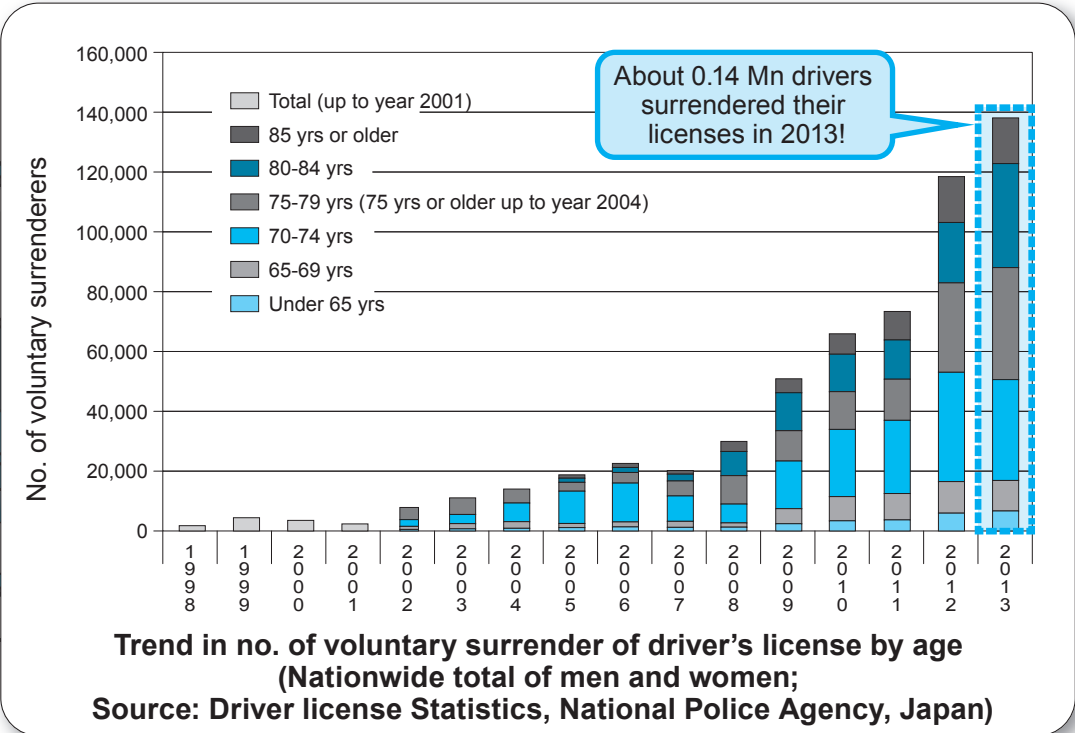
ITARDA INFORMATION

交通事故分析レポート

No.109

Special feature

Renewal characteristics of elderly male driver's license holders



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1 Introduction

Despite the decline in traffic accidents year by year, the ratio of older drivers involved as the primary party in accidents is on the rise. The physical abilities of older drivers may deteriorate to the point that driving safety may be seriously affected and it is important to give it a thought as to how long they could continue driving safely. In course of their habitual driving or through suggestions from family members, many older drivers come to think of voluntarily surrendering their driver's licenses. By presenting data to such people, on the accident characteristics etc. of senior drivers who continued driving and those who gave up their car keys either voluntarily or by disqualification, may form one of the bases for deciding the possession of driver's license by older drivers.

The purpose of driving vehicles by senior citizens may vary with age, locality and the development in public transportation. Therefore in this issue, we have focused our analysis on the older male drivers across Japan.

The term "Voluntary surrender" refers to the act of applying the revocation of one's driver's license to the Public Safety Commission for reasons such as decreased confidence in one's own driving skill or when the chances of driving has decreased over time; whereas the term "disqualification" refers to the automatic revocation of driver's license when it is not renewed within the deadline.

2 75 years, 78 years and 81 years: Junctures to contemplate the possession of driver's license

Fig.1 shows the rate of decline of licensed older male drivers (rate of decline of valid license-holders in the end of the relevant year as compared to the end of the previous year) who were born in 1928, by age. Apparently, a peak can be seen in every 3 years at 75, 78, 81 and 84 years. As seen in Table 1, this may be due to the fact that although the number of drivers due for renewing their licenses at 75 years has increased and similar trend is expected subsequently after every 3 years, there were many older drivers who did not renew their licenses. This trend was observed in older drivers who were born after 1923 regardless of their gender or the locality they hailed from.

