Position paper

Analyzing accidents and developing elderly driver-targeted measures based on accident and violation records

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ABSTRACT

For this study, we performed a variety of analyses using the Institute for Traffic Accident Research and Data Analysis’s Integrated Driver Database with traffic accident and violation records. The database integrates driver management data and road traffic accident statistics data, making it possible to explore the relationships among driver attributes and road traffic accident characteristics in considerable detail.

By controlling our compilation conditions and refining our sets of driver attributes, our analysis showed that drivers who experience accidents drive more carefully immediately after an accident, revealed high accident rates among drivers who have experienced certain violations, and produced other findings that could constitute a foundation for developing individual driver-targeted measures. Our analysis of large age groups, meanwhile, showed that drivers with a history of numerous accidents or apprehensions/violations are more likely to cause accidents.

The Integrated Driver Database with traffic accident and violation records boasts an expansive scope, covering all of the 81 million licensed drivers in Japan, and features 200 variables pertaining to driver attributes, accidents, and violations. In addition to letting users refine their focuses by driver age, sex, and place of residence, the database also enables analyses that account for lifestyle-related variables like when drivers received their licenses and whether drivers have moved to new addresses. The sheer diversity of driver attributes in the database makes it a promising resource for formulating driver-targeted measures.

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1. Introduction

A wide variety of traffic accident countermeasures has helped reduce the numbers of traffic accidents, accident casualties, and traffic accident fatalities in recent years, but experts suggest that the government will need to make further efforts in order to meet its goal of bringing the number of traffic accident fatalities to 2500 or less by 2018. Human-targeted measures, especially driver-targeted measures like safety education programs, enforcement initiatives, and other non-structural measures, often defy systematic evaluation; compared to measures geared toward roads, road facilities, and vehicles, these people-oriented measures still have considerable room for improvement and exploration.

The general presumption is that most drivers try to improve on their past mistakes in order to avoid causing the same type of accident or committing the same type of violation again, but this assumption does not hold for all drivers: some demonstrate recurring accident or violation patterns. Devising effective driver-targeted measures that take specific aim at the characteristics of these recurring accidents and violations requires more than just analyses of individual accidents and violations—investigations need to focus on the accident and violation records of individual drivers.

Created in 1992, the Institute for Traffic Accident Research and Data Analysis has compiled road traffic accident statistics data and driver management data into an integrated database that allows users to examine the relationships among driver accident records, driver violation records, and the occurrence of accidents in both qualitative and quantitative terms.

This report presents examples of analyses that we performed using the Institute for Traffic Accident Research and Data Analysis’s Integrated Driver Database with traffic accident and violation records, which combines road traffic accident statistics data and driver management data, and discusses approaches to using the database in developing measures that target elderly drivers and other members of the driving population.

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2. The need for integrated driver data with accident and violation records

2.1. Road traffic accident statistics data

The Japanese National Police Agency maintains data on hundreds of thousands of traffic accidents that have resulted in personal injury or death. This collection of road traffic accident statistics data includes over 100 variables, including basic characteristics of each accident (date/time, location, weather conditions, collision configuration, and cause, etc.), the attributes of the vehicle(s) involved (vehicle type and configuration), the attributes of the individuals involved (road user type, age, and sex), maneuver, damage, and the attributes of the road where the each accident occurred. Not only does this set of data serve as the basis for yearly reports and publicity materials from government agencies and other organizations, but it also provides specialists and other individuals with resources that they can use to evaluate traffic accident conditions, assess the effects of measures and policies, and research traffic safety measures.

Many countries around the world gather road traffic accident statistics data. Although the data format and the number of variables vary from country to country (Table 1), many variables—including accident date/time, weather conditions, victim age, victim sex, road usage conditions, vehicle type, road type, and road configuration—are core pieces of virtually every country’s data tracking procedures. With efforts to define and standardize variables making continued progress, the OECD has begun to construct an integrated database of its member countries’ variables in order to facilitate international comparisons of traffic accident conditions (http://www.internationaltransportforum.org/irtadpublic/about.html).