Depopulation may also be thought of as a reason for the decline in licensed older drivers. However, in the case of population decline since no such peak is observed after every 3 years, it may be deduced that with age, the ratio of older drivers not renewing their licenses at the due date has increased, suggesting that this may be the point of time to contemplate the possession of one's driver's license.

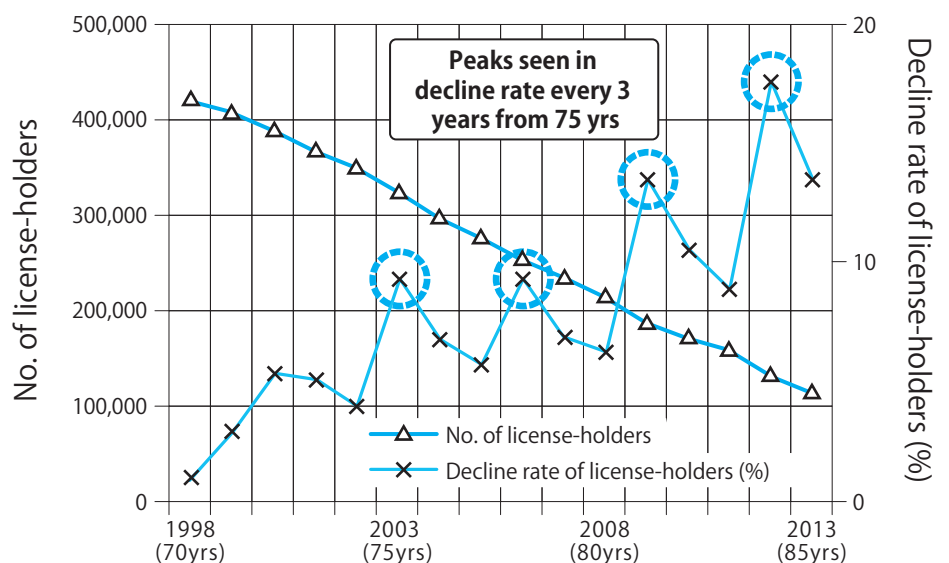


Fig.1 Trend in the number and decline rate of license-holders (Nationwide: Men born in 1928)

Table 1 Validity of license of older drivers

Category of driver	Exact age at renewal	Validity	Age at next renewal
Drivers without violation record or with minor violation record	70 years	5 years	75 years
	71 years	4 years	75 years
	72 years or older	3 years	3rd birthday (Renewal at 72yrs → next due at 75 yrs)
Drivers with violation records etc.		3 years	3rd birthday

3 Indicators to express accident and violation characteristics ••

In this section, the following four types of indicators are used to consider the road usage characteristics, accident and violation characteristics, etc. of license-renewing drivers.

■ Indicator for driving frequency : Quasi-Induced Exposure

Vehicle-kilometers is one of the common indicators used to denote driving frequency. However, the driver groups are so varied that adequate data had not been collected in the past. Partly for this reason, the Quasi-Induced Exposure, derived from the traffic accident data used for research purposes in the past is taken into account. Here it would mean the rate of drivers in the subject driver group involved without any liability as secondary party in vehicle-to-vehicle accidents in one year. The driving frequency is almost proportional to this value.

■ Rate of drivers involved as primary parties in one year : Accident driver rate

The rate of drivers among the subject driver groups involved as primary parties in accidents in one year (accident driver rate), is used.

■ Rate of accidents with respect to driving frequency: Relative accident rate

Driving frequency, as well as the driving method, is influential on the rate of accidents caused in one year. To understand the accident hazards of the driving method itself, here, the rate of primary parties to that of non-labile secondary parties in vehicle-to-vehicle accidents (relative accident rate) has been used as the rate of accidents with the driving frequency. This indicator is equivalent to the rate of accidents with respect to vehicle-kilometers.

■ Rate of drivers penalized for violations : Violation driver rate

The rate of drivers in the subject driver group penalized for committing traffic violations in one year (violation driver rate) is used.