2.2. Limits on the analysis of road traffic accident statistics data

Countries often bring in data from other databases to enrich the data that they collect on road traffic accident statistics; Japan and the United States, for example, consult databases of driving records to incorporate information on any past accidents and apprehensions/violations in the records of the drivers involved. While augmenting road traffic accident data may allow users to bring new investigation items into analyses of accidents in general, there is only so much that these enhancements can do for analyses of the drivers involved.

Given the breadth of human diversity, accident driver analyses need to classify drivers not only by sex, age, and occupation but also according to accident records and violation records for various types of incidents. Traditional approaches have allowed for analyses of the drivers involved in accidents, but the lack of any information on the general statistical population (including those not involved in accidents) has hampered efforts to make quantitative assessments of driver attributes (diversity).

Integrating road traffic accident statistics data with driver management data that includes information on driver attributes thus makes it possible to obtain information on all drivers not involved in accidents—the general population that plays an integral role in any quantitative analysis.

2.3. Prior research: the usefulness of data in the Integrated Driver Database: analysis example 1 [3]

The Institute for Traffic Accident Research and Data Analysis began by extracting a set of drivers from the driver management file at an extraction rate of 0.1% to ensure that the data volume would not exceed the performance capacities of our computers and software. The Institute then used an integrated database of accident and violation records (hereinafter the “Mini Integrated Database”) to compile the results.

Based on a subject population of 33,000 male drivers (excluding so-called “paper drivers” [people who have driver’s licenses but never actually drive]) from the Mini Integrated Database, Fig. 1 plots the number of drivers (on the y axis) versus the number of rear-end B and broadband collisions that the drivers experienced over the last five years (2001–2005) to illustrate accident distribution.

### Table 1

Comparison of accident report forms in Japan, the United Kingdom, and the United States.

<table>
<thead>
<tr>
<th>Type of report form</th>
<th>Japan Items</th>
<th>UK (STATA 20 [1]) Items</th>
<th>USA (FARS [2]) Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident report form 1 (for 1st and 2nd parties)</td>
<td>114</td>
<td>Accident statistics date, time, town, county, grid reference, # of vehicles/casualties, road type, junction detail, weather, light conditions, and road surface conditions.</td>
<td>25</td>
</tr>
<tr>
<td>Accident report form 2 (for other parties)</td>
<td>34n</td>
<td>Vehicle record type of vehicle, hit and run, age/sex of driver, and maneuvers.</td>
<td>23n</td>
</tr>
<tr>
<td>Accident report form 3 (for expressways)</td>
<td>23</td>
<td>Casualty record age/sex of casualties, casualty class, seat belt use, and severity of casualty.</td>
<td>18n</td>
</tr>
<tr>
<td>Unique items</td>
<td>Distance from victim’s house (for pedestrian/cyclist)</td>
<td>Direction of vehicle travel (N–E–S–W)</td>
<td>Height and weight of driver Emergency medical service</td>
</tr>
</tbody>
</table>

FARS: Fatality Analysis Reporting System.
MV: moving vehicle.
~n: multiplied by number of vehicles/drivers/persons.
The distributions of random incidents occurring across a certain time period are believed to follow the Poisson distribution. For comparison purposes, the Figure thus also includes lines illustrating the driver distributions that would occur if the number of accidents over the time period in question were to conform to the Poisson distribution. The number of drivers who experienced two broadside collision accidents (■) is relatively close to the corresponding Poisson distribution value (□), but the point indicating the distribution for rear-end B collisions (▲) sits higher than the point for the corresponding Poisson distribution (△). In other words, the number of drivers who experience recurring rear-end B collisions exceeds random involvement rate-based projections; this suggests that certain factors contribute to the recurrence of rear-end B accidents.