The first three indicators mentioned above are related to one another in the following manner.

$$\boxed{\begin{array}{c} \text{Rate of drivers involved} \\ \text{as primary parties in one year} \\ \text{(Accident driver rate)} \end{array}} = \boxed{\begin{array}{c} \text{Indicator for} \\ \text{driving frequency} \\ \text{(Quasi-Induced Exposure)} \end{array}} \times \boxed{\begin{array}{c} \text{Rate of accidents with} \\ \text{respect to driving frequency} \\ \text{(Relative accident rate)} \end{array}}$$

<Example>

As seen in Table 2, the accident driver rate for male drivers in the age group of [65-69 yrs] and [45-49 yrs] in 2011 stands at 0.84% alike. However, the driving frequency (Quasi-Induced Exposure) of male drivers aged [65-69 yrs] is about 60% (0.28/0.49) of the [45-49 yrs] group, whereas the rate of accidents with respect to driving frequency (Relative accident rate) is 1.7 times (2.99/1.73) higher than the driver group of [45-49yrs]. In other words, the relative accident rate is higher for older drivers which can be attributable to the decline in their physical abilities and deterioration in their driving skills.

The characteristics of accidents can thus be reviewed in a multi-faceted manner with these three types of accident rates.

Table 2 Rate of accidents in 2011 (driving mopeds or beyond)

	Men			Women
	45-49 yrs	65-69yrs	All ages	All ages
A: No. of drivers	3,873,881	3,320,585	45,448,263	35,767,003
B: No. of primary parties	32,541	27,776	447,443	208,503
C: No. of non-labile secondary parties	18,834	9,291	205,794	121,147
Quasi-Induced Exposure (%) (C/A)	0.49	0.28	0.45	0.34
Accident driver rate (%) (B/A)	0.84	0.84	0.98	0.58
Relative accident rate (B/C)	1.73	2.99	2.17	1.72

4 Drivers with high rate of license renewal are those without accident records but with violation records

Fig.2 shows the ratio of license-renewing male drivers by accident/violation experience in the last three years and driver age. Whereas the ratio has risen temporarily for drivers of 75 years for the 'no accident; no violation' group (depicted by ○ in the figure), the license-renewing ratio has gradually declined with the increase in age for all groups. Also, the ratio is maximum for the 'no accident; violation' group (●) and minimum for the 'no accident; no violation' group (○) for drivers upto 75 years and for the 'accident; no violation' group (□) for drivers over 75 years.

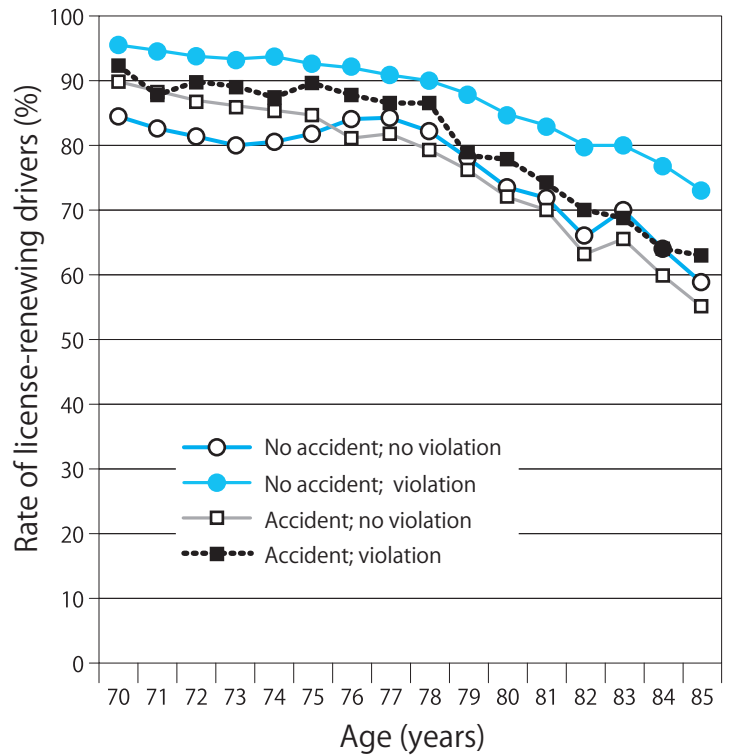


Fig.2 Ratio of license-renewing drivers by accident/violation experience in the last three years and driver age

(Ratio of license-holders who renewed their licenses in 2012 due for renewal in that year)

5 Voluntary surrender of license on upsurge since 2012; The ratio of voluntary surrender of drivers over 75 years with accident records increases remarkably

Fig. 3 shows the trend in the number of voluntary surrenderers of driver's license by age. This number has gradually increased ever since the issue of driver's license history certificate in 2002 but has increased sharply after the validity status of the history certificate has been changed to permanent in accordance with the revised Road Traffic Law enforced on April 1, 2012, particularly in the age group of 75 years and older.

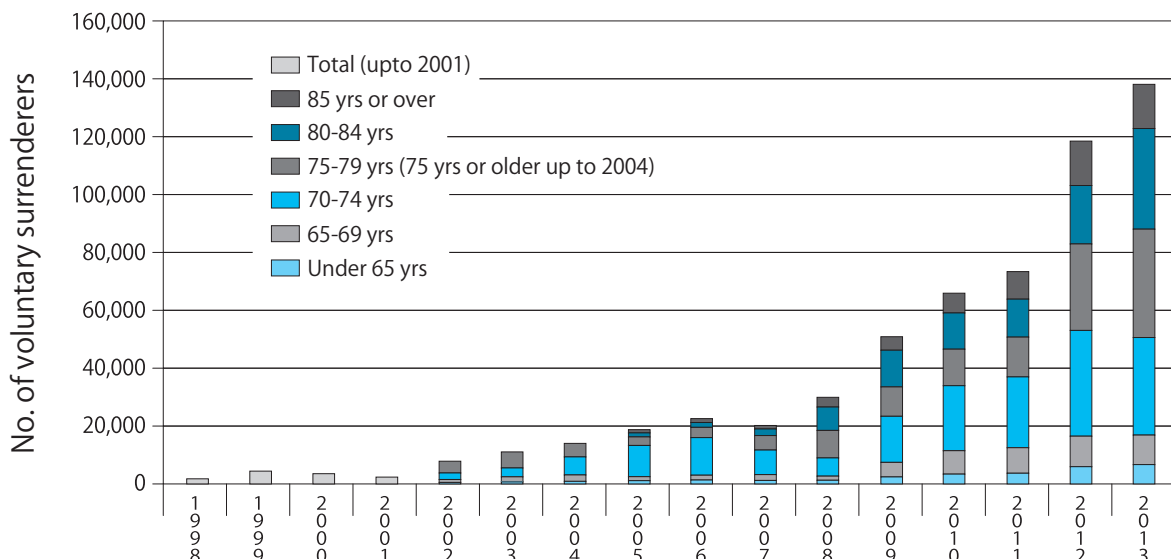


Fig.3 Trend in no. of voluntary surrenderers of driver's license by age (Nationwide total of men and women; Driver License Statistics; National Police Agency, Japan)

Fig. 4 shows the ratio of male drivers who voluntarily surrendered their drivers' licenses between 2011 and 2012 by accident/violation experience in the last three years. Apparently, the ratio of voluntary surrenderers is high for the 'no accident; no violation' group (○) for drivers upto 75 years, as compared to other groups. However, the ratio is high for the 'accident; no violation' group (□) for drivers beyond 75 years, and for the 'accident; violation' group (■) for drivers beyond 80 years. The ratio is minimum for the 'no accident; violation' group (●) for drivers between 70 and 85 years.