These results underline the need to think carefully about how to tailor the content and delivery of driver education programs to the types of accidents that recipients have experienced.

2.4. Prior research: the usefulness of data in the Integrated Driver Database: analysis example 2 [4]

In order to secure a larger data set, the Institute later extracted the data on the necessary driver groups for each analysis from the driver management file to enable compilation of a database that integrated accident and violation records (hereinafter the “Temporary Integrated Database”).

The Institute then set out to verify the hypothesis that drivers drive more carefully immediately after experiencing accidents. To do so, researchers extracted 43,142 individuals from the population of male drivers who were involved in accidents in 2006 (an extraction rate of 10%) and constructed a database that integrated the information on the accidents that those individuals had experienced since 1995.

Looking only at the ratios of accident involvement by accident experience in the preceding year, the ratio of drivers with accident experience is high; this apparently contradicts the above hypothesis. Expanding the scope of inquiry to assess the number of accidents attributed to drivers who had gone at least five years without an accident (“base accidents”) by accident type and the number of years that had elapsed since the base accident, however, reveals that the number of rear-end B accidents (▲) and broadside collision accidents (■). Please interchange within one year after the corresponding base accidents were 38% and 23% below their respective previous levels. These reductions in accident occurrence grew gradually smaller with time, however, eventually returning to the original incidence ratios around five years after the corresponding base accidents (Fig.2).

The results of this analysis show that voluntary efforts among drivers to correct and improve consciousness and behavior have only a limited effect on preventing accidents.

2.5. The need for complete data

Although the two prior studies uncover some interesting findings, the analysis results need to be more reliable in order to form a basis for actual policies. Analyzing a larger collection of data reduces the scope of error in the results; considering area-specific differences and diversity among the driver population, however, an effective analysis ultimately requires the use of an integrated database that covers all the drivers in Japan. In other words, not having any additional, untreated data to work with is an essential piece in demonstrating the validity of and limitations on governmental policies.

3. The Integrated Driver Database with traffic accident and violation records

3.1. Extensive, detailed data

There are two basic approaches to researching drivers’ traffic accident characteristics: using data from experiments and limited investigations or using statistical data to grasp the overall conditions. While researchers often have trouble generalizing the findings that experiments and limited investigations generate, large-scale data and total data on a target population generally render the issue of generalization irrelevant because they constitute the full extent of the data available. As discussed below, road traffic accident statistics data and driver management data also include a wide variety of variables; integrating these items allows for highly detailed analyses.

3.2. Building the Integrated Driver Database with traffic accident and violation records

After constructing the integrated database for analysis 2, the Institute for Traffic Accident Research and Data Analysis began building a full-scale Integrated Driver Database with individual traffic accident and violation records for each driver. The latest integrated database covers 61 basic driver attributes, including sex, age, and place of residence, 114 traffic accident record variables, which matches the number of items available in the road traffic accident statistics data set, and 22 violation record variables, including vehicle type and apprehension date, time, and place. In terms of volume, the database integrates the accident records (approximately 1 million per year) and violation

Fig. 1. Number of drivers by number of accidents experienced and type of accident, 2001–2005 (33,000 male drivers extracted randomly from throughout Japan).

Fig. 2. Effect of accident experience on future accident risk. (43,142 male drivers extracted from the population of drivers who caused traffic accidents in 2006, where the accident in 2006 was the accident subsequent to the base accident).
records (approximately 10 million per year) for 81 million drivers over the 19-year period from 1995 to 2013 (Fig. 3).

Analysis examples 1 and 2 used the basic items for up to approximately 70,000 drivers, extracted from the pool of all license holders, and combined that data with the corresponding accident and violation records, operating on the assumption that Excel 2003 would be the interface for database use. The effort to build the database of all drivers, however, also included the development of a special system for streamlining large-scale data processing on personal computers. Successfully compiling the integrated database of 81 million drivers in a practically feasible amount of time created a trade-off between efficiency and the potential for detailed analysis, meaning that compiling data under complex conditions would result in protracted execution times.