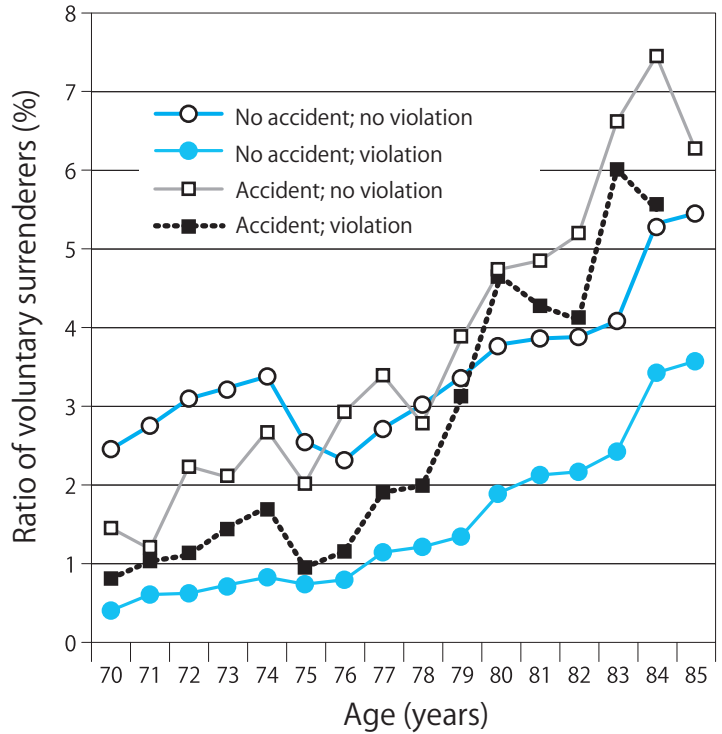


Fig.4 Ratio of voluntary surrenderers of license by accident/violation experience and age
 (Ratio of voluntary surrenderers in 2011-2012 in total male drivers due for renewing their licenses in 2012)

6 Driving frequency of license-renewing drivers is high, but this declines with age

Fig. 5 shows the driving frequency (Quasi-Induced Exposure) of male drivers registered in the end of 2012 who renewed their licenses, by age. Apparently, the driving frequency of license-renewing drivers (◇) is more than that of drivers whose licenses were revoked due to non-renewal, suggesting that drivers who wished to continue driving renewed their licenses. However, even for the license-renewing drivers, the driving frequency (Quasi-Induced Exposure) has declined with age.

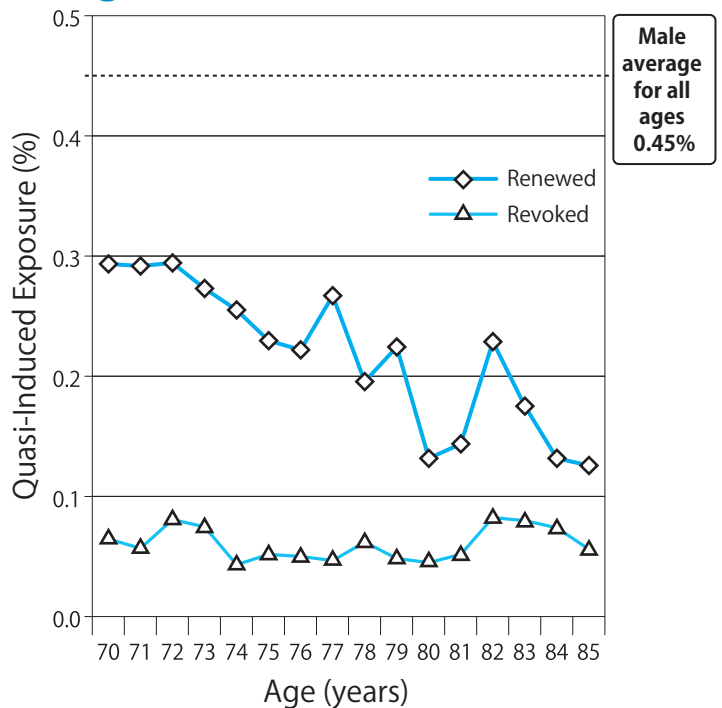


Fig.5 Quasi-Induced Exposure of license-renewing and license-revoked drivers by age (male; registered in the end of 2012)
 (Note: The accident and violation records of 2011, one year prior to 2012, the year of renewal or probable renewal of licenses, are used to estimate the accident or violation driver ratio in figures 5 to 8.)

7 Accident driver rate of drivers over 75 years who voluntarily surrender their licenses, is high

Fig. 6 shows the accident driver rate of older male drivers who renewed their licenses and otherwise (license revoked and voluntarily surrendered) during the one-year period of 2011, by age. The rate has not increased with age for license-renewing drivers (◇) until the age of 81 years. However, the rate has increased for voluntary surrenderers (■) after 75 years as compared to the license-renewing drivers, indicating that experiencing an accident may have influenced some drivers to contemplate their possession of drivers' licenses.