4. Analyzing integrated data (ex.)

4.1. Analysis methods

While we were researching accidents among elderly drivers, we realized that our discussions needed to distinguish between accident rate per period and accident rate per exposure. We thus incorporated this distinction into our approach to integrated database-driven analyses, as well. Compiling vehicle kilometerage data (a common element in evaluating exposure to road traffic) under meticulous conditions (by accident or violation record, for example) is technically feasible, but the need to protect personal information makes such efforts problematic. Therefore, we decided to derive quasi-induced exposure percentage—an indicator equivalent to exposure to road traffic—from the set of road traffic accident statistics data in accordance with research ([5] and [6], for instance) on exposure to serve as a parameter of past road traffic accidents.

The following analyses use three accident ratios.

Quasi-induced exposure (an indicator of road usage frequency; %): The ratio of the number of innocent drivers (2P) involved in vehicle-to-vehicle accidents over a certain period (one year, for example) to the total number of drivers in the corresponding group.

Accident driver ratio (an indicator of accident risk; %): The ratio of the number of drivers responsible for accidents (1P) over a certain period (one year, for example) to the total number of drivers in the corresponding group; in analyses of fatal accidents, this number represents the fatal accident driver ratio.

Relative accident ratio (an indicator of driving method danger; ratio): The ratio of the number of drivers responsible for accidents (1P) to the number of innocent drivers (2P) involved in vehicle-to-vehicle accidents; this ratio represents the number of accidents relative to road usage frequency and equates to the accident ratio per unit of driving frequency (the accident rate per vehicle kilometerage, for instance); in analyses of fatal accidents, this number represents the relative fatal accident ratio.

The three accident ratios have the following mathematical relationship.

\[
\text{Accident driver ratio} = \frac{\text{Relative accident ratio} \times \text{Quasi-induced exposure}}{}
\]

4.2. Reasons for accident-prone driving: analysis example 3 [7]

A look at the accident driver ratio by accident count and apprehension/violation count among drivers ages 25 to 34, 45 to 54, and 65 to 74 over the last five years shows that the accident driver ratio increased along with the number of incidents in all three age groups (Fig. 4).

According to the formula, having at least an elevated relative accident ratio or an elevated quasi-induced exposure percentage leads to a higher accident driver ratio. The data reveals that quasi-induced exposure percentage increased along with the number of incidents across all age groups, as was the case with accident driver ratio (Fig. 5). Meanwhile, relative accident ratio tended to be higher among young drivers in the 25–34 age group who have more accident experience and drivers.
in the 45–54 age group who have more accident and apprehension/violation experience. There appears to be no correlation between relative accident ratio and accidents or apprehensions/violations in the 65–74 age group of elderly drivers, however, given the scope of error (Fig. 6).

The fact that accident characteristics differ by age group suggests that traffic accident countermeasures need to apply a variety of approaches, not the same concepts across the board.

Elderly drivers and young/middle-aged drivers demonstrated different tendencies in the relationship between the number of past accidents/violations and the characteristics of subsequent accidents. The relative accident ratio for elderly drivers in the 65–74 age group who had zero accidents and apprehensions/violations—the lowest count possible—was still at least 3, a level comparable to or higher than the highest accident ratios in the 25–34 and 45–54 age groups. In other words, elderly citizens exhibit problems in their driving methods regardless of accident or violation history.

The results of our investigations into relative accident ratios validate the 2002 revisions to the Road Traffic Act, which specified different license validity periods: three years for all elderly drivers ages 75 and older, regardless of accident or violation history (although a slightly shorter period would be ideal, considering the effects of dementia and other health concerns in the age group), three years for other drivers with accidents or violations on their records (along with frequent opportunities for improving driving methods), and five years for drivers without any history of accidents or violations.