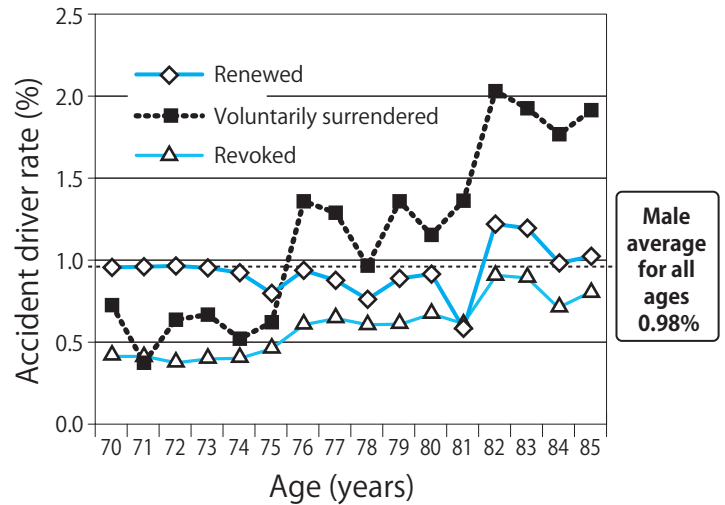


Fig. 6 Accident driver rate of license-renewing drivers etc. by age (male; registered in the end of 2012)

Similarly as seen in Fig. 7, the relative accident rate has risen for license-revoked drivers (△) with age. The appropriate explanation for this result would be that the driving frequency of such drivers was low from the start, the so-called low-mileage bias (drivers with less driving experience have higher accident rate with respect to driving frequency). Although the data for voluntary surrenderers being too little is not shown in the graph, it is higher as compared to those drivers whose licenses were revoked.

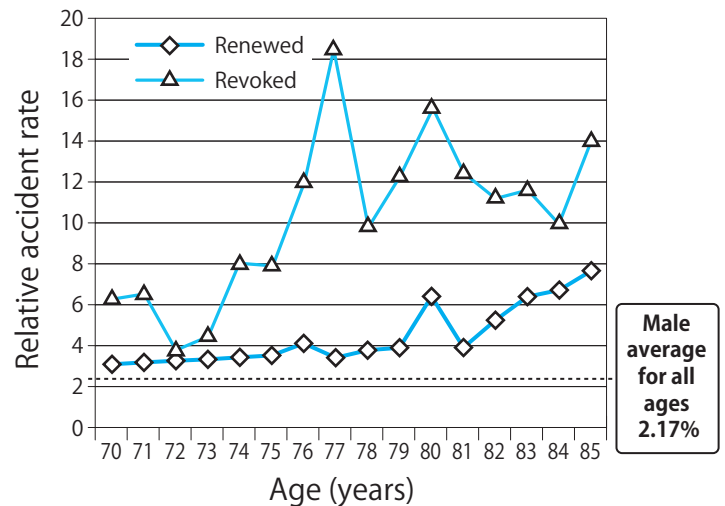


Fig. 7 Relative accident rate of license-renewing drivers etc. by age (male; registered in the end of 2012)

Further, the violation driver rate of license-renewing drivers (◇) has decreased with age for drivers up to 81 years (Fig. 8). This is attributable to the fact that in proportion to the decrease in the accident frequency (Quasi-Induced Exposure) as was seen in the case of Fig.5, the possibility of drivers getting penalized also decreased. Although lower than the Violation driver rate of license-renewing drivers, the rate has increased for voluntary surrenderers (■) with age.

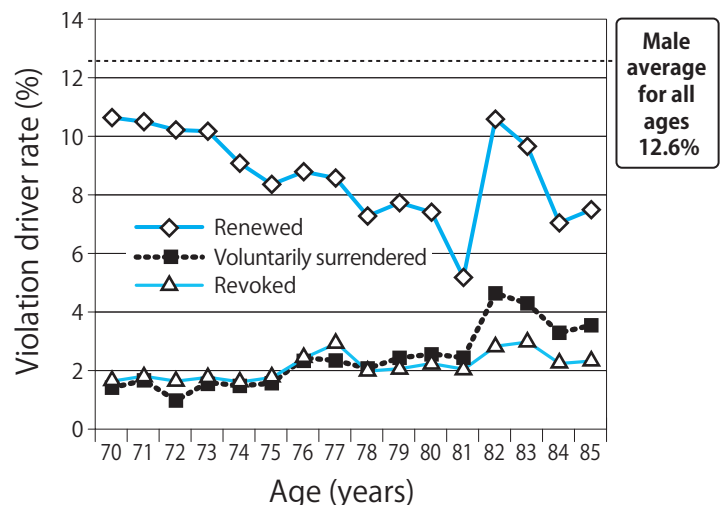


Fig. 8 Violation driver rate of license-renewing drivers etc. by age (male; registered in the end of 2012)