4.3. Changes in accident characteristics over time: analysis example 4

In order to assess how accident characteristics have changed over time, we directed our focus at male drivers in age groups split at five-year intervals. We then looked at the accident driver ratio in each age group over six-year period (2004-2006 versus 2010-2012), dividing the age groups into drivers with accident experience and drivers without accident experience in the previous three years. The figures show that accident driver ratio has decreased over the six years in all the age groups, regardless of accident experience (Fig. 7, left). Shifting our focus to relative accident ratio over the same six-year period, we found compelling differences: drivers who had no accident experience in the previous three years began to exhibit higher relative accident ratios after the age of 70, for example, while the relative accident ratios
among those with accident experience started to increase when the drivers were in their mid-50s (Fig. 7, right). We thus segmentalized the accident experience conditions and conducted an analysis to evaluate the impact of aging on relative accident ratio.

Given the connections between accident type and human factor, the idea of susceptibility to recurrence likely applies to both accident type and human factor. Fig. 8, which covers male drivers born in four different generations, shows how experiencing accidents caused by two types of human error over the preceding six years affected the relative accident ratios for accidents caused by the same types of human error over the three-year period immediately thereafter. The three-year relative accident ratio among drivers who had experienced accidents caused by distracted driving not only easily exceeded the relative accident ratio for those with no distracted driving-related accident experience but also trended upward with age across each age group. However, the three-year relative accident ratio among drivers who had experienced accidents caused by a failure to perform a safety check stayed relatively close to the ratio for those with no related experience, as was the change with age.

The differences in the recurrence of these two human factors arise from the fact that prior research delegated distracted driving as the predominant human factor for rear-end B collisions and failure to perform a safety check as the predominant human factor for broadside collisions. In other words, accidents caused by distracted driving tend to recur more often than projections of collision counts based on driving frequency (the assumed number of accidents occurring at random) suggest that they will because distracted driving arises from driving method-related issues; the recurrence of accidents caused by a failure to perform a safety check, on the other hand, tends to coincide with driving frequency (in a pattern proportional to driving frequency) rather than identify exclusively with driving methods.

The ability to produce results that define the relationships between traffic accidents and the psychological characteristics of drivers—the type of output that researchers have conventionally obtained via experimentation and investigations under controlled conditions—illustrates the usefulness of the Integrated Driver Database with traffic accident and violation records.
Sleep apnea syndrome (SAS) has emerged as a concerning cause of traffic accidents. An IATSS research project is thus using the Integrated Driver Database with traffic accident and violation records to analyze accidents that have possible ties to sleep disorders.

The most fitting classification for the human factors behind accidents attributable to drivers with sleep disorders would be “absent-minded driving,” a category that includes “falling asleep at the wheel.” As drivers with sleep disorders are more prone to having accidents than other drivers are, failing to seek medical attention makes drivers suffering from sleep disorders more likely to cause accidents on a recurring basis. In order to get a better idea of accident recurrence, we looked at the accident rates among drivers who had already caused accidents due to absent-minded driving. Our investigations showed that the relative accident ratios for accident drivers who had caused rear-end B collisions due to absent-minded driving were higher than the total relative accident ratio for the overall accident driver population (Fig. 9).

These results suggest that relative accident ratio depends on driving method; having inherently higher levels of driving frequency as a career driver, for example, is not the only factor that contributes toward accident recurrence among drivers who have already caused accidents due to absent-minded driving.

4.5. Accident record and fatal accidents: analysis example 6

Drunk driving and speeding are two forms of dangerous driving that people often see as common causes of major accidents. To delve deeper into this perception, we examined the correlation between the five-year violation records of drivers responsible for fatal accidents in 2011 and fatal accident driver ratio by the type of violation leading to apprehension. As some individual drivers have histories of apprehension for a variety of violations, we limited the scope of our investigation to drivers who have committed only the target violation under examination in order to delineate the connections between individual violation types and accident driver ratios.

According to our analysis, drivers with records of apprehension for cellular phone use while driving and driving where not permitted have higher fatal accident driver ratios than drivers with histories of apprehension for drunk driving and speeding do (Fig. 10). One could thus make the argument that the potential for fatal accidents is actually higher among drivers who commit violations by failing to pay attention.
to the cars in front of them—a behavior that often prevents drivers from being able to avoid collisions and thereby leads to a larger risk of high-speed impact—than among drivers who commit the types of violations that society has traditionally viewed as constituting high-risk behavior (Fig. 11).

However, accident driver ratio hinges on more than just relative accident ratio—it also depends on the degree of quasi-induced exposure. A look at the relationship between the quasi-induced exposure and fatal accident driver ratio of people who have been apprehended for the various violations reveals positive correlations (Fig. 12). In other words, drivers who are apprehended for cellular phone use while driving or driving where not permitted might have higher fatal accident driver ratios than those apprehended for drunk driving or speeding simply because they drive more frequently (have higher levels of quasi-induced exposure).

4.6. Characteristics not related to driving behavior: analysis example 7 [9]

In addition to providing data on accident and violation records, the integrated database also contains driver's license status information (validity, expiration, and voluntary surrender, etc.). Materials from the Institute for Traffic Accident Research and Data Analysis ([9]) show that driver's license renewal rates drop with age (Fig. 13). Looking at the data on accident driver ratios for the one-year periods immediately preceding the years in which drivers have renewed their licenses, had their licenses expire, or voluntarily surrendered their licenses, one can see that accident driver ratios of license-renewing drivers are higher than those ratios of drivers who voluntarily surrender their licenses or allow their licenses to expire through the age of 75; and the effects of accident experience likely have little to no effect on voluntary surrender in this age group. The increased ratio of voluntary surrender after the age of 75, however, suggests that accident experience begins to prompt drivers in this older age group to give up their licenses voluntarily (Fig. 14).

5. The basic approach to developing driver-targeted measures

5.1. Categorizing driver-targeted measures according to accident and violation records

5.1.1. Drivers who cause recurring accidents

Distributing drivers according to accident type and accident experience count revealed that there are certain types of accidents prone to recurrence (accidents that occur more frequently than they would under random conditions and involve the same drivers multiple times). Given these conditions, drivers who have experienced recurring accidents should not be subject to the same driver-targeted measures as other drivers—specific measures are necessary.
Drivers who have recurring accidents because of improper driving methods, for example, would benefit from educational programs that aim to correct and improve driving mistakes. Instead of just working to increase awareness by urging drivers to “be careful,” these measures should involve some kind of action—enforcing compliance with stop signs or making a point of signaling to others, for instance—to be effective. For drivers who are technically proficient but cause recurring accidents simply by virtue of driving more frequently than others, meanwhile, efforts should focus not on improving driving methods but rather on creating driver-targeted measures that encourage drivers to balance their driving hours, optimize their routes, and take other steps to adjust their driving opportunities and giving drivers the choice of driving vehicles with more extensive safety equipment.

5.2. Formulating driver education approaches according to apprehension/violation type and apprehension/violation count: detailed terms and general terms

Our analyses revealed general characteristics (general terms) and specific characteristics (detailed terms). In general, drivers are more prone to be involved in accidents when they have more accidents and apprehensions/violations on their records, regardless of accident or violation type. In more specific terms, risk per exposure (relative accident ratio) varies according to the circumstances and types of the accidents and violations that a driver has experienced.

Although both of these findings are factual, the best approach toward educating drivers would be to explain the connections between violation experience and fatal accidents in general terms or detailed terms based on each driver’s violation record.

5.3. Providing information on license possession among the elderly

Many of those who surrender their driver’s licenses voluntarily elect to do so because of accident or violation experience, not necessarily just to get access to the public transportation discounts and other benefits that voluntary license surrender grants them.