8 With age, the ratio of voluntary surrender of license after its renewal increases

Physical abilities, driving frequency and the like may be thought as the factors considered by older drivers at the time of license renewal. Nevertheless, many older drivers may be in two minds whether they should renew their licenses or decide otherwise. There are drivers who within two years of renewing decide to voluntarily surrender their licenses, without waiting for the next due date of renewal. Fig.9 shows that this ratio has increased with age.

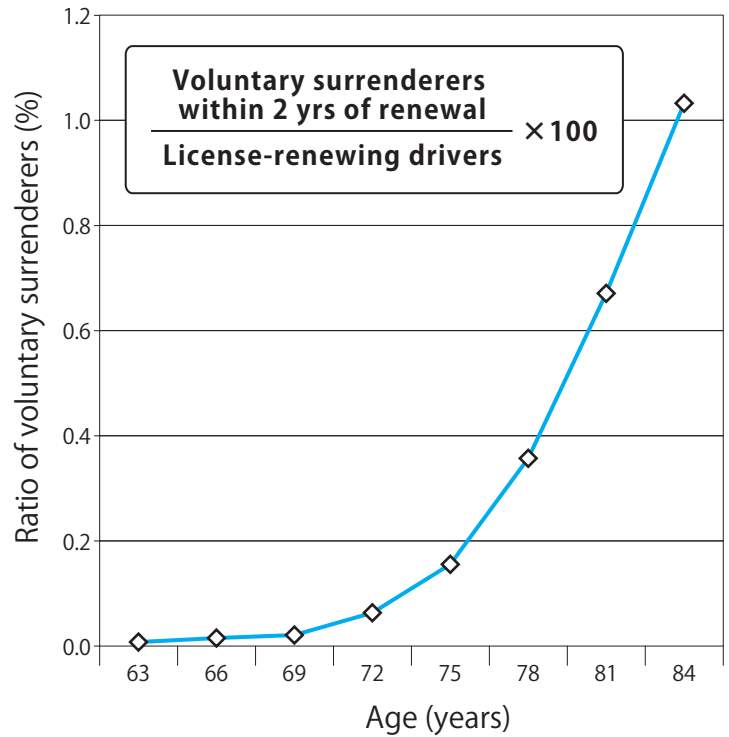
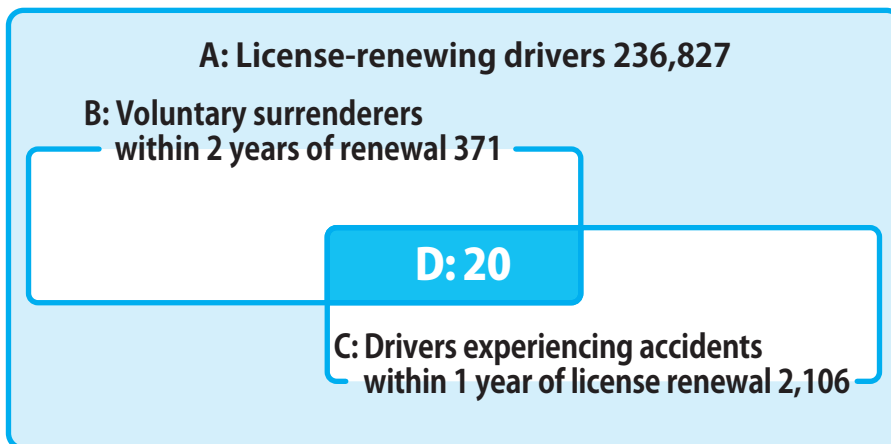


Fig. 9 Ratio of voluntary surrender of license within 2 years of its renewal (male drivers who renewed licenses in 2010)

As seen in Fig. 10, although little, rate of older drivers who surrendered their driver’s license within 1 year of its renewal (D: 20) among those who surrendered their driver’s license within 2 years of its renewal (B: 371) is 5.4%, which is higher than the rate of drivers with accident experience in the total number of license-renewing cases (C/A:0.9%). Providing ample data on accident risks to older drivers at the time of license renewal may be one way of providing them with an option of not renewing their licenses, thereby possibly preventing the increase in the number of drivers who may encounter tragic accidents after renewal.