Although people with accident experience often end up causing accidents on a recurring basis, a tendency that our analysis examples also corroborate, there are probably many drivers who renew their licenses without recognizing this simple fact. Providing appropriate information that helps drivers looking to renew their licenses decide whether or not they should actually go through with renewal might help reduce the number of people who eventually have accidents or other unfortunate experiences that make them regret renewing their licenses.

Our analyses targeted Japanese males, but further research could focus on the female population, look at prefecture-to-prefecture differences, and take a variety of other approaches. Generating analysis results for a diverse set of driver attributes would shed light on the road traffic environments that different subjects encounter in different areas of Japan, helping elderly license holders make informed decisions.

6. Conclusion

This paper discussed approaches to formulating driver-targeted measures based on analysis examples and analysis results that we were able to obtain by employing a database of information on individual drivers. Road traffic accident statistics data alone would not have provided enough information to make these findings.

7. Analysis and summary

7.1. Accident experience and the three accident ratios

Accident driver ratio (the percentage of drivers who cause accidents over a certain period of time) is the product of quasi-induced exposure (an indicator of driving frequency) and relative accident ratio (an indicator of driving method danger). Bringing two possible explanations into determining the reasons for increased accident experience—higher driving frequency or driving method problems—makes for effective driver-targeted measures.

7.2. Recurring accidents: absent-minded driving and single-vehicle accidents

For the cases that we incorporated into this paper, we used the following conditions to characterize drivers who have problems with their driving methods or characteristics. Further analyses under a broader variety of conditions will help expand the list of conditions.

- At least two collisions with parked vehicles or single-vehicle accidents within the last five years.
- Drivers who have collided with a parked vehicle due to absent-minded driving while operating a freight vehicle (not including light freight vehicles).

7.3. Violation experience and fatal accidents

People who have been apprehended for cellular phone use while driving or driving where not permitted have higher fatal accident driver ratios and relative fatal accident ratios. Generally, however, a driver’s fatal accident driver ratio tends to increase with the number of apprehensions/violations he or she has.

7.4. License surrender

Enhancements to the license surrender system have led more and more elderly drivers to surrender their licenses voluntarily. Looking at the data on accident driver ratios for the periods immediately preceding drivers’ license surrender procedures, the effects of accident experience appear to have a limited effect on voluntary surrender through the age of 75 but emerge more prominently among drivers over the age of 75.

7.5. The basic approach to developing driver-targeted measures

Road users and drivers, especially, come in more shapes, sizes, and qualities than roads and vehicles do. Data analyses that account for this diversity not only help experts develop effective measures but also help the drivers subject to the measures understand what people with similar attributes are going through—resources that encourage better safety awareness and better driving methods.

7.6. The effectiveness and future of the Integrated Driver Database

The latest Integrated Driver Database with traffic accident and violation records covers the last 19 years of traffic accident and traffic violation records for all of the 81 million licensed drivers in Japan and also includes data on drivers’ places of residence and license acquisition background, making it a useful resource in building elderly driver-targeted measures around lifecycle conditions.

By providing ways to identify elderly drivers who pose minimal accident risks and offering insight into how to guide people along the path toward becoming low-risk drivers, the Integrated Driver Database will help forge proposals for elderly driver-targeted measures that include other options besides voluntary license surrender.

Terms

Rear-end B collision A rear-end collision with a standing/parked vehicle
Broadside collision A two-vehicle accident in which a vehicle impacts the side of another vehicle
1P (1st party) The driver most responsible for an accident
2P (2nd party) The driver of the first vehicle impacted by the 1P

7.6.1. Addendum
Analysis example 4 used research results from a Grants-in-Aid Science Research project (Scientific Research C: Understanding the mechanisms of how age affects driving ability through a cohort analysis of traffic accidents; H25-27); and analysis example 6 was performed to supplement a joint research project between the Institute for Traffic Accident Research and Data Analysis and the IATSS (research on methods of evaluating traffic safety policies; "Perception of traffic safety policies, 2014–2015: An analysis of recipient consciousness" performed by IATSS).

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