Rate of drivers experiencing accidents in the total number of license-renewing drivers (C/A): 0.9%
Rate of drivers experiencing accidents in the total number of voluntary surrenderers (D/B): 5.4%

* D represents the voluntary surrenderers within 2 years of license renewal who had experienced accidents within 1 year of license renewal. The 20 drivers in D are included in both B and C population.

Fig.10 Ratio of drivers with accident experience within 1 year of license renewal (male drivers who renewed licenses at 75 yrs in 2010)

(Note: Renewal period is calculated on monthly basis by taking aggregate of one year after renewal)

9 Conclusion

Renewing driver's license

The trend of license-holders by age indicates that the rate of older drivers of 75 yrs, 78 yrs, 81 yrs and 84 yrs in the age gap of 3 years not renewing their driver's licenses is high. Targeting the education of older drivers in this renewal period is expected to yield better results.

Characteristics of license-renewing or voluntary surrendering of driver's license

- The driving frequency of license-renewing drivers is high (See Fig.5).
- After 75 years, the accident driver rate increases in the year previous to surrender of license for voluntary surrenderers (See Fig. 6).
Focusing on these two trends may enable us to discuss the cut-off period, conditions etc. of voluntary surrender as well as the possession of driver's license by older drivers.
- In the case of drivers who have committed violations, correlation with voluntary surrender of driver's license is not seen (See Fig.8) as opposed to drivers with accident records. However, there is data ("reference materials" given below) available indicating that the rate of violators getting involved in accidents is high, which makes it important to have older violators consider voluntary surrender of their licenses.

Provide information to license-renewing drivers

Some older male drivers do not wait till the next renewal date and voluntarily surrender their licenses after they have renewed their licenses. Although such rate is low, it increases with age (See Fig.9). It is therefore important to provide them with objective information about accident and violation records and their correlation with accident characteristics thereafter. This could be an effective way of aiding them to decide on their own whether or not they should renew their licenses, based on such objective information.

Going forward, it is also important to perform analysis on regional trends such as in urban and rural areas as well as on older female drivers and engage in widespread dissemination of useful information on the risks associated with older drivers so that they can contemplate the possession of their drivers' licenses.

(Yasushi Nishida, Masahide Honda)

<Supplementary notes>

This issue of ITARDA Information is a partial compilation of the ongoing "Research on the Evaluation Method of Traffic Safety Policies" jointly carried out by the Institute for Traffic Accident Research and Data Analysis (ITARDA) and the public interest incorporated foundation International Association of Traffic and Safety Sciences (IATSS), that started in 2014.

<Reference materials>

- 1) Japan Safe Driving Center: "Investigative research on skills etc. required for safe driving, vol I-IV; Investigative research report from FY 2006-2009."
- 2) Japan Safe Driving Center: "Investigative research on accident and violation characteristics, their correlation with accident rates thereafter and their utilization plan, vol I & II; Investigative research report for FY 2010 and 2011."

<Our apology and correction>

We apologize for the error in ITARDA Information No. 108 and would like to correct the same as given on the right.

(Incorrect) Chiba prefecture

Name of village/town/city	Population (0.1 million)	Fatalities per 0.1 million population
Oamishirasato city	1.5	1.98
Shisui town	5.1	0.20
Sakae town	2.1	0.47
Kozaki town	2.2	0.00
Tako town	0.7	1.53
Tohnosho town	1.6	0.00

(Correct) Chiba prefecture

Name of village/town/city	Population (0.1 million)	Fatalities per 0.1 million population
Oamishirasato city	5.1	0.59
Shisui town	2.1	0.47
Sakae town	2.2	0.45
Kozaki town	0.7	0.00
Tako town	1.6	0.63
Tohnosho town	1.5	0.00

*The downloadable PDF file posted on our webpage has already been corrected.

